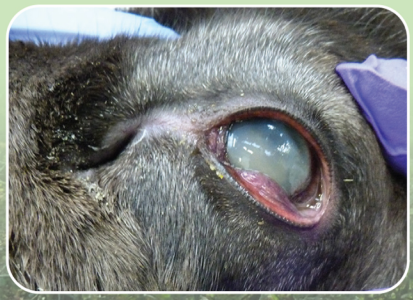
DEER VETERINARY MEDICINE

EDITED BY AIDEN P. FOSTER



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Dedication

This book is dedicated to the authors and editors of the Veterinary Deer Society book entitled *Management and Diseases of Deer* (1994), which was our inspiration. We are here today because we stand on the shoulders of these experts.

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Foreword

This book is a triumph and it is a great privilege to have been asked to write its foreword. That so many contributors could find motivation to write in their own time, in their busy lives, is a testament to their enthusiasm, especially to that of Aiden P. Foster, who has been the editor and organising force.

Its previous iteration, published in 1986, grew out of the Veterinary Deer Society, which today has been renamed as the British Deer Veterinary Association. The Society arose from a conversation that I had with Tom Alexander on the back of a trailer being pulled slowly around Studley Royal park as we tried to approach deer closely enough for me to dart them, initially with a crossbow. That crossbow was the brainchild of the inspirational and brilliant scientist Roger Short. In 1969 I had the extreme good fortune to become a member of a team from the Veterinary School at Cambridge, led by Roger, working with red deer on the Isle of Rum. As well as the wild deer, myself, Gerald Lincoln and Fiona Guinness used a group of hand-reared red deer females to elucidate their oestrous cycle and gestation length and unpick the ways in which testosterone controlled antler growth and rutting behaviour.

I cite this because it is remarkable that, until then, these basic facts were not clearly understood. In America, Caton (1877) had written a scientific treatise about deer and even speculated on their domestication and, in Scotland, Henry Evans (1890) and Fraser Darling (1937) had described the social behaviour and performance of wild red deer in the Highlands and Islands. However, it was not until our work on Rum, followed closely by that on the experimental deer farm at Glensaugh (Blaxter et al. 1974), that in-depth investigations of disease and physiology were published. It was the advent of deer farming that made such research feasible and commercially viable. This book demonstrates just how much has been learnt since that time and when at last we could get our hands on increasingly domesticated living deer.

Humans have kept deer in enclosed ‘parks’ for over two thousand years as status symbols, for sport, and sometimes for venison, but it took the development of wire fences to make actual farming possible and to create, in red deer, probably the first new domesticated livestock species for at least five thousand years (Fletcher 2001).

Most deer species are, in physiological terms, highly seasonal and adapted to northern temperate climates. Where deer and people co-exist, we have always exploited their antlers, their hides and their meat. Otzi the man preserved in ice for over 5000 years in the Austro-Italian Alps ate venison at one of his last meals, walked in deer skin shoes, wore deer hide clothing, kept his antler-tipped arrows in a quiver constructed from roe deer hide and carried an antler tool probably used to shape flints.

In fact, we talk of the Stone Age, but there was an even longer antler age. The Mesolithic flint mines at Grimes Graves in Norfolk were worked with picks made of red deer antlers. Many of these remain, discarded as worn out but still carrying handprints of the miners in the clay that covers them (Clutton-Brock 1984). Many prehistoric monuments depended on the use of antler tools and it has been calculated that each of the many mine shafts would have used up to 400 antlers each year. How were so many cast antlers found? I like to think that with good knowledge of deer behaviour stags might have been gathered by feeding them browse, such as ivy, which the deer could not reach. There is pollen evidence that ivy was being stored in human settlements (Simmons & Dimbleby 1974) and if the deer were encouraged to stay in the same area during the short period of antler casting, then collecting them before they were covered by the growth of spring vegetation would have been made very much easier. Perhaps such systems foreshadowed future deer parks.

Because deer remained largely inaccessible and only fleetingly glimpsed, they have always been fertile ground for myths and, because the antlers could be seen to regrow each year, deer became symbols of rejuvenation and longevity wherever they existed from Japan to Ireland.

And where have we come to now? The beliefs that motivated deer farming are clear: in their natural environment are not deer better adapted to seasonal climates than the alien cattle and sheep? Yet they remain wild in that they have a rut, which can be difficult to manage on farms, and they are active and carry antlers making handling and containment more expensive. However, they have not been bred and managed to the point where they are subject to the many diseases of overproduction and their meat is better suited to modern human needs than that of conventional livestock, being leaner and high in polyunsaturated fats and iron.

In the United Kingdom, most of the deer industry relates to the production of venison from farms and parks and, especially, by far the largest source, from wild shot deer. There is substantial pressure to reduce deer numbers throughout most of Britain. Notoriously difficult to count, there is no doubt that the native roe, invasive and non-native muntjac, and naturalised fallow deer, in particular, have extended their range whilst their numbers have also grown steadily for decades to reach perhaps the largest cumulative populations at any time in history. These deer are impacting agriculture, forestry and horticulture, the natural environment and causing road traffic accidents with their human toll. Several people die each year in Britain as a result of collisions with deer and many more are injured.

All the governments within the United Kingdom wish to increase woodland in order to lower net greenhouse gas emissions and reduce our dependence on timber imports. Ecologists press for the planting of native woodland to improve biodiversity. Deer of all species negatively impact on tree planting, thus venison from culled deer represents the most sustainable meat available and consumption is rising.

Wild deer provide over 95% of the venison coming to market in Britain and might be assumed to provide a much cheaper source than either farmed or park venison. However, much of this wild venison is derived from red deer in Scotland, and the costs of shooting wild deer and especially the recovery of the carcases are substantial. Across the UK market, the quality is inevitably highly variable, not least because it comes from a variety of different species as taxonomically removed from each other as cows are to sheep, yet all labelled generically, as venison. The costs of creating a hygienic, marketable product from a carcase that has been eviscerated before it has been skinned and which will usually have sustained damage from the bullet are also high. These factors combine to make farmed venison produced consistently to a uniform standard under stringent quality assurance regulations, killed humanely and processed hygienically, likely to command strong prices in a growing market.

This book wisely avoids much discussion of the worldwide industries that revolve around deer, but antlers drive much of their exploitation. To the outsider the values placed on large antlers as trophies may seem bizarre, yet for many 'hunters', who shoot deer in enclosures at close range in order to hang the trophy on the wall, the sky seems to be the limit. Some veterinarians have used artificial reproductive techniques to enable deer breeders to pursue their remorseless quest for ever heavier antlers, fostering the production of some white-tailed deer which can no longer lift their heads from the ground.

The trophy business is probably no larger than the extraordinary farming of deer in much of Asia for the production of the growing antlers harvested by amputation when the growth is at its maximum. In Russia and beyond, wealthy men drink, or even bathe in, the fresh blood as it spurts from the cut surface. The most widely traded commodity is slices of dried growing antler. This velvet is prized by the traditional Chinese medicine trade and is produced in New Zealand with very stringent welfare safeguards. Despite substantial investment, there is no very convincing peer-reviewed literature to substantiate claims of the medicinal value of velvet antlers. The same is true of the many other deer products that are marketed, including sinews, tails and fetuses. Within the United Kingdom and most of Europe, the amputation of growing antlers is illegal except where it may alleviate suffering.

It is the steady growth of the farmed deer industry that has provided the impetus for this book and stimulated the knowledge and veterinary science which also benefit the wild, park and zoo deer.

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Preface

In 1994, the Veterinary Deer Society (VDS) published the second edition of their book *Management and Diseases of Deer (A Handbook for Veterinary Surgeons)* edited by Tom Alexander and David Buxton. The book is out of print and was converted into a CD-ROM version, which is available from the British Deer Veterinary Association (BDVA).

In commissioning the current book, the primary aims were to build on the substantial content of the VDS book and to compile a series of chapters that would form a useful handbook for veterinary surgeons/veterinarians when dealing with deer. It is acknowledged that while the book is aimed at veterinary surgeons who may not know a great deal about deer – given that most veterinarians will have limited scope for undertaking deer work – that deer owners, managers, stalkers and others will find the book of interest and assistance.

There are 38 authors, including members of the BDVA committee, who have also read all of the chapters. The committee includes Gareth Boyes, Sam Ecroyd, Peter Green, Kit Heawood and Ken Urquhart. The authors are largely drawn from across the UK, with colleagues from Ireland, Sweden, Switzerland and the United States.

Deer are enclosed and managed within a variety of settings from farms to parks to zoological collections, with some kept in a manner akin to companion animals or pets. In the United Kingdom, there are six species of wild deer and many other species in zoological collections.

- The first part of the book introduces deer species and how they can be handled, restrained and managed in farms, parks and in the wild, leading onto the submission of deer carcases into the human food chain. Subsequent chapters provide overviews of the nutritional needs of deer, dealing with antlers, reproductive interventions and the needs of wild deer with particular reference to emergency situations.
- Deer are susceptible to notifiable diseases, most notably chronic wasting disease and infection with *Mycobacterium bovis* (TB). These and other notifiable conditions are discussed.
- Diseases of deer are presented using a systems-based approach (including gut, nervous, respiratory and skin) and there is an associated chapter that includes some of the important zoonotic diseases and agents that they may harbour.
- Given their importance, both here in the United Kingdom and elsewhere, there are specific chapters about muntjac, reindeer and white-tailed deer.
- Finally, there are two key chapters on postmortem examination and a drug formulary.

The aims of the book also included the inclusion of illustrations and sources of further reading and references to help provide an evidence base for dealing with situations and disease in deer.

Given the structure of the book, it is inevitable that chapters have some overlapping content. Where possible, the overlaps have been signposted and covered in the index. Readers should treat each chapter as a separate stand-alone item, albeit with potential links to several chapters within the book.

Acknowledgements

The BDVA would like to express its appreciation for the time and effort that the authors have committed to sharing their expertise in writing their chapters. There has been considerable support from prospective authors and colleagues in terms of recruiting authors and gaining access to images. I am particularly grateful to Peter Green and Jim Walsh who have shared much of their extensive collections of deer images. I am particularly grateful to David Buxton and Tom Alexander, the editors of the 1994 Veterinary Deer Society (VDS) book, also to John Fletcher, Pete Goddard and Ranald Munro, who wrote many of the chapters; they provided lots of useful contacts and advice.

While the book was in preparation, one of the leading authors of the 1994 VDS book, Hugh Reid, passed away. Hugh made a major contribution to veterinary virology and this included important research into agents that affect deer. He worked for many years at the Moredun Research Institute and his legacy is well reflected in the large group of authors who are based at the Moredun and who have provided detailed expert chapters on a variety of diseases that affect deer (and humans potentially).

My thanks go to Dominic Alexander for commenting on parts of the text and to Alun Murphy for providing information about lead analyses.

Additional specific acknowledgements in relation to the chapters are given below, including those provided by the authors.

Chapter 10 Antlers – Acknowledgements for images including Jim Walsh, Paul Rodgers, Pavel Scherer and Gemma Thorpe.

Chapter 15 Tb Serology

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Chapter 17 MCF This chapter is an update of a previous edition written by Hugh Reid, whose contribution to MCF research was considerable. The structure of the article and much of the background was Hugh's, while the more modern aspects were added by the current authors.

Chapter 26 Skin – For the provision of images and advice Gareth Boyes, John Fletcher, Toby Floyd, Mark Fox, Peter Green, Pavel Scherer, Ken Urquhart and Richard Wall.

Chapter 30 Muntjac

The late Donald Chapman initiated the field studies that gave rise to these data, setting up the project with permission of the Forestry Commission. After his untimely death in a road traffic

accident in 1982, overall supervision of the field studies was undertaken by Professor Stephen Harris, who supervised several PhD students undertaking ecological research in the study area. The authors acknowledge the invaluable input of Mick Claydon, Cathy Claydon, Diane Blakely and the many volunteers who participated in the flushing, netting and processing of the deer. The authors are grateful to John Cooper and Andrew B. Forbes for their involvement with the collection of samples and to Sam Pearce for assistance with statistical analysis.

Photographs

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List of Tables

List of Illustrations/Images