

Book Reviews

Gracey's Meat Hygiene, Eleventh Edition

Edited by DS Collins and RJ Huey (2015). Published by Wiley-Blackwell, 9600 Garsington Road, Oxford OX4 2DQ, UK 352 pages Hardback (ISBN 978-1118650028). Price £89.99, €121.50.

This is the 11th edition of a book that has become the standard text in its field, and it has undergone significant revision since the 10th edition was published in 1999. The book is published in a larger format, on high-quality paper and with plenty of illustrations, many in colour.

The 758 pages of the 10th edition have been reduced in the larger-format 11th edition to 329, mainly by the elimination of the very detailed chapters on diseases of animals which, as the preface points out, are covered more comprehensively in other texts. On the other hand, the previous material on occupational hazards has been expanded into a very useful chapter on health and safety in meat processing. This is a valuable addition, given the high rate of accidents and injury in the meat industry and the scope for litigation against employers or veterinarians who may be unaware of their responsibilities in this area. The chapters on plant sanitation and microbiology have been updated, and a new chapter has been added on residues of veterinary medicines and contaminants.

Much of the revision is a reflection of the radical changes since 1999 in European legislation on meat hygiene and animal welfare. These include a move to place more responsibility for compliance with the legislation and its enforcement on management instead of on public authorities, which is covered in new material in this edition on topics such as system controls, standard operating procedures and Integrated Food Safety Management.

This edition seems to contain fewer references to American practices and procedures than the previous one and more to the European Union (EU) legislation. This is appropriate in a British text covering topics that are now legislated almost, but not completely, at EU level, but for the non-EU reader it may be confusing to be told, for example, that "All those who transport livestock in connection with an economic activity must do so in accordance with the requirements of EU Regulation 1/2005."

The first page of the chapter on 'The food animals' should be revised for the next edition. It contains the statement that "There appears to be little doubt that the dangers of trichinosis and of *Cysticercus cellulosae* were recognised 1,400 years before the birth of Christ." On the contrary, there is every doubt, since the lifecycles of these parasites were not elucidated until the middle of the 19th century. In any case, if the consumption of pigmeat had been banned to prevent the transmission of zoonoses, the consumption of other species would also have been banned for the same reason. In fact, it is now considered that it was the keeping rather than the eating of pigs that was the problem. Pastoral nomadic people could not easily herd pigs and provide them with the shelter and wallows they need in the

arid Near East, and when the semitic tribes settled, and developed agriculture, pigs were in competition with them for grains and tubers. The bans imposed by Jewish and Muslim authorities were almost certainly motivated by ecological rather than epidemiological factors.

Another anomaly on the first page is the bland statement that 'the Creator' made the domestic animals and decided that they would make suitable food for man. Creationism has no place in a scientific textbook; it would be more interesting and informative to replace the biblical references with a reference to a publication on the evolution of domesticated animals.

There are some interesting comparisons made between animal husbandry practices in the UK and continental Europe. For example, cattle and sheep are routinely castrated in the UK but not on the continent, and the authors give some convincing reasons to doubt the traditional explanations given for the UK practice. On the other hand, the castration of pigs is less common in the UK than on the continent, where pigs are slaughtered at a slightly higher weight and boar taint is considered to be a problem if they are not castrated. It would have been interesting to have some more information on the causes, prevention and even the perception of boar taint, which is given only a fleeting mention.

The well-illustrated chapter on the anatomy of the food animals has been retained, and its layout improved. However, at the end of this chapter there are sections on the 'Debasement of food' (adulteration and substitution), on ingredients used for this purpose and on 'Food tampering'. These sections seem out of place in a chapter on anatomy and would be more appropriately added to one of the chapters on meat hygiene practice or controls on residues. In addition, the section on the debasement of food begins with a paragraph on the EU Standing Committee on the Food Chain and Animal Health which is out of place here.

The chapter on 'Meat establishment construction and equipment' contains in its introduction the advice that "the overall number and siting of abattoirs in any country should be geared closely to the demands of livestock production", particularly to keep animal transport times to a minimum. This is indeed a laudable aim, but it is difficult to see how such an ambition can be achieved in a free-market economy. This chapter (chapter 3) includes a section on lairage construction for the different species, with a cross-reference to chapter 6 ('From farm to slaughter') which also has a section on lairage construction, with a cross-reference back to chapter 3. It would have been preferable to put all the requirements for the construction and operation of lairages together in one chapter. It would have made for a more coherent presentation and would have prevented, for example, the contradiction between the statement in chapter 3 that a fine water spray is useful in reducing fighting among pigs, and the statement in chapter 6 that "research work has failed to demonstrate that sprays actually reduce fighting".

A surprising omission from chapter 3 is any consideration of the use of CCTV in slaughterhouses, particularly in the lairage and stunning/slaughter areas. The use of CCTV is not legally required, but it is a very valuable tool in monitoring the welfare of animals at slaughter. A study published by the UK Farm Animal Welfare Committee in February 2015 revealed that all of the major food retailers in the UK require their supplying abattoirs to install it. By 2013, 43% of red meat slaughterhouses and 55% of poultry meat slaughterhouses had installed it, and the number has probably increased since then. These slaughterhouses account for around 90% of red meat and nearly 100% of poultry meat production, so the practice clearly merits a mention in this book.

In the chapter on 'Plant sanitation' there is an interesting paragraph on the scotoma (blindspot) effect in relation to plant hygiene. This is the phenomenon whereby those who work every day in a meat plant become 'blind' to hygiene faults which are immediately apparent to third party inspectors. This is a real problem, and it applies equally to animal welfare defects as to hygiene defects. Plant operators can be surprised to be told that it is not inevitable that animals have to be prodded and beaten to persuade them to move, or that poultry entering a water-bath stunner are subjected to pre-shocks, since these are their everyday experiences which they assume are normal and inevitable.

Chapter 6 is an excellent updating of the equivalent chapter in the 10th edition, recognising that that the Western consumer seeks "traceable, guaranteed safe and wholesome, environmental and animal-welfare friendly" meat.

This chapter rightly emphasises the vital importance of good stockmanship in ensuring that the welfare of animals is safeguarded on farms, during transport and at the slaughterhouse. An interesting observation is that the award of bonuses to drivers where meat quality after transport meets a certain standard, or deductions for failing to meet 'dead on arrival' targets or a certain level of bruising, can lead to dramatic improvements in animal welfare. Given that poor handling in lairages is as much to blame as poor transport for injuries, stress and consequent downgrading of carcasses, it might be worthwhile for operators to consider similar carrots and sticks for lairage workers.

The section on the assessment of an animal's welfare is a welcome addition to this chapter, and could usefully be expanded in future editions.

This chapter includes an inset on the role of advisory bodies and charities whose work is relevant to the welfare of animals on farms, during transport and at slaughter. It is an extremely useful summary and source of references to websites, but there are a couple of places in which it is out of date.

One is in relation to the Council of Europe. The invaluable work done by the Council of Europe over several decades in the field of animal welfare was unfortunately brought to an abrupt halt in 2010 for budgetary reasons. While understandable, given the financial constraints on its member states and the priorities for humanitarian work, it is most regrettable that the practical advice it produced, especially

for members with little tradition or knowledge of animal welfare, is no longer being continued.

The other is the less important change of name of the UK Farm Animal Welfare Council to Farm Animal Welfare Committee, a victim of the UK Government's 'bonfire of the quangos', or at least of their names. As it remains 'FAWC', the web address has not changed.

In the introduction to the chapter on 'Humane slaughter', there is a quote (Thorpe 1965) from a UK Government report of the time which is no longer necessary in the light of advances since then in animal welfare science. It contrasts the errors of assuming on the one hand that the 'feelings and anxieties' of domestic animals are essentially the same as those of humans, or on the other hand that animals are mere automata. No serious person takes either of those extreme positions today and this observation is only of historical interest. It is certainly not helpful in deciding what constitutes "avoidable pain, distress or suffering", as the EU legislation puts it.

Nevertheless, this chapter has undergone extensive, useful and informative revision since the 10th edition. It gives a comprehensive account of the current requirements for humane slaughter and of the most up-to-date methods for achieving it.

This chapter contains requirements for the humane slaughter of poultry, which are also covered in the later chapter on 'Poultry production, slaughter and inspection'. It would be preferable to bring all of the information on stunning of poultry together in one place, and to go into more detail on the dilemma between efficient stunning or killing, and meat quality defects resulting particularly from the use of electric currents at the higher end of the recommended range.

The same remark with respect to consolidation could be made about the section in this chapter on the 'Slaughter of minor species', given that much of the material is repeated in the later chapter on 'Exotic meat production'. In both of these chapters, the stunning of rabbits by a blow to the head is mentioned, and in the later chapter it is described as 'permissible'. Under EU legislation, this is not permissible for any species in slaughterhouses except as a back-up to stunning.

The section which in the 10th edition was headed 'Religious slaughter' is now more accurately referred to as 'Slaughter without pre-stunning', since not all religious requirements in respect of slaughter preclude stunning. This topic is even more controversial today than it was in the 1990s, and in an apparent attempt to be even-handed, the authors introduce this section with two highly dubious statements.

They cite the conclusion of FAWC that slaughter without pre-stunning is "unacceptable since, even under ideal conditions the basic principles that pre-slaughter handling facilities should minimize stress and that unconsciousness should be induced without stress were not satisfactorily observed". They then make the statement that the same accusation could be made about other accepted slaughter techniques. Perhaps that accusation could be made, but it could not be sustained. It is true that conventional restraint, stunning and slaughter may sometimes be performed in a manner less than optimal, but under 'ideal conditions' handling should cause little or no stress and unconsciousness can be induced instantaneously.

The other dubious statement made here is that there is room for considerable argument as to the pain caused by the cut itself. For the cut to be painless all of the tissues of the neck would have to be devoid of pain receptors at the point of the cut, which they are not. In any case, the next paragraph of the text cites a New Zealand study demonstrating that that the cut is associated with “substantial noxious stimulation that would be expected to be perceived as painful”.

The other arguments that have been used in the past to justify slaughter without pre-stunning are demolished in this book, including the claim that bleeding is more complete, which it is not, and that the loss of consciousness is immediate, which it is not. If this practice is to be allowed to continue it should at the very least be accompanied by requirements for a post-cut stun (opposed by religious authorities when it was proposed for EU legislation and a Council of Europe Recommendation) and labeling of all of the meat to the final consumer.

In conclusion, despite the need for some consolidation of sections and some updating, this remains an excellent basic text on both meat hygiene and the welfare of animals for slaughter. It is to be hoped that we don't have to wait another 16 years for the next edition.

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The Animal Trade

CJC Phillips (2015). Published by CABI Nosworthy Way, Wallingford, Oxfordshire OX10 8DE, UK. 208 pages Hardback (ISBN 978-1-78064-313-7). Price £67.50, €90.00, \$US 112.50.

Clive Phillips starts his book by pointing out that, although some long-distance animal trade has occurred for thousands of years, large-scale international trade in food animals is very recent and exponentially expanding. He also finds somewhat obscure parallels between animal migration, human migration and long-distance trade. However, his comparison between the arguments used to justify the Australian live export trade and those used in the 18th and 19th centuries to defend slavery is particularly telling. Although the author does not say that he finds these trades morally equivalent, he does emphasise the extent to which people will seek to justify their own financial benefit without always considering the moral costs of the enterprise. The biggest cost of the live animal trade is the poor welfare of the animals that would not occur if carcasses were exported.

Figures are presented to explain that some international animal trade is the result of what we already know to be, in the long term, a very inefficient agricultural practice. Chicken production in Brazil is enormously greater than the demand for chicken in Brazil because millions of tonnes of

chicken meat are exported. Almost all of this export is to rich countries so it is not doing much to alleviate food shortages. Growing maize and soya for chicken production is 2.5 to 5 times less efficient in energy terms than for humans to consume the plant material directly. Of course, the fault here is with the consumers in Europe, North America and South-East Asia as much as with the producers in Brazil. Reference in the book to environmental consequences of Amazonian production is somewhat misleading nowadays, as Brazil now enforces one of the most advanced conservation laws in the world. In most of Amazonas, all land-owners (over 50 ha) have to keep 50–80% of their land with natural vegetation and in already developed areas of Brazil it is at least 20%.

Examples of trade restrictions of various kinds, and their impact on international animal trade, are presented in an interesting way in a chapter of this book. In addition, the real costs of animal production and animal transport are addressed. One of the costs that is mentioned, but which has major animal welfare consequences and merits more extensive coverage, is disease transfer. This is of rapidly increasing importance in relation to plant and animal export.

The author's recent work on the welfare of livestock during long-distance live animal transport by sea contributes significantly to an interesting chapter on this subject. One key aspect of this is the lack of welfare checking systems, especially in the countries to which animals are exported. A problem for researchers on the welfare of animals during loading onto ships, during the many weeks of travel, and during the unloading in destination countries, is that the members of staff know that the study is being carried out and the worst practices are likely to be avoided. As the author mentions, filming of what happens by undercover investigators has given some more honest information and has resulted in the production of videos that have later been shown on television in the exporting country. Such videos increase the pressure on politicians to regulate or ban the trade.

Most of the book concerns long-distance animal export and international trade in meat products. However, there are also short sections on trade in horses, cats, dogs, exotic animals, marine animals, kangaroos and bush-meat. Whilst these sections are interesting, they are different from the rest of the book. They look a little out of place because the book does not comprehensively cover trade in animals and animal products. Despite such minor points, overall the book is readable and informative. It challenges the views of many people in ways that could lead to changes resulting in better welfare of animals and more efficient use of world resources.

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