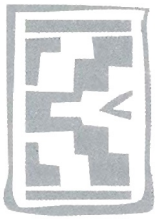

Book reviews

Manual of standards for diagnostic tests and vaccines. *Office International des Épizooties.* English, 2000. ISBN 92-9044-510-6 957 pp. Price 120 euros

The 2000 OIE manual of standards for diagnostic tests and vaccines has a hard cover and has been expanded by some 200 pages. The standard format has been retained and a new section, dealing with the role of official bodies in the regulation of veterinary biologicals, has been added to the introductory chapters.

List A diseases remain unchanged, but trichinellosis has been moved from the List B diseases of swine to those affecting multiple species. In addition, mange has been moved from List B diseases of equines and placed under diseases not covered in the code, together with a *Tropilaelaps* infestation parasitic disease of honey bees.

The section listing the OIE reference laboratories now also includes those experts dealing with diseases of fish, molluscs and crustaceans, taken from the Aquatic Animal Health Code.

There is a well laid out introduction that is very useful for first-time users, as it explains the arrangement of the manual, the format of the chapters, the tests described and the information on the list of OIE reference laboratories. A useful table summarises the diseases according to their listing status and provides a quick reference to the tests acceptable for international trade. It is unfortunately not clear from this table what action should be taken when there are no prescribed tests for international trade. Guidelines in this regard would be useful. A short summary at the start of each chapter indicating the reference laboratories and accepted tests for international trade for the disease would have added value. In general, the bibliographies at the end of each chapter are particularly well presented and complete, and the co-ordinators are to be congratulated. More references, however, would have added value to the chapter on foot and mouth disease (FMD).

There are introductory chapters covering the following topics: sampling methods; quality management in veterinary diagnostic laboratories; principles of validation of diagnostic assays for infectious diseases; tests for sterility and freedom from contamination in biological materials; human safety in the veterinary microbiology laboratory; principles of veterinary vaccine production; biotechnology in the diagnosis of infectious diseases and vaccine development; and the role of official bodies in the international regulation of veterinary biologicals. There are a few points that require clarification in the chapter on sampling methods, which is on the whole most informative. The difference in procedure to be followed when sending samples to a laboratory immediately or when there is a delay is not clear. The reference to bottles for serum samples may be confusing, as vacuum tubes are almost invariably used. An important element has been omitted from the information that should be sent with specimens for diagnosis, namely the total number of animals on the affected premises. The death of 30 out of 30 animals has very different implications from 30 out of 3 000! When a controlled disease is suspected, prior notification should be given and a person identified who will receive the specimens. The chapter on quality management is a good introduction to a most important subject. The remaining chapters likewise offer useful summaries of the important topics they cover.

Almost all the bibliographies have been expanded to include many new references dealing mainly with molecular diagnostic techniques and, in some cases,

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with new vaccines. Particularly the chapters on porcine reproductive and respiratory syndrome (PRRS) (currently not in the Code), bovine spongiform encephalopathy (BSE) and viral haemorrhagic disease (VHD), renamed rabbit haemorrhagic disease (RHD), include some 30 new references each.

There has been one major viral reclassification since the 1996 Code. A new order Nidovirales has been created, containing two families, Arteriviridae and Coronaviridae. The former is of interest because it contains the viruses of PRRS and equine viral arteritis (EVA). The formal naming of African swine fever (ASF) virus as the only member of the genus *Asfivirus* and the family Asfarviridae is not yet captured in the chapter on ASF. Among the new viruses mentioned are the pathogenic Type 2 bovine viral diarrhea (BVD) virus, a new apathogenic rabbit calicivirus (RCV) that must be differentiated from the calicivirus causing RHD and the new Australian bat lyssavirus included as genotype 7, increasing the molecular diversity of that genus.

Among the wide variety of diagnostic techniques, many presented in an easy-to-follow stepwise form, are polymerase chain reactions (PCR) for virtually all the viral diseases, with a bluetongue PCR probably the first to be prescribed for international trade. Tests prescribed for international trade are highlighted where applicable. Newcastle disease (NCD) is now clearly defined, as are the parameters required to classify an isolate as velogenic. The biological tests in eggs and chickens used to calculate pathogenicity indices can now be replaced by a RT-PCR of the FO cleavage site as a routine test for virulence, improving the speed of reporting NCD outbreaks. All the methods currently available to diagnose FMD are described, but detail on nucleic acid recognition, the use of sequencing, and the use of monoclonal antibodies to identify virus is lacking. While the current relevant serological tests for FMD used for international trade, namely the liquid phase blocking ELISA and the virus neutralisation test, are described in detail, flow diagrams and diagrams of the plate layouts would have been beneficial. Inclusion of the serological tests using non-structural proteins that can distinguish between vaccinated and infected animals has enhanced the FMD chapter. Although these tests have not been fully validated, the importance of their contribution in the past to assist eradication and, in the recent FMD outbreaks in South Africa, to detect subclinical spread of the disease, should not be underestimated. The manual makes it clear that these tests are herd screening tests and should be interpreted as such.

New vaccines tend towards subunit and marker vaccines, the latter to distinguish between vaccination and natural exposure. Among new viral vaccines, some experimental, are a fowlpox vaccine expressing the H5 and H7 antigens of avian influenza; an E2 marker vaccine for classical swine fever; a deletion mutant IBR marker vaccine; a live A/Equi 2 influenza vaccine for intranasal use; a second inactivated EVA vaccine; a new inactivated duck virus enteritis vaccine; an experimental recombinant myxomavirus expressing RHDV protein to confer protection against both rabbit diseases, and an experimental E2 marker vaccine for BVD. New technology to deliver live IBD (Gumboro) virus into 18-day incubated eggs as a vaccination strategy is described. There is also a recommendation that A/Equi 1 be removed, leaving a monovalent equine influenza vaccine.

With respect to bacterial diseases, the 2000 manual is a substantial improvement on the previous edition. The number of bacterial diseases described has remained the same, but each chapter has been greatly expanded. Outdated methods have been omitted or mentioned only briefly, and recommended tests are described in much greater detail, whereas in previous editions the reader was often referred to the original publications, which were not always easily accessible. This edition gives greater coverage of all tests, and emphasises the recommended tests for international trade. Reasons are also given why certain tests are not recommended, for example general serology for *Salmonella*, since testing for antibodies to approximately 2 500 types is impractical. Rational alternatives are suggested.

For laboratories not involved in the import/export trade or vaccine production, this volume provides a useful and up-to-date textbook for the identification of animal diseases. Recommended tests are highlighted and the reasons given for recommendation, while useful but not entirely specific tests, are discussed with suggestions on how to proceed further. There are many tips on how to isolate bacteria from poor specimens, for example bone marrow is a good source of septicaemic bacteria from old, rotting carcasses or when only bones are available. There is a detailed description of propagation of the gamma phage of anthrax and correct aging of the M'Fadyean strain. Practical methods to limit interference by normal flora when culturing *Taylorella* (CEM) are described.

Knowledge of bacteria has increased logarithmically in the last decade, mostly owing to the employment of molecular techniques. A number of these methods are included in the text, as well as the required primers, e.g. for *Bacillus anthracis* and *Brucella*.

The newer names of bacteria have been incorporated, e.g. the agent of glanders is now *Burkholdea mallei*. *Chlamydia psittaci* has become *Chlamydophila abortus* and, based on sequence analysis, the family now contains nine species in the two genera *Chlamydia* and *Chlamydophila*.

Other useful additions are the inclusion of more laboratory safety precautions, as well as which tests are

dangerous to perform and why they should be avoided if at all possible. Sources of materials such as test kits, sera, media, and strains are noted.

A few typographic and editorial errors were noted, particularly in the chapters on mycobacterial diseases.

This issue of the OIE manual, which is already being updated for release of the next edition in 2004, is an exceptional volume. It is essential reading for scientists involved in the diagnostic and research disciplines and for officials involved in certification for import/export of animals and genetic products destined for the international market. For the bacteriologist, the manual is so useful that one could wish for a similar one for all bacteria, and not only those listed by the OIE.

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Mycobacterial infections in domestic and wild animals 2001. Manning, E.J.B. & Collins M.T. (co-ordinators). *Revue Scientifique et Technique. Office International des Epizooties.* ISSN 0253-1933, ISBN 92-9044-519-X. 20(1) 350 pp.

In this well referred compilation of review articles by leading researchers the different aspects of mycobacterium infections in domestic and wild animals are described. Many of the papers highlight the advances made in molecular characterization of these bacteria that has enabled improvements in the study of epidemiology and the diagnosis, as well as advances made in understanding the pathobiology of mycobacterial infections. All the papers have been written in English with abstracts in French and Spanish. This book is a useful reference for anyone who is interested in mycobacteriosis of all animals, both researchers and veterinarians alike.

The mycobacteria: an introduction to nomenclature and pathogenesis—N. RASTOGI, E. LEGRAND & C. SOLA

This is an introductory paper reviewing the current knowledge on the anatomical structure, phenotypic and more the precise genotypic taxonomy as well as cellular and molecular pathogenesis of the mycobacteria. The unique cell wall in relation to its permeability to antimycobiotic agents and the role the capsules of virulent mycobacteria play in intracellular survival in macrophages is discussed. Tables are provided of identified *Mycobacterium* species. The phenotypic ways in which this group is identified and the genetic relatedness of mycobacterial infections are described. The interaction of some *Mycobacteria* species and the different components of the immune system are reviewed.

[192 references]

Treatment of mycobacterial infections—W.W. BARROW

This paper describes the difficulty in treatment of mycobacterium infections due to the impermeability of the bacterial cell wall and the fact that it is an intracellular parasite that has altered physiology in its active and dormant states. The mode of action and activity of the various antimycobiotics are compared as well as drug delivery systems that allow the delivery of medicines to target cells and increase the treatment interval.

[133 references]

***Mycobacterium bovis* infection and control in domestic stock—D.V. COUSINS**

This is an overview of the epidemiology and prevalence of *M. bovis* infections in cattle, pigs, goats, camelids, horses, sheep, dogs and cats. Different control schemes including disease monitoring are critically evaluated using the successful control campaign in Australia as a model. In countries where test and slaughter schemes are not feasible the possible future use of vaccination is discussed.

[84 references]

***Mycobacterium bovis* in free-living and captive wildlife farmed deer—G.W. DE LISLE, C.G. MACKINTOSH & R.G. BENGIS**

This paper reviews the epidemiology and the role wild animals, be they maintenance or spill-over hosts, play in the transmission of *M. bovis* to domestic ani-

mals. The role of bushtailed possums, ferrets and deer in New Zealand, badgers in the United Kingdom and Ireland, African buffalo and greater kudu with spill-over into wild carnivores in Africa, water buffalo and feral pigs in Australia, bison and deer in North America and feral pigs in other countries are described in detail. Also highlighted are the difficulties of control of infections in wildlife. The authors present an overview of disease due to *M. bovis* in captive primates and farmed deer.

[111 references]

Vaccination of animals against *Mycobacterium bovis*—M.A. SKINNER, D.N. WEDLOCK & B.M. BUDDLE

The test and slaughter policy is not always feasible in wild animals and in some countries in livestock due to economic and political constraints. Hence the need to develop effective vaccines and practical delivery systems. The authors review challenge models for the different target animal species, the processes involved in the immunity to mycobacteria, vaccines currently available or under investigation, from the live BCG vaccine to recombinants and DNA vaccines. Novel vaccine delivery systems, especially for oral vaccines are discussed. From the information provided in this paper it is apparent that the development of safe, cost-effective and potent vaccines are imperative for the future control of *M. bovis* infections.

[161 references]

***Mycobacterium avium* subsp. *paratuberculosis*: pathogen, pathogenesis and diagnosis—E.J.B. MANNIN & M.T. COLLINS**

Paratuberculosis has become an increasingly important disease of ruminants, especially in countries that have eradicated or have a low prevalence of *M. bovis* infections. The authors review the ecology of this hardy but fastidious bacterium, the transmission, age and species susceptibility, pathogenesis, clinical signs and pathology in cattle, sheep, goats, bison and cervids. Since it is a chronic disease where only a few infected animals exhibit clinical signs in late disease, the diagnosis of infected animals is critical in its control. The different diagnostic tests are critically evaluated and research into the development of an assay to detect circulating antigen 85 produced by *M. paratuberculosis* is discussed. A motivated need to further investigate whether this agent can be transmitted to humans is presented.

[162 references]

Control of *Mycobacterium avium* subsp. *paratuberculosis* in agricultural species—D.J. KENNEDY & G. BENEDICTUS

There is some overlap with the previous paper in certain sections such as the epidemiology and clinical signs in different animals. However, these authors go on to present the prevalence of this disease and analyze the direct and indirect losses that may be incurred. Different control strategies are considered to be related to the management situation, relative importance of the disease to the livestock industry in that area and diagnostic/surveillance methods available. The authors critically evaluate the different methods used to control disease in disease-free and endemic areas such as the use of disease zoning with the restriction of movement of ruminants in disease-free areas. In endemic areas the removal of infected animals, reduction of exposure of susceptible animals to infection and vaccination are discussed. The differences in national paratuberculosis control activities in countries throughout the world are briefly reviewed.

[202 references]

Mycobacteriosis in birds—L.A. TELL, L. WOODS & R.L. CROMIE

All aspects of avian tuberculosis caused primarily by *M. avium* subsp. *avium* and the newly described highly virulent *M. genavense* are reviewed. This includes bird host range, direct and indirect sources of infection, zoonotic potential, immunology, clinical signs in different susceptible bird families, diagnostic methods both in live bird and at necropsy and control. [164 references]

***Mycobacterium leprae* and *Mycobacterium lepraemurium* infections in domestic and wild animals—O. ROJAS-ESPINOSA & M. LØVIK**

Since *M. leprae* is essentially a disease of humans, with rare infections of non-human primates and armadillos, the disease in humans is described. The authors present an informative and well-illustrated review of its immunology and how this knowledge can be applied to vaccine development and immunotherapy. Animal experimental models and natural infection in animals are described. The second half of the paper reviews *M. lepraemurium* infections in rodents and cats and evaluates the use of infection in mice with this agent as an animal model for leprosy in humans.

[288 references]

***Mycobacterium ulcerans* in wild animals—F. PORTAELS, K. CHEMICAL, P. ELSEN, P.D.B. JOHNSON, J.A. HAYMAN, J. HIBBLE, R. KIRKWOOD & W.M. MEYERS**

Buruli ulcer, a tropical ulcerative cutaneous disease in humans is reviewed. This paper presents both old and novel theories on the transmission of this organism which like the toxin it produces is unique. The authors discuss experimental infections in animals and

a few rare natural infections in koala bears, bush-tailed possums and an alpaca.

[51 references]

Mycobacterial infections in domestic and wild animals due to *Mycobacterium marinum, M. fortuitum, M. chelonae, M. porcinum, M. farcinogenes, M. smegmatis, M. scrofulaceum, M. xenopi, M. simiae* and *M. genavense*—H. BERCOVIER & V. VINCENT

The authors review the epidemiologies, the agents, clinical presentations and lesions, experimental diseases, diagnoses and treatments of this varied group of saprophytic mycobacteria known either as non-tuberculous mycobacteria (NTM) or mycobacteria other than tuberculosis (MOTT). This group contains important fish pathogens and opportunistic pathogens of animals and humans. Useful descriptions are provided of the laboratory identification of each organism, it is, however, essential that Table IV in the first paper in this book be used as a guide.

[275 references]

***Mycobacterium tuberculosis* in zoo and wildlife species—R.J. MONTALI, S.K. MIKOTA & L.I. CHENG**

The authors briefly review human tuberculosis or especially captive non-human primates, elephants, wild ungulates and psittacine birds. Of additional interest is the surveillance and control/treatment programme of this disease in elephants in the United States of America. Although *M. tuberculosis* is essentially a human pathogen, the authors present evidence for infected wild animals infecting humans.

[78 references]

The *in vivo* and *in vitro* diagnosis of *Mycobacterium bovis* infection—L.G. ADAMS

In this very useful adjunct to the two papers on bovine tuberculosis, the author critically evaluates the different diagnostic methods and tests, incorporating not only traditional methods but also more recently developed technologies.

[151 references]

Epidemiology of selected mycobacteria that infect humans and other animals—D.A. ASHFORD, E. WHITNEY, P. RAGHUNATHAN & O. COSIVI

This review is essentially for readers who want to read a brief overview of the agent, disease and epidemiology of infections with *M. bovis, M. ulcerans, M. leprae* and *M. avium* complex in humans. For detailed information, it is essential that other papers in this book be read as well as other review articles.

[156 references]