

CONTRIBUTORS

CONTRIBUTORS AND PROFESSIONAL ADDRESS AT TIME OF WRITING

The chapters in the Terrestrial Manual are prepared by invited contributors (OIE Reference Experts, where possible). In accordance with OIE standard procedure, all chapters are circulated to OIE Members for comment. The OIE Biological Standards Commission and the Consultant Editor then modify the text to take account of comments received, and the text is circulated a second time as the final version that will be presented for adoption by the World Assembly of Delegates to OIE at the General Session in May of each year. The Terrestrial Manual is thus deemed to be a OIE Standard that has come into being by international agreement. For this reason, the names of the contributors are not shown on individual chapters but are listed below. The Biological Standards Commission greatly appreciates the work of the following contributors (address at the time of writing):

- | | |
|--|---|
| 1.1.1. Management of veterinary diagnostic laboratories | Dr T. Drew
Australian Centre for Disease Preparedness,
CSIRO, 5 Portarlington Road, Geelong, Victoria
3220, Australia. |
| 1.1.2. Collection, submission and storage of diagnostic specimens | OIE <i>ad hoc</i> Group on Biosafety and Biosecurity in Veterinary Laboratories |
| 1.1.3. Transport of biological materials | OIE <i>ad hoc</i> Group on Transport of Biological Materials |
| 1.1.4. Biosafety and biosecurity: standard for managing biological risk in the veterinary laboratory and animal facilities | OIE <i>ad hoc</i> Group on Biosafety and Biosecurity in Veterinary Laboratories |
| 1.1.5. Quality management in veterinary testing laboratories | Dr A. Colling
Australian Centre for Disease Preparedness,
CSIRO, 5 Portarlington Road, Geelong,
Victoria 3220, Australia. |
| 1.1.6. Principles of validation of diagnostic assays for infectious diseases ¹ | Dr R.H. Jacobson (retired)
27801 Skyridge Drive, Eugene, Oregon 97405,
USA.

Dr P. Wright (retired)
Aquatic Animal Health, Fisheries and Oceans
Canada, 343 University Avenue, Moncton,
New Brunswick E1C 9B6, Canada. |

1 This chapter was updated by consensus of the OIE *ad hoc* Group on Validation of Diagnostic Assays.

- 1.1.7. *Standards for high throughput sequencing, bioinformatics and computational genomics*²
- Dr S. Belak & Dr F. Granberg**
Swedish University of Agricultural Sciences,
Department of Biomedical Sciences and
Veterinary Public Health, P.O. Box 7036, 750 07
Uppsala, Sweden.
- 1.1.8. *Principles of veterinary vaccine production*
- OIE Collaborating Centre for Veterinary Medicinal Products, Anses Fougères, France**
- 1.1.9. *Tests for sterility and freedom from contamination of biological materials intended for veterinary use*
- Dr A. Colling & Dr K. Newberry**
Australian Centre for Disease Preparedness,
CSIRO, 5 Portarlington Road, Geelong,
Victoria 3220, Australia.
- 1.1.10. *Vaccine banks*
- OIE *ad hoc* Group on Vaccine Banks**
- 2.1.1. *Laboratory methodologies for bacterial antimicrobial susceptibility testing*
- Dr D. White**
US Food and Drug Administration, Center for
Veterinary Medicine, Office of Research, 8401
Muirkirk Road, Laurel, MD 20708, USA.
- 2.1.2. *Biotechnology advances in the diagnosis of infectious diseases*
- Dr S. Belak³**
Swedish University of Agricultural Sciences,
Department of Biomedical Sciences and
Veterinary Public Health, P.O. Box 7036,
750 07 Uppsala, Sweden.
- 2.1.3. *Managing biorisk: examples of aligning risk management strategies with assessed biorisks*
- OIE *ad hoc* Group on Biosafety and Biosecurity in Veterinary Laboratories**
- 2.2.1. *Development and optimisation of antibody detection assays*
- 2.2.2. *Development and optimisation of antigen detection assays*
- 2.2.3. *Development and optimisation of nucleic acid detection assays*
- 2.2.4. *Measurement uncertainty*
- 2.2.5. *Statistical approaches to validation*
- 2.2.6. *Selection and use of reference samples and panels*
- 2.2.7*. *Principles and methods for the validation of diagnostic tests for infectious diseases applicable to wildlife*
- OIE *ad hoc* Group on Validation of Diagnostic Assays**
- *OIE *ad hoc* Group on Validation of Diagnostic Tests for Wildlife**
- 2.2.8. *Comparability of assays after changes in a validated test method*
- 2.3.1. *The application of biotechnology to the development of veterinary vaccines*
- Dr A.A. Potter, Dr V. Gerdt, Dr G. Mutwiri,
Dr S. Tikoo & De S. van Drunen Littel-
van den Hurk**
Vaccine and Infectious Disease Organization,
120 Veterinary Road, Saskatoon S7N 5E3, Canada.

2 This chapter was updated by consensus of the OIE *ad hoc* Group on High Throughput Sequencing, Bioinformatics and Computational Genomics.

3 This chapter was updated by consensus of an Expert Consultation

2.3.2. *The role of official bodies in the international regulation of veterinary biologicals*

Dr J.-P. Orand and Dr C. Lambert

Agence Nationale du Médicament Vétérinaire, Anses Fougères, 8 rue Claude Bourgelat, Parc d'Activités de la Grande Marche, Javené CS 70611, 35306 Fougères, France.

Dr B. Rippke

Center for Veterinary Biologics, USDA, APHIS, Veterinary Services, P.O. Box 844, Ames Iowa 50010, USA.

Dr T. Tsutsui

National Institute of Animal Health, Division of Viral Disease and Epidemiology, National Institute of Animal Health, NARO 3-1-5, Kannondai, Tsukuba, Ibaraki 305-0856, Japan.

2.3.3. *Minimum requirements for the organisation and management of a vaccine manufacturing facility*

2.3.4. *Minimum requirements for the production and quality control of vaccines*

OIE Collaborating Centre for Veterinary Medicinal Products, Anses Fougères, France

2.3.5. *Minimum requirements for aseptic production in vaccine manufacture*

3.1.1. *Anthrax*

Dr E. Golsteyn-Thomas

Canadian Food Inspection Agency, Lethbridge Laboratory, P.O. Box 640, Township Road 9-1 Lethbridge, Alberta T1J 3Z4, Canada.

Dr G. Harvey

USDA, APHIS, National Veterinary Services Laboratories, P.O. Box 844, Ames, Iowa 50010, USA.

3.1.2. *Aujeszky's disease (infection with Aujeszky's disease virus)*

Dr A. Jestin & Dr M.F. Le Potier

Anses-Ploufragan, Laboratoire d'études et de recherches avicoles et porcines, Zoopôle des Côtes d'Armor-Les Croix, BP 53, 22440 Ploufragan, France.

Dr W. Loeffen

Wageningen Bioveterinary Research, P.O. Box 65 8200 AB Lelystad, The Netherlands.

Dr S.L. Swenson

USDA, APHIS, National Veterinary Services Laboratories, P.O. Box 844, Ames, Iowa 50010, USA.

3.1.3. *Bluetongue (infection with bluetongue virus)⁴*

Dr Debbie Eagles

Australian Centre for Disease Preparedness, CSIRO, 5 Portarlington Road, Private Bag 24 (Ryrie Street), Geelong 3220, Victoria, Australia.

3.1.4. *Brucellosis (infection with *Brucella abortus*, *B. melitensis* and *B. suis*)⁵*

Dr A. Whatmore

APHA Weybridge, New Haw, Addlestone, Surrey KT15 3NB, Weybridge, UK.

4 This chapter was updated by consensus of all OIE Reference Laboratories for bluetongue.

5 This chapter was updated by consensus of all OIE Reference Laboratories for brucellosis.

3.1.5. *Crimean–Congo haemorrhagic fever***Prof. J.T. Paweska & P. Jansen van Vuren**

National Institute for Communicable Diseases, A
Division of the National Health Laboratory Service,
Private Bag X4, Sandringham-Johannesburg, 2131,
Modderfontein Road 1, Gauteng, South Africa.

Dr M. Bouloy (retired)

Unité de génétique moléculaire des Bunyavirus
Département de Virologie, Institut Pasteur,
25 rue du Dr Roux, 75724 Paris cedex 15
France.

**Prof. M.H. Groschup, Dr M. Mertens &
Dr K. Schmidt**

Head of Institute for Novel and Emerging
Infectious Diseases, at the Friedrich-Loeffler-
Institut, Federal Research Institute for Animal
Health, Südufer 10, 17493 Greifswald – Insel
Riems, Germany.

3.1.6. *Echinococcosis (infection with Echinococcus
granulosus and with E. multilocularis virus)***Dr G. Masala**

Istituto Zooprofilattico Sperimentale (IZS) of
Sardinia, Via Duca degli Abruzzi, 8, 07100 Sassari,
Italy.

Dr M. Donadeu & Dr M. Lightowers

Faculty of Veterinary and Agricultural Sciences,
The University of Melbourne, 250 Princes
Highway, Werribee, Australia.

3.1.7. *Epizootic haemorrhagic disease (infection with
epizootic hemorrhagic disease virus)***Dr S. Zientara & Dr C. Sailleau**

Laboratoire de santé animale de Maisons-Alfort,
UMR 1161, 12 rue Pierre et Marie Curie, 94703
Maisons-Alfort, France.

3.1.8. *Foot and mouth disease (infection with foot and
mouth disease virus)⁶***Dr D.J. King**

The Pirbright Institute, Ash Road, Woking,
Surrey GU24 0NF, UK.

3.1.9. *Heartwater***Dr N. Vachiéry & Dr I. Marcelino**

UMR CIRAD-INRA 117 ASTRE,, TA G-Bureau 205,
Campus International de Baillarguet – TA30/G,
34398 Montpellier Cedex 5, France.

3.1.10. *Japanese encephalitis***Dr D.-K. Yang**

Animal and Plant Quarantine Agency,
177 Hyeoksin 8-ro, Gimcheong-si,
Gyeongsangbuk-do 39660, Korea (Rep. of).

3.1.11. *Leishmaniosis***Dr F. Vitale**

Istituto Zooprofilattico Sperimentale della Sicilia
(IZSSi), National Reference Centre for
Leishmaniasis (C.Re.Na.L.), via Gino Marinuzzi
3,90129, Palermo, Italy.

6 This chapter was updated by consensus of all OIE Reference Laboratories for foot and mouth disease.

3.1.12. *Leptospirosis*⁷**Dr J. Petrakovsky**

Laboratorio de Leptospirosis, Dirección General de Laboratorios y Control Técnico, Servicio Nacional de Sanidad y Calidad Agroalimentaria (SENASA), Avenida Talcahuano N° 1660 (1640), Martínez, Pcia de Buenos Aires, Argentina.

3.1.13. *Mammalian tuberculosis (infection with Mycobacterium tuberculosis complex)***OIE *Ad hoc* Group on Replacement of the International Standard Bovine Tuberculin**3.1.14. *New World screwworm (Cochliomyia hominivorax) and Old World screwworm (Chrysomya bezziana)***Dr J. Welch**

COPEG (Panama–US Commission for the Eradication and Prevention of NWS), Apartado Postal 0816-07636, Panama, Panama.

Dr M.J.R. Hall

Department of Entomology, The Natural History Museum, Cromwell Road, London SW7 5BD, UK.

3.1.15. *Nipah and Hendra virus diseases***Dr K. Halpin**

Australian Centre for Disease Preparedness, CSIRO, 5 Portarlington Road, Geelong, Victoria 3220, Australia.

3.1.16. *Paratuberculosis (Johne's disease)*⁸**Dr I. Slaná**

Veterinary Research Institute, Hudcova 70, 62132 Brno, Czech Republic.

Dr Bernardo Alonso

DILAB (Dirección de Laboratorios y Control Técnico), Servicio Nacional de Sanidad y Calidad, Agroalimentaria (SENASA), Talcahuano 1660, 1640 Martínez, Prov. de Buenos Aires, Argentina.

Dr Virginie Poisson

Anses Laboratoire de Niort, 60 rue de Pied-de-Fond, B.P. 3081, 79012 Niort Cedex, France.

3.1.17. *Q fever***Dr E. Rousset & Dr K. Sidi-Boumedine**

Anses Sophia Antipolis, Laboratoire d'Études et de Recherches sur les Petits Ruminants et les Abeilles (LERPRA), Les Templiers, 105 route des Chappes, BP 111, 06902 Sophia Antipolis Cedex, France.

Dr B. Kadra & Dr B. Kupcsulik

Ceva-Phylaxia Co. Ltd, Szallas utca 5, H-1107, Budapest, Hungary.

3.1.18. *Rabies (infection with rabies virus and other lyssaviruses)***OIE *ad hoc* Group on the *Terrestrial Manual* Chapter on Rabies⁹**

⁷ This chapter was updated by consensus of all OIE Reference Laboratories for leptospirosis.

⁸ This chapter was updated by consensus of all OIE Reference Laboratories for paratuberculosis.

⁹ This chapter was updated by consensus of all OIE Reference Laboratories for rabies.

3.1.19. Rift Valley fever
(infection with Rift Valley fever virus)¹⁰

Dr M. Bouloy (retired)

Unité de génétique moléculaire des Bunyavirus
Département de Virologie, Institut Pasteur
25 rue du Dr Roux, 75724 Paris cedex 15, France.

Dr B.A. Lubisi

Onderstepoort Veterinary Institute, Agricultural
Research Council, Private Bag X05,
Onderstepoort 0110, South Africa.

3.1.20. Rinderpest (infection with rinderpest virus)

Dr G. Libeau

CIRAD-BIOS, Control of Exotic and Emerging
Animal Diseases, Programme Santé Animale,
Campus International de Baillarguet TA A-15/G,
34398 Montpellier Cedex 5, France.

Dr M. Baron

The Pirbright Institute, Ash Road, Woking,
Surrey GU24 0NF, UK.

Dr K. Yoshida

National Institute of Animal Health (NIAH),
National Agriculture and Food Research
Organization, Josuiehoncho 6-20-1, Kodaïra, Tokyo,
187-0022, Japan.

3.1.21. Surra in all species (*Trypanosoma evansi*
infection)¹¹

Dr M. Desquesnes

UMR177-Intertryp (CIRAD-IRD), CIRAD-bios,
Campus international de Baillarguet, TA A-17 / G,
34398 Montpellier Cedex 5, France.

3.1.22. Trichinellosis (infection with *Trichinella* spp.)

Dr A. Gajadhar (retired) & Dr B. Scandrett

Canadian Food Inspection Agency, Centre for
Foodborne & Animal Parasitology, 116 Veterinary
Road, Saskatoon, Saskatchewan S7N 2R3
Canada.

Dr E. Pozio

Istituto Superiore di Sanita, Laboratorio di
Parasitologia, Viale Regina Elena 299, 00161 Roma,
Italy

3.1.23. Tularemia

Dr T.E. Rocke

USGS National Wildlife Health Center, 6006
Schroeder Road, Madison, WI 53711, United States
of America.

Dr M. Gyuranecz

Laboratory of Zoonotic Bacteriology and
Mycoplasmology, Institute for Veterinary Medical
Research, Centre for Agricultural Research,
Hungarian Academy of Sciences, Hungaria krt. 21,
Budapest 1143, Hungary.

¹⁰ This chapter was updated by consensus of the OIE *ad hoc* Group on Rift Valley fever.

¹¹ This chapter was updated by consensus of the OIE *ad hoc* Group on Diagnostic Tests for Trypanosomoses.

3.1.24. Vesicular stomatitis**Dr E.M. Pituco**

PANAFTOSA, Av. President Kennedy 7778
25040-000 Duque de Caxias, Rio de Janeiro
Brazil.

Dr M.K. Torchetti

USDA, APHIS, National Veterinary Services
Laboratories, P.O. Box 844, Ames, Iowa 50010,
USA.

3.1.25. West Nile fever**Dr F. Monaco**

Istituto Zooprofilattico Sperimentale dell'Abruzzo
e del Molise "G. Caporale", Via Campo Boario,
64100 Teramo, Italy.

Dr T. Sturgill

USDA, APHIS, National Veterinary Services
Laboratories, P.O. Box 844, Ames, Iowa 50010,
United States of America.

*Introductory note on bee diseases***Dr M.-P. Chauzat**

Anses Sophia Antipolis, Laboratoire d'études et
de recherches sur les ruminants et les abeilles
105 route des Chappes, B.P. 111, 06902 Sophia
Antipolis, France.

**3.2.1. Acarapisosis of honey bees (infestation of honey
bees with *Acarapis woodi*)****Dr R. Hall**

Diagnostic and Surveillance Services, Biosecurity
New Zealand, Ministry for Primary Industries, 66
Ward Street, P.O. Box 40742, Upper Hutt 5140,
New Zealand.

**3.2.2. American foulbrood of honey bees (infection of
honey bees with *Paenibacillus larvae*)****Dr A. Alippi**

Facultad de Ciencias Agrarias y Forestales
Universidad Nacional de La Plata, Unidad de
Bacteriología del Centro de Investigaciones en
Fitopatología (UB-CIDEFI), calle 60 y 119 s/n c.c.
31, 1900 La Plata, Argentina.

**3.2.3. European foulbrood of honey bees (infection of
honey bees with *Melissococcus plutonius*)****Dr D.C. de Graaf**

Laboratory of Zoophysiology, University of Ghent,
K.L. Ledeganckstraat 35, B-9000 Ghent, Belgium.

Dr A. Alippi

Facultad de Ciencias Agrarias y Forestales
Universidad Nacional de La Plata, Unidad de
Bacteriología del Centro de Investigaciones en
Fitopatología (UB-CIDEFI), calle 60 y 119 s/n c.c.
31, 1900 La Plata, Argentina.

3.2.4. Nosemosis of honey bees**Dr I. Fries**

Honey Bee Research Group, Department of
Ecology, Swedish University of Agricultural
Sciences, Box 7044, 75007 Uppsala, Sweden.

3.2.5. *Infestation with Aethina tumida (small hive beetle)*

3.2.6. *Infestation with Tropilaelaps spp.*

3.2.7. *Varroosis of honey bees (infestation of honey bees with Varroa spp.)*

Dr M.-P. Chauzat, Dr S. Franco, Dr V. Duquesne & Dr M.-P. Rivière

Anses, Laboratoire de Sophia Antipolis, Unité Pathologie de l'Abeille, Les Templiers, 105 route des Chappes, CS 20111, 06902 Sophia Antipolis, France.

Dr M.O. Schäfer

National Reference Laboratory for Bee Diseases, Friedrich-Loeffler-Institut, Federal Research Institute for Animal Health, Institute of Infectology, Südufer 10, 17493 Greifswald – Insel Riems, Germany.

3.3.1. *Avian chlamydiosis*

Dr C. Schnee

Institute of Molecular Pathogenesis, Friedrich-Loeffler-Institut, Federal Research Institute for Animal Health, Naumburger Str. 96a, 07743 Jena, Germany.

Prof. D. Vanrompay

Laboratory for Immunology and Animal Biotechnology, Department of Animal Production, Faculty of Bioscience Engineering, Ghent University, Coupure Links, 653, 9000 Ghent, Belgium.

Dr K. Laroucau

Anses Maisons-Alfort, Animal Health Laboratory Bacterial Zoonoses Unit, 14 rue Pierre et Marie Curie, 94701 Maisons-Alfort Cedex, France.

3.3.2. *Avian infectious bronchitis*

Dr J.J. (Sjaak) de Wit

Department R&D, GD Animal Health, P.O. Box 9, 7400 AA Deventer, The Netherlands.

Dr P. Britton

The Pirbright Institute, Compton Laboratory, Newbury, Berkshire RG20 7NN, UK.

3.3.3. *Avian infectious laryngotracheitis*

Dr A.H. Noormohammadi & Dr J. Devlin

Faculty of Veterinary Science, The University of Melbourne, 250 Princes Highway, Werribee, Victoria, 3030, Australia.

3.3.4. *Avian influenza*

(including infection with high pathogenicity avian influenza viruses)¹²

Dr D. Swayne

Southeast Poultry Research Laboratory, 934 College Station Road, Athens, Georgia 30605, USA.

Prof. I. Brown

APHA Weybridge, New Haw, Addlestone, Surrey KT15 3NB, Weybridge, UK.

12 This chapter was updated by consensus of all OIE Reference Laboratories for avian influenza.

3.3.5. *Avian mycoplasmosis*
(*Mycoplasma gallisepticum*, *M. synoviae*)

Dr S. Catania
Mycoplasma Unit, Istituto Zooprofilattico
Sperimentale delle Venezie, Via S. Giacomo 5,
37135 Verona, Italy

3.6. *Avian tuberculosis*

Dr Evelin Lobo Riveroi
MYCOLAB Laboratorio para diagnóstico de
micoplasmas, Centro Nacional de Sanidad
Agropecuaria, San José de las Lajas, Provincia
Mayabeque, Cuba.

3.3.7. *Duck virus enteritis*

Dr I. Pavlik (formerly) & Dr I. Slaná
Veterinary Research Institute, Hudcova 70,
62132 Brno, Czech Republic.

3.3.8. *Duck virus hepatitis*

Dr S. Stoute
California Animal Health and Food Safety
Laboratory System, University of California, Davis
West Health Sciences Drive, P.O. Box 1770, Davis,
California 95617, USA.

3.3.9. *Fowl cholera*

Dr P. Blackall
Poultry Hub Australia, Queensland Alliance for
Agriculture and Food Innovation, University of
Queensland, EcoSciences Precinct, Level 2A East,
GPO Box 267, Brisbane Qld 4001, Australia.

3.3.10. *Fowl pox*

Dr D.N. Tripathy
University of Illinois at Urbana-Champaign,
College of Veterinary Medicine, Department of
Veterinary Pathbiology, 2001 South Lincoln
Avenue, Urbana, Illinois 61802, USA.

3.3.11. *Fowl typhoid and Pullorum disease*

Dr R. Davies
APHA Weybridge, New Haw, Addlestone,
Surrey KT15 3NB, UK.

3.3.12. *Infectious bursal disease (Gumboro disease)*

Dr N. Eterradossi
Anses, Laboratoire de Ploufragan-Plouzané,
Laboratoire d'études et de recherches avicoles,
porcines et piscicoles, B.P. 53, 22440 Ploufragan-
Plouzané, France.

3.3.13. *Marek's disease*

Dr Y. Saif
Food Animal Health Research Program, Ohio
Agricultural Research and Development Center,
Ohio State University, 1680 Madison Avenue,
Wooster, OH 44691-4096, USA.

Dr V. Nair
The Pirbright Institute, Ash Road, Woking,
Surrey GU24 0NF, UK.

Dr J.R. Dunn
United States Department of Agriculture,
Agriculture Research Service, Avian Disease and
Oncology Laboratory, 4279 E Mount Hope Road,
East Lansing, Michigan 48823, USA.

- 3.3.14. Newcastle disease
(infection with Newcastle disease virus)¹³
- Dr D. Swayne**
Southeast Poultry Research Laboratory,
934 College Station Road, Athens,
Georgia 30605, USA.
- Prof. I. Brown**
APHA Weybridge, New Haw, Addlestone,
Surrey KT15 3NB, Weybridge, UK.
- 3.3.15. Turkey rhinotracheitis
(avian metapneumovirus)
- Dr N. Eterradossi & Dr P. Brown**
Anses, Laboratoire de Ploufragan-Plouzané,
Laboratoire d'études et de recherches avicoles,
porcines et piscicoles, B.P. 53, 22440 Ploufragan-
Plouzané, France.
- 3.4.1. Bovine anaplasmosis
- Dr F. Parrodi (formerly) & Dr J.J. Mosqueda Gualito**
Centro Nacional de Servicios de Constatación en
Salud Animal (CENAPA), Carretera Cuernavaca
Cuatla #8534 Colonia Progreso, CB 62550,
Jiutepec, Morelos, Mexico.
- 3.4.2. Bovine babesiosis
- Prof. N. Yokoyama**
National Research Center for Protozoan Disease
Obihiro University of Agriculture and Veterinary
Medicine, Nishi 2-13, Inada-cho, Obihiro, Hokkaido
080-8555, Japan.
- Dr J.J. Mosqueda Gualito**
Centro Nacional de Servicios de Constatación en
Salud Animal (CENAPA), Carretera Cuernavaca
Cuatla #8534, Colonia Progreso, CB 62550,
Jiutepec, Morelos, Mexico.
- 3.4.3. Bovine cysticercosis
- See chapter 3.10.3.
- 3.4.4. Bovine genital campylobacteriosis
- Prof. J.A. Wagenaar & Dr L. van der Graaf-van
Blois**
Department of Infectious Diseases and
Immunology, Faculty of Veterinary Medicine,
Utrecht University, P.O. Box 80.165, 3508 TD
Utrecht, The Netherlands.
- 3.4.5. Bovine spongiform encephalopathy¹⁴
- Prof. T. Seuberlich**
NeuroCentre, Department of Clinical Research
and Veterinary Public Health, Division of
Experimental Clinical Research, University of
Bern, Bremgartenstrasse 109A, 3012 Bern,
Switzerland.
- 3.4.6. Bovine tuberculosis
- Dr D.V. Cousins (formerly)**
Australian Reference Laboratory for Bovine
Tuberculosis, Western Australia Dept of
Agriculture and Food, Locked Bag N° 4, Bentley
Delivery Centre, Bentley WA 6983, Australia.

13 This chapter was updated by consensus of all OIE Reference Laboratories for Newcastle disease.

14 This chapter was updated by consensus of all OIE Reference Laboratories for bovine spongiform encephalopathy.

- 3.4.7. *Bovine viral diarrhoea*¹⁵
- Dr P. Kirkland**
Elizabeth Macarthur Agriculture Institute (EMAI),
Virology Laboratory, Woodbridge Rd, Menangle,
PMB 8, Camden NSW 2570, Australia.
- 3.4.8. *Contagious bovine pleuropneumonia (infection
with Mycoplasma mycoides subsp. mycoides)*¹⁶
- Dr F. Thiaucourt (retired)**
CIRAD-EMVT, Campus international de
Baillarguet, Montferriez-sur-Lez, B.P. 5035, 34032
Montpellier Cedex 1, France.
- 3.4.9. *Enzootic bovine leukosis*
- Prof. T.W. Vahlenkamp**
Institute of Virology, Centre for Infectious
Diseases, Faculty of Veterinary Medicine, Leipzig
University, An den Tierkliniken 29, 04103 Leipzig,
Germany.
- Dr B. Choudhury**
APHA Weybridge, New Haw, Addlestone,
Surrey KT15 3NB, UK.
- Dr J. Kuzmak**
National Veterinary Research Institute, Al.
Partyzantow str. 57, 24-100 Pulawy, Poland.
- 3.4.10. *Haemorrhagic septicaemia (Pasteurella
multocida serotypes 6:b and 6:e)*
- Dr S.B. Shivachandra**
ICAR-National Institute of Veterinary
Epidemiology and Disease Informatics (NIVEDI),
Post Box No. 6450, Ramagondanahalli, Yelahanka,
Bengaluru-560 064, Karnataka, India.
- 3.4.11. *Infectious bovine rhinotracheitis/
infectious pustular vulvovaginitis*
- Dr M. Beer**
Institute of Diagnostic Virology, Friedrich-
Loeffler-Institut, Südufer 10, D-17493 Greifswald-
Insel Riems, Germany.
- Dr A. Dastjerdi**
APHA Weybridge, New Haw, Addlestone,
Surrey KT15 3NB, UK.
- 3.4.12. *Lumpy skin disease*
- Dr P. Beard**
The Pirbright Institute, Ash Road, Woking,
Surrey GU24 0NF, UK.
- Dr D. Wallace**
Onderstepoort Veterinary Institute, Agricultural
Research Council, Private Bag X05,
Onderstepoort 0110, South Africa.
- 3.4.13. *Malignant catarrhal fever*
- Dr G. Russell**
Moredun Research Institute, International
Research Centre, Pentlands Science Park, Bush
Loan, Penicuik EH26 0PZ, Scotland, UK.

15 This chapter was updated by consensus of all OIE Reference Laboratories for bovine viral diarrhoea.

16 This chapter was updated by consensus of all OIE Reference Laboratories for contagious bovine pleuropneumonia.

3.4.14. *Nagana: infections with salivarian trypanosomoses (excluding Trypanosoma evansi and T. equiperdum)*¹⁷

Dr M. Desquesnes

UMR177-Intertryp (CIRAD-IRD), CIRAD-bios, Campus international de Baillarguet, TA A-17 / G, 34398 Montpellier Cedex 5, France.

3.4.15. *Theileriosis in cattle (infection with Theileria annulata, T. orientalis and T. parva)*

Dr P. Toye

Animal Health and Genetics, International Livestock Research Institute, P.O. Box 30709-00100, Nairobi, Kenya.

Dr D. Geysen

Institute of Tropical Medicine, Department of Animal Health, Nationalestraat 155, 2000 Antwerpen, Belgium.

3.4.16. *Trichomonosis*

Dr E. Authie (formerly)

Laboratoire National de Contrôle des Reproducteurs, 13 rue Jouet, 94704 Maisons-Alfort cedex, France.

Prof. A. Lew-Tabor

The University of Queensland, 306 Carmody Rd, Blg 80, St. Lucia, Brisbane Qld 4067 Australia.

Prof. I. Diallo

Biosecurity Sciences Laboratory, Block 12, Health and Food Sciences Precinct, 39 Kessels Road, Coopers Plains, Brisbane Qld 4108, Australia.

3.5.1. *Camelpox*

Dr U. Wernery, Dr K. Kamal-Aldin, Mrs S. Joseph & Mrs A. Riya Thomas

Central Veterinary Research Laboratory, P.O. Box 597, Dubai, United Arab Emirates.

2.5.2. *Middle East respiratory syndrome (infection of dromedary camels with MERS-CoV)*

OIE *ad hoc* Group on Middle East Respiratory Syndrome Coronavirus (MERS-Cov)

3.6.1. *African horse sickness (infection with African horse sickness virus)*

Prof. J.M. Sánchez-Vizcaíno

Centro de Vigilancia Sanitaria Veterinaria (VISAVET), Facultad de Veterinaria, HCV Planta sótano, Universidad Complutense de Madrid (UCM), Avda Puerta de Hierro s/n, 28040 Madrid Spain.

Dr M. Agüero Garcia

Laboratorio Central de Veterinaria, LCV-Algete, Ctra. Algete Km 8, 28110 Algete (Madrid), Spain.

Dr J. Baron Castillo-Olivares

The Pirbright Institute, Ash Road, Woking, Surrey GU24 0NF, UK.

¹⁷ This chapter was updated by consensus of the following OIE experts on trypanosomes: Dr L. Touratier (deceased), Prof. N. Inoue, Prof. Ph. Büscher, Dr K. Suganuma, Dr M. Gonzatti.

3.6.2. Contagious equine metritis

Dr I. Mawhinney

APHA Bury St Edmunds, Rougham Hill, Bury St Edmunds, Suffolk IP44 2RX, UK

Dr M.M. Erdman

USDA, APHIS, National Veterinary Services Laboratories, P.O. Box 844, Ames, Iowa 50010, USA.

3.6.3. Dourine in horses (*Trypanosoma equiperdum* infection)¹⁸**Prof. Ph. Büscher (retired)**

Unit of Parasite Diagnostics, Department of Biomedical Sciences, Institute of Tropical Medicine, Nationalestraat 155, 2000 Antwerp, Belgium.

3.6.4. Epizootic lymphangitis

Dr C. Scantlebury

Department of Functional and Comparative Genomics, Institute of Integrative Biology, Biosciences Building, University of Liverpool, L69 7ZB, UK.

3.6.5. Equine encephalomyelitis (Eastern, Western and Venezuelan)

Dr T. Sturgill

USDA, APHIS, National Veterinary Services Laboratories, P.O. Box 844, Ames, Iowa 50010, USA.

3.6.6. Equine infectious anaemia

Dr E.N. Ostlund

USDA, APHIS, National Veterinary Services Laboratories, P.O. Box 844, Ames, Iowa 50010, USA.

Dr J. Zhou

Laboratory of Equine Infectious Anemia Harbin Veterinary Research Institute of Chinese Academy of Agricultural Sciences, 427 Maduan Street, Harbin 150001, China (People's Rep. of).

Dr K. Murakami

National Institute of Animal Health, Viral Disease Section, 3-1-5 Kannondai, Tsukuba, Ibaraki 305-0856, Japan.

3.6.7. Equine influenza (infection with equine influenza virus)¹⁹**Prof. A. Cullinane**

Irish Equine Centre, Johnstown, Naas, Co. Kildare, Ireland.

3.6.8. Equine piroplasmiasis

Prof. N. Yokoyama

National Research Center for Protozoan Disease Obihiro University of Agriculture and Veterinary Medicine, Nishi 2-13, Inada-cho, Obihiro, Hokkaido 080-8555, Japan.

18 This chapter was updated by consensus of the following OIE experts on trypanosomes: Dr M.I. Gonzatti, Dr I. Pascucci, Dr L. Touratier (deceased), Dr M. Desquesnes, Dr A. Schnauffer, Dr K. Suganuma, Dr N. Inoue, Dr N. Van Reet, Dr N. Ledesma, Dr L. Hébert.

19 This chapter was updated by consensus of all OIE Reference Laboratories for equine influenza.

3.6.9. *Equine rhinopneumonitis*
(*equine herpesvirus-1 and -4*)²⁰

Dr D. Elton & Dr N. Bryant
Animal Health Trust, Centre for Preventive
Medicine, Lanwades Park, Kentford,
Suffolk CB8 7UU, UK.

3.6.10. *Equine viral arteritis (infection with equine
arteritis virus)*

Dr P.J. Timoney
University of Kentucky, Department of Veterinary
Science, 108 Gluck Equine Research Center,
Lexington, Kentucky 40546-0099, USA.

Dr T. Drew & Prof. F. Steinbach
APHA Weybridge, New Haw, Addlestone,
Surrey KT15 3NB, UK.

3.6.11. *Glanders and melioidosis*

Dr H. Neubauer
Friedrich-Loeffler Institut, Institut für Bakterielle
Infektionen und Zoonosen, Naumburger Strasse
96a, 07743 Jena, Germany.

Prof. U. Wernery
Central Veterinary Research Laboratory, P.O. Box
597, Dubai, United Arab Emirates.

3.7.1. *Myxomatosis*

3.7.2. *Rabbit haemorrhagic disease*

Dr A. Lavazza, Dr L. Capucci & Dr P. Cavadini
Istituto Zooprofilattico Sperimentale della
Lombardia e dell'Emilia Romagna, Via Bianchi 7/9,
25124 Brescia, Italy.

3.8.1. *Border disease*

Dr P. Kirkland
Elizabeth Macarthur Agriculture Institute (EMAI),
Virology Laboratory, Woodbridge Rd, Menangle,
PMB 8, Camden NSW 2570, Australia..

3.8.2. *Caprine arthritis/encephalitis & Maedi-visna*

Dr D. Knowles & Dr L.M. Herrmann
USDA- ARS, Animal Disease Research Unit, 3003
ADBF, Washington State University, Pullman,
Washington 99164-6630, USA.

3.8.3. *Contagious agalactia*

Dr R. Ayling
APHA Weybridge, New Haw, Addlestone,
Surrey KT15 3NB, UK.

Dr G. Loria
Istituto Zooprofilattico Sperimentale della Sicilia
(IZSSI), via Gino Marinuzzi 3, 90129, Palermo, Italy.

3.8.4. *Contagious caprine pleuropneumonia*

Dr F. Thiaucourt
CIRAD-EMVT, Campus international de
Baillarguet, Montferriez-sur-Lez, B.P. 5035, 34032
Montpellier Cedex 1, France.

20 This chapter was updated by consensus of all OIE Reference Laboratories for equine rhinopneumonitis.

- 3.8.5. *Enzootic abortion of ewes (ovine chlamydiosis) (infection with Chlamydia abortus)* **Dr C. Schnee**
Institute of Molecular Pathogenesis, Friedrich-Loeffler-Institut, Federal Research Institute for Animal Health, Naumburger Str. 96a, 07743 Jena, Germany.
- Dr N. Borel**
Institute for Veterinary Pathology (IVPZ), Vetsuisse Faculty, University of Zurich, Winterthurerstrasse 268, CH-8057, Zurich, Switzerland.
- Dr K. Laroucau**
Anses Maisons-Alfort, Animal Health Laboratory Bacterial Zoonoses Unit, 14 rue Pierre et Marie Curie, 94701 Maisons-Alfort Cedex, France.
- 3.8.6. *Nairobi sheep disease* See chapter 3.10.1.
- 3.8.7. *Ovine epididymitis (Brucella ovis)*²¹ **Dr B. Garin-Bastuji**
Direction des Affaires Européennes & Internationales, 14 rue Pierre et Marie Curie F-94701 Maisons-Alfort Cedex, France.
- Dr J.M. Blasco**
Centro de Investigación y Tecnología Agroalimentaria de Aragón (CITAA), Apartado 727, 50080 Zaragoza, Spain.
- 3.8.8. *Ovine pulmonary adenocarcinoma (adenomatosis)* **Dr M.J. Sharp (formerly)**
APHA, Lasswade Laboratory, Pentlands Science Park, Bush Loan, Penicuik EH26 0PZ, Scotland, UK.
- 3.8.9. *Peste des petits ruminants (infection with small ruminant morbillivirus)*²² **Dr M. Baron**
The Pirbright Institute, Ash Road, Woking, Surrey GU24 0NF, UK.
- 3.8.10. *Salmonellosis (S. abortusovis)* See chapter 3.10.7
- 3.8.11. *Scrapie*²³ **Dr J. Spiropoulos**
APHA Weybridge, New Haw, Addlestone, Surrey KT15 3NB, UK..
- 3.8.12. *Sheep pox and goat pox* **Dr P. Beard**
The Pirbright Institute, Ash Road, Woking, Surrey GU24 0NF, UK.
- Dr B.A. Lubisi**
Onderstepoort Veterinary Institute, Agricultural Research Council, Private Bag X05, Onderstepoort 0110, South Africa.
- Dr H. Reza Varshovi**
RAZI Vaccine & Serum Research Institute, P.O. Box 31975/148, Hessarak, Karaj, Teheran, Iran.

21 This chapter was updated by consensus of all OIE Reference Laboratories for brucellosis and other experts.

22 This chapter was updated by consensus of all OIE Reference Laboratories for peste des petits ruminants.

23 This chapter was updated by consensus of all OIE Reference Laboratories for scrapie.

3.8.13 *Theileriosis in sheep and goats (infection with Theileria lestoquardi, T. luwenshuni and T. uilenbergi)*

Dr A. Torina

Istituto Zooprofilattico Sperimentale della Sicilia (IZSSI), via Gino Marinuzzi 3, 90129, Palermo, Italy.

3.9.1. *African swine fever*

Dr C.A.L. Oura (formerly)

The Pirbright Institute, Ash Road, Woking, Surrey GU24 0NF, UK.

3.9.2. *Atrophic rhinitis of swine*

Dr M. Arias

Centro de Investigación en Sanidad Animal (CISA-INIA), Valdeolmos, 28130 Madrid, Spain.

3.9.3. *Classical swine fever (infection with classical swine fever virus)²⁴*

Dr K.B. Register

USDA, ARS, National Animal Disease Center, 2300 Dayton Avenue, Ames, Iowa 50010, USA.

3.9.4. *Nipah virus encephalitis*

Prof. P. Becher

University of Veterinary Medicine of Hannover, Department of Infectious Diseases, Institute of Virology, Bünteweg 17, 30559 Hannover, Germany.

3.9.5. *Porcine cysticercosis (infection with Taenia solium)*

See chapter 3.1.14.

See chapter 3.10.3.

3.9.6. *Porcine reproductive and respiratory syndrome²⁵*

Prof. Z. Pejsak & Dr K. Podgórska

National Veterinary Research Institute, Partyzantow Str. 57, 24-100 Pulawy, Poland.

Dr K. Tian

Veterinary Diagnostic Laboratory, China Animal Disease Control Center, No.17 Tiangui Street Biomedical Base, Daxing District, Beijing, China (People's Rep. of).

24 This chapter was updated by consensus of the OIE *ad hoc* Group on Classical Swine Fever (vaccine section) and of all OIE Reference Laboratories for classical swine fever (diagnostic section).

25 This chapter was updated with help from: Nicolas Ruggli (The Institute of Virology and Immunology, Mittelhäusern, Switzerland); Tomasz Stadejek (Warsaw University of Life Sciences, Warsaw, Poland).

3.9.7. Influenza A virus of swine**Dr S.L. Swenson**

National Veterinary Services Laboratories, P.O.
Box 844, Ames, Iowa 50010, USA.

Dr E. Foni

Istituto Zooprofilattico Sperimentale della
Lombardia e dell'Emilia Romagna "Bruno
Ubertini", Via Bianchi 9, 25124 Brescia,
Italy.

Dr T. Saito

Viral Disease and Epidemiology Research
Division, National Institute of Animal Health,
National Agriculture and Food Research
Organization, Kannondai, Tsukuba, Ibaraki, 305-
0856, Japan.

Prof. I. Brown

APHA Weybridge, New Haw, Addlestone,
Surrey KT15 3NB, Weybridge, UK.

3.9.8. Swine vesicular disease**Dr D. King**

The Pirbright Institute, Ash Road, Woking,
Surrey GU24 0NF, UK.

Dr E. Brocchi,

Istituto Zooprofilattico Sperimentale della e
dell'Emilia Romagna (IZSLER), Via A. Bianchi
No. 9, 25124 Brescia, Italy.

3.9.9. Teschovirus encephalomyelitis**Mr N. Knowles**

The Pirbright Institute, Ash Road, Woking,
Surrey GU24 0NF, UK.

3.9.10. Transmissible gastroenteritis**Dr L.J. Saif**

The Ohio State University, Ohio Agricultural
Research and Development Center, Food Animal
Health Research Program, 1680 Madison Avenue,
Wooster, Ohio 44691-4096, USA.

**3.10.1. Bunyaviral diseases of animals
(excluding Rift Valley fever and
Crimean–Congo haemorrhagic fever)****Dr B.A. Lubisi**

Onderstepoort Veterinary Institute, Agricultural
Research Council, Private Bag X05,
Onderstepoort 0110, South Africa.

Dr M. Beer

Institute of Diagnostic Virology, Friedrich-
Loeffler-Institut, Südufer 10, D-17493 Greifswald-
Insel Riems, Germany.

Dr M. Baron

The Pirbright Institute, Ash Road, Woking,
Surrey GU24 0NF, UK.

3.10.2. Cryptosporidiosis**Dr R. Chalmers**

Cryptosporidium Reference Unit, Public Health
Wales Microbiology, Singleton Hospital, Swansea
SA2 8QA, UK.

- 3.10.3. *Cysticercosis* **Prof. P. Dorny & Prof. S. Gabriël**
Department of Veterinary Public Health and Food Safety, Faculty of Veterinary Medicine, Ghent University, Salisburylaan 133, 9820 Merelbeke, Belgium
- 3.10.4. *Infection with Campylobacter jejuni and C. coli* **Prof. J.A. Wagenaar & Dr L. van der Graaf-van Bloois**
Department of Infectious Diseases and Immunology, Faculty of Veterinary Medicine, Utrecht University, P.O. Box 80.165, 3508 TD Utrecht, The Netherlands.
- 3.10.5. *Listeria monocytogenes*²⁶ **Dr A. Leclercq**
Institut Pasteur, CNR & CCOMS Listeria, Unité de Biologie des Infections, 25 rue du Docteur Roux, 75724 Paris cedex 15, France.
- 3.10.6. *Mange* **Dr J.L. Schlater & Dr J.W. Mertins**
Parasitology and Clinical Pathology Section, Pathobiology Laboratory, National Veterinary Services Laboratories, USDA, APHIS, VS, P.O. Box 844, Ames, Iowa 50010, USA.
- 3.10.7. *Salmonellosis*²⁷ **Dr R. Davies**
APHA Weybridge, New Haw, Addlestone, Surrey KT15 3NB, Weybridge, UK.
- 3.10.8. *Toxoplasmosis* **Dr J.P. Dubey**
Animal Parasitic Diseases Laboratory, USDA, Agricultural Research Service, 10300 Baltimore Avenue, Beltsville, Maryland, USA.
- 3.10.9. *Verocytotoxigenic Escherichia coli* **Dr F.A. Clifton-Hadley**
APHA Weybridge, New Haw, Addlestone, Surrey KT15 3NB, UK.
- 3.10.10. *Zoonoses transmissible from non-human primates* **Dr S. Edwards (retired)**
APHA Weybridge, New Haw, Addlestone, Surrey KT15 3NB, UK.
- Dr T. Brooks**
Rare & Imported Pathogens Laboratory, Public Health England, Porton Down, Salisbury SP4 0JG, UK

26 This chapter was updated with help from: Dr R. Rathbone (AOAC, USA); Dr G. Riegler (AOAC, USA); Dr K. Jinneman (FDA, USA); Dr Y. Chen (FDA, USA); Dr T. Hammack (FDA, USA); Dr S. Granier (Anses Maisons-Alfort, France); Dr R. Danguy-des-Deserts (Laboratoire départementale de développement et d'analyses, France); Dr A. Oevermann (University of Bern, Switzerland).

27 This chapter was updated by consensus of all OIE Reference Laboratories for salmonellosis.

