

Volume 11 June 1 2010

ISSN 1466-2523

Animal Health Research Reviews

Special Issue: Influenza in Animals



**CAMBRIDGE
UNIVERSITY PRESS**

Animal Health Research Reviews

Editor-in-Chief

Carlton L. Gyles

University of Guelph, Canada

Founding Editor

Robert P. Ellis

Colorado State University, USA

Section Editors

Physiology and Pharmacology Gerhard Breves, *Veterinary School of Hannover, Germany*

Parasitology Katherine M. Kocan, *Oklahoma State University, USA*

Bacteriology Janet MacInnes, *University of Guelph, Canada*

Food and Environmental Safety Qijing Zhang, *Iowa State University, USA*

Epidemiology M. D. Salman, *Colorado State University, USA*

Virology Y. M. Saif, *Ohio State University, USA*

Editorial Board

Franklin A. Ahrens, *Iowa State University, USA*

Sang-Nae Cho, *Yonsei University, Republic of Korea*

Lynette B. Corbeil, *University of California-San Diego Medical Center, USA*

Joachim Frey, *University of Berne, Switzerland*

Ian Gardner, *University of California-Davis, USA*

Mario Jacques, *University of Montreal, Canada*

Vivek Kapur, *Pennsylvania State University, USA*

Joan K. Lunney, *USDA-Livestock and Poultry Sciences Institute, USA*

Prem S. Paul, *University of Nebraska-Lincoln, USA*

Brian Perry, *International Livestock Research Institute, Kenya*

Leon N. D. Potgieter, *University of Tennessee, USA*

Donald L. Reynolds, *University of Prince Edward Island, Canada*

Linda J. Saif, *Ohio State University, USA*

Alejandro Schudel, *University of Buenos Aires, Argentina*

Ronald D. Schultz, *University of Wisconsin, USA*

Bruce S. Seal, *USDA-Poultry Microbiological Safety Research Unit, USA*

J. Glenn Songer, *University of Arizona, USA*

Bert E. Stromberg, *University of Minnesota, USA*

Francisco Suárez-Güemes, *Universidad Nacional Autónoma de México, México*

Richard W. Titball, *Defence Evaluation and Research Agency, UK*

James A. Will, *University of Wisconsin, USA*

Aims and Scope

Animal Health Research Reviews provides an international vehicle for the publication of reviews and commentaries on all aspects of animal health. The Journal covers both infectious and non-infectious diseases in companion, production and wild animals. Articles may be in-depth reviews of a specific aspect of a disease or pathogen, or may cover all aspects of a disease, but must include new findings or advance new concepts and hypotheses. The Journal publishes both solicited and unsolicited articles. Reviews will normally be 5000–6000 words in length. The Journal is also produced electronically and is available on the Internet. If you wish to write a review please contact the editors at ahrjournal@cambridge.org.

Subscriptions

Animal Health Research Reviews (ISSN 1466-2523) is published twice a year. The subscription price for institutions of Volume 11 (2010) which includes electronic access and delivery by air is £265 (US \$515 in the USA, Canada and Mexico); the electronic only price for institutions is £212 (US \$410 in the USA, Canada and Mexico).

Orders, which must be accompanied by payment, may be sent to a bookseller, subscription agent or direct to the publisher: Cambridge University Press, The Edinburgh Building, Shaftesbury Road, Cambridge CB2 8RU, UK; or in the USA, Canada and Mexico: Cambridge University Press, Journals Fulfillment Department, 100 Brook Hill Drive, West Nyack, New York, 10994-2133. EU subscribers (outside the UK) who are not registered for VAT should add VAT at their country's rate. VAT registered subscribers should provide their VAT registration number. Japanese prices for institutions are available from Kinokuniya Company Ltd, P. O. Box 55, Chitose, Tokyo 156, Japan.

Copies of the journal for subscribers in the USA, Canada and Mexico are sent by air to New York to arrive with minimum delay. Periodicals postage paid at New York, NY, and at additional mailing offices. Postmaster: send address changes in the USA, Canada and Mexico to: *Animal*, Cambridge University Press, 100 Brook Hill Drive, West Nyack, New York 10994-2133. Claims for missing issues should be made immediately on receipt of the subsequent issue.

Advertising

Advertising queries for all parts of the world *except* the USA, Canada and Mexico to the Journals Advertising Co-ordinator: Rebecca Curtis, ad_sales@cambridge.org. Address enquiries in the USA, Mexico and Canada *only* to: journals_advertising@cup.org

Copying

This journal is registered with the Copyright Clearance Centre, 222 Rosewood Drive, Danvers, MA 01923, USA.

Organizations in the USA who are also registered with C. C. C. may therefore copy material (beyond the limits permitted by sections 107 and 108 of U.S. Copyright law) subject to promotional or commercial purposes. Code 0266-4674/2010 \$16.00.

ISI Tear Sheet Service, 3501 Market Street, Philadelphia, PA 19104, USA is authorized to supply single copies of separate articles for private use only.

Organizations authorized by the Copyright Licensing Agency may also copy material subject to the usual conditions. *For all other use*, permission should be sought from Cambridge or the American Branch of Cambridge University Press.

Internet Access

This journal is included in the Cambridge Journals Online Service which can be found at www.journals.cambridge.org

Animal Health Research Reviews

Special Issue: Influenza in Animals

Contents

Influenza in animals <i>Carlton L. Gyles</i>	1
Perspectives on influenza evolution and the role of research <i>Heather L. Forrest and Robert G. Webster</i>	3
Avian influenza: our current understanding <i>David L. Suarez</i>	19
Avian biology, the human influence on global avian influenza transmission, and performing surveillance in wild birds <i>Samantha E. J. Gibbs</i>	35
Equine and canine influenza: a review of current events <i>E. Paul J. Gibbs and Tara C. Anderson</i>	43
Interspecies and intraspecies transmission of influenza viruses: viral, host and environmental factors <i>Hadi M. Yassine, Chang-Won Lee, Renukaradhyia Gourapura and Yebia M. Saif</i>	53
Genome informatics of influenza A: from data sharing to shared analytical capabilities <i>Daniel A. Janies, Igor O. Voronkin, Manirupa Das, Jori Hardman, Travis W. Treseder and Jonathon Studer</i>	73
Swine influenza vaccines: current status and future perspectives <i>Wenjun Ma and Jürgen A. Richt</i>	81