Journal of Equine Veterinary Science

Editorial Staff

Journal of Equine Veterinary Science (JEVS) is an international publication designed for the practicing equine veterinarian, equine researcher, and other equine health care specialist. Published monthly, each issue of JEVS includes original scientific research, reviews, case reports and studies, short communications, and clinical techniques from leaders in the equine veterinary field, covering such topics as laminitis, reproduction, infectious disease, parasitology, behavior, podology, internal medicine, surgery and nutrition. JEVS is also an official publication of the Equine Science Society.

Editor-in-Chief
Edward L. Squires, MS, PhD, ACT (hon), University of Kentucky, Gluck Equine Research Center, USA

Associate Editor
James A. Orsini, DVM, Dipl. ACVS, University of Pennsylvania, Laminitis Institute, New Bolton Center, USA

Editorial Board
Willem Back, DVM, Cert. Pract. KNMvD (Equine Practice), PhD, Dipl. ECVS, Utrecht University, The Netherlands
James Belknap, DVM, PhD, Dipl. ACVS, The Ohio State University, USA
Hilary M. Clayton, BVMS, PhD, Dipl. ACVS, Michigan State University, USA
Linda A. Dahlgren, DVM, PhD, Dipl. ACVS, Virginia Polytechnic Institute and State University, USA
John Dascanio, VMD, Dipl. ABVP & ACT, Ross University, USA
Thomas J. Divers, DVM, Dipl. ACVECC & ACVIM, Cornell University, USA
Bernd Driessen, DVM, PhD, Dipl. ACVA & ECVPT, University of Pennsylvania, USA
Sue Dyson, VetMB, PhD & FRCVS, Animal Health Trust, Suffolk, United Kingdom
Lutz S. Goehring, DVM, MS, PhD, Dipl. ACVIM, Ludwig-Maximilians University of Munich, Germany
R. Reid Hanson, DVM, Dipl. ACVECC & ACVS, Auburn University, USA
Jerry H. Johnson, DVM, MS, Dipl. ACVS & CVA, Lexington, KY, USA
Kevin H. Kline, PhD, University of Illinois, USA
Arno E. Lindner, DVM, Dr. Med. Vet., Jüllch, Germany
Patrick M. McCue, DVM, PhD, Dipl. ACT, Colorado State University, USA
Kenneth H. McKeever, PhD, Dipl. FACSM, Rutgers, The State University of New Jersey, USA
Martin K. Nielsen, DVM, PhD, Dipl. EVPC, University of Kentucky, USA
Giuseppe Piccione, DVM, University of Messina, Italy
Sarah L. Ralston, VMD, PhD, Dipl. ACVN, Rutgers, The State University of New Jersey, USA
Chris W.W. Rogers, MAgriSci, PhD, Massey University, New Zealand
John Schumacher, DVM, Dipl. ACVIM & AVBP, Auburn University, USA
Donald L. Thompson Jr., PhD, Louisiana State University, USA
Peter Timoney, MVB, MS, PhD, Dipl. FRCVS, University of Kentucky, USA
Dirk K. Vanderwall, DVM, PhD, Dipl. ACT, University of Pennsylvania, USA
Nathaniel A. White II, DVM, Dipl. ACVS, Virginia Polytechnic Institute and State University, USA

Publication Information: Journal of Equine Veterinary Science (ISSN: 0737-0806) is published monthly by Elsevier Inc., (360 Park Avenue South, New York, NY 10010-1710, USA). Further information on this journal is available from the Publisher or from the Elsevier Customer Service Department nearest you or from this journal's website (http://www.j-evs.com/). Information on other Elsevier products is available through Elsevier's website (http://www.elsevier.com). Periodicals postage paid at New York, NY and additional mailing offices. Periodicals postage paid at New York, NY and at additional mailing offices.

USA POSTMASTER: Send change of address to Journal of Equine Veterinary Science, Elsevier Customer Service Department, 3251 Riverport Lane, Maryland Heights, MO 63043, USA.

© 2016 Elsevier Inc. All rights reserved.

This journal and the individual contributions contained in it are protected under copyright by Elsevier Inc. No part of this publication may be reproduced or copied either wholly or in part without the permission of the publisher.

YEARLY SUBSCRIPTION RATES: United States and possessions: Individual $345; Student $139. All other countries (prices include airspeed delivery): Individual $378; Student $171. To receive student/resident rate, orders must be accompanied by name of affiliated institution, date of term and the signature of program/residency coordinator on institution letterhead. Orders will be billed at the individual rate until proof of status is received. Current prices are in effect for back volumes and back issues. JEVS is an official publication of the Equine Science Society.
127 Evidence of Equine Viral Arteritis (EVA) infection in horses of Serbia

D. Gaudaire 1, D. Lupulovic 2, S. Savic 2, F. Chevê 1, F. Lecouturier 1, G. Lazic 4, A. Hans 3
1 ANSES-Douzol Laboratory for Equine Diseases, Virology Unit, Goustranville, France; 2 Scientific Veterinary Institute “Novi Sad”, Virology Department, Novi Sad, Serbia

Equine arteritis virus (EAV) is the causative agent of equine viral arteritis (EVA) and one of the major viral pathogens of horses. EAV is an Arterivirus belonging to the Arteriviridae family in the order Nidovirales. EVA is a respiratory and reproductive disease of horses that occurs worldwide. The vast majority of EAV infections are subclinical, but acutely infected animals may develop a wide range of clinical signs including pyrexia, depression, edema, conjunctivitis and respiratory distress. The direct consequences of EVA outbreaks are financial losses mainly due to abortions of pregnant mares and death of young foals. Following primary EAV infection, up to 70% of the stallions will carry the virus in their reproductive tract sometimes for years and will shed the virus in their semen. Several studies have shown that EAV infection has occurred among horses in North and South America, Europe, Australia, Africa, and Asia. Interestingly, EAV infection prevalence in horses varies between countries and horse breeds. In order to determine equine viral arteritis (EVA) prevalence among the 5000 horses housed in the Vojvodina region of Serbia, 429 sera from non-vaccinated horses have been collected. Serological analysis of equine sera, collected from 2013 and 2014, was performed using virus neutralization test (VNT) as described by the World Organization of Animal Health (OIE). So far sera of 156 horses coming from 10 different studs-farms of the Vojvodina region have been tested. The population tested was composed 86 stallions, aged between 1 and 26 year old, and 70 mares ranged from 1 year old to 23 year old. The mean age of the population tested was 9.9 year old. Our preliminary results indicated that 121 sera were negative (77.60%), thirty three were detected positive (21.15%), two sera were cytotoxic (1.25%). Among the positive sera fifteen (45.45%) exhibit an antibody titer range from 4 to 16, ten (30.30%) sera exhibited a titer ranged from 24 to 96 and eight (24.24%) sera had a titer above 128. Moreover, 9 out of 10 stud farms that have been included in this survey exhibited positive horses for EAV showing that EAV is circulating in the horse population kept in the Vojvodina region. So far, only one seropositive stallion has been found positive for the presence of the virus in his semen. Phylogenetic analysis performed on the 3 kb sequence encoding the structural proteins of the virus shows that this isolate seems different from those described in the literature so far.

151 Occurrence of multiple abortions due to Salmonella enterica serovar abortus equi infection

L. Llorente 1, A. Ivanissevich 2, S. Camina 1, L. Marco 1, A. Vissani 3, C Olguin Periglane 1, M. Herrera 2, M. Barrandeguy 2
1 Polo Breeding Farm; 2 Cresal Veterinaria S.A.; 3 Instituto de Virología, CICVyA, INTA Castelar; 4 Dirección de Laboratorios y Control Técnico (DILAB), SENASA, Buenos Aires, Argentina

Salmonella enterica serovar abortus equi (S. abortus equi) is a host-adapted organism known to cause abortion in mares and other clinical syndromes in foals. Re-emergence of S. abortus equi was identified in Argentina in 2011. Since then several outbreaks of abortion associated with this bacterium had been detected. This study describes the features of an extensive abortion outbreak caused by S. abortus equi infection in a polo pony breeding farm located in Buenos Aires province, Argentina. The population at risk consisted of 120 pregnant mares managed in three groups (40 mare/group). They had unrestricted access to pasture. Even though the vaccination program included vaccines against Equine Herpesvirus 1 (EHV-1) and Rhodococcus equi, it did not contemplate S. abortus equi bacterin. The outbreak of S. abortus equi abortion occurred among recipient mares derived from five different embryo transfer centers, with an index case reported on April 4 and the last registered case so far was on July 27, 2015. Abortions took place with no premonitory clinical signs, and the resulting attack rate was 24.2% (29/120 pregnant mares aborted). Nine aborted fetuses and placentas were submitted for necropsy and laboratory diagnosis. Samples from lung, thymus, spleen, liver and placenta resulted negative for Equine Herpesviruses (EHV-1 and EHV-4) and Equine Arteritis Virus by virus isolation and polymerase chain reaction (PCR) in all cases. However, a gram-negative motile bacterium sensitive to a broad range of antibiotics was isolated in pure culture from several tissues collected from all fetuses, and subsequently identified as S. abortus equi (4,12; · · · · e, n, x). Serological diagnosis of S. abortus equi was performed in all in-foal mares, and those that showed high antibody titers were treated with Sulfamethoxazol-Trimethoprim (25mg/kg, q12h for 30 days). In addition, in-foal mares were segregated into smaller groups (<15 mares/group) according to their age of gestation, and were vaccinated with a commercial S. abortus equi vaccine (two boosters with a 21-day interval) followed by two additional boosters using an autogenous S. abortus equi bacterin. Even though two new cases of abortion occurred right after the treatment was implemented, the outbreak was successfully controlled and no additional cases were reported. The source of the outbreak could not be elucidated due to the diverse origin of the animals and to the absence of reported cases from other farms linked to the affected premise. However, occurrence of S. abortus equi associated abortions was reported in other nearby locations. In light of this, a greater awareness of S. abortus equi infection as a potential cause of widespread abortions is required among equine practitioners and breeders. Thus, breeding farms need to take into consideration appropriate biosecurity and preventive measures to reduce the risk of abortion outbreaks caused by this agent.

153 Salmonella enterica serovar Abortusequi as an emergent pathogen causing equine abortion in Argentina

C.P. Bustos 1, J. Gallardo 3, G. Retamar 1, N.S. Lanza 1, E. Falzoni 1, M.J. Caffer 2, J. Picos 2, A.J. Muñoz 1, A. Pérez 1, E.V. Moras 1, M. Mesplet 1, N. Guida 1
1 Facultad de Ciencias Veterinarias, Universidad de Buenos Aires, Chorroáin 280, CABA, Argentina; 2 Servicio Enterobacterias, Departamento Bacteriología, INEI - ANLIS “Dr. Carlos G. Malbrán”, Av. Vélez Sarfield 563, CABA, Argentina

Salmonellosis is an infectious disease that affects humans, mammals, reptiles and poultry. It is produced by Salmonella spp. which is a gramnegative bacillus of 0.7-1.5 x 2-5 μm, facultative anaerobes and nonsporulating. Salmonella enterica serovar Abortusequi (Salmonella Abortusequi) is a serovar adapted to the host producing abortion in mares. If the animals do not abort,