The Complement Fixation test (CFT) is the prescribed sero-diagnostic method for glanders for international trade. However, its sensitivity and specificity has been questioned. False-negative glanders test results may lead to the introduction of the infectious agent into a glanders free-region and false-positive test results may lead to unnecessary restrictions on international trade of animals and result in financial losses for owners and the equine industry. CFT alternative methods such as Western blot (WB) and ELISAs have been developed but have not been fully validated to date according to the principles and methods of validation of diagnostic assays for infectious diseases. This project is funded by OIE and aims the further development and finalization of validation of alternative methods like indirect ELISA including recombinant ELISA already developed in several laboratories worldwide. The WB technique developed by the OIE-reference laboratory, Germany, has given promising results during the last years using the CFT and the WB in a two-cascade testing approach [1, 2]. The iELISAs developed by the project partners EU Reference Laboratory for Equine diseases, France and the Universidade Federal Rural de Pernambuco, Departamento de Medicina Veterinária, Brazil using semi-purified B. mallei antigenic fractions as well as the recombinant ELISA developed by the National Research Centre on Equines, Hisar, India gave encouraging results [3, 4].

The project is sub-divided into work packages (WP). WP1 “Constitution of a qualified sample collection’ of “true positive” and “true negative”. Special attention will be given to the inclusion of field samples from endemic countries like Brazil, India and Pakistan. WP2- ‘Producing standard sera for glanders’. Serum from glandered animals identified in WP1 will be collected to produce a large stock of positive sera as possibly international standard for glanders serodiagnostics. These sera will be available for the whole community as standard control reagents and will be included in the panel of sera for the validation pathway (WP3).

WP3- “Serological tests validation following OIE validation pathway”. Performance of tests to be evaluated will be investigated in parallel using sera collected in WP1. The validation will include the analytical performance characteristics; repeatability, analytical specificity including exclusivity and exclusivity. All tests will be validated and compared regarding sensitivity using the same panel of true positive samples. The test specificity is the most discussed issue in glanders serological diagnosis. However, the sample collection for the validation will include negative samples from different regions. For example our partners from Pakistan (University of Agriculture, Fasialabad) and Brazil (Reference laboratory for Glanders, Recife) will contribute by providing large sample collections.

Finally, for all tests the positive and negative predictive values should be calculable based on actual prevalence situation in the involved region, and allow to select the right test for the respective situation, as there are eradication scenarios, surveillance after being free of glanders, or for trade of animals. To contribute to the availability of the tests upon validation, companies will be encouraged to commercialize the ELISA and also transform the technology into a faster flow through assay (WP4).

References


Santana V, Saqib M, Comtet L. A new ELISA assay for Glanders diagnosis. 3rd Pan-American Congress of Zoonoses, 4-6/06/014, La Plata, Argentina 2014, Poster.


080 Quantitative estimation of the sensitivity of the French surveillance system for equine viral arteritis

J.P. Amat1,2, T. Vergne3, A. Hans1, B. Ferry4, P. Hendrikx5, J. Tapprest1, B. Dufour6, A. Leblond2

1 French Agency for Food, Environmental and Occupational Health Safety (Anses), Doulze Laboratory for Equine Diseases, France; 2 National Institute for Agricultural Research (INRA), UR0346, Saint-Genés-Champangelle, France; 3 Royal Veterinary College, London, United Kingdom; 4 French horse and riding institute (IFCE), Saint-Ouen-de-Thouberville, France; 5 Anses, Lyon, France; 6 Veterinary School of Maisons-Alfort, Maisons-Alfort, France

Equine viral arteritis (EVA) is a cause of abortion and neonatal deaths. In France, surveillance of EVA is based mostly on serological testing of all or part of the breeding horses, depending on the studbooks’ regulations. Hence, EVA incidence is not precisely known in the overall breeding population. The first objective of this study was to estimate the number of EVA cases and outbreaks detected by the equine breeding stock surveillance between 2006 and 2013 in France, by establishing suitable rules for identification of seroconversion. The second objective was to assess the surveillance sensitivity, after having estimated the total number of outbreaks that occurred in breeding stock during this period using a capture-recapture model. Data from breeding mares which exhibited at least one positive result in serology using viral neutralization test between 2006 and 2013 were used for analysis (n = 1,645). Data consisted of the annual antibody titers and the location of the mares (towns). Seroconversion was defined as a change in antibody titer from negative to at least 32 or a three-fold increase. The number of seroconversions was counted for each town and modeled using an unlist zero-truncated binomial (ZTB) capture-recapture model with R software. The binomial denominator was the number of horses tested in each infected town. From 2006 to 2013, 239 cases of seroconversion located in 177 towns (outbreaks) were identified. During this period, the number of outbreaks in breeding stock was estimated at 1,482 (Clo95% 1,257-1,815) using the ZTB model. Consequently, it is estimated that over 1,000 outbreaks were not detected and the surveillance sensitivity at the town level was estimated around 12% (Clo95% 10%-14%). This study revealed a significant number of outbreaks in breeding stock. However, the surveillance sensitivity seems underestimated, especially due to lack of details related to the holdings, such as the number of at risk contacts or their precise address (the holdings list was not available and several holdings may be located within the same town). Nevertheless, the sensitivity could certainly be improved by including more breeding horses in the active surveillance. This study is the first in France to estimate the EVA incidence in breeding stock and to assess quantitatively the surveillance sensitivity. Moreover, the rules for identification of seroconversion defined in this study may be used to analyze other EVA surveillance datasets based on serology, such as testing before sales or international trade, and even compulsory or voluntary passive surveillance. Such rules, adjusted to the local environment, could conceivably be applied in other countries with EVA surveillance programs.

085 Re-launch of Equinella: a web-based equine disease reporting and information platform

F. Wohlfender-Remy1,2, R. Struchen1, C. Graubner2, S. Balmer3, D. Hadorn3

1 Veterinary Public Health Institute, Vetsuisse Faculty, University Bern, Switzerland; 2 Institut suisse de médecine équine, Vetsuisse Faculty, University Bern, Switzerland; 3 Federal Food Safety and Veterinary Office, Bern, Switzerland

Equinella (www.equinella.ch) is a Swiss voluntary veterinary reporting system for equine infectious diseases first established in 1990. It focuses on equine diseases not notifiable by Swiss law. In 2012, an evaluation of the old paper-based system showed that it was not representative anymore[1]. Based on the findings from a survey, a new electronic reporting system was developed as a collaboration between the Federal Food Safety and Veterinary Office, stakeholders from research (Vetsuisse Faculty, Bern) and the Swiss Association of Equine Practitioners. The new Equinella is based on a user-friendly web-based platform (functional since November 2013) and allows registered veterinarians to report symptoms and equine diseases either using computers or portable devices. Participants benefit from various non-monetary incentives: access to a table and interactive map of all incoming, anonymized reports, a monthly newsletter and a mobile phone text message service to alarm them in case of an outbreak. Furthermore, they can contact and draw from the expertise of the Equinella specialists team and attend one free professional development course per year. Outdoor smartphones were provided to those interested. To facilitate and standardize data collection veterinarians can choose clinical symptoms or diseases from pre-defined checklists. Data on the equid and the holding are collected (no unique identifiers required to preserve anonymity). Additional information can be entered in a free text box and pictures can be uploaded. A reminder email is automatically sent to all registered veterinarians (n = 77, 31.08.2015) once a month. Recipients can then either confirm that they had no clinical observations of relevance to Equinella in their practice in the previous month or report their observations retrospectively. The monthly proportion of veterinarians that either submitted a report or confirmed not having observed any relevant cases varied between 41.6% and 87.2% (median = 71.4%). A total of 262 reports were submitted (November 2013 - August 2015; median cases per month: 8 (min =2, max =48)); 82 (31.3%) included only symptoms, 40 (15.3%) only diseases and 140 (53.4%) had both. EHV-1 and Strangles were most frequently diagnosed (clinical and/or laboratory diagnosis), whereas fever of unknown origin was the most frequently reported symptom. Equinella currently covers 50% of the Swiss equine population. Near real-time analysis of the Equinella data benefit the early detection of new, exotic and re-emerging equine diseases; thereby allowing appropriate measures in a timely manner for the protection of the equine population. Furthermore, experiences with Equinella might help establishing similar early disease detection systems for other animal species.