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Main topic : Animal Health

A new indirect ELISA for the discrimination of anti-Equine Herpes Virus Type 1 and Type 4 antibodies in horse sera

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Introduction
Equine herpes virus type 1 and 4 (EHV-1 and EHV-4) infections are widespread in horse population around the world. Both viruses are responsible for respiratory syndromes, but EHV-1 is more of concern for horse industry because of severe symptoms, such as neurological disorders and abortions, that do not occur during EHV-4 infections. Performances of sport horses are affected as much as equine breeding, resulting in considerable economic loss.
These two alphaherpesviruses are closely related, making serological diagnosis difficult by conventional methods.
Therefore, the ID Screen® EHV-1/EHV-4 Discrimination test Indirect ELISA kit was developed as a bivalent ELISA in order to distinguish between antibodies against EHV-1 or EHV-4 in equine serum / plasma, without cross-reactions.
Material and Methods
Diagnostic specificity and sensitivity of this tool was evaluated using horse sera from France and Iceland. Results were compared to another commercial ELISA.
Seroconversion of 7 experimentally infected horses (EHV-1 strain FR-56628) was followed-up. Horses were sampled between day 0 and 20 dpi. Sera were tested in parallel by VNT test and ID Screen® ELISA.
For EHV-4, eight horses were monitored during a natural EHV-4 infection (France). Sera and nasal swabs were collected regularly from these 8 horses, from the appearance of the first clinical signs in the stable (day 0) and until 77 days. All sera were tested with the ID Screen® ELISA.
Results
Correlation with the other commercial ELISA was good with a correlation of 83% for EHV-1 (k = 0.76 ; CI95% = [0.73; 0.90]), and 92% for EHV-4 (k = 0.65 ; CI95% = [0.51; 0.93]).
Regarding EHV-1 seroconversion, EHV-1-antibodies were detected between 13 and 17 dpi by the ID Screen® ELISA.
During EHV-4 outbreak, EHV-4 antibodies were detected by the ID Screen® ELISA between 6 and 10 days following first clinical signs.
No cross-reactivity was observed between EHV-1 and EHV-4 antibodies, allowing for distinction between both viral infections.
Conclusion
The ID Screen® ELISA is easy-to-use with both EHV-1 and EHV-4 testing performed within the same analytical run, thanks to its biwell plate format. It presents excellent discriminatory capacity between EHV-1 and EHV-4 infected horses and shows good correlation with another commercial ELISA Kit, based on field samples.