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Evaluation of a commercial ELISA for the specific detection of antibodies against Besnoitia besnoiti.

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Source

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Abstract

Bovine besnoitiosis is an economically important disease in cattle caused by the protozoan parasite Besnoitia besnoiti, which occurs endemically in many countries of Africa and Asia and is spreading in Europe. Serological identification of subclinically infected cattle is important to avoid the introduction of infected animals into naive herds. Here we determine the sensitivity and specificity of the PrioCHECK(®) Besnoitia Ab, a serological test recently introduced into the European market. Analytical specificity was examined using sera from animals experimentally infected with parasites related to B. besnoiti (n=27). Three animals experimentally infected with Neospora caninum or Toxoplasma gondii showed inconclusive reactions in the ELISA (percent positivity relative to the positive control [PP] 10% ≤ 20%) while all other sera reacted negative (PP<10%). An estimate of the diagnostic specificity was obtained by analysing field sera from bovine herds without besnoitiosis but with abortion problems associated to N. caninum (n=403). The analysis revealed a specificity of 94.3% or 96.8% depending on the applied cut-off (PP 10% or 20%, respectively). Sensitivity was assessed with sera from 110 animals of a herd in Germany where clinical bovine besnoitiosis was first diagnosed in September 2008. A positive serological reference standard was defined regarding sera from animals as reference positive, if these animals had tested positive in at least two of a panel of three other serological tests (two different B. besnoiti immunoblots and one immunofluorescence antibody test) on both of two sampling dates, November 2008 and April 2009. A diagnostic sensitivity of 91.8% or 75.5% was determined for sera collected in November 2008 and a sensitivity of 82.7% or 50% for sera collected in April 2009 (cut-off PP 10% or PP 20%, respectively). The marked drop in sensitivity from November 2008 to April 2009 was predominantly observed in reference-positive cattle without clinical signs. We conclude that PrioCHECK(®) Besnoitia Ab is a valuable diagnostic tool to detect clinically infected animals. Thus it may be used to support control measures, e.g., for the separation of infected animals from the remaining herd to avoid a further transmission of the infection within the herd.