Medicina Veterinária

Development and validation of an Indirect ELISA using Brucella abortus S-LPS as antigen for the diagnosis of bovine brucellosis

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Resumo

Bovine brucellosis is an important zoonotic disease caused by the bacteria Brucella abortus. The diagnosis of bovine brucellosis is manly serological, and in a systematic review and meta-analysis conducted by Andrade et al., 2024, it was found that the Indirect Enzyme Linked Immunosorbent Assay iELISA have a high diagnostic sensitivity (DSe). However, there is not much elucidation in literature about the patronization of the test. Therefore, this study aims to validate and evaluate the accuracy of an iELISA using the smooth lipopolysaccharide (S-LPS) of B. abortus as antigen, taking to account the interference of vaccine antigens and cross-reactions. The B. abortus stain 544 (ATCC 23448) was cultivated in Tryptic Soy Agar (TSA) for 48h, at 37ºC and 5% CO2. After this, the S-LPS was extracted by the hot water-phenol method, as described by Moreno et al., 1979. To evaluate the performance of iELISa using B. abortus antigen, a total of 263 bovine serum samples were analyzed, divided into eight groups: G1 (28 samples from non-vaccinated, brucellosis-positive animals), G2 (30 samples from S19-vaccinated heifers at D28), G3 (28 samples from S19-vaccinated heifers at D56), G4 (30 samples from RB51-vaccinated heifers at D28), G5 (30 samples from RB51-vaccinated heifers at D56), and G6 (43 samples from animals positive vaccinated, naturally infected; culture positive), G7 (32 samples from negative non-vaccinated animals, herds from brucellosis-free area) and G8 (42 samples from experimentally inoculated animals with Yersinia enterocolitica O:9). To estimate the DSe and DSp and the confidence interval (CI) (99%) was used the program R version 4.5.1. The test showed a high performance, with values DSe of 99.57% (99% C.I.: 97.77 - 99.94%) and DSp of 99.56 % (99% C.I.: 97.74 - 99.94%) and a calculated cut-off point of 0.2698. The iELISA showed high Se and Sp, supporting its use as a single test in contexts of low prevalence and eradication programs. Its high accuracy and large-scale applicability reduce losses from false results and improve herd-level control of bovine brucellosis.

Palavras-Chave: Serological test, Accuracy;, Diagnostic sensitivity.
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Link do pitch: https://youtu.be/4qQrDwKhpaE