Efficient screening test for the detection of anti-Brucella antibodies in camels
Broad antigen spectrum for high sensitivity
Efficient automation solutions available

Technical data

- **Antigen**: Suitable components of Brucella, native
- **Calibration**: Semiquantitative: Calculation of a ratio from the extinction of the sample and the extinction of the calibrator
- **Result interpretation**:EUROIMMUN recommends interpreting results as follows:
  - Ratio ≥ 0.8: negative
  - Ratio ≥ 0.8 to < 1.1: borderline
  - Ratio ≥ 1.1: positive
- **Sample dilution**: Camelid serum or plasma, 1:101 in sample buffer
- **Reagents**: Ready for use, with the exception of the wash buffer (10x), colour-coded solutions
- **Test procedure**: 30 min (37°C) / 30 min (37°C) / 15 min (room temperature), fully automatable
- **Measurement**: 450 nm, reference wavelength between 620 nm and 650 nm
- **Test kit format**: 96 break-off wells; kit includes all necessary reagents
- **Order number**: EI 2189-9601 GK

Clinical significance

Brucellosis is a long known zoonotic disease which is caused by the gram-negative bacterium Brucella. Brucella is classified as risk group III by the WHO. The species Brucella abortus and Brucella melitensis were identified in camels. The disease was first described in 1931. Even though clinical symptoms are generally mild in camels, Brucella can be transmitted to humans via fresh milk or raw meat and turn into a serious health problem in the affected regions. The worldwide camel population encompasses almost 26 million animals, which, in theory, could transfer the disease to 1050 million people in Africa and 2870 million people in Asia (excluding China), which shows the significance of the disease.

Camels of the species Camelus bactrianus and Camelus dromedarius are often infected with Brucella, especially if they live in direct vicinity of infected ruminants such as cattle, sheep or goats. Entry sites for Brucella are the lungs, intestinal tract, mucous membranes and the skin. The pathogen travels via the blood to various organs such as liver, spleen, or the haematopoietic system. Experimental infection of camels with Brucella abortus led to mild clinical symptoms, e.g. inappetence, minimal lameness due to arthritis, and bilateral lacrimation. Orchitis and epididymitis occurred with Brucella abortus and Brucella melitensis. Retained placenta (retentio secundarium), placentitis, infections of the urogenital tract, abortion with mummification, and infertility were also observed. The economic loss by abortion, decreased milk production and fertility, and the transmission of the disease to other species, including humans, is significant.

In most developed countries, brucellosis is under control. In economically underdeveloped regions, however, it is often unknown or ignored, in particular with respect to the transmission via dairy products or meat.
**Diagnostic application**

Reliable diagnosis can only be achieved by direct detection of Brucella in the affected tissue, e.g. from the placenta or lymph nodes. This procedure, however, is complicated, and also constitutes a large infection risk for the laboratory staff. For this reason, various serological test systems for the detection of antibodies against Brucella have been developed, including the complement fixation test (CFT) and Rose Bengal test (RBT). But these tests are time-consuming and limited with respect to sensitivity and standardisation. The RBT can only be used for monitoring in Brucella-free regions. The World Organisation for Animal Health (OIE) names various serological tests for the diagnosis of bovine antibodies against Brucella, including the above-mentioned CFT and RBT, as well as ELISA. However, the OIE also points out that a positive result should always be verified using a confirmatory test. Due to its large antigen spectrum the Anti-Brucella ELISA Camel (IgG) provides a high sensitivity and is therefore ideally suited for screening.

**Reproducibility**

The reproducibility was investigated by determining the intra- and inter-assay coefficients of variation using three sera. The intra-assay CVs are based on 20 determinations and the inter-assay CVs on four determinations performed in six different test runs.

<table>
<thead>
<tr>
<th>Serum</th>
<th>Intra-assay variation, n = 20</th>
<th>Inter-assay variation, n = 4 x 6</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Mean value (ratio)</td>
<td>CV (%)</td>
</tr>
<tr>
<td>1</td>
<td>0.9</td>
<td>3.5</td>
</tr>
<tr>
<td>2</td>
<td>4.1</td>
<td>3.7</td>
</tr>
<tr>
<td>3</td>
<td>5.6</td>
<td>1.1</td>
</tr>
</tbody>
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**Sensitivity and specificity**

The sensitivity was determined by investigating 147 sera from camels from Dubai. The results were then compared with those of a commercially available multi-species ELISA for the detection of antibodies against Brucella. The specificity was determined by analysing 20 camelid sera from German zoos and 156 camelid sera from Gran Canaria, all with a negative expected value. The sensitivity and specificity of the Anti-Brucella ELISA Camel (IgG) were 100%.

**Literature**