

**Oral Vaccination with heat-inactivated *Mycobacterium bovis*
does not interfere with the ante mortem Diagnostic
Techniques for Tuberculosis in goats**

Abstract:

Vaccination against tuberculosis (TB) is prohibited in cattle or other species subjected to specific TB eradication campaigns, due to the interference that it may cause with the official diagnostic tests. However, immunization with a heat-inactivated (HI) *Mycobacterium bovis* vaccine via the oral route has been suggested to overcome this issue. In this study, the main goal was to assess the interference of the HI vaccine by different routes of administration using a previous vaccination and re-vaccination (boosting) protocol. TB-free kid goats were divided into three groups: oral ($n = 16$), intramuscular (IM; $n = 16$), and control ($n = 16$). Results showed that there was a significant difference in the percentage of animals positive to the single intra-dermal test (SIT) and blood based interferon-gamma release assay (IGRA) caused by vaccination when performed in the IM group compared to the oral group ($p < 0.001$). Nevertheless, no positivity to the SIT or IGRA test was observed in orally vaccinated goats regardless of the different interpretation criteria applied. None of the groups presented positive antibody titers using an in-house ELISA and samples collected 2 months after the boost. These results suggest the potential usefulness of the HI vaccine by the oral route in goats to minimize the interference on diagnostic tests (skin and IGRA tests) and reducing the necessity of defined antigens to replace the traditional purified protein derivatives for diagnosis. Finally, the results pave the way to future efficacy studies in goats using different routes of HI vaccination