

Technical University of Denmark



Use of Novel Recombinant Antigens in the Interferon Gamma Assay for Detection of Mycobacterium Avium Subsp. Paratuberculosis Infection in Cattle

Melvang, Heidi Mikkelsen; Aagaard, Claus ; Nielsen, Søren Saxmose; Jungersen , Gregers

Publication date:
2012

Document Version
Publisher's PDF, also known as Version of record

[Link back to DTU Orbit](#)

Citation (APA):

Mikkelsen, H., Aagaard, . C., Nielsen, S. S., & Jungersen , G. (2012). Use of Novel Recombinant Antigens in the Interferon Gamma Assay for Detection of Mycobacterium Avium Subsp. Paratuberculosis Infection in Cattle. Abstract from 11th International Colloquium on Paratuberculosis, Sidney, Australia.

DTU Library

Technical Information Center of Denmark

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

USE OF NOVEL RECOMBINANT ANTIGENS IN THE INTERFERON GAMMA ASSAY FOR DETECTION OF MYCOBACTERIUM AVIUM SUBSP. PARATUBERCULOSIS INFECTION IN CATTLE

Mikkelsen, H^{1,2}, Aagaard, C³, Nielsen, S.S.² and Jungersen, G²

1 National Veterinary Institute, Technical University of Denmark, Copenhagen, Denmark

2 Department of Large Animal Sciences, University of Copenhagen, Copenhagen, Denmark

3 Statens Serum Institut, Department of Infectious Disease Immunology, Copenhagen, Denmark

Early stage *Mycobacterium avium* subsp. *paratuberculosis* (MAP) infection can be detected by measuring antigen specific cell mediated immune responses by the interferon gamma (IFN- γ) assay. Available IFN- γ assay use purified protein derivate of Johnin (PPDj) leading to low specificity. The objectives of the study were to evaluate immunogenicity and specificity of 14 novel recombinant antigens for use in the IFN- γ assay and to assess the consistency of IFN- γ responses. The antigens used were 4 ESAT-6 family members, 4 latency proteins, 4 secreted proteins including Ag85B, 3 other antigens and PPDj. The study included blood samples from 26 heifers of a MAP infected herd, collected three times with 4 and 5 week interval and blood samples from 60 heifers of a MAP non-infected herd collected once. The IFN- γ responses of the non-infected heifers were used to establish cut-off values for each antigen. Animals of the MAP infected herd were grouped as cases or non-cases by a case definition that was: an animal with ≥ 2 positive tests for ≥ 4 antigens, which resulted in 13 cases and 13 non-cases. Based on the case-definition, immunogenicity and specificity of each antigen were calculated. IFN- γ levels of the infected and non-infected herds were significantly ($P < 0.05$) different and IFN- γ levels of cases were significantly higher than non-cases ($P < 0.05$). The results of the IFN- γ assay using PPDj did not correlate with the results using the novel antigens since 5 of the 17 animals that were positive to PPDj were non-cases and one case were negative to PPDj but positive to all other tested antigens. Furthermore, PPDj produced elevated IFN- γ responses of both the infected and non-infected herds and showed low consistency. Immunogenicity was highest for the group of latency proteins (0.65-0.85) that also had high specificity (0.92-1.00). Three latency proteins showed positive IFN- γ tests that correlated highly with the case definition and one of these antigens (LATP-2) had no homologue sequence in the *M. avium* subsp. *avium* or *M. bovis* genome and could be a promising diagnostic antigen. The combination of antigens for use as a cocktail should be further investigated. However, to detect the animals defined as cases, 8 of the novel antigens and Ag85B would have to be included.