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*Publication date:*  
2014

*Document Version*  
Peer reviewed version

[Link back to DTU Orbit](#)

*Citation (APA):*

Thakur, A., Aagaard, C., Melvang, H. M., Hassan, S. B., Andersen, P., & Jungersen, G. (2014). Tissue reduction of map numbers after post-exposure vaccination with single latency antigen is improved by combination with acute-stage antigens in goats. Abstract from 12th International Colloquium on Paratuberculosis, Parma, Italy.

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## **TISSUE REDUCTION OF MAP NUMBERS AFTER POST-EXPOSURE VACCINATION WITH SINGLE LATENCY ANTIGEN IS IMPROVED BY COMBINATION WITH ACUTE-STAGE ANTIGENS IN GOATS**

A new (FET11) multi-stage vaccine against paratuberculosis has been shown to reduce Map numbers in cattle after post-exposure vaccination. Here we investigated the effect of vaccination with latency antigen alone, or two different constructs of the multi-stage vaccine in a goat model.

Goats were orally inoculated with 4x10<sup>9</sup> live Map in their third week of life and randomly assigned to four groups of five goats each. One group was left unvaccinated, while other goats were post-exposure vaccinated at 14 and 18 weeks post Map inoculation with either a single FadE5 protein (100 µg), FET11 multi-stage vaccine with FadE5 (60 µg) and ESAT-fusion protein (40 µg), or FET13 with FadE5 and ESAT proteins combined in a single fusion protein (100 µg), respectively. All proteins were delivered in CAF09 adjuvant (DDA/MMG/Poly I:C). Antibody responses were measured by ID Screen® ELISA and individual vaccine protein ELISAs along with IFN-γ release assay with PPDj and vaccine proteins. At termination 32 weeks post Map inoculation, Map burden in 15 gut tissues and lymph nodes was determined by quantitative IS900 PCR.

FadE5 vaccination induced a protective effect in goats with consistently reduced Map numbers compared to unvaccinated control goats. FET11 and FET13 vaccination, however, provided significantly protection with absent or very low Map numbers in tissues. No goats seroconverted in ID Screen® ELISA, except for a single goat in the unvaccinated control group at last sampling prior to euthanasia. PPDj responses were low in all goats at all times.

These results indicate a combination of acute and latent stage antigens in appropriate adjuvant formulation induces a protective immune response against paratuberculosis and corroborate previous findings of the FET11 vaccine in calves.