Oral vaccination of mice with *Mycobacterium bovis* BCG vaccine in a lipid matrix protects against infection with *M. avium* subsp. *paratuberculosis*

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**OBJECTIVE**
Existing vaccines against MAP, based on whole killed or live attenuated bacteria, can delay the onset of clinical symptoms but not the actual infection. Moreover, vaccinated cattle develop antibodies that interfere with serodiagnosis of Johne’s disease and they become reactive in the PPD skin-test, used for the control of bovine tuberculosis. Furthermore, the intramuscular administration of these vaccines in oily adjuvant induces local granulomas at the injection site and poses a risk for the veterinarian. Here we have analyzed the potential of oral vaccination to overcome these hurdles.

**MATERIALS AND METHODS**
MAP susceptible BALB.B10 mice (Roupie et al, 2008) were taken off food but not water for five hours before placing them individually in a cage with water, minimal bedding and the lipid vaccine (*M. bovis* BCG Danish 1331, 10⁷ CFU in lipid PK) in a cup as described before (Clark et al., 2008). Control animals were fed with cups containing only lipid PK. Each animal was left overnight to consume the vaccine. After the paste was eaten, animals were returned to group cages with normal mouse food available. Mycobacteria specific IFN-g responses were analyzed 5 weeks post immunisation. Fifteen weeks post immunisation, mice were challenged with 1.6 x10⁶ RLU of luminescent MAP ATCC 19698 and bacterial replication was monitored in spleen and liver for 12 weeks.

**RESULTS**
Although only weak mycobacteria-specific IFN-g and lymphoproliferative immune responses were detected in spleen and maxillary lymph nodes of mice fed with the lipid-formulated BCG vaccine, bacterial numbers (as detected by luminometry) were significantly lower in spleen and particularly in liver at four and eight weeks post challenge.

**CONCLUSION**
Lipid based, orally delivered mycobacterial vaccines may be a safe and practical method of controlling paratuberculosis.

**REFERENCES**