

Science and Research Projects

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Evaluation of the protection efficacy of vaccines against bovine TB in a natural transmission setting. - SE3227

Description

Bovine tuberculosis remains an economically important problem in Great Britain with potential zoonotic consequences. As such, Defra continues to have a statutory obligation to control tuberculosis in farm animals in Great Britain under the Animal Health Act of 1981, the Tuberculosis Orders, and various EC directives. Despite implementation of a test and slaughter strategy using the tuberculin skin test to detect infected animals, the incidence of bovine tuberculosis in cattle has been increasing exponentially since 1988. In 1996, an independent scientific commission chaired by Professor John Krebs to review the situation of bovine TB in GB concluded that the development of a cattle vaccine and associated diagnostic test had the best prospect of controlling the disease in the National Herd. This conclusion has been re-affirmed in the House of Commons Environment, Food and Rural Affairs Committee's report on Bovine TB (2004) and by the findings of the Independent Scientific Group Vaccine Scoping Subcommittee, which highlighted that work on development and testing of vaccines should be maintained in order to produce a vaccine that is more effective than BCG in cattle. Significant scientific advances have been made towards this goal by VLA and our collaborators (especially AgResearch, NZ) as a result of Defra-funded projects. These advances have meant that Defra's TB vaccine programme is broadly on track with the timeline outlined by the Krebs' Report for the development of cattle TB vaccines.

However, as highlighted by Defra's Vaccine Programme Advisory Group (VPAG) at their inaugural meeting, a major barrier to progress in cattle vaccine research is the absence of experimental systems to measure vaccine efficacy in a natural transmission setting. Without this information, it is difficult to assess whether "laboratory" advances will have any significant impact in the field. The need to assess the ability of promising TB vaccine candidates to protect cattle against natural transmission of *M. bovis* was announced by the Animal Health Minister Ben Bradshaw to the House of Commons on 9 June 2005 and by Defra in an accompanying press release. In the press release it was stated that Defra would contract 'further work looking at new vaccine candidates and delivery protocols in a natural transmission study in cattle at the Veterinary Laboratories Agency. A naturally infected herd will be used to compare the effectiveness of several vaccines'.

The aim of this proposal is to establish a facility for generating natural transmission of *M. bovis* between cattle by assembling reactor cattle in a contained setting. This facility will then be used to determine the efficacy of promising vaccine candidates under conditions of natural transmission. This will be done by introducing sentinel vaccinated and control animals into the reactor herd and leaving them in-contact with reactor animals for 10-12 months. The protective efficacy of vaccine candidates will be determined by comparing disease rates between vaccinated and unvaccinated cattle. The first vaccine to be tested will be BCG given to neonates. Subsequent vaccines to be tested in this way will be prioritised on the basis that they have been shown to induce better protection against experimental challenge in cattle than BCG. This design was presented to and approved by VPAG, which includes a representative from the ISG, at its meeting on 12 May 2005.

Objective

01. To develop logistical framework for project
02. To perform proof of concept experiment
03. To determine protective efficacies of cattle TB vaccines under conditions of natural transmission
04. To evaluate reagents for differential diagnosis

Time-Scale and Cost**From:** 2005**To:** 2012**Cost:** £6,945,146**Contractor / Funded Organisations**[Veterinary Laboratories Agency](#)**Keywords**[Animal Health](#)[Bovine Tuberculosis](#)[Plants and Animals](#)[Transmission](#)[Zoonoses](#)**Fields of Study**[Animal Health](#)