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Thematic portfolio



Controlling bovine tuberculosis: a One Health challenge



PERSPECTIVES

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AROUND THE WORLD

Vaccination of cattle against bovine tuberculosis could be a particularly valuable control strategy in countries faced with intractable ongoing infection from a disease reservoir in wildlife [1].

A field vaccination trial was undertaken in New Zealand which included 1,286 effectively free-ranging cattle stocked at low densities in a remote 7,600 ha area; 55% were vaccinated using a high dose (10^{7-8} colony forming units [cfu]) of *Mycobacterium bovis* BCG (Danish strain 1311) ([see the original research article, *Efficacy of oral BCG vaccination in protecting free-ranging cattle from natural infection by Mycobacterium bovis*, published in *Veterinary Microbiology* \[2\]](#)). Vaccine was administered orally in all but 34 cases (where it was injected). The cattle were exposed to natural sources of *M. bovis* infection in cattle and wildlife, most notably the brushtail possum (*Trichosurus vulpecula*). Cattle were slaughtered at 3–5 years of age and inspected for tuberculous lesions, with mycobacteriological culture of tissues from almost all animals. The prevalence of *M. bovis* infection was 4.8% among oral BCG vaccinates, significantly lower than the 11.9% in non-vaccinates.

Vaccination appeared to reduce the incidence of infection, and to slow disease progression substantially in cattle that did become infected. Based on apparent annual incidence, the protective efficacy of oral BCG vaccine was 67.4% for preventing infection, and was higher in cattle slaughtered soon (within 1–2 years) after vaccination. Skin-test reactivity to tuberculin was initially elevated, being high in vaccinates re-tested 70 days after oral vaccination but not in non-vaccinates, although reactor animals had minimal response in gamma-interferon blood tests. However, in re-tests conducted more than 12 months after vaccination, skin-test reactivity among vaccinates did not differ significantly from that in non-vaccinates. These results indicate that oral BCG vaccination could be an effective tool for greatly reducing detectable infection in cattle.

A subsequent similar trial in the same area involving a much lower dose (3×10^5 cfu) of BCG, delivered by injection, reduced the apparent annual incidence of abattoir-detectable infection by 87% [3].

Highlights

- Bovine tuberculosis is difficult to eliminate from livestock where infected wildlife is present.
- Oral BCG vaccination was trialled in free-ranging New Zealand cattle exposed to a combined cattle and wildlife tuberculosis reservoir.
- Vaccination showed 67.4% efficacy in preventing infection and also slowed disease progression in infected cattle.
- Vaccination of livestock could be useful where tuberculosis persists in wildlife reservoirs.

DOI of the original research article published in *Veterinary Microbiology*:
<https://doi.org/10.1016/j.vetmic.2017.07.029>

DOSSIER

Efficacy of oral BCG vaccination in protecting free-ranging cattle

(Abstract from manuscript)

KEYWORDS

#BCG vaccine, #bovine tuberculosis, #free-ranging cattle, #Mycobacterium bovis, #New Zealand, #oral vaccination, #vaccination, #Veterinary Microbiology, #wildlife.

AUTHORS

Graham Nugent⁽¹⁾, Ivor J. Yockney⁽¹⁾, Jackie Whitford⁽¹⁾, Frank E. Aldwell⁽²⁾ & Bryce M. Buddle^{(3)*}

(1) Manaaki Whenua – Landcare Research, PO Box 40, Lincoln, 7640, New Zealand.

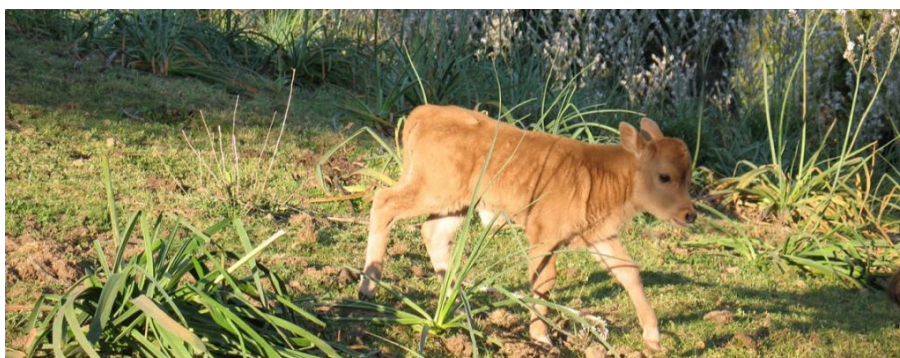
(2) Centre for Innovation, University of Otago, Dunedin, New Zealand.

(3) AgResearch, Hopkirk Research Institute, Palmerston North, New Zealand.

* Corresponding author: bryce.buddle@agresearch.co.nz

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12, rue de Prony - 75017 Paris, France

Tel.: +33 (0)1 44 15 18 88 - Fax: +33 (0)1 42 67 09 87 - oie@oie.int