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Control and eradication of bovine tuberculosis (bTB) is desirable for animal welfare, socioeconomic and zoonotic reasons. Tuberculin potency affects test sensitivity and specificity. Therefore, accurate potency determination is critical for test performance. Eradication of bTB will undoubtedly continue to require a multifaceted approach if it is to be successful.

The Irish national bTB eradication programme commenced in 1954 with 80% herd and 17% animal (22% cows) prevalence rates [1]. The single intradermal comparative tuberculin test using avian and mammalian tuberculin purified protein derivatives (PPDs) addressed non-specific sensitisation by abundant environmental mycobacteria. Skin testing requires minimal technology (Fig. 1) and, being safe, allows testing from birth [1, 2]. Progress was dramatic to 1965 but stalled at ~30,000 reactors removed/year until 2000 (Fig. 2).

Programme milestones

- 1974, first tuberculous badger detected, by the 1980s infected badgers found countrywide;
- 1975-1976, programme interruption (fewer reactors);
- 1976-1977, bovine replaced human tuberculin PPD (more sensitive and specific);
- 1978-1979, tuberculin potency fell, affecting bTB detection (initiated routine potency assay on infected cattle as critical quality control);
- 1980, tuberculin supplier changed;
- 1989, TB investigation unit (now CVERA) founded to investigate bTB and improve eradication, using science-informed policy in a national context;
- 1990, endemically infected badgers recognised as tuberculosis maintenance host (culled since 2003 when epidemiological investigation associated them with bTB breakdowns);
- 1991, interferon-■ assay (using tuberculin) used in bTB herds to remove additional infected cattle (legally recognised 2005);
- 1992, PPD potency standardised for Irish programme at bovine 30,000 IU/ml, avian 25,000 IU/ml (giving optimal sensitivity/specificity). Studies showed imprecise guinea pig bio-assay potency estimates and a significant fall in the number of infected cattle detected using low potency tuberculin but if standard potency maintained there was no apparent impact from changing supplier/manufacturer [1, 3].

Clinical bovine tuberculosis and human zoonotic tuberculosis are now uncommon in Ireland

The Irish programme uses tuberculin PPD and optimal test methodologies for bTB eradication; considers disease epidemiological profile, controls non-bovine maintenance hosts, pursues rigorous quality controls (including tuberculin potency assay), evaluates surveillance protocols, test performance, policy efficacy and outcomes, and is modified reflecting findings and scientific advances [2, 3]. Clinical bTB and human zoonotic tuberculosis [4] are now uncommon.







Fig. 1. Testing cattle: clip sites mid-neck; measure skin thickness; inject tuberculin – avian and bovine; 72-hours later measure and compare responses [2, 3]. ©A. Duignan

Number of animals

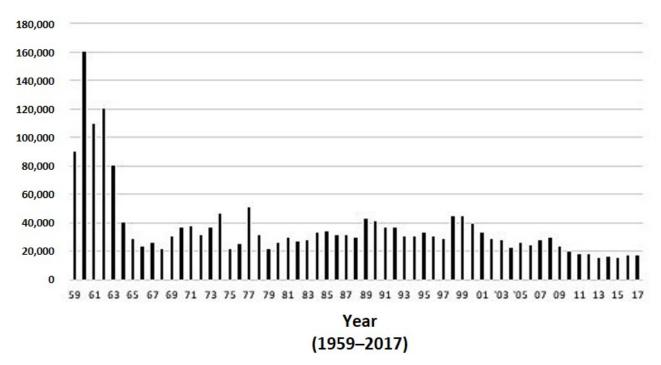


Fig. 2. Number of animals removed annually 1959 to 2017 inclusive under the Irish bovine tuberculosis eradication programme



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AROUND THE WORLD



The Irish experience of the tuberculin test in bovine tuberculosis eradication

KEYWORDS

#bovine tuberculosis, #eradication, #Ireland, #purified protein derivative (PPD), #tuberculin, #tuberculin potency.

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REFERENCES

1. Good M. (2011). – The tuberculin test and its role in the strategic management and eradication of tuberculosis in cattle. Utrecht University Repository (Dissertation). Publisher: Utrecht University. ISBN: 978-90-393-5645-6.

2. Good M., Bakker D., Duignan A. & Collins D.M. (2018). - The history of in vivo tuberculin testing in bovines: tuberculosis, a 'One Health' issue. Front. Vet. Sci., 5 (Art





59). https://doi.org/10.3389/fvets.2018.00059.
3. Good M. & Duignan A. (2017). – Veterinary handbook for herd management in the bovine TB eradication programme. Department of Agriculture, Food and the Marine, Dublin, Ireland.

4. World Health Organization (WHO), World Organisation for Animal Health (OIE) & Food and Agriculture Organization of the United Nations (FAO) (2017). - Roadmap for Zoonotic Tuberculosis.

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