

## Executive Summary

### Flaws in Current Bovine Tuberculosis Policy in the UK and Recommendations for Future Policy Directions

#### Overview

- Bovine tuberculosis (bTB) is a chronic infectious bacterial disease affecting animals, primarily caused by *Mycobacterium bovis* (*M.bovis*)<sup>1</sup>. Historically, it posed a significant public health threat in the UK, with 40% of dairy herds infected in the 1930s and thousands of human fatalities annually<sup>2</sup>. Public health measures, including test-and-cull regimes, carcass inspection and milk pasteurisation, have since dramatically reduced human cases<sup>3</sup>.
- Beyond its zoonotic potential, bTB causes significant economic and welfare challenges. Farmers face reduced productivity, emotional strain and financial losses, with over £150 million of taxpayers and industry funding spent annually on control measures<sup>4</sup>. Despite these efforts, the UK has yet to achieve eradication, hindered by reservoirs of infection in wildlife (primarily badgers) and undetected cases in cattle.
- Since 2014, over £1 billion has been spent on bTB control in England<sup>5</sup>, resulting in the slaughter of over 278,000 cattle and culling of 230,000 badgers<sup>6</sup>. However, progress remains limited, highlighting the urgent need for policy reform to secure the UK's officially TB-free status by 2038 (99.8% of herd officially bTB free (OTF) for six consecutive years<sup>7</sup>) crucial for underpinning trade, agricultural sustainability and food security.
- In England, the epicentre for bTB is in the southwest, particularly Cornwall, Devon and Dorset. Currently, over 600 herds are non-OTF - representing over 8% of all herds in the area - despite significant badger culling over 80% of the land area in the past five years<sup>8</sup>.
- There is growing consensus within the livestock veterinary community that cattle-to-cattle transmission is the primary driver of bTB persistence in the UK. Future policy requires a balanced and open-minded approach, encouraging dialogue amongst stakeholders and empowering farmers to play a leading role in disease control.

#### Current bTB Control Measures and Challenges

##### Cattle-to-Cattle Transmission

###### 1. Test-and-Cull Policy

- Reliance on the Single Intradermal Comparative Cervical Tuberculin Test (SICCT) and gamma-interferon tests for particular herds/areas is the cornerstone of control efforts.
- SICCT has limited sensitivity (36-60% in field studies<sup>9</sup>), potentially leading up to half of infected animals undetected in a herd which can remain as a reservoir of infection.
- Over-reliance on statutory tests neglects alternative diagnostics (IDEXX ELISA, Actiphage, Enferplex) which could enhance bTB detection, but usage requires prior approval from the APHA. Inflexibility in testing protocols, regardless of OTF status, further compounds the issue of infective cattle remaining undetected in herds.
- Current costs of this strategy exceed £150 million annually<sup>4</sup>, shared by taxpayers and farmers, with limited improvement in long-term bTB control outcomes.

###### 2. Cattle Vaccination

- Development of the cattle BCG vaccine and differentiating infected from vaccinated animals (DIVA) test is promising but not yet deployable.
- Challenges include interference with current test and surveillance with possible repercussions for international trade.

##### Wildlife-to-Cattle Transmission

<sup>1</sup> <https://www.woah.org/en/disease/bovine-tuberculosis/>

<sup>2</sup> <https://acmsf.food.gov.uk/sites/default/files/multimedia/pdfs/committee/acm995mbovis.pdf>

<sup>3</sup> <https://www.gov.uk/government/publications/mycobacterium-bovis-mbovis-tuberculosis-annual-data/mycobacterium-bovis-notifications-to-national-tuberculosis-surveillance-uk-2000-to-2023>

<sup>4</sup> <https://www.gov.uk/government/publications/a-strategy-for-achieving-bovine-tuberculosis-free-status-for-england-2018-review-government-response/executive-summary#fn:1>

<sup>5</sup> <https://questions-statements.parliament.uk/written-questions/detail/2022-10-11/HL2483/#:~:text=We%20estimate%20that%20the%20total,the%20last%2010%20financial%20years.>

<sup>6</sup> <https://deframedia.blog.gov.uk/2024/09/02/government-announces-tb-eradication-strategy-to-end-the-badger-cull/>

<sup>7</sup> [https://www.woah.org/en/what-we-do/standards/codes-and-manuals/terrestrial-code-online-access/?id=169&L=1&htmlfile=chapitre\\_bovine\\_tuberculosis.htm](https://www.woah.org/en/what-we-do/standards/codes-and-manuals/terrestrial-code-online-access/?id=169&L=1&htmlfile=chapitre_bovine_tuberculosis.htm)

<sup>8</sup> <https://savemetrust.co.uk/2024/08/20/defraspin/>

<sup>9</sup> A. Lahuerta-Marin, M.G. Milne, J. McNair, R.A. Skuce, S.H. McBride, F.D. Menzies, S.J.W. McDowell, A.W. Byrne, I.G. Handel, B.M. de C. Bronsvort, Bayesian latent class estimation of sensitivity and specificity parameters of diagnostic tests for bovine tuberculosis in chronically infected herds in Northern Ireland, The Veterinary Journal, Volume 238, 2018, Pages 15-21, ISSN 1090-0233, <https://doi.org/10.1016/j.tvjl.2018.04.019>.

1. Badger Culling:

- Culling is controversial due to inconsistent evidence of its efficacy<sup>10</sup> and concerns about the ‘perturbation effect’ which can exacerbate bTB incidence in adjacent areas to cull zones<sup>11</sup>,
- Comparative studies suggest cattle-to-cattle transmission drives bTB spread far more significantly than badger-to-cattle transmission<sup>12,13</sup>.

2. Non-lethal Measures; Badger Vaccination and Fertility Control:

- Vaccination reduces severity of infection and transmissibility of bTB<sup>14</sup> but is expensive and requires sufficient wildlife penetration to be effective<sup>15</sup>.
- Fertility control is a potential tool to reduce badger population density but remains in early stages of development and is highly resource intensive.

## Recommendations for Future Policy

1. Funding Realignment

- When bTB meat can enter the food chain (non-visible lesions, or lesions in one organ/area), why are we using tax-payers money for compensation of the carcass which enters the human food chain as normal?
  - Realigning funding will support a more strategic and sustainable approach to bTB management, reduce financial waste and allow collaboration between farmers, vets and government. This funding redirection goes hand-in-hand with recommended policy number two (see later).
- **Redirect culling compensation funds** towards providing enhanced bTB testing, veterinary intervention, tailored bTB herd management plans and bTB research.
- **Tie compensation to compliance** with recommended disease control strategies to incentivise proactive engagement with bTB eradication.

2. Flexible bTB Breakdown Management Strategies

- Replacing blanket policies of compulsory slaughter and compensation with **herd-specific strategies** to maintain herd viability, farmer wellbeing and ‘manage-out’ the disease. This could include the isolation of infected or high-risk animals with their removal based on economic and disease control considerations and enhanced testing of the remainder of the herd.

3. Modernisation of bTB Diagnostics in Cattle

- Improve statutory testing by adopting **higher-sensitivity tests**, such as the Single Intradermal Cervical Test (SICT), as in the EU, recommended in the Godfray report for high-risk and edge areas<sup>16</sup>.
- **Increase access** of non-statutory tests for high-risk herds, breakdown herds, edge-areas and once herds have regained OTF status to identify infected cattle undetected by statutory tests.
- Allow farmers **flexibility to retest outside of statutory schedules** for improved detection of latent and persistently infected individuals.

4. Cattle Vaccination

- Requires an accompanying DIVA test to align with ongoing herd surveillance and monitoring, and **collaborative work with the EU and WOA** to ensure that this measure will not hinder trade.

5. Transition to Non-lethal Wildlife Control

- Use the upcoming badger population survey to inform and monitor evidence-based strategies on effective bTB control in badgers, and **if they are necessary at all**.
- End badger culling and shift to **evidence-based** vaccination, fertility control and biosecurity measures.

6. Enhanced Farm Biosecurity

- Promote measures such as badger-proof fencing, secure feed and water sources, and stricter management of herd contact with wildlife.

<sup>10</sup> Torgerson, P.R., Hartnack, S., Rasmussen, P. et al. Absence of effects of widespread badger culling on tuberculosis in cattle. *Sci Rep* 14, 16326 (2024). <https://doi.org/10.1038/s41598-024-67160-0>

<sup>11</sup> <https://assets.publishing.service.gov.uk/media/5beed433e5274a2af111f622/tb-review-final-report-corrected.pdf>

<sup>12</sup> Joseph Crispell, Clare H Benton, Daniel Balaz, Nicola De Maio, Assel Ahkmetova, Adrian Allen, Roman Biek, Eleanor L Presho, James Dale, Glyn Hewinson, Samantha J Lycett, Javier Nunez-Garcia, Robin A Skuce, Hannah Trewby, Daniel J Wilson, Ruth N Zadoks, Richard J Delahay, Rowland Raymond Kao (2019) Combining genomics and epidemiology to analyse bi-directional transmission of *Mycobacterium bovis* in a multi-host system eLife 8:e45833 <https://doi.org/>

<sup>13</sup> <https://www.microbiologyresearch.org/content/journal/mgen/10.1099/mgen.0.001023>

<sup>14</sup> <https://tbhub.co.uk/wp-content/uploads/2022/06/AR-factsheet-badger-vaccination-01.06.22.pdf>

<sup>15</sup> <https://www.bbc.co.uk/news/uk-england-nottinghamshire-65017116>

<sup>16</sup> <https://assets.publishing.service.gov.uk/media/5beed433e5274a2af111f622/tb-review-final-report-corrected.pdf>

- Strengthen protocols to reduce environmental contamination with *M.bovis* and human-mediated transmissions of onto farms.
- 7. Implementation of Risk-based Cattle Trading
  - Implement **stricter regulations for high-risk cattle movements** and mandatory pre- and post-movement bTB testing of **all cattle**.
  - **Disincentivise risky trading behaviours** by reducing compensation for culling bTB positive animals or through other measures.
- 8. Research Priorities
  - Focus on understanding **bTB transmissions pathways**, including faeco-oral and vertical transmission routes.
  - Evaluate the **basic reproduction number ( $R_0$ ) of bTB in badgers**, its role in transmission dynamics and therefore is the inclusion of badgers in bTB control policy in cattle is necessary.
  - Develop and validate advanced diagnostics and assess their efficacy in reducing **undetected reservoirs and latent infections**.

### Predicted Outcomes

- Short-term:
  - Increased bTB incidence as hidden infections are detected by more sensitive diagnostic tests.
  - Higher initial costs for enhanced testing and implementation of strict biosecurity and other measures.
- Long-term:
  - Reduced reservoir of infection in cattle herds and decreased reliance on culling infected animals.
  - Improved disease control outcomes through better diagnostics, biosecurity and other strategies.
  - Enhanced cost-effectiveness and sustainability of bTB control reducing financial burdens on taxpayers and the farming industry.