

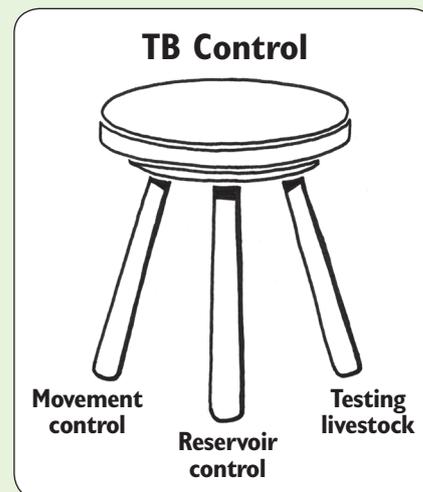
Bovine Tuberculosis (bTB)

History

Before pasteurisation of milk (1935) and compulsory testing (1950) bovine TB (bTB) was a recognised cause of death in humans. In cattle, emaciation due to lung disease was common. The testing programme reduced the incidence of disease in cattle to very low levels by the late 1970s, but there remained a persistent level of disease in the South West. In 1971, bTB was discovered in badgers in Gloucestershire and badger controls were introduced by 1975.

In 1981 badgers were protected by the Wildlife and Countryside Act.

Over the last 30 years there has been a steady increase in both incidence and geographical spread. Suspension of testing due to Foot and Mouth in 2001 led to a further increase. The Randomised Badger Culling Trial (RBCT) showed that culling badgers reduces bTB in cattle, although a temporary increase occurs due to badger perturbation. Experience from other countries (e.g. New Zealand) shows that a holistic “three legged stool” (consisting of movement controls, reservoir controls and testing of livestock) approach needs to be used for bTB control.



Testing

No test is 100% right at all times, so it is important to know:

- How often the test misses what it is testing for (Sensitivity)
- How often the test gets confused with something else (Specificity)

A 60% sensitive test will mean 40% are false negative results (they test negative but have bTB). A 90% specific test means 10% are false positive (they test positive but don't have bTB).

Skin test

Familiar to all farmers, this relies on the body's reaction to a purified extract of TB bacteria. It has a relatively poor sensitivity so is best used as a herd test rather than for individual animals. As it is highly specific, positive results are usually TB infected animals.



Gamma interferon

This provides increased sensitivity, but carries the risk of more false positive (animals with positive test but no disease).

Post mortem examination

As early TB lesions can be very small, there is a risk that infection will be missed (false negatives).

Culture

Mycobacteria are hard to grow in the lab and take a long time. The wait to get confirmation can be up to 12 weeks.

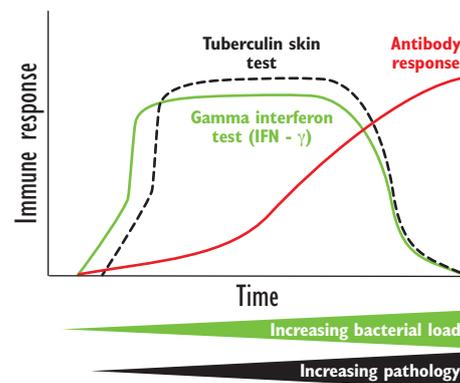
Table 1. A guide to the relative accuracy of the available tests

	Sensitivity	Specificity
Skin test (standard interpretation)	Moderate	Very good >99.9%
Skin test (severe interpretation)	Good	Very good
Gamma interferon test	Good	Good
Post mortem	Poor	100%

Infection with *Mycobacterium bovis* (M.bovis) does not automatically lead to an immune response. In addition, over time the body can stop reacting to the tuberculin test.

Figure 1. below shows how the body responds, with the time varying between animals. This shows how a cow can go from an inconclusive result to a clear result but remain infected.

Figure 1. Response to bTB in cattle





Spread of disease by badgers and cattle

It is now widely accepted that, in the endemic areas of the UK, badgers act as a true reservoir host (i.e. the disease circulates in the badger population). The exact mechanism of transmission between badgers and cattle is unknown, but is likely to involve contamination of the shared environment (pasture or stored feed). They therefore act as a constant source of re-infection. In non-endemic areas, the movement of infected cattle is the most significant source of infection.

Badger control

The most controversial area of TB control, due to differing opinions based on the same trial – the RBCT from 1998 to 2005. Culling has been shown to produce a reduction in bTB, but a short term increase due to badger movements (perturbation). Localised culling at a farm level risks spreading disease to neighbours, so any cull has to be on a wide scale.



Badger vaccination

Recent work has shown that BCG vaccinated badgers have less bTB and react to fewer tests than unvaccinated badgers. The effect on cattle is unknown at present (Summer 2014). As with all vaccines, it will work best in areas where the badgers are not endemically infected.

Other animals

bTB can infect almost all other mammals. Wild boar and deer, fallow in particular, can be a problem in certain areas. Of the domestic animals, goats, llama and alpaca present a real risk. New tests should help lessen this risk
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Make your farm your fortress

bTB is an infectious disease spread principally by cattle and badgers. The preventative measures for bTB will also have a beneficial effect on reducing the risk of other infectious diseases.

1. Keep a closed herd – don't buy infection in.
2. Ensure that your cattle can't make contact with neighbour's cattle.
3. Keep feed stores closed (a badger can get through any gap taller than a mobile phone).
4. Supply water troughs for fields.
5. Utilise badger-proof feeders for feed buckets (if needed).
6. Fence off your pasture from badgers or fence off known latrines.
7. Isolate any positive or inconclusive animals until they are re-tested or slaughtered.

Discuss disease prevention with your vet, as all the above will be different between endemic and "free" areas.



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