

Survival of *Mycobacterium bovis* in feed, water and soil

Bovine TB is caused by the bacterium *Mycobacterium bovis* (*M. bovis*). Infected cattle or wildlife may shed *M. bovis* in their faeces, urine or saliva, which can contaminate the farm environment. Studying *M. bovis* survival in the environment is challenging, but several studies using samples artificially spiked with *M. bovis* have investigated survival under a range of conditions. Survival of the bacteria is typically higher in cool, moist, dark conditions and lower in hot, dry, sunny conditions.

How long can *M. bovis* survive in feed?

Studies suggest that *M. bovis* can survive on hay and maize for a few days in spring/summer, but for up to 40 days in colder overcast conditions in autumn/winter [1]. Recent research suggests *M. bovis* can also survive for several days in the field on salt/mineral licks [2].



How long can *M. bovis* survive in water or soil?

M. bovis can survive in water for about 20-60 days depending on the conditions [1]. Studies have shown that *M. bovis* can survive in soil for about 14 days in summer [1], 3 months in winter [1] and potentially much longer if stored in cold dark conditions [3]. Studies in Spain have also identified *M. bovis* in mud and water in natural water bodies used by wildlife, highlighting the potential for disease transmission to cattle [4].



Can *M. bovis* survive in silage?

The ensiling process results in low oxygen conditions which are likely to reduce *M. bovis* survival, although pH (around 4-5) and temperatures (20-30°C) are within the ranges that the bacteria can potentially survive. Research from the US suggests that *M. bovis* does not survive past 28 days in silage (the bacteria could not be cultured) [5]. This suggests that properly ensiled forage is unlikely to be a source of infection in cattle, although the detection of *M. bovis* DNA (at the end of the 112 day experiment), means that the risk cannot be totally ruled out.



Is there evidence of a risk to cattle?

Experimental studies have shown that cattle can become infected with *M. bovis* by consuming feed and using troughs contaminated by infected wildlife [6]. Increased TB risk has also been associated with use of silage clamps [7]. Contamination by wildlife may be one explanation for this, or it may be associated with other farm factors such as the intensity of production.



How can the risk be reduced?

- **Minimise wildlife access to feed and troughs.** Practical information on how to do this can be found here <http://www.tbhub.co.uk/biosecurity/biosecurity-factsheets/>
- **Regularly clean and disinfect troughs and feed storage areas if possible**
- **Slurry spreading on silage fields.** Where possible slurry should be stored for 6 months before spreading and land should be left for at least 2 months after spreading to minimise the risk of contamination

Where can I find out more information?

For a thorough review of the science on TB in manure, slurry and silage see <https://www.daera-ni.gov.uk/publications/review-potential-role-cattle-slurry-spread-bovine-tuberculosis>

For more information on other TB topics visit www.tbhub.co.uk. This sheet was produced as part of a Knowledge Exchange project funded by NERC. For more information and to download the full list of fact sheets visit www.tbknowledgeexchange.co.uk

Studies referenced

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