

# 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](http://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](http://www.tbknowledgeexchange.co.uk)

## Studies referenced

1. Fine (2011) Veterinary Medicine International
2. Kaneene (2017) American Journal of Veterinary Research
3. Maddock (1933) The Journal of Hygiene
4. Barasona (2016) Transboundary and emerging diseases
5. Grooms (2019) American Journal of Veterinary Research
6. Palmer (2004) American Journal of Veterinary Research
7. Reilly (2007) Preventive Veterinary Medicine