

# 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 may 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 <sup>[1]</sup>. Recent research suggests *M. bovis* can also survive for several days in the field on salt/mineral licks <sup>[2]</sup>.



## 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 <sup>[1]</sup>. Studies have shown that *M. bovis* can survive in soil for about 14 days in summer<sup>[1]</sup>, 3 months in winter<sup>[1]</sup> and potentially much longer if stored in cold dark conditions <sup>[3]</sup>. 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 <sup>[4]</sup>.

## 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) and temperatures (20-30°C) are within the ranges that the bacteria can potentially survive. Further research is needed to understand survival in silage. Preventing contamination is likely to be the best way to minimise risk.



## Is there evidence of a risk to cattle?

Experimental studies have shown that cattle can become infected with bovine TB by consuming feed and using troughs contaminated by infected wildlife [5]. Increased TB risk has also been associated with use of silage clamps [6]. 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 more info?

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>

Information is also available on [www.TBhub.co.uk](http://www.TBhub.co.uk)

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. Palmer (2004) American Journal of Veterinary Research
6. Reilly (2007) Preventive Veterinary Medicine

**This factsheet has been created as part of a Knowledge exchange project in collaboration with the regional TB eradication groups. If you would like to know more about this or other TB related topics please contact [a.robertson@exeter.ac.uk](mailto:a.robertson@exeter.ac.uk)**