

Survival of *Mycobacterium bovis* in cattle faeces and slurry

Cattle faeces as a source of *M. bovis* infection

Bovine TB is caused by the bacterium *Mycobacterium bovis* (*M. bovis*). Cattle in the advanced stages of infection may shed *M. bovis* in their faeces which may act as a source of infection for other animals. Studying the bacteria in the environment is challenging, but several studies using samples artificially spiked with *M. bovis* have investigated survival under a range of conditions.

How long can *M. bovis* survive in slurry/faeces?

Research suggests that *M. bovis* can survive in **stored slurry for up to 6 months**^[1]. On pasture *M. bovis* can survive in cattle faeces for **up to 2 months in warm summer conditions** and **up to 5-6 months in cold winter conditions**^[2]. Survival of *M. bovis* is typically higher in cool, moist, dark conditions and lower in hot, dry, sunny conditions.



Can *M. bovis* survive in manure?

Solid manure goes through a composting process resulting in high temperatures of 50°C+ which will likely kill the bacteria. However, composting conditions can be variable, so it is possible that it could survive in parts of a manure stack. The risk of infection from manure is believed to be lower than from slurry, but TB transmission from manure is still possible.

Can *M. bovis* survive in anaerobic digesters (ADs)?

No studies have looked specifically at *M. bovis* survival in ADs. But work on *M. paratuberculosis* (which causes Johne's disease) suggests this bacteria cannot survive in thermophilic ADs (operating at about 50°C)^[3]. The bacteria can however survive in mesophilic ADs (operating at 20-30°C) for up to 2 months^[4], but it is unclear whether products from these ADs can be considered safe.



How can the risk be reduced?

- **Store slurry for long periods before use.** It is recommended that slurry is stored for at least 6 months prior to spreading. Slurry spreading without storage is linked to a higher disease risk ^[5].
- **Ensure solid manure is thoroughly composted.** Solid manure (with low water or high straw content) should be left for 30 days before use. Manure with high water content should be treated like slurry and stored for longer periods if possible
- **Spread slurry/manure on fields several months before grazing.** It is recommended that where slurry/manure is spread on fields, they are not subsequently grazed for at least 2 months (60 days). Grazing cattle less than 2 months after spreading is linked to a higher disease risk ^[6].
- **Controlled slurry application.** Spreading when there is little or no wind and using controlled methods such as inverted spreading plates or direct injection will minimise the spread of potentially infected material.
- **Use of slurry contractors.** Avoid using hired or shared equipment where possible. Where unavoidable ensure that equipment is thoroughly disinfected.
- **Keep farms as clean and tidy as practically possible and minimise contact between livestock and stored manure or slurry**



Where can I find more info?

For a thorough review of the science on TB in manure and slurry 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

1. Scanlon (2000). Irish Veterinary Journal
2. Williams (1930) Journal of Hygiene
3. Olsen (1985) Agricultural Wastes
4. Slana (2011) Applied and Environmental Microbiology
5. Christiansen (1993) University College Dublin
6. Griffin (1993) 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