Annex 6

# What is Bovine Tuberculosis (TB)?

Bovine Tuberculosis (TB) is an infectious disease of cattle. It is caused by the bacterium Mycobacterium bovis (M. bovis) which can also infect and cause disease in many other mammals including humans, deer, goats, pigs, cats, dogs and badgers. In cattle, it is mainly a respiratory disease but clinical signs are rare. TB in humans can be caused by both Mycobacterium bovis and the human form, Mycobacterium tuberculosis.

## How does TB spread?

Evidence of bovine TB is most commonly found in the lymph glands of the throat and lungs of affected animals. This means that the bacteria, which cause the disease, are mainly passed out of the infected animal’s body in its breath or in discharges from the nose or mouth.

Infection is mainly through inhalation or ingestion of the bacteria. Contaminated food and water can also be a source of infection.
Bovine TB is transmitted between cattle, between badgers, and between the two species.

Cattle can spread this disease to other cattle:

* directly via respiratory route
* directly via infected milk
* directly before birth through the placenta
* indirectly via environmental contamination

Badgers can spread this disease to other badgers directly via close contact including intimate contact between mother and cub

The disease can be spread between badgers and cattle:

* directly via close contact
* indirectly via environmental contamination with infected sputum / faeces /urine or discharges from abscesses and skin lesions

Cattle grazing areas where infected badgers have been present are exposed to a risk of infection. Exposure may also happen in farm buildings.
Routes of potential transmission from cattle to badgers are not well documented.

Deer are also a potential source but the routes of potential transmission from deer to cattle are not well established or documented. TB infection in deer tends to be enteric.

## How can I prevent TB?

Eradication of Bovine TB is the ultimate aim for DARD but cattle farmers can play their part in reducing the spread of TB. While it is impossible to guarantee that a herd will remain clear of disease, it is possible to reduce the risk of disease by the following means:

### Introduction of TB into your herd by bought-in cattle

* maintain a closed herd
* if you must purchase cattle, purchase directly from a known source and avoid cattle that may have been frequently moved
* take particular care about the origin of breeding cattle
* ask about the test history of the animals you are purchasing
* if possible, isolate cattle after purchase and ask your veterinary surgeon to carry out a private tuberculin test on the animal(s) prior to mixing with other cattle (your veterinary surgeon will need to obtain permission from DARD to perform this test; and the test will be carried out at your expense)
* bought-in beef store cattle for finishing should be kept separately from your breeding stock

### Introduction of TB into your herd through contact with badgers and deer

* minimise both direct and indirect cattle contact with badgers and deer
* if possible, avoid grazing fields which contain badger setts or where badgers or deer are active
* remove badger carcases from fields
* avoid over-grazing of fields
* fence off badger setts to prevent access by cattle
* if possible, badger paths and latrines should also be fenced off
* troughs, drinkers and mineral licks should be managed and designed to minimise badger access
* prevent badger access to farm buildings, feed and feed stores (including silage pits)
* If possible, prevent deer using round feeders provided for cattle.

### Introduction of TB into your herd through contact with cattle from other herds

* maintain good boundaries that prevent contact with cattle from neighbouring herds, or don’t graze cattle in fields adjacent to cattle from neighbouring herds
* do not share winter housing
* do not borrow bulls
* minimise the return of cattle from markets

### Introduction of TB into your herd through contact with people and equipment

* minimise visitor contact with your herd and ensure all visitors take precautions to prevent the introduction of infection to your premises
* provide a disinfectant footbath
* clean and disinfect cattle housing and equipment before restocking a house
* change clothes and disinfect after visiting other herds and before coming into contact with your own cattle
* avoid sharing equipment or vehicles with other farmers

### Introduction of TB into your herd by slurry from other farms

* avoid grazing land for 6 weeks after spreading
* do not use slurry or manure from other herds on your land

### General means to reduce risk of disease

* cattle should not be reliant on natural water sources and should be prevented from access where possible
* test your herd on time and allow adequate time for the testing officer to do a thorough job

# Bovine Tuberculosis (TB) and wildlife

We have a rigorous TB eradication programme in place, which is approved by the EU Commission and includes a strand to address the wildlife factor. The issue of badgers and bovine TB is very complex, emotive and contentious.

While science has established that there is a link between TB in badgers and TB in cattle, it has not yet established, with certainty, how the disease is spread between them and what can be done to prevent its spread and, also, how much disease is in the badger population.

As the badger is a protected species, any direct interventions in the badger population here would be subject to the agreement of the Environment Minister and the issue of appropriate licences.

Funding has been allocated in our budget to conduct TB and wildlife research and studies to help ensure we have well informed and evidence based strategies to address the issue of cattle to cattle spread of TB as well as the wildlife issue. We will use the evidence produced by this research to guide our TB eradication strategy in the future.

Following discussions with industry (farmer, veterinary and environmental) stakeholders and informed by the views of the external experts who attended the International Vaccination Experts Scientific Symposium hosted in Belfast in May 2012, the Minister requested her officials to design specific wildlife intervention research which is unique to NI and is not simply an expensive duplication of action being taken elsewhere.

The approach would involve testing live badgers, vaccinating and releasing the test negative badgers, and removing the test positive ones – “test, vaccinate or remove” (TVR).

The first stage of this work was to commission the then Food and Environment Research Agency (FERA) to undertake the necessary modelling work in order to help identify an appropriate study area(s) that is/are of sufficient size and the appropriate duration of the intervention to ensure that the design is scientifically robust.

Direct interventions in wildlife will incur substantial cost and must be fully justified in cost-benefit terms, that is we need to be certain that the benefit would justify the considerable costs.

We continue to learn from the research experiences of other regions, such as the work that is ongoing in the south of Ireland and England to develop a viable oral vaccine and cost-effective means of vaccine deployment and also the developments in England to produce a viable cattle vaccine. It is important that we draw down the lessons from that work and collaborate where appropriate.

We are also monitoring closely the progress in England and Wales on their proposals for badger control in areas with high and persistent levels of bovine TB.

## The badger's role in TB

TB has been found to be present in the badger population throughout the UK and Ireland. A road traffic accident (RTA) survey conducted 1999-2010 in Northern Ireland suggested a badger TB prevalence of 20%. Science has established a link between TB in badgers and TB in cattle. The exact means of spread between the species and the relative importance of potential routes of infection have not been established. The proportion of the disease in cattle can be directly attributed to badgers has not been quantified. Further information can be found on our [badgers page](https://www.dardni.gov.uk/articles/advice-badgers).

## The deer's role in TB

Deer are rarely implicated in TB breakdowns in cattle herds in NI. However, it makes good sense to avoid having cattle and deer grazing together and to keep deer away from cattle feed troughs.

# Introduction to Bovine Tuberculosis (TB) research and development

The DARD Evidence and Innovation Strategy (EIS), published in 2009, provides a high-level framework for our evidence gathering and innovation support activities (2009-2013). One of the key principles of the EIS is that DARD-funded evidence gathering and innovation support activities will be both robust and policy-led.

## Background on TB research and development

Whilst the EIS sets out a framework for research, the detailed evidence and innovation activities are co-ordinated through four Programme Management Boards (PMBs), which align broadly to the EIS Strategic Goals.

The PMBs annually assess our evidence and innovation needs, consult stakeholders and make recommendations on the content of a work programme for their area of responsibility. An overarching Evidence and Innovation Priorities Group (EIPG) then makes final decisions on the overall size and shape of the DARD directed AFBI Research Work Programme.

The Agri-Food and Biosciences Institute (AFBI) was created on 1 April 2006 as an amalgamation of DARD’s Science Service and the Agricultural Research Institute of Northern Ireland (ARINI). AFBI is a DARD Non-Departmental Public Body (NDPB). It carries out high technology research and development, statutory, analytical, and diagnostic testing functions for DARD and other Government departments, public bodies and commercial companies.

There is still much that we do not know about how TB spreads, how it can be diagnosed more accurately, what can be done to prevent its spread between cattle and between wildlife and cattle. etc. Therefore, as a priority we will continue to invest in TB and wildlife research and studies to build the evidence to help deal effectively with all the disease risk factors and reduce TB further.

Additional funding has been allocated in our budget to conduct TB and wildlife research and studies. This programme of TB and wildlife research and studies will help improve the detection and control of TB and guide our eradication strategy in the future. We need to ensure that our research effort is targeted to get maximum value for our spend. We are pursuing TB and wildlife research and studies to identify new and better ways of preventing transmission between cattle and between wildlife and cattle. However it is important to avoid unnecessary costly duplication of research underway in Britain and Ireland, but we will draw down the lessons from that work and also collaborate where appropriate.

### Deer Surveys

There are 3 species of wild or feral deer in Northern Ireland: Dama dama (fallow deer), Cervus nippon (sika deer) and Cervus elaphus (red deer).  A survey carried out in 1995, in which deer of the three species were sampled, demonstrated a prevalence of 5.8% (397 deer sampled).

A small surveillance exercise carried out in 2009, in which fallow and sika deer were sampled, revealed a prevalence of 2% (146 deer sampled).  The low number of deer (less than 3,500 estimated), their restricted range, limited contact with cattle, and the enteric nature of the infection, suggests that their role in the epidemiology of bovine TB is likely to be limited if not entirely insignificant.