

# Bovine Digital Dermatitis (BDD)



**Bovine Digital Dermatitis (BDD) is a common cause of infectious lameness worldwide.**

BDD lesions can be acute or chronic and cause mild but more commonly severe lameness. The lesions affect a large area of the haired soft tissue portions of the foot, classically above the heel bulbs of the hind feet. Typically BDD lesions are extremely sensitive and readily bleed (acute lesions). It is this sensitivity which causes lameness. Cows are often seen shaking the affected foot once placed.

Severity of the lameness caused, combined with the high herd incidence, make BDD a cattle industry welfare concern. The negative financial impacts of the disease (milk drop, treatment costs, labour costs) and effects on herd health parameters, such as reproduction, make BDD a costly disease to ignore. Conservative estimates of costs range from £50 - £100+ per case of BDD.

## Cause

The precise cause of BDD is uncertain, but spirochete bacteria are the most frequently identified organism from BDD lesions. Spirochetes are a group of mobile bacteria which includes other animal disease causing bacteria such as Leptospira and Treponema. It is thought that the BDD causing bacteria are able to enter the hairy parts of the foot by penetrating at the weakest points (hair follicles and sebaceous glands). Damage to the surface (caused by prickly/stiff bedding, automatic scrapers, wet slurry contaminated environments etc) make the skin more susceptible to invasion. However, there also appears to be a 'cow factor' as certain individuals seem far more likely to suffer BDD whereas others within the same environment may never contract the disease.

Once within the soft tissues, these bacteria release enzymes which cause more skin damage, haemorrhage and pain.



## How are bacteria (Treponemes) transmitted between individual cows and farms?

Historically it was thought that the causal organism of BDD was found within unhygienic environments and particularly slurry. However, Treponemes generally do not survive for long periods of time within slurry. Recent discoveries have shown that BDD-associated Treponeme species have a much greater tolerance of air, and are far more likely to be transmitted directly from cow to cow by contact, and brief spells of survival away from the cow in slurry, wet bedding and water-only foot baths before being deposited on the next cows' feet.

This means the most likely route of spread between farms is from direct cattle movements.

## Where are Treponemes coming from?

We now believe transmission is mostly through direct contact. These bacteria are assumed to be coming from the cows themselves. If this is true of all BDD affected cattle, then this will have an impact on treatment and prevention.





### TREATMENT

#### Treatment

In the past we have tended to treat BDD lesions with a mixture of antibiotics (generally with variable results), topical astringents (such as formalin which has welfare implications), and footbaths (variety of agents including antibiotics). The fact that so many treatment regimes exist suggests we haven't found the best approach. Studies of BDD-associated Treponemes in the laboratory have found that Penicillin based antibiotics are by far the most effective.



### PREVENTION



#### Prevention

Prevention will come down to understanding the transmission of the infectious agent and ultimately designing strategies to break this cycle. If we can treat the infection effectively, perhaps with penicillin-based antibiotics, but more importantly prevent direct contact spread of the bacteria between cows, we have a real opportunity to stop the perpetuation of infection within a herd.

### PREVENTION AWARENESS

#### 1. Environment

- Floor space / stocking density
- Slats versus concrete
- Drainage / slurry pooling
- Automatic scrapers – frequency, distance, design
- Manual scraping practices

#### 2. Foot bathing

- Frequency
- Disinfectant versus antibiotic
- Protocol should be designed with your vet

#### 3. Treatment of individual cases

- Early detection
- Adequate treatment
- Foot trimming

#### 4. Functional foot trimming

- Correct foot angle
- Minimise slurry heel

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