



## Escherichia Coli Mastitis

*Escherichia coli* (*E.coli*) is a Gram negative bacteria that is a normal bacteria of the gastrointestinal tracts of cattle. Due to this, is it ubiquitous in the environment. It is a bacterium that is easily killed by sunlight, drying pasteurisation, and disinfectants.

The bacteria is considered to be an opportunistic environmental mastitis pathogen. Soil, faeces, water and vegetable matter are the likely source of infection. These particular environmental conditions (high moisture conditions) can allow the bacteria to persist for a long time. Infection is usually transmitted between milkings (generally not transmitted in the milking shed), however wet teats and poor hygiene during milking can also predispose to infections.

The *E.coli* bacteria penetrate the teat by propulsion, it does not colonise the teat orifice. Once it has entered into the udder the organisms proliferate rapidly, also increasing the number of inflammatory cells in the udder. These inflammatory cells kill the bacteria but in doing so, there is a mass release of lipopolysaccharide endotoxins. This process weakens the blood- milk barrier through increases vascular permeability and the endotoxins spread to the blood of the affected cow.

Due to the swift ability of the inflammatory cells to enter the udder (usually within 6-12 hours post infection) and therefore kill the invading bacteria, infections are usually brief. This means that clinical signs seen in the cow are not due to the *E.coli* bacteria, they are due to the cow's inflammatory response and the endotoxins produced when the bacteria are killed (Bacterial number often significantly declined before clinical signs are seen). Severe toxemia (**peracute coliform mastitis**) is seen 8-10% of *E.coli* mastitis infections.

This type of mastitis is unique in the fact that Infection can spread from quarter to quarter!

Most infections resolve without any antibiotic treatment over 7 to 14 days. However, antibiotics can be justified in severely affected cows as approximately 30% of them will have a bacteraemia (bacteria present in the blood).

General treatment protocols for *E.coli* mastitis infections:

Mild mastitis -Clots or wateriness that persists for more than 3 squirts of milk

- No intramammary or intramuscular antibiotics
- +/- anti-inflammatories

Moderate mastitis- Changes in the milk and/or a swollen quarter that is hard and warm to the touch (often painful)

- No intramammary or intramuscular antibiotics
- Anti-inflammatories

Severe mastitis- Changes in milk and/or swollen quarter, visibility unwell (reluctant to walk or is down) and a degree of dehydration (sunken eyed). These cows have a bacteraemia/ toxemia.

- Intravenous antibiotics
- Intravenous anti-inflammatory
- Intravenous fluid therapy
- Intramammary treatment
- Oxytocin in the muscle to aid in the cow letting down her milk
- Stripping the quarters out
- Down cow management- deep bedding, frequent rolling from side to side, lifting twice daily for 20 minutes (if she is willing to stand when lifted) and offering clean water and feed.

#### Control

- Herd environment should be dry and clean as possible
- Calve cows down in clean, grassed paddocks with no surface water
- Milking dry clean teats – if washing is required best to dry with paper towel before cups put on
- Using internal teat sealant and an intramammary antibiotic at dry off (important to reduce mastitis post dry off)
- Ensure cows diet had adequate selenium being offered- this is important for the cow's immune system.