



PERFORMANCE PRO-BIOTICS
DIRECT-FED MICROBIALS

LAMENESS IN DAIRY CATTLE

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Last Updated **Nicola Brazier** | April 2012

Recent wet weather across the country has caused all sorts of problems, lameness in our herds being one of them. Figures from around the globe indicate that one case of lameness costs in the order of \$250 - \$300, including vet expenses, discarded milk as well as reduced annual milk yield, reproductive inefficiency and culling. By the time a cow begins to limp, Dry Matter Intake has dropped by 7% and Milk Yield has dropped by 17%.

Nutrition can play a big role in prevention of lameness, and most farmers are mindful of this. However wet, muddy conditions always seem to take their toll. An understanding of the hoof anatomy and the types of lameness may highlight areas where improvements can be made.

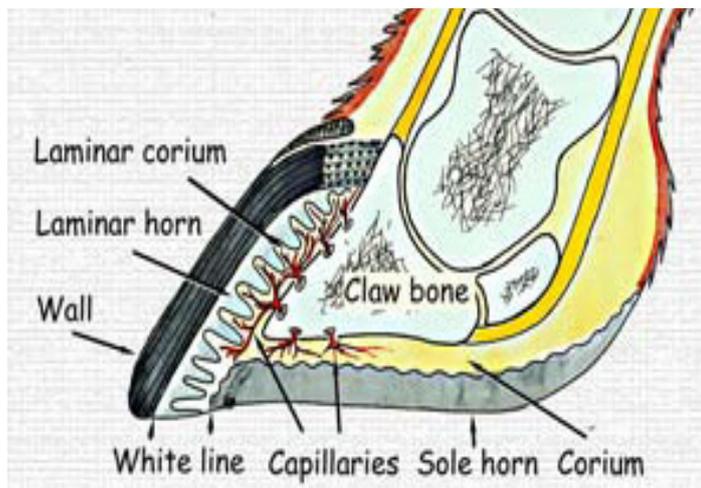


Figure 1. Hoof Structure (from Bergsten, C., www.txanc.org)

The hoof consists of two claws, with an area of hairless tissue between, called the interdigital skin. The hoof wall and sole are made from keratin, with the sole being much thinner (less than 1 cm) than the wall. Beneath the horn is the corium, where blood vessels and nerves are located. Laminae attach the wall to internal structures, and are responsible for the grooves of the hoof wall. The white line sits between the wall and the sole and is the softest of the external hoof tissue.

Most simply, footrot, warts and dermatitis are associated with the interdigital skin. Sole Abscesses are infections within the corium caused by external injury to the sole, while Laminitis is more of an internal problem, which causes secondary issues of White Line Disease and Sole Ulcers.

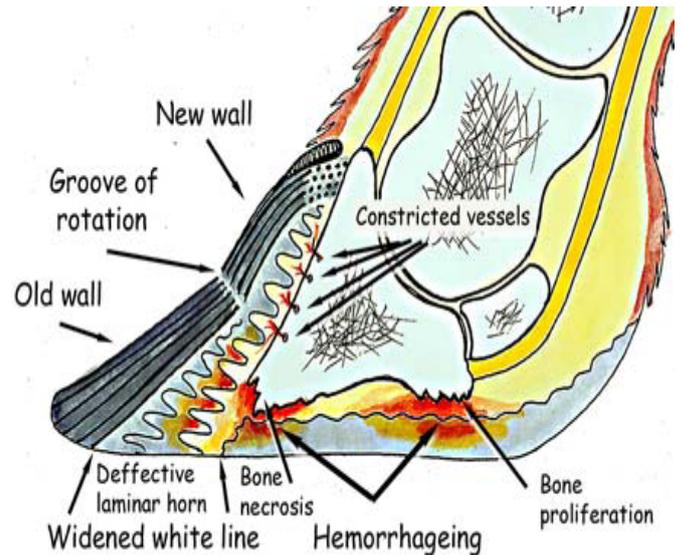


Figure 2. Laminitis (from Bergsten, C., www.txanc.org)

Laminitis results when the blood flow is compromised by factors such as acidosis. The hoof circulation shuts down and less oxygen and nutrients are delivered. Softer keratin is produced and susceptibility to external injury increases. Internally, the claw bone is able to sink and rotate. Haemorrhages and sole Ulcers are the result, while movement of the bone results in irregular grooving of the hoof wall and widening of the White Line (Figure 2).

The general perception is that footrot is the main cause of lameness in Australia, however actions to harden hooves have reduced lameness incidence, indicating there are other problems involved.

There are a number of factors that will impact the hardness of keratin, and thus the hardness of hooves:

- Bloodflow and the delivery of the correct nutrients via the bloodstream
- Sulphur amino acids (methionine, cysteine and histadine)
- Minerals including Zinc, Copper, Manganese and Calcium
- Vitamins A, D and B12 and the vitamin Biotin
- The hoof will absorb water faster than it dries, so the environment



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plays a role

- It takes up to three months to impact the hardness of the sole, and 15 – 20 months for the wall to grow from top to bottom

The immune system and the cow's ability to fight infections will help reduce the extent of infection in the hoof:

- Two of the probiotic bacteria selected by Performance will directly stimulate the immune system (*Bifidobacteria longum* and *Bifidobacteria thermophilum*).
- Selenium and Vitamin E are antioxidants
- Calcium and Iodine are involved in cell mediated immunity
- Zinc will improve wound healing and improve skin integrity, in addition to its role in keratin production.

Mineral nutrition is one of the most important considerations, as detailed above. The Performance Healthy Herd range contains excellent levels of trace minerals and vitamins, and the Hoof Boost range contains additional organic minerals as well as the vitamin Biotin. Final nutritional considerations are those to prevent acidosis, thereby reducing the incidence of Laminitis:

- Changes to rations should be made gradually
- Care should be taken to manage grain:forage ratios
- Buffers, including probiotics and yeasts, can be of assistance.

Management outside of Nutrition is just as important, particularly given the ever-changing Australian environment.

- Regular hoof trimming redistributes weight bearing to the walls of the hoof and ensures problems are detected early and are diagnosed correctly
- A track width of five metres is recommended for herds over 200 cows, with correct crowning and sufficient drainage. Hedges should be trimmed to ensure that tracks dry quickly in wet conditions. If necessary, first upgrade those areas of highest use such as the areas closest to the dairy

- A good guide for walking speed is 45 metres per minute, or between 2.5 and 3 kilometres per hour
- Foot baths or mats are an excellent treatment for footrot and disease of the interdigital skin. A solution of 10% copper sulphate or 20% zinc sulphate should be used. Mats (or even shaggy carpet) are a great option and can be placed just prior to cows entering the platform.

As with all farming practices, there is a balance between the most practical solution and the most ideal. The key is to act early and correctly diagnose the cause. Please contact Performance for access to nutritionists or for further information on their products.

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