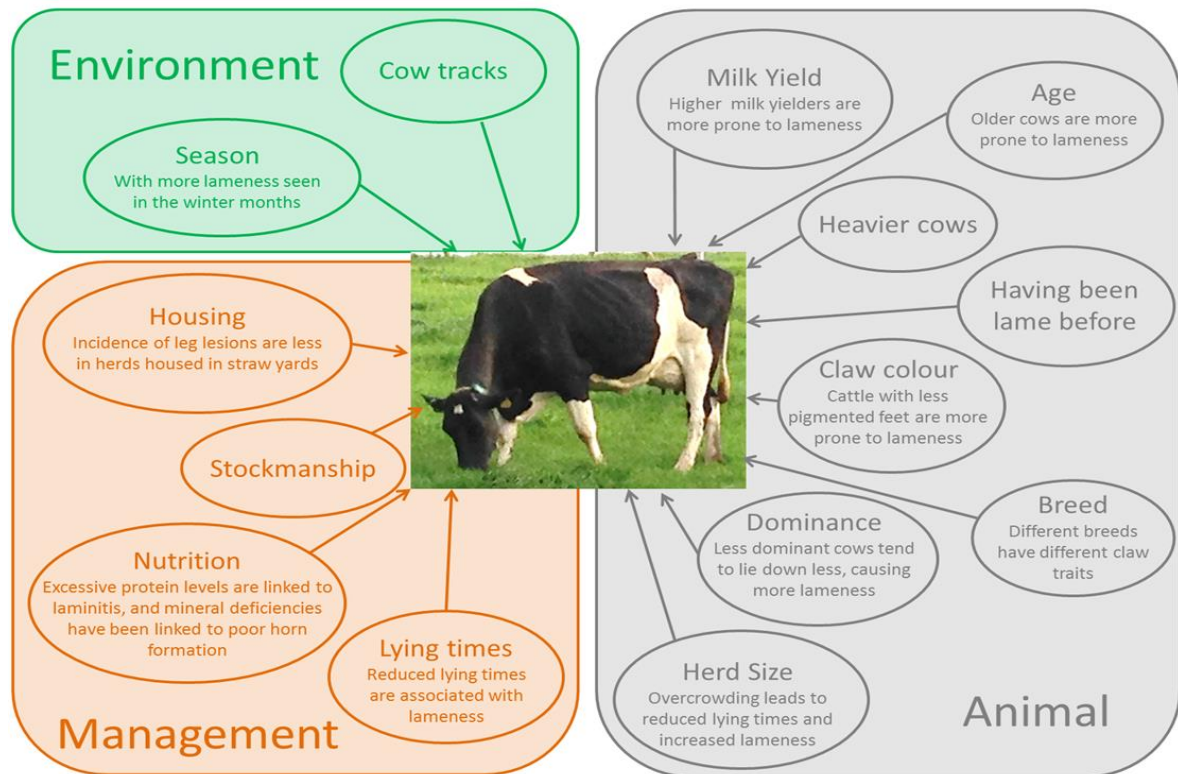


## Laminitis in Dairy Animals

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Lameness is when a cow struggles to walk, often because they have a foot or leg condition or injury. Lameness causes severe pain and prolonged suffering for cows, and can prevent them from walking or even standing up. Lameness is when a cow struggles to walk, often because they have a foot or leg condition or injury. The problem of lameness is widespread. Lameness is one of the greatest constraints to productivity, health and welfare of dairy cattle. Also, it causes significant financial losses to animal breeders. It is a clinical manifestation of a vast spectrum of diseases



specified in a total of 43 causes and more than 80 potential hazards. Hazards to claw health and cow mobility can take many different forms. For instance, many aspects of the cow environment such as housing type, flooring quality and cubicle design can put claw health at risk. Management decisions such as claw trimming

routine or over-crowding are also considered to have an impact on claw health. Foot and leg problems are a major health concern for many dairy farmers. Cow lameness results in poor performance and substantial economic loss. Nutrition and feeding, housing and environment, concurrent disease, genetic influences, and management factors all predispose a cow to problems. The greatest incidence (90 percent) of lameness involves the foot, and of these, 90 percent involve the rear feet.

**Synonym:** Coriosis, *Pododermatitis aseptica diffusa*, coriosis, ‘founder.’

### **Etiology**

The major etiology behind the problem is diffuse acute, subacute, subclinical or chronic inflammation of pododerm, usually in several digits. Chronic cases without acute stage (subclinical) are often seen.

### **Incidence**

Sporadic acute cases, widespread subacute, sub-clinical and chronic cases commonly in dairy units, high incidence in recently calved heifers and younger cows around parturition. Acute form occasionally pre-sents as outbreak in barley beef units. Common in beef feedlots.

### **Predisposition**

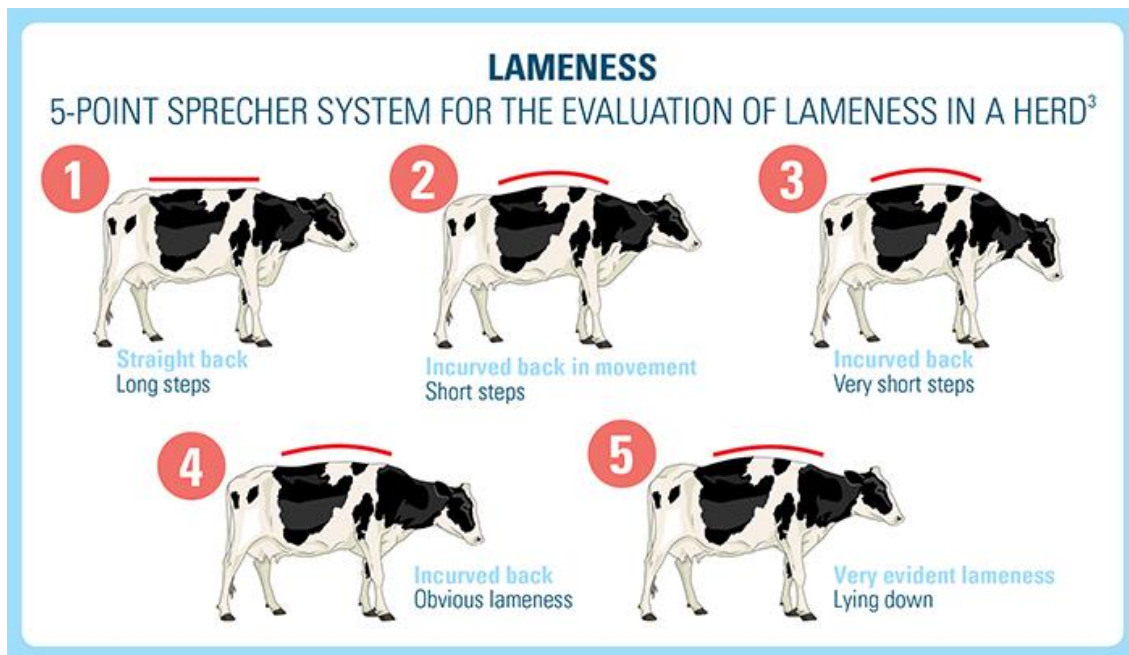
- Inherited factors: Parturition (proven in Jersey)
- Feeding stress (ruminal lactic acidosis, subacute ruminal acidosis or SARA) from change of dry cow concentrate diet to high production rations
- Potentially dangerous reduction of roughage intake and exacerbation by trauma (overburdening)
- Excessive standing due to reluctance to use cubicles (inexperience, bullying by herdmates) and improper shed make.

### **Signs**

- Acute stage: painful hot digit, digital arterial pulsation, general depression, severe lameness, abnormal stance, possibly recumbent (LS 2–3) subacute: less painful but persistent stiffness, stilted gait, solar and white line haemorrhages (LS 1)
- Chronic: stiff gait or not lame (LS 0–1), ‘slipper foot’ malformation with horizontal



lines on sole wall, concave dorsal wall, widened white line and evidence of old solear and white line haemorrhages.



### Pathology

- Blood and serum exudation in acute stage, later (chronic) grooves on hoof wall, concave profile, widened white line and flat sole.
- Significant sinking of distal phalanx due to peripartum slackening of the connective tissue support structures; thin sole or ulceration near tip of distal phalanx ('toe ulcer') is evident as haemorrhage ('bruising') as toe tip has no fat layer in its corium.
- White line lesions may develop into white line disease; sole lesions at sole-heel junction may develop into solear ulceration.

### Histopathology

Oedema, haemorrhages and thrombosis in acute stage, fibrosis and chronic thrombosis in later stages.

### Differential diagnosis:

Bruised sole, white line disease, punctured sole, solear ulceration all of which may be present.

### Treatment

- Acute stage: give systemic NSAIDs (flunixin meglumine or meloxicam) or possibly corticosteroids (only if non-pregnant) and diuretics
- Ensure exercise (to improve local circulation and further reduce developing oedema), preferably by turning on to soft ground, e.g., field



- Feed no concentrates until acute phase is over in recumbent case consider digital nerve block to get heifer or cow to stand, then forced exercise
- subacute stage: as in acute case
- chronic case: hoof trimming

### **Prophylaxis**

- Avoid large amounts of prepartum concentrates ('steaming up' 'lead feeding'), which should not exceed 2 kg daily
- Avoid high intake of concentrate in early lactation, and aim at peak yield about six weeks postpartum ensure ready access to roughage immediately before and after concentrate intake, or consider change to complete diet feeding (TMR, total mixed rations)
- If problem persists improve buffering capacity of rumen fluid (avoid lactic acidosis or SARA) by increasing saliva production: give iodide or rock salt, grass or lucerne nuts in concentrate
- Consider adding 1% sodium bicarbonate to concentrate ration, which should be fed as three to four daily portions
- Accustom down-calving heifers gradually to concrete yards and cubicles several weeks beforehand, but ensure plenty of exercise in both pre- and post-partum weeks
- Avoid exposure to excessive sole wear from long stony tracks, rough concrete
- High fibre diets should be used in rearing dairy heifers in long term planning
- Ensure regular claw examination and trimming

### **Discussion**

Excess lactic acid production alters rumenal bacterial flora, and causes release of bacterial endotoxins involving histamine release and stagnation of blood in laminae of digital horn, with consequent hypoxia and functional ischaemia. Ischaemic necrosis of the corium and laminae heals by fibrosis. These tissues then inevitably produce defective (soft, poor quality) horn in aberrant manner, resulting in signs seen in subacute and chronic stages. Toxic conditions (mastitis, metritis) may also contribute to development of laminitis in some dairy cattle

### **Economic Loss**

Economically, the results of foot disease are much greater than the treatment costs. Reduced milk yields, lower reproductive performance, increased involuntary cull rates, discarded milk, and the additional labor costs to manage these cows accounts for



the largest monetary loses.

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