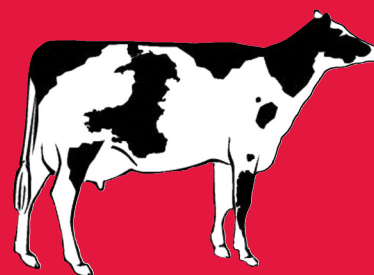


Improving the Welsh Dairy Supply Chain

Zero lameness: what does it take?

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Lameness incidence in dairy cattle has increased since records began. Going back is not an option. Therefore this information leaflet reviews some of the challenges faced by farmers looking to keep lameness at very low levels to optimise their herds' performance (milk, fertility, secondary disease and cow longevity) and minimise direct disease costs (vet and medicine costs, labour).

Digital dermatitis

Digital dermatitis was first reported in the UK in 1988. While we still can't be sure we know all the organisms involved, three families of spirochaete appear consistently in lesions, and are absent from healthy feet. The highly infectious nature of the organism can make this a challenge for dairy herds faced with epidemics and no obvious risk factors. The major risk factors appear to be long term exposure to wet, slurry contaminated conditions (housing or tracks) which are significant for any dairy herd, especially older facilities that are densely stocked or using automatic scrapers. There may be an effect on yield and some protection conferred by cross-breeding.

Key features that make control difficult include:

- Genetically vulnerable cows appear to never mount a sustained immune response (although naive heifers are more likely to suffer severe infections indicating some immune protection is acquired with age and exposure).
- Some animals develop chronic lesions which become difficult to treat with topical agents alone.
- Following treatment of a lesion, visibly healed skin may still have spirochaetes.
- Lesions may be present between heels and in the interdigital space.

- Herd antibiotics are off-license, and with increasing scrutiny, pouring antibiotics into footbaths and then slurry lagoons is probably unsustainable.
- Aldehydes such as formaldehyde (formalin) may damage skin and horn increasing risk when foot bathing ceases.
- Copper and zinc sulphate are heavy metals, and are therefore biotoxic at levels used by some large herds.
- Multiple spirochaete families and isolates make an effective vaccine unlikely.

Despite these concerns, digital dermatitis is probably the most easily controlled condition causing lameness through:

- Daily foot disinfection (many disinfectants appear effective including formalin, organic acids, copper sulphate, zinc sulphate).
- Prompt and effective treatment of cows with infected lesions. Bandaging digital dermatitis lesions for 2-3 days can improve treatment success, but leaving bandages on for long periods reduces the cure rate. Injectable antibiotics may aid the treatment of more difficult cases. Toe necrosis, wall ulcer and chronic sole ulcers may be important sources of further herd infections.
- Controlling disease in youngstock and dry cows.
- Minimising the depth of slurry cows are exposed to (keeping the skin of the heels clean and dry).
- Being hygienic at foot trimming.
- If herds remain closed then the risk of buying in new isolates is minimised.



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In the future there may be great potential in selecting for genetic resistance. Eradication has shown some potential. New footbathing products are being discovered. Herds without infection should take great steps to maintain this.

Sole ulcer and White line disease

Sole ulcer and white line disease represent the two most common claw horn diseases.

Sole ulcers represent the most costly lameness disease associated with significant pain and suffering, yet this disease is very preventable for the following reasons:

- Most damage producing sole ulcers start at calving, although they may be triggered when cows are housed, especially in cows with poor foot angle, claw overgrowth or thin soles.
- It usually takes at least two months for the bruised sole to ulcerate through the sole.
- In many cows the condition is likely to be self-limiting (even self-curing) with good lying comfort and short standing times at milking allowing resting time (lying time).
- Early intervention is likely to be effective, correcting claw imbalance and overgrowth while the claw is just bruised i.e. not yet ulcerated.
- It is probably the disease of the thin, debilitated animal and heifer, which have thinner digital cushions.

The role of acidosis and 'laminitis' in the development of sole ulcers has been seriously questioned in recent years, although body condition loss and claw over-growth clearly have a nutritional basis. While there may be a role of the diet in weakening the claw horn (poor horn quality) and altering claw shape (increased horn growth, abnormal wear), the evidence is weak and incomplete for this theory. On the positive side, sole ulcer prevention is achievable for the well managed herd with short standing times and good lying comfort. Unfortunately, for many herds there is a legacy; once the sole has ulcerated this is usually an indicator that permanent damage is done, meaning for some, herds will continue to experience problems years after the risk factors have been addressed.



Figure 1: Sole ulcers are thought to arise through a combination of factors: poor fat pad under the sole, poor foot angle, slackening of ligaments attached to the pedal bone at calving, long standing times, poor lying times, poor foot shape, poor quality horn and finally secondary infection

White line disease remains the one condition that is least well understood. This may be because the risk factors are harder to quantify (uneven floor surfaces, shearing forces, and sporadic injuries associated with slips or flight movements) or due to the long progression of this disease. Work done at Warwick University illustrated the benefit of nutritional intervention. Biotin (20mg/head/day) was needed for at least six months before any detectable benefit was found, and this was not seen in first lactation heifers. However, the top 25% of herds which pay attention to foot dryness/hygiene, standing times/lying times, diet/nutrition, cow flow/walking surfaces and spot lameness early and treat them effectively, would appear to maintain herds with less than 1% of score 3 cows.

Improvement of breeding indices to include foot health traits more closely linked to lesions is an opportunity waiting to be explored in the UK. The future of lameness monitoring looks exciting too. Mobility scoring works as well, if not better than existing automated systems, aiding the management of lameness but automation as an additional detection and monitoring tool is urgently required especially for the majority of farmers that cannot tolerate lame cows for many reasons.

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