LAME COWS

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Summary

- Lameness is a serious welfare and productivity issue.
- Calving causes structural changes to the support structures of the hoof which increases susceptibility to lameness. Manage the cow and system to reduce stress and allow time for feeding and lying.
- Nutrition is unlikely to be a major contributor to lameness in NZ.
- Detect and treat lame cows early.
- Record all lame cows.

Introduction

Lameness accounts for around one-fifth of all health problems and diseases recorded by New Zealand dairy farmers. The welfare implications of lameness are significant, making it one of the most important issues for dairy cows in New Zealand. Farmers rank lameness of high importance with regards to both welfare and productivity.

On the face of it, it appears farmers are equipped with skills and knowledge to manage lameness, or at least have access to appropriate resources and services (for example the Healthy Hoof programme). However, lameness has not been decreasing and there are new causes and types of lameness in NZ. A DairyNZ project in late 2015 took a fresh look at an old problem.

The following is a summary of an extensive literature review of lameness in New Zealand and internationally, findings from in-depth discussions with farmers and rural professionals throughout the country, and key outcomes from an advisory group made up of New Zealand's lameness experts.

Notes:

What we know about lameness: A iterature review

Rates of lameness and cost

Internationally, many countries have over 20% of their herd lame in a year and over 15% of their herd lame at any one time. From the seven studies in New Zealand published between 1978 and 2014, the average percentage of the herd that becomes lame in a year is **13.8%.** (Dewes, 1978, Tranter and Morris, 1991, Verkerk et al., 2013, Xu and Burton, 2003, Gibbs, 2010, Alawneh et al., 2011, Chawala et al., 2013.)Gibbs (2010) reported a figure of 26% when farmers were trained in detection and encouraged to record all lameness events.

It has been found that an average of **8.1%** of a herd is lame at any single point in time during the season (Fabian et al. 2014). This figure gives us a better idea of the welfare and cost implications of the disease, as it takes in to account how many cows become lame and for how long they remain lame.

A conservative estimate of one case of lameness is $200, which accounts for time, treatment, lost milk and reduced fertility. For an average South Island farm, this would equate to $17,500 ($200 x 634 x 13.8).

Detection of lameness

Lameness events are generally under-detected on farm, and often disease has progressed before affected cows are identified.

The delay from when a cow first becomes lame to when she is detected and treated can be up to three weeks, and the majority of cows take four weeks to fully recover after treatment. Delayed detection, therefore, results in significant welfare and productivity costs.

In addition, cases of lameness only tend to be recorded if the cow requires treatment that has a with-holding period, such as antibiotics. From an industry perspective, this lack of robust data makes it difficult to create industry benchmarks for lameness and to explore the opportunities for lameness breeding values.

Types of lameness

Ninety percent of lameness in New Zealand is due to four main types: white line disease (>40%), sole injury (20-50%), foot rot (<10%) and hoof wall cracks/lesions (3-13%).

Risk factors for lameness

Lameness is a result of multiple risk factors. These factors include: the cow, trauma due to environment and management, nutrition and infection.

Cow

- Age has some effect on lameness. Heifers are more prone to sole injuries and older cows to white line disease (Chesterton et al., 2008, Lawrence et al., 2011).
- Low body condition has been reported to be a risk factor for lameness. The theory is that thin cows have less fat in their digital cushion (the shock absorber of the foot) (Bichalho et al., 2009b).
- There is mounting evidence that calving and the onset of lactation causes structural changes in the hoof leading to increased susceptibility to lameness, including sole injury and white line disease. (Tarlton et al., 2002, Knott et al., 2007).

Environment and management

- Wet weather has long been blamed for lameness. It is true that when horn tissue absorbs water it becomes softer and is more susceptible to damage. It is difficult in our seasonal herds to separate wet weather from other risk factors such as onset of calving, lowering body condition score, increased herd sizes, hoof wear and longer standing time.
- Hoof wear is an issue when it exceeds hoof growth. It has been suggested that it takes up to 12 weeks for the hoof to adapt to increased wear (Livesey and Laven, 2007), which may partly explain lameness occurring several months into lactation – especially for heifers.
- Race and yard design are well recognised as contributing to lameness (Bramley et al., 2013, Harris et al., 1988, Tranter and Morris, 1991), as well as stock handling practises. Cows pushing each other and/or being pushed by farmers (bikes, backing gates etc.) are significant risk factors (Chesterton et al., 1989, Barker et al, 2010).
- Herd size is not conclusively linked with lameness (Barker et al, 2010). It is possible that reduced time for lying and recovery as a result of long milking times may have an effect, but this has not been proven.
- The evidence for preventative trimming decreasing lameness incidence is inconclusive. There has been only one study in New Zealand, and it demonstrated potential delay to the onset of lameness but did not decrease the overall incidence rate (Bryan et al, 2012). Further research is required.

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Nutrition

Nutrition and lameness is widely debated in New Zealand and internationally.

Laminitis occurs when reduced blood supply or inflammation (in the hoof), interferes with the necessary supply of nutrients to grow healthy horn tissue. Causes of reduced blood supply or inflammation include: other illnesses (e.g. mastitis, metritis) or ruminal acidosis.

- For excess protein, it is theorised that the breakdown of protein causes release of histamines, resulting in inflammation (Woodacre, 2006). Another study dismissed the correlation between excess protein and lameness (Espejo and Endres, 2007).
- Ruminal acidosis (low rumen pH) can be caused by a diet with high digestible energy and low effective fibre. A complicated and not well understood mechanism then causes laminitis.

Given clinical acidosis can result in clinical laminitis, can subclinical acidosis result in subclinical laminitis? Extensively studied around the world for over 20 years, this is still a poorly understood area of lameness, especially for pastoral-based dairy farming. It is possible that research from intensive dairy systems, using housed cows fed a high concentrate diet, could apply here due to our lush spring and autumn pastures having high concentrations of degradable protein and low concentrations of effective fibre. Could this diet cause subclinical acidosis and lameness? Probably not: when measured, low rumen pH readings are observed, but the acid and ammonia concentrations and rumen microbes (or bugs) are normal, so it is not causing the same issues as found in the Northern Hemisphere (Gibbs, 2009, Tacoma et al., 2004, Wales and Doyle, 2003). Other symptoms such as reduced feed intake, reduced milk production, diarrhoea or liver abscesses, are also not observed in cows grazing spring and autumn pastures.

DairyCo, a research and extension organisation in the UK, reviewed all the literature available on the role of nutrition in white line disease and sole lesions. Half the studies found no effect of diet and many of these studies had very weak correlations. (Potterton et al., 2012).

Where to from here: Discussions with farmers, rural professionals and lameness experts

DairyNZ conducted in-depth interviews with farmers, veterinarians, farm consultants and hoof trimmers in late 2015.

Key issues identified from farmer interviews

- Farmers are concerned about lameness, but it is not often a priority on farm compared with other animal health issues.
- Limited understanding of the true costs of lameness.

- Lack of measuring and monitoring of lameness. There are no benchmarks available to track performance.
- Recording lameness is not simple.
- Decision makers on farm concerned at the lack of lameness knowledge and skills amongst farm assistants.
- Lameness research not accessible.
- Mixed messaging and disagreement between professionals is creating confusion.
- Infrastructure and maintenance is a huge expense, but there is a lack of good information available.
- General desire to treat lame cows appropriately, but some farmers have not made it a priority to upskill.

Key issues identified from rural professional interviews

- Lameness is low on the priority list for farmers and professionals.
- Lack of metrics and benchmarks means farmers are not aware of performance.
- Limited on-farm lameness recording, partly because there are limited simple recording options.
- Knowledge and skill set of farmers is variable. In particular, identification of lame cows is too late and treatment is too late or inappropriate.
- Professional skill level inconsistent with limited accountability.
- Research gaps in New Zealand. Causes of lameness is not well understood.
- Mixed messages and disagreement between professionals is creating confusion.
- Dairy industry promotion is lacking.

Lameness technical advisory group

A small group consisting of leaders in lameness has been formed. This group includes scientists, veterinarians, a hoof trimmer, and a lane contractor.

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The group concluded that the priorities to address lameness in New Zealand are:

- Ensure industry lameness messages are consistent
- Improve on-farm lameness records, enabling benchmarks to be set.

The industry messages that the group agreed on are:

- Calving reduces resilience of the hoof – ensure a safe, non-stressful environment and time for cows to feed and rest
- Record details of lameness for all affected cows
- Provide treatment as soon as feasible after detection
- Good facilities and training make treatment easier and safer for you and the cow
- Benchmarks must be determined, with appropriate support channels available to farmers seeking assistance.

The research priorities include:

- Effect of preventative hoof trimming
- Impact of sole thickness and hoof wear
- Impact of, or association with, body condition.

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