

The High Cost of Lameness

What you can do about it

A recent study by the US Department of Agriculture reported that lameness accounted directly for 15% of culling in US dairy herds. This figure underestimates the total effect of lameness on culling because it does not account for its indirect contributions to low production and poor reproduction. Together, these accounted for an additional 49.1% of culling.

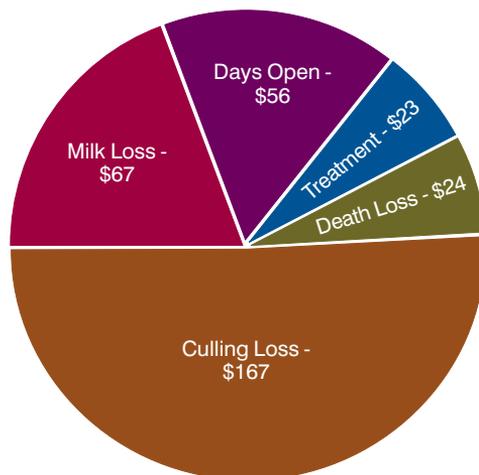
An article in the Fall 2001 issue of *Western Dairy Digest* summarized the results of a study that demonstrated significantly reduced likelihood of conception resulting from various lameness disorders. Other research has confirmed that cows diagnosed clinically lame in early lactation showed fewer standing heats and took longer to conceive.

Lameness can also have negative effects on production. A study of two New York herds found that lame cows produced between 0.2 and 2.2 kg less milk per day than healthy cows, depending on parity and the specific disorder causing lameness. Results of a Florida study demonstrated an 857 kg decline in 305 day mature equivalent production for cows with foot rot, a 154 kg decline for those with foot warts and a 206 kg drop for cows with claw lesions.

Dr. Chuck Guard at the Cornell Veterinary College evaluated the potential financial losses due to lameness. His estimates are summarized in the pie chart above. The total cost amounted to \$346 per lame cow.

How many of your cows are lame?

Although several surveys have placed the average incidence of lameness in Canadian and US dairy herds at 20-30%, producers typically underestimate the incidence and severity of lameness in their herds. For this reason, veterinarians at Michigan State University developed a 5-point locomotion scoring system to assess lameness. The system is based on the observation of cows both standing and walking, with particular emphasis on back posture. The table on the page opposite summarizes the criteria used to assign each locomotion score. In testing this system, its authors concluded that a cow with a lameness score greater than 2 would be:



Total Costs: \$346 per lame cow

- 3 times more likely to be above the herd average for days to first service;
 - 16 times more likely to be above the herd average for days open;
 - 16 times more likely to have spent more time in the breeding herd than her non-lame herdmates;
 - 9 times more likely to have required more than the average number of breedings to become pregnant;
 - 8 times more likely to be culled than a normal cow.
- They also observed that reproductive and production losses occurred before symptoms became obvious (score 3+). Scoring helped to detect many cases of lameness in their early stages before losses and treatment costs became significant.

Factors that increase lameness

Lameness is influenced by both genetic and environmental factors. Environmental risk factors include:

- *Free stall housing.* A 1978 survey of over 1700 herds in the northeastern US found that 43% of free stall herds had major foot problems compared with 24% of herds in stanchions and 19% in tie stalls.
- *Resilience of stall and alley surfaces.* Unyielding stall surfaces cause cows to spend more time standing, placing additional stress on legs and hooves. With appropriate management, virtually any of the current stall bedding options (sand, sawdust, shavings, mattresses) will help to minimize leg and hoof in-

Michigan State Locomotion Scoring System

Score	Description	Assessment
1	Normal	The cow stands and walks with a level-back posture. Her gait is normal.
2	Mildly lame	The cow stands and walks with a level-back posture but develops an arched-back posture while walking. Her gait remains normal.
3	Moderately lame	An arched-back posture is evident both while standing and walking. Her gait is affected and is best described as short-striding with one or more limbs.
4	Lame	An arched-back posture is always evident and gait is best described as one deliberate step at a time. The cow favors one or more limbs/feet.
5	Severely lame	The cow additionally demonstrates an inability or extreme reluctance to bear weight on one or more of her limbs/feet.

source: Sprecher, D.J. et al., *Theriogenology* 47:1179 (1997)

juries and encourage cows to get off their feet. In an attempt to improve alley surfaces, there has been increasing interest in the use of rubber mats and belting. Although anecdotal evidence supports the use of rubber flooring, objective research trials have failed to clearly demonstrate reduced lameness.

- *Abrasiveness of stall and alley surfaces.* Cows on concrete tend to develop deformed hooves, resulting in uneven weighting on inside and outside claws and damage to the hoof pad. The abrasive surfaces of many cow mattresses are associated with increased hock lesions. Ample loose bedding material on top of 'geotextile' mattresses is essential in minimizing these lesions.
- *Slippery alleys.* Many limb injuries result from cows losing their footing in alleys with surfaces that are too smooth. Inadequate removal of slurry both decreases friction between hoof and flooring and increases susceptibility of hooves to infection by

manure-borne pathogens. Insecure footing and lameness also reduce displays of standing heat, lowering heat detection efficiency.

- *Nutrition.* Rations containing inadequate effective fiber result in high rumen acid levels and low pH. Low rumen pH increases the risk of laminitis, resulting in the malformation of new claw tissue and making the claw more susceptible to injury and infection. High acid conditions also reduce the synthesis of biotin by rumen microbes. As a result, several trials have demonstrated improved hoof health from the dietary supplementation of biotin. Adequate levels of dietary copper and zinc are also important for the synthesis of healthy hoof horn. Under some conditions, zinc supplemented as an organic complex with methionine has been shown to be more beneficial than inorganic zinc fed at the same level.

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