

Dairy Cattle Hoof Health



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<http://dairyhoofhealth.info>

Can Breeding Improve Hoof Health?

Hoof lesions recorded by hoof trimmers in Alberta, British Columbia and Ontario have been analyzed to evaluate the possibility of using this type of data for selection purposes. Results were promising, although the volume of data needs to increase in order to allow validation.

Despite the low heritability of hoof health traits, the estimated breeding values (EBVs) showed variability between sires. Higher EBVs were observed for sires with lower prevalence of affected daughters, creating the possibility of selecting on the basis of hoof health parameters. The table on the right illustrates differences in the prevalence of hoof lesions in daughters of sires with high or low EBVs for resistance to 3 specific lesions. Only sires with at least 50 daughters were included in the analysis (182 sires in total).

Lesion	Best 10% of Sires	All Sires	Worst 10% of Sires
	---- % of daughters with lesion ----		
Digital dermatitis	7.4	14.2	22.7
Sole ulcer	2.9	4.5	8.2
Interdigital hyperplasia	0.6	1.6	4.1

A current project funded by the Dairy Farmers of Canada's Research Cluster is aimed at linking hoof lesion data routinely collected by trimmers into the national Dairy Herd Improvement (DHI) database for use in genetic selection.

source: Francesca Malchiodi, Anne-Marie Christen and Filippo Miglior; DAIRY GLOBAL Volume 2, No. 3, Page 11, 2015

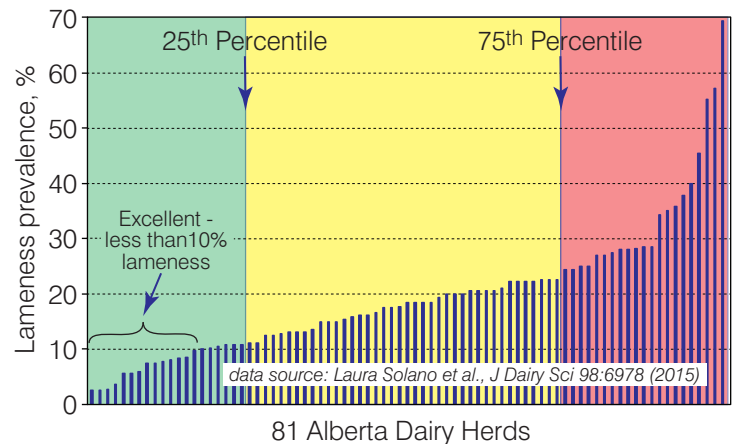
Lameness Assessment in Dairy Farmers of Canada's proAction Animal Care Module

Dairy Farmers of Canada (DFC) launched the Animal Care (AC) module of its proAction initiative in September 2015; full implementation is scheduled to begin in September 2017. Among the requirements specified in the AC program is a periodic examination of animal injuries, body condition scores and lameness by a third-party assessor.

Based on observations made as part of DFC's Cow Comfort Project, many producers will find that corrective actions are required to bring the level of lameness in their herds into compliance. The graph on the right summarizes the lameness prevalence observed in the 81 Alberta farms that participated in the project. The 4 areas of the graph are described in the AC Farmer Manual as follows:

"The excellent thresholds are the ideal goals to reach. For the first two years of the program's implementation, the coloured zones will be based on population data. The Green zone represents the results that the top 25% of herds have achieved. The Yellow zone represents the results that the middle 50% of herds have achieved. The Red zone represents the results that the bottom 25% of herds have achieved.

Results that fall in the Green zone are good. The Yellow zone means caution and you should consider corrective action to improve. The Red zone means that you need to write a



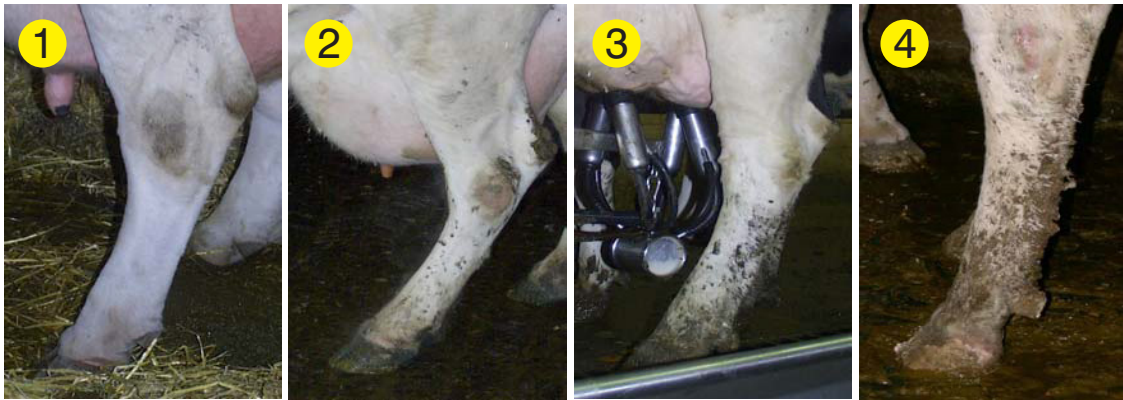
corrective action plan in consultation with your veterinarian or nutritionist or dairy specialist to outline your plan to improve out of that zone."

Only 17% of Alberta herds in the Cow Comfort Project would have achieved an excellent score. Lameness prevalence of herds in the Green zone ranged from 2.6% to 10.8%; in the Yellow zone, the range was 11.1 % to 22.5%; in the Red zone, 24.3% to 69.4%. Since these participating herds were typical Alberta herds in terms of size, housing and management, it is likely that these levels of lameness are representative of all herds in the province.

Leg Hygiene Guides Foot Bathing Frequency

Manure contamination of cows' lower legs is a good indicator of barn hygiene and susceptibility to hoof lesions. The greater the contamination of the lower leg, the more frequently cows should be foot bathed. While some farms with excellent leg hygiene may use a footbath only once a week, others should be foot bathing 5-7 days per week.

Use the four point leg hygiene scoring assessment illustrated below to determine foot bathing frequency. Score at least 20% of the cows in each pen in a free stall herd or all of the cows in a tie stall herd. In herds with fewer than 25% of cows scoring a 3 or 4 score, foot bathing can be done as needed. Conversely, where herds have >75% of cows scoring 3 and 4, foot bathing is probably a necessity 7 days per week.



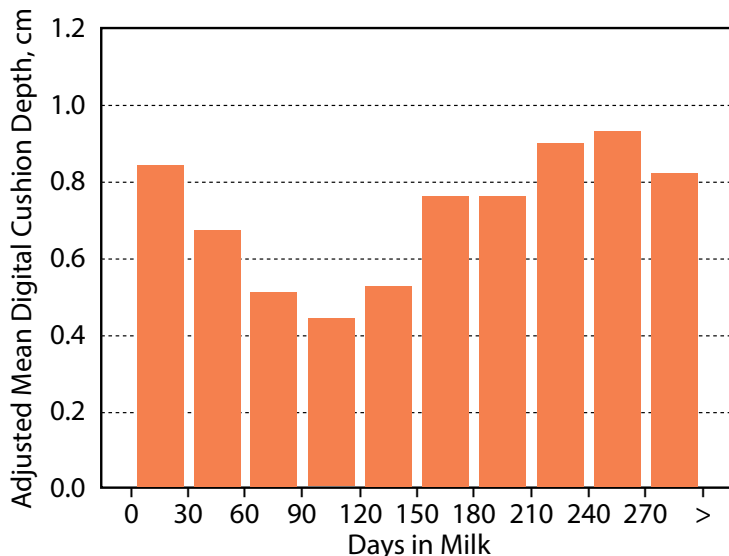
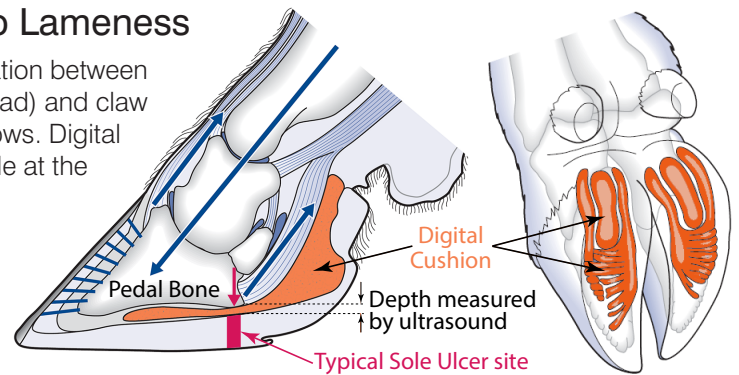
% of cows scoring 3 or 4	Suggested Foot Bathing Frequency
< 25%	as required
25 - 50%	2 days/week
50 - 75%	5 days/week
>75%	7 days/week

source: Nigel Cook, University of Wisconsin

Body Condition Score Affects Susceptibility to Lameness

A study by researchers at Cornell University examined the association between body condition score (BCS), the depth of the digital cushion (fat pad) and claw horn lesions in 192 first lactation and 309 second-plus lactation cows. Digital cushion depth was evaluated by ultrasound examination of the sole at the typical sole ulcer site as illustrated in the figure on the right.

The prevalence of sole ulcers and white line lesions increased significantly with decreasing thickness of the digital cushion. And cows with the highest 25% of digital cushion thickness had a lameness prevalence that was 15 percentage points lower than



cows with the lowest 25% of digital cushion thickness (24.4% versus 8.6% prevalence).

Digital cushion thickness increased with higher BCS. As illustrated in the graph on the left, digital cushion thickness decreased steadily from the first month of lactation and reached a low point between 90 and 120 days after calving, matching the typical pattern seen for BCS.

These results support the idea that sole ulcers and white line lesions are related to injuries within the claw horn capsule resulting from the lower capacity of the digital cushion to dampen the pressure exerted by the pedal bone on the soft tissue beneath it. Increased pressure causes bruising (sole hemorrhage) in the sole corium (the sole horn producing tissue) and eventually, an ulcer that penetrates both corium and horn.

source: R.C. Bicalho et al., Journal of Dairy Science 92:3175 (2009)