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Research Reports
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Improvements in lameness detection

Lameness is one of the greatest challenges facing the dairy industry - approximately 25% of the dairy cows in Canada are lame. It is important that new cases of lameness are promptly identified, as treatment of chronically lame animals is often unsuccessful. Unfortunately, it is difficult to correctly identify lame animals. In particular, it can be challenging to differentiate between imperfect gait and mild lameness, meaning that a diagnosis of mild lameness may be unreliable especially when based on a single assessment.

New research at UBC has shown that gait assessments (Figure 1) are more reliable when done repeatedly. More frequent assessments also increase the likelihood of finding new cases, but there is little consensus on how often lameness should be evaluated on farm when performing lameness studies.

Figure 1. Gait assessment at the UBC Dairy Education and Research Centre.

We followed 262 cows from dry-off until calving on six farms in British Columbia. All cows were considered sound at the beginning of the study. Gait was scored weekly, using a 1-5 scale (1 to 2 = freely able to move, 3 = compromised locomotion, 4 to 5 = severely restricted ability to move). We used three increasingly stringent definitions of mild lameness (Table 1) and tested how the different definitions affected our ability to identify new cases. Animals with locomotion score ≥4 were considered severely lame in all definitions. To determine how well our findings related to the presence of claw lesions, we compared the different lameness definitions against claw records collected by professional hoof trimmers.

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Table 1. Lameness definitions

LAME1	Scored 3 or higher at least once
LAME2	Scored 3 on at least 2 consecutive occasions, or ≥4 at least once
LAME3	Scored 3 on at least 3 consecutive occasions, or ≥4 at least once

To evaluate how assessment frequency affected the identification of new lameness cases, we created three different data sets containing the same animals. Either every, every other, or every third assessment in the original data set was kept for each animal, with the first assessment being the same in all three data sets. A high percentage of the animals (82%) were diagnosed as lame when using the LAME1 definition, compared to 50% and 35% of cows when using either the LAME2 or LAME3 definition. Of the 158 animals considered mildly lame according to the LAME1 definition, 28% were scored 3 on only one occasion. Conversely, 71% of the animals that scored 3 on two consecutive occasions also scored 3 the following visit. When comparing LAME2 and LAME3 there was a high agreement in how cows were classified, with 85% of the cows classified the same way.

When assessing how well the different lameness definitions related to the presence of claw lesions at trimming, LAME1 proved to be the least useful. Over 75% of the cows identified as lame had no lesions at trimming. Both LAME2 and LAME3 were more successful at discriminating between animals with and without claw lesions. Given that recovery is better when claw lesions are treated promptly, we recommend using the LAME2 methods as this leads to a more rapid diagnosis than is possible with LAME3.

Our results also showed the value of more frequent gait assessments. Fewer animals were considered lame when assessment frequency decreased. We found that 50% of the cows were identified as lame when they were assessed weekly, but only 23% when gait scoring occurred every 3 weeks, showing that many cases of lameness can be missed when scoring is infrequent. With frequent scoring, any cases that were missed were likely to be very short; we found that 69% of the cows that changed category from lame to sound when assessed every two weeks were lame for two weeks or less. Conversely, 49% of the animals that changed category when assessed every third week were lame for four weeks or more.

Our results provide evidence that new cases of lameness are common during the dry period. Using occasional gait scores of 3 to identify lameness leads to over-estimates of the number of lame animals. In addition, many cases of lameness can be missed if cows are assessed infrequently. We therefore recommend that gait should be evaluated at least every other week in adult dairy cattle, including dry cows. Cows that are deemed mildly lame should be monitored more often by the farmer, and have their claws checked if gait does not improve. Severely lame animals should be examined upon first detection.

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