



Locomotion Scoring Dairy Cows

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Lameness is a continuing problem on California dairies. Whether it is caused by physical injury, hoof disease or dietary nutrient deficiencies, it results in increased veterinary costs, increased culling, increased angst, decreased milk yield and, ultimately, decreased profitability. There are two key issues related to lameness. The first is to determine the extent of the problem and assess its cost, and the second is to determine how to alleviate the problem, if it is deemed serious enough that it is cost effective to do so. Locomotion scoring is a relatively new tool to address the first issue (i.e., determine the extent of lameness) in order to determine if the problem is serious enough to justify attempting to alleviate it.

What is a Locomotion Score ?

A locomotion score is a qualitative index of a cows ability to walk normally. Visually scored on a scale of 1 to 5 (Table 1), where a score of 1 reflects a cow that walks normally and a score of 5 reflects a cow that is three-legged lame, a locomotion score is made in a few seconds per cow. Generally locomotion scores of 2 and 3 are considered to represent subclinically lame cows whereas locomotion scores of 4 and 5 represent those cows that are clinically lame. A locomotion score higher than 1 is not an indication of why the cow's gait is affected, merely the degree of lameness that she is showing.

Table 1. Locomotion Scoring Guide

Score	Description	Back	Assessment
1	Normal	Flat	Cow stands and walks with a level back. Gait is normal.
2	Mildly lame	Flat or arch	Cow stands level backed , but develops an arched back to walk. Normal gait.
3	Moderately lame	Arch	Arched back is evident while standing and walking. Gait is short strided.
4	Lame	Arch	Arch back is always evident and gait is one deliberate step at a time. Cow favors one or more legs/feet
5	Severely	3-legged	Cow demonstrates an inability, or extreme reluctance to bear weight on one or more limbs/feet

Adapted from Sprecher et al. (Theriogenology 47:1179-1187; 1997).

What Can a Locomotion Score be Used For ?

Locomotion scores can be used to assess the extent of the expected reduction in dry matter intake and milk yield due to lameness. Based on data developed from dairy cows on commercial dairies in California, these reductions can be substantial (Table 2).

Table 2. Reductions in Dry Matter Intake and Milk Yield Related to Locomotion Score.

	DM Intake	Milk Yield
Locomotion Score	---- % reduction vs. locomotion score=1 ----	
2	1	0
3	3	5
4	7	17
5	16	36

The higher % reductions for milk yield, vs. DM intake, reflect the higher priority need for energy to maintain body tissues, meaning that the full impact of reductions in DM intake are seen in reduced milk production. Nevertheless, there is a strong negative correlation between locomotion scores and body condition scores, with body condition scores decreasing as body locomotion scores increase (i.e., lame cows are thinner).

Locomotion scores of individual cows can be used to select cows for hoof examination, to assess the reason for the higher locomotion scores, before they become clinically lame. In work completed on a commercial California dairy, cows that locomotion scored 3 were four times more likely to score 4 or 5 one month later than cows that scored 2.

Finally, tracking average locomotion scores on a regular (i.e., monthly) basis provides a running index of the extent of lameness on a dairy, or in a string within a dairy, as well as providing a criteria to assess when to intervene as well as to assess the impact of any intervention designed to alleviate lameness.

Assessing the Cost of Lameness ?

It is certainly well accepted that lameness costs the dairy producer lost milk and milk revenue. But how much ? Based upon the information outlined above, milk losses can be estimated based upon the body locomotion score profile of any group of cows. A simple 'Excel' spreadsheet can be downloaded from the author's web address of:

animalscience.ucdavis.edu/faculty/robinson

An example printout (Table 3) shows the impact of one particular set of circumstances. Such numbers can be used to assess the relative milk cost of lameness and thus whether intervention strategies would be expected to be cost effective.

Table 3. Predicted Milk Revenue Losses Due to a Particular Locomotion Score Profile.

Animal Inputs			Predicted Outputs		
Group milk average	99.0	lb/d	Avg. LS	1.18	LS units
Group size	200	total cows			
Milk price	\$12.25	\$/100 lbs	Losses		
Locomotion scores (LS)			Milk	1.96	lb/cow/c
1	62.0	% of cows		393	lb/group/c
2	22.0	% of cows			
3	8.0	% of cows	Fiscal	\$0.24	\$/cow/c
4	7.0	% of cows		\$48	\$/group/c
5	1.0	% of cows		\$1,443	\$/group/mo

Note: Bolded cells are input and non-bolded cells are predicted outputs.

The locomotion score profile in Table 3 would not generally be considered to represent a herd with serious lameness (i.e., only 8% clinically lame), yet the string milk revenue losses would be close to \$1500 per month. Such a high cost would likely be judged to be sufficiently high to justify general string management and/or nutritional interventions, as well as specific interventions in locomotion score 3 cows to prevent them from developing into locomotion score 4 or 5 or cull cows.

Summary

Locomotion scoring is a relatively quick and simple qualitative assessment of the ability of cows to walk normally. Locomotion scores, if collected regularly (e.g., monthly), can be used to identify specific cows at risk of becoming clinically lame for examination of the cause of the lameness. Locomotion scores can also be used to determine the expected milk revenue losses within a dairy or string and that loss can be used as a criteria to determine of general interventions, of either a management or nutritional nature, are warranted. Finally, locomotion score profiles collected regularly within a dairy or string provide a running index of the extent of lameness as well as being an index of the impact of interventions designed to alleviate lameness.

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