

LE
RENDEZ-VOUS
Laitier 
A Q I N A C

13^e édition

One step at a time: why lameness is still a challenge in the era of science and technology in the dairy industry

Presented by: Clemence Nash, Ph. D(c)

Why is lameness important?

Welfare Implications

- Ethics
- Consumer and retailer confidence

Reduced fertility (Bicalho et al., 2007)

- 15% for mildly lame cows
- 24% for severely lame cows

Increased risk of culling (Bicalho et al., 2007)

- + 45% for mildly lame cows
- + 74% for severely lame cows

Reduced milk yield (Green et al., 2002; Bicalho et al., 2008)

- 360 to 400 kg over lactation

Costly – estimates of \$200 to \$900 per case!

Cha et al, 2010; Willshire et al, 2007; Kossaibati et al, 1997



What is Lameness?



Hoof health

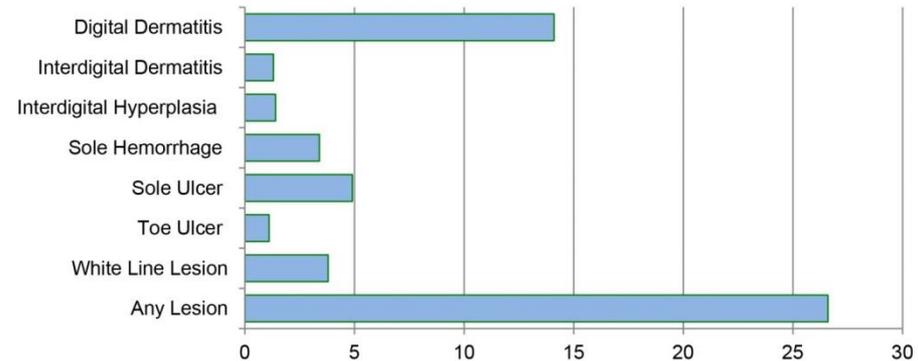
- Infections
 - Digital dermatitis, foot rot, etc
- Non Infectious
 - White line, laminitis, ulcers, etc

Does hoof health = lameness?

Non hoof related causes of lameness

- Injuries
- Arthritis
- Joint problems
- Conformation
- “crampiness”

Figure 1: Prevalence of hoof lesions based on herds included in research projects in three Canadian provinces



Source: <https://www.edn.ca/document.php?id=458>
Marchiodi, Christen and Miglior 2016



Identifying Lameness early

Locomotion scoring:

- Identifies what types of lameness?
- Subjective or objective?
- Same in tiestall and freestall?
- Does it require training?

Hoof trimming:

- Identifies what types of lameness?
- Subjective or objective?
- Same in tiestall and freestall?
- Does it require training?

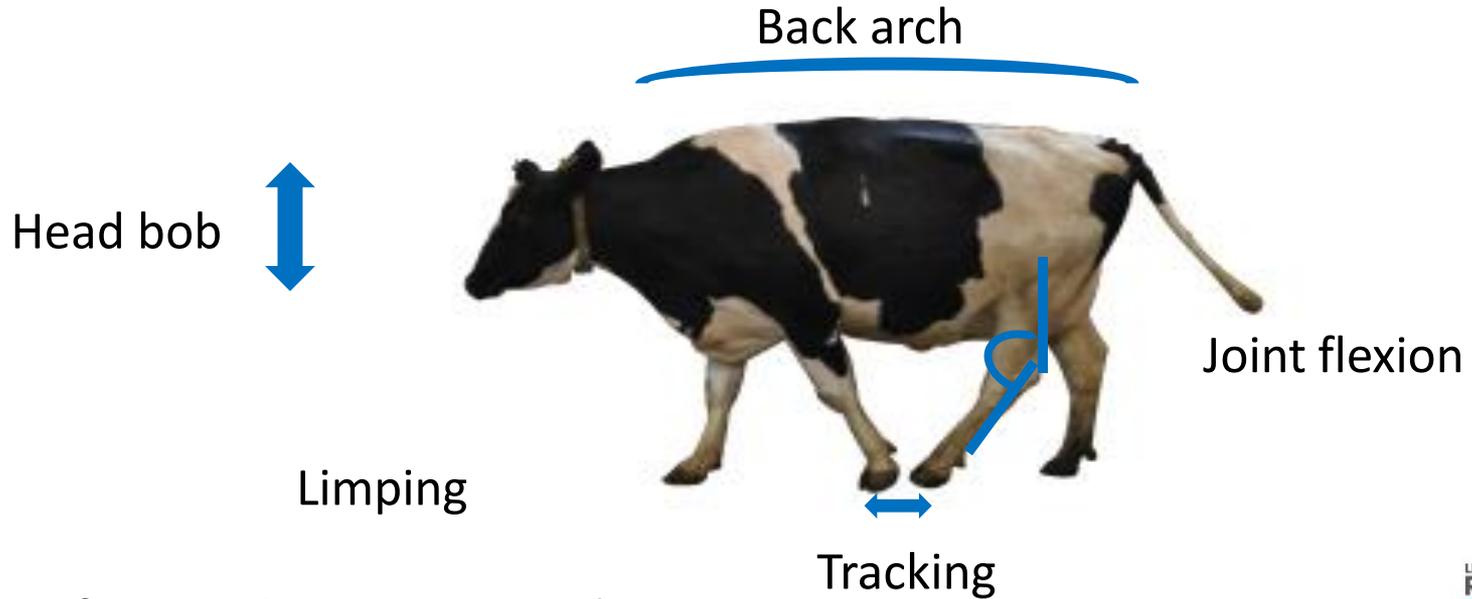
Let's practice!



Picture Source: Wilson et al, RVC

Practice Locomotion scoring

Lameness behaviours?



Source of imagery: Novus International

(Adapted from Flower and Weary, 2006)

Practice Locomotion scoring

What scale to use...

<p>LOCOMOTION SCORE 1 NORMAL Description: Stands and walks normally with a level back. Makes long confident strides.</p>	 <p>Back Posture Standing Flat</p>	 <p>Back Posture Walking Flat</p>
<p>LOCOMOTION SCORE 2 MILDLY LAME Description: Stands with flat back, but arches when walks. Gait is slightly abnormal.</p>	 <p>Back Posture Standing Flat</p>	 <p>Back Posture Walking Arched</p>
<p>LOCOMOTION SCORE 3 MODERATELY LAME Description: Stands and walks with an arched back and short strides with one or more legs. Slight sinking of dew claws in limb opposite to the affected limb may be evident.</p>	 <p>Back Posture Standing Arched</p>	 <p>Back Posture Walking Arched</p>
<p>LOCOMOTION SCORE 4 LAME Description: Arched back standing and walking. Favoring one or more limbs but can still bear some weight on them. Sinking of the dew claws is evident in the limb opposite to the affected limb.</p>	 <p>Back Posture Standing Arched</p>	 <p>Back Posture Walking Arched</p>
<p>LOCOMOTION SCORE 5 SEVERELY LAME Description: Pronounced arching of back. Reluctant to move, with almost complete weight transfer of the affected limb.</p>	 <p>Back Posture Standing Arched</p>	 <p>Back Posture Walking Arched</p>

*Adapted from Spencer, D.L., Goodrich, D.L., Krawiec, J.B. 1997. The copyright © 1997 by NRC and contributed from Cook, N.B., University of Wisconsin.

Category of score
<p>Good mobility</p> 
<p>Imperfect mobility</p> 
<p>Impaired mobility</p> 
<p>Severely impaired mobility</p> 

Gait Score	Category	Description
1 (Sound)	Not lame “Acceptable”	walks with a smooth and fluid locomotion, a flat back and even steps.
2 (Imperfect gait)		walks with a slightly uneven gait and slight joint stiffness but with <u>no limp</u> .
3 (Mildly lame)	Mildly lame “Monitor”	walks with shortened strides, sometimes an arched back and a <u>slight limp</u> .
4 (Moderately lame)		walks with an <u>obvious limp</u> , usually an arched back and a jerky head bob.
5 (Severely lame)	Severely lame “Require corrective action”	Unwilling to bear weight on one limb and/or must be vigorously encouraged to stand or move.

(Adapted from Flower and Weary, 2006)

Practice Locomotion scoring

SEE VIDEOS

www.nationaldairystudy.ca/videos

Practice In-Install Lameness scoring

Behaviour Indicator	Description
Standing Post (voluntary movements)	
STAND ON EDGE	<p>Placement of one or more hooves on the edge of the stall while standing stationary.</p> <p>Standing on the edge of a step when stationary, typically to relieve pressure on one part of the claw (Figure 11). This does not refer to when both hind hooves are in the gutter or when cow briefly places her hoof on the edge during a movement/step.</p>
WEIGHT SHIFT	<p>Regular, repeated shifting of weight from one hoof to another. Repeated shifting is defined as lifting each hind hoof at least twice off the ground (L-R-L-R or vice versa).</p> <p>The hoof must be lifted and returned to the same location and does not include stepping forward or backward</p>
UNEVEN WEIGHT (REST)	<p>Repeated resting of one foot more than the other as indicated by the cow raising a part or the entire hoof off the ground. This does NOT include raising of the hoof to lick or during kicking (Figure 12).</p>
Cow moved from side to side	
UNEVEN MOVEMENT	<p>Uneven weight bearing between hooves when the cow was encouraged to move from side to side. This is demonstrated by greater rapid movement of one hoof relative to the other, or by an evident reluctance to bear weight on a particular foot.</p>



Source: Dairy Farmers of Canada

Practice In-Stall Lameness scoring

SEE VIDEOS

www.nationaldairystudy.ca/videos

So... How much lameness are we talking about here?

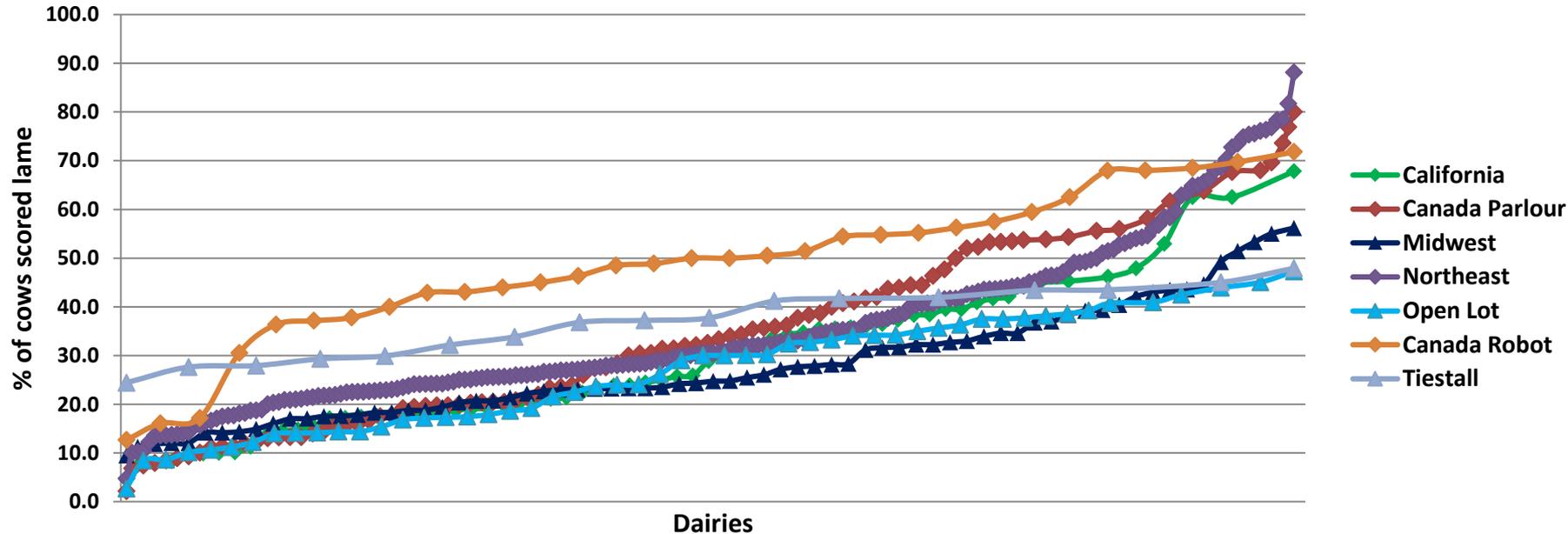


<https://www.docowseatgrass.org/blogs/farm-any-other-name>



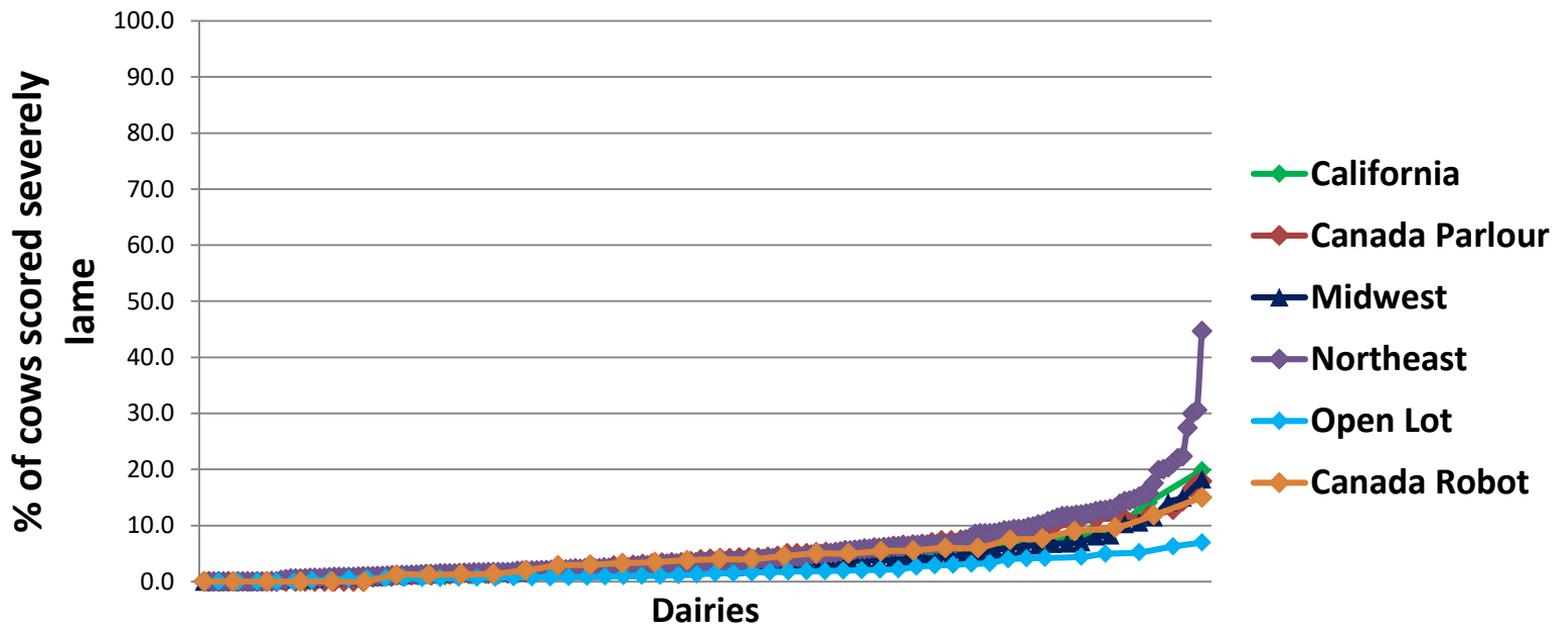
NODPA

Overall Lameness by Region



(von Keyserlingk et al., 2012; Novus C.O.W.S. data)

Severe Lameness by Region



(von Keyserlingk et al., 2012; Novus C.O.W.S. data)

WHY IS LAMENESS STILL SUCH A CHALLENGE?



Early identification

Early identification is difficult because:

- Barn Blindness
- Subjective
- Requires some skill
- Time consuming and/or labour intensive

Figure 1 Difference between farmer-estimated and measured prevalence of lameness in freestall barns

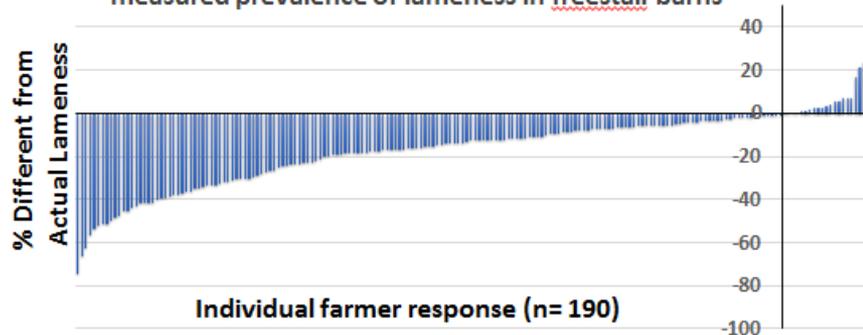
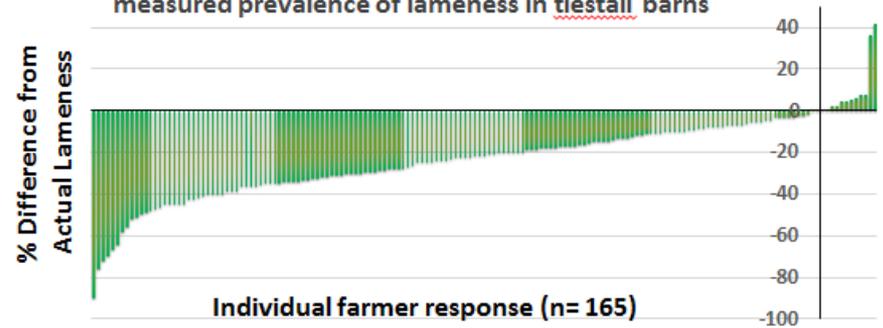


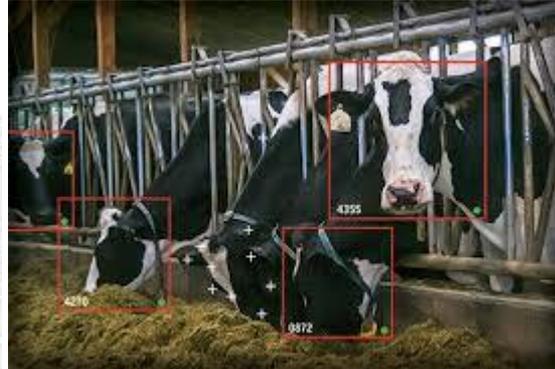
Figure 2 Difference between farmer-estimated and measured prevalence of lameness in tiestall barns



Source: Croyle et al, 2018

Possible solutions

More focus on accurate record keeping and prevention, and inform yourself on automation technology!



Risk factors are high

Lameness risk factors are high because:

- **Housing is becoming more intensive**
- **Animal performance is ever increasing.. Could this lead to more sensitive animals?**
- **Human practicality sometimes favoured over cow practicality**
 - **Barn design**
 - **Management style**
- **Difficult to pinpoint root cause!**

Possible solutions

Focus on cow comfort:

- **Reduce stocking densities: all resources accessible at all times**
 - Lying space (quantity and quality)
 - Water space (quantity and quality)
 - Feed space (quantity and quality)
 - Clean, high traction alleys
 - Air and light (quantity and quality)
- **Optimize preventative trimming and footbath schedule**
 - All cows seen by trimmer minimum at dry off and 80 DIM
 - More priority should be placed on mildly lame cows

Examples



Recommendation summary

Footbath: Ideal dimensions: 10-12' long x 20-24" wide x 6" deep, sloped walls, stay conservative on number of passes on any given product. Follow concentration instruction – more is not better! Frequency depends on status of infectious hoof problems on a farm

Rubber flooring: Good in areas cows spend a lot of time standing (holding area, parlour, robot, feed alley), but can mask lameness and increase need for trimming

Grooving: I prefer resurfacing over grooving, but durability can be low and it's easy to do wrong. If grooving, ensure the hoof is fully supported and provided traction when moving in any direction. Groove recommendations: 3/8'-1/2' wide, 1/2' deep, 2' apart

Stall dimensions: 90% of cows in a given pen should be able to comfortably stand with all 4 feet in a stall, and lay down without being in direct contact with curbs/brisket locators/dividers. If stalls are too short, provide more width until this can be corrected.

Stocking density: max 100% or min 120 sqft (feedbunk space AND stalls/pack), try for less during times of heat stress

Trimming: All cows should be seen at dry off and 80-100 DIM, plus as needed. Heifers should be assed for trimming prior to breeding and/or 6-8 weeks prior to calving, depending on hoof growth rate

Sources: UW Dairyland Initiative (www.thedairylandinitiative.vetmed.wisc.edu), University of Cornell Pro-Dairy program (www.prodairy.cals.cornell.edu), UofG Dairy at Guelph (www.dairyatguelph.ca)

Best strategy (in my opinion):

- **First, build the best team you can, including:**
 - **Farm staff**
 - **Veterinarian**
 - **Nutritionist**
 - **Hoof trimmer**
 - **Farm suppliers**

Ideally, all should be in regular communication with each other!

- **Next, start looking into automation technologies for early detection of lameness and potentially other health factors while simultaneously training yourself and staff to detect lameness earlier!**
- **Finally, using the above, identify root causes of existing problems and work towards focusing on prevention rather than solely treatment!**

Thank you!

Any questions?

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