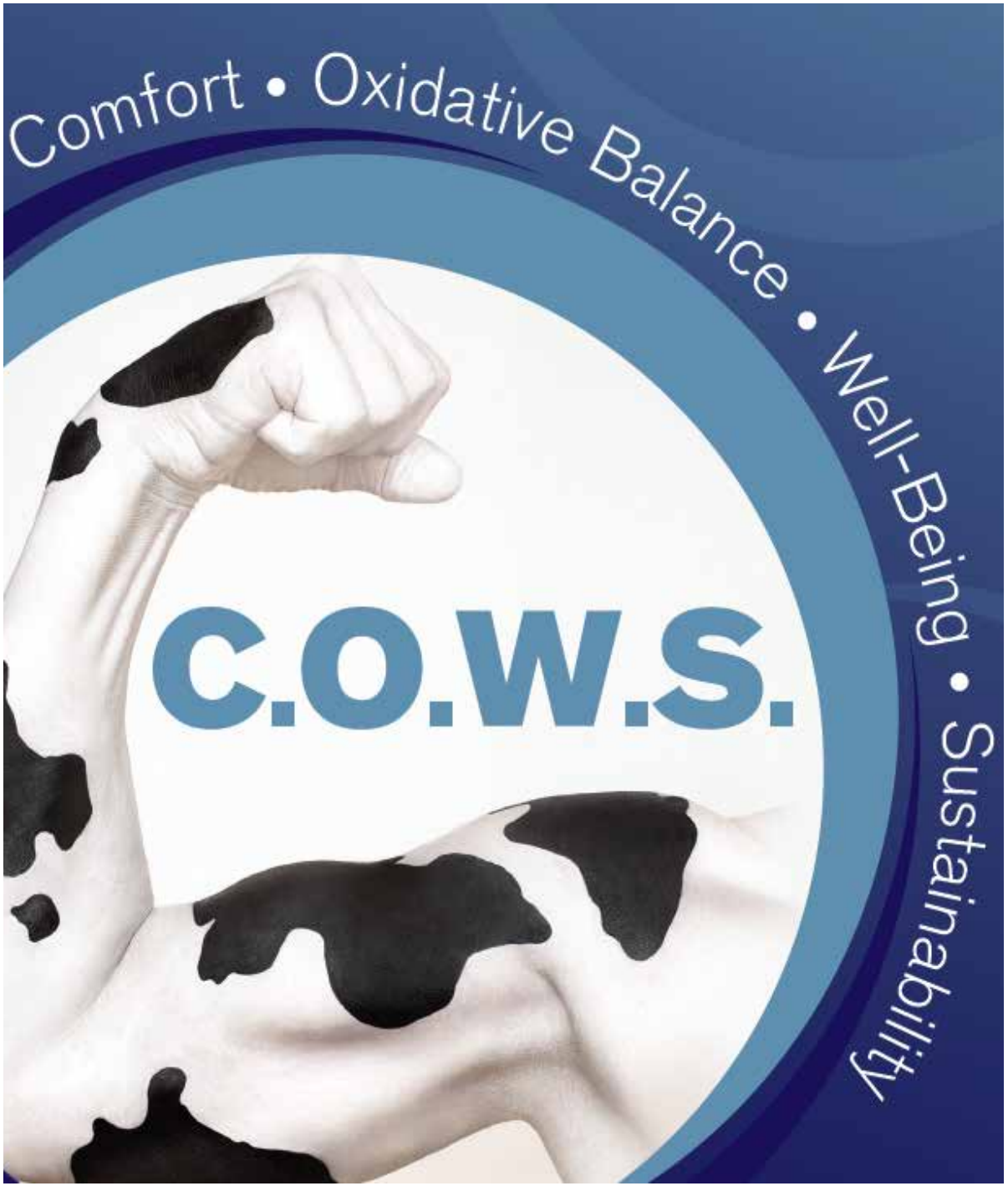


The Novus C.O.W.S. Program®: Measuring Cow Comfort Across the Country

Lindsay Collings
Novus C.O.W.S.®
Project Manager

Nov 6, 2015
DPC Annual Meeting
Burlington, VT

NOVUS®
SOLUTIONS SERVICE SUSTAINABILITY™

Novus C.O.W.S. Program

Comprehensive on-farm assessment program offered to Novus customers aimed at:

- Identifying and unlocking bottlenecks
- Optimizing cow comfort and well-being
- Improving productive efficiency
- Contributing to sustainability

NOVUS

Novus C.O.W.S. Assessments

- Focus on 1 pen for each farm (usually the high-producing, mature cows)
- Voluntary assessment (not an audit)
- Information is kept confidential between Novus, the producer, and their nutrition consultant

NOVUS

The Novus C.O.W.S. Program

- Started as a Master's project at the University of British Columbia (UBC), Canada in 2008
- Novus partnered with UBC in 2010
- Novus C.O.W.S. Program, 2011

NOVUS

The Novus C.O.W.S. Team

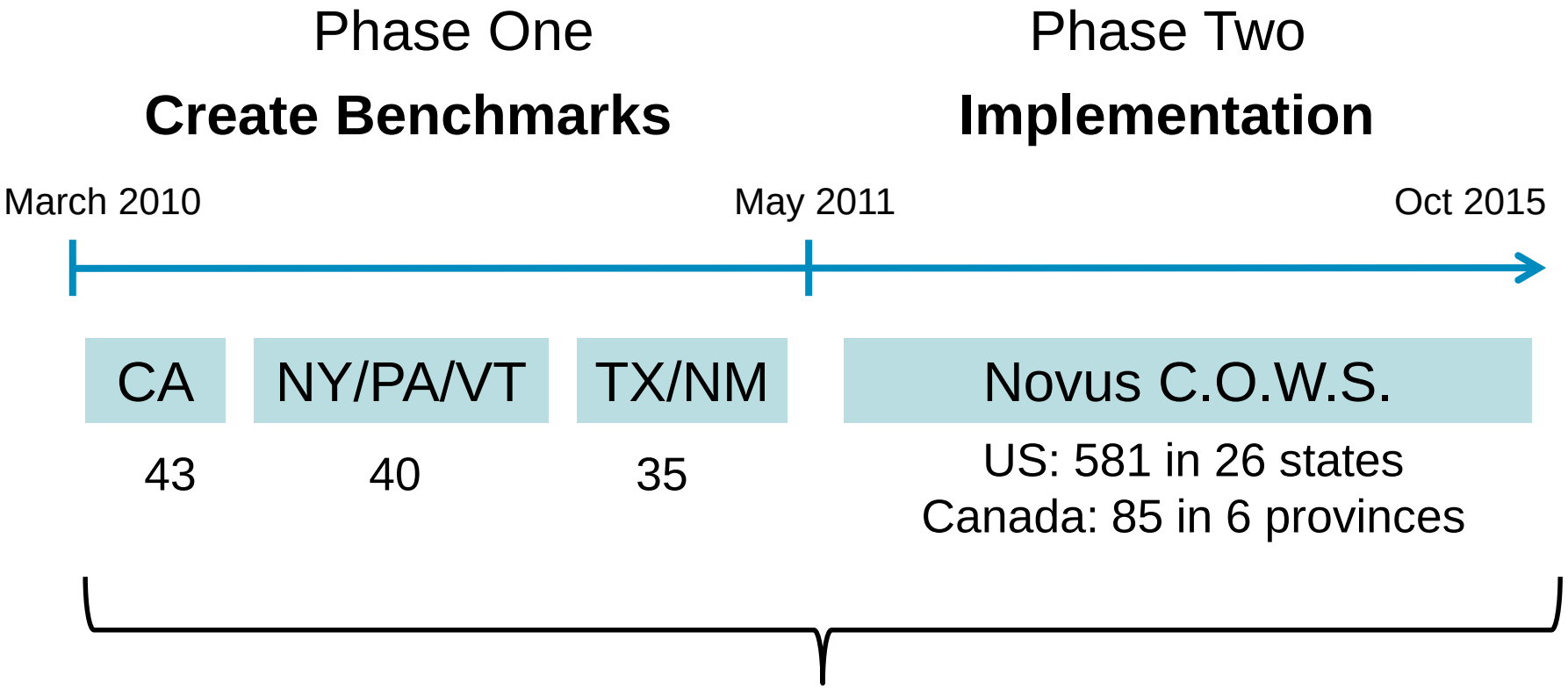
Lindsay
Collings, NY

Katie
Wood, NY

Megan
Mouw, CA

Clemence
Nash,
Canada

Novus C.O.W.S. Assessments



784 assessments and over 123,000 cows gait scored

How does Novus C.O.W.S. work?

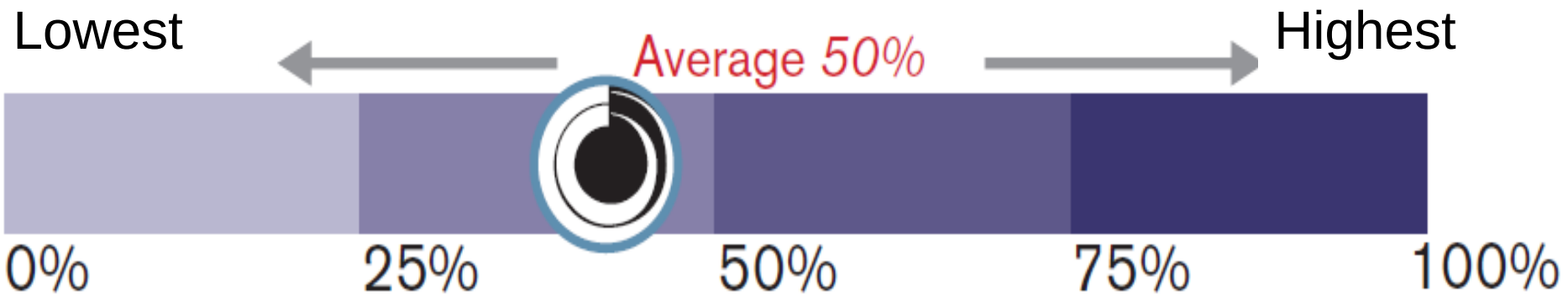
1. On-farm assessment

- Cow-based measures
  - § Lying time
  - § Hock & knee injuries
  - § Lameness
- Management/facility measures
  - § Stall design
  - § Bedding quality
  - § Stocking density, etc.

How does Novus C.O.W.S. work?

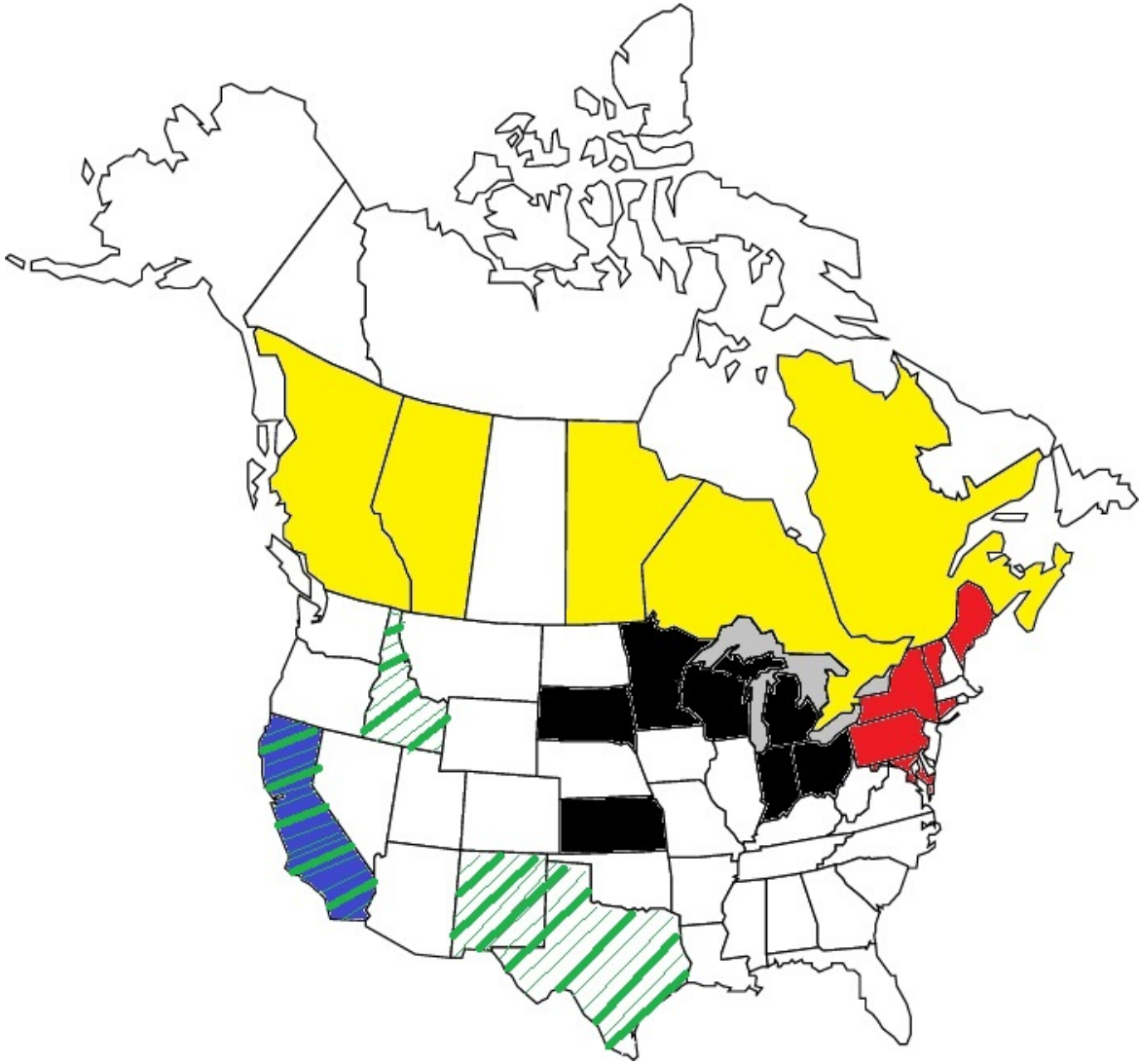
2. Feedback to the dairy relative to regional benchmark

- 4-6 weeks after the on-farm assessment, the Novus sales manager delivers the report to the nutritionist and dairyman
- The producer receives information specific to his/her dairy as well as how the dairy compares to the regional benchmark



Novus C.O.W.S. Benchmarks

- **California**
  - 56 freestall dairies
- **Openlots**
  - 48 openlot dairies
- **Northeast**
  - 189 freestall dairies
- **Midwest**
  - 62 freestall dairies
- **Canada**
  - 44 freestall dairies



Part A: Cow-based Measures

1. On-farm assessment

A: Cow-based measures

- § Lying time
- § Hock & knee injuries
- § Lameness

B: Management/facility measures

- Stall design
- Bedding quality
- Stocking density, etc.

LYING TIME

NOVUS

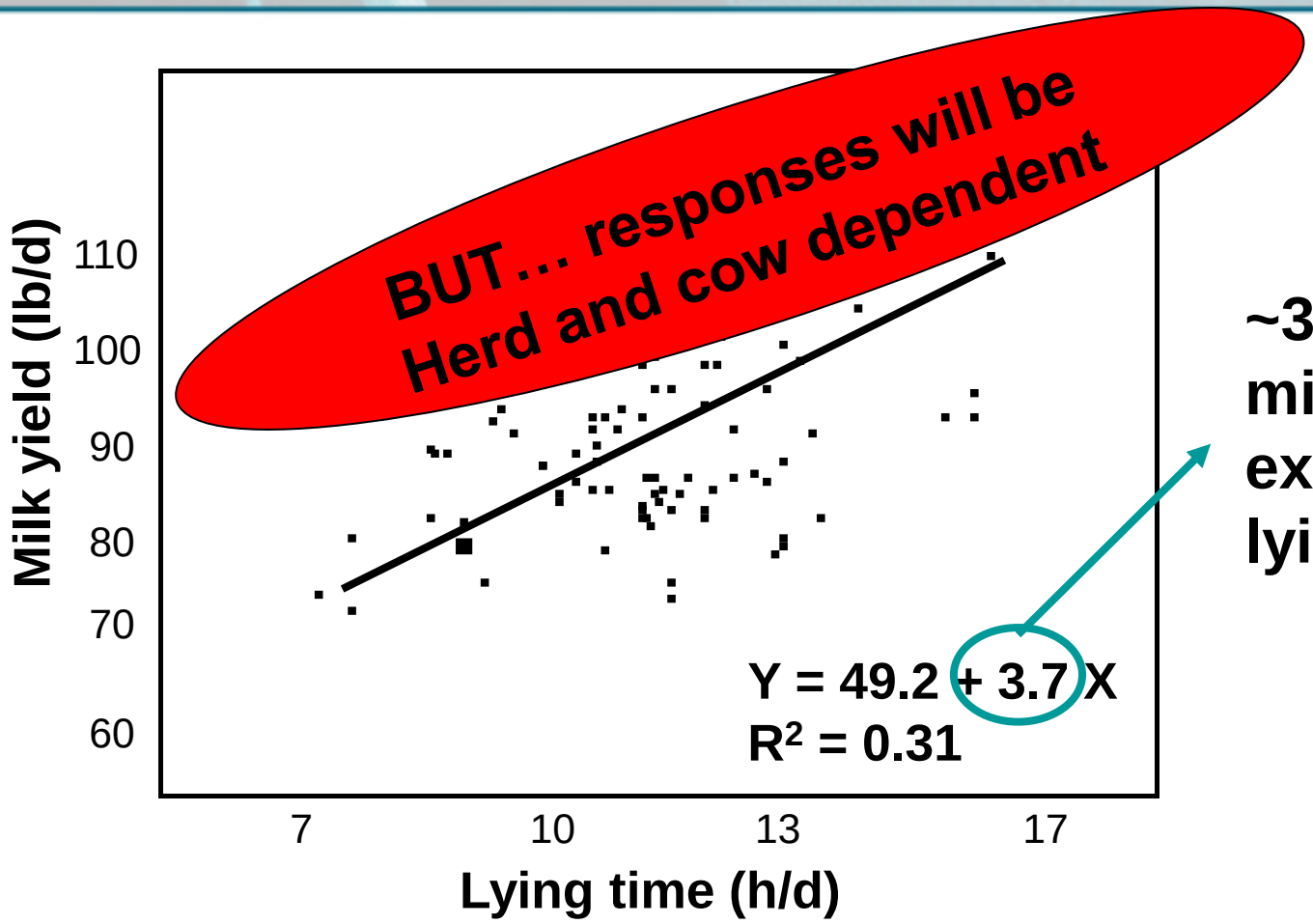
Why is lying important for cows?

- Motivation to lie down for ~12 hours/day (Jensen et al., 2005)
- Lying is a high priority behavior (Munksgaard et al., 2005)
    - Lying behavior takes precedence over eating and social behavior when opportunities to perform these behaviors are restricted
- Link to lameness (Cook and Nordlund, 2009)
    - Standing on concrete instead of lying down in stalls
    - Reduced rest due to uncomfortable stalls
- Every cow has different lying time requirements

NOVUS

Economics of lying time

Relationship between milk yield and lying time



~3.7 lb/d more milk for each extra hour of lying down

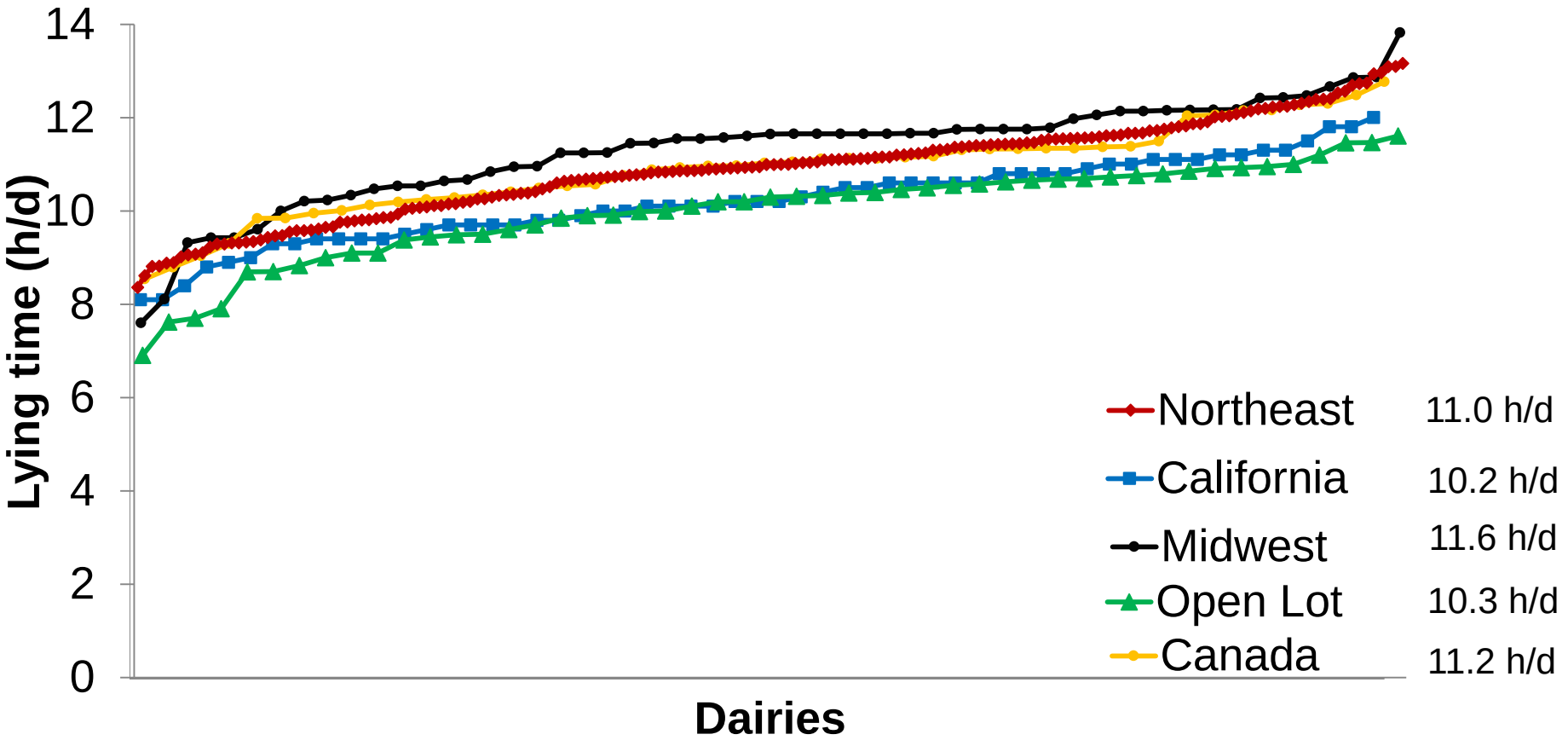
(Miner Institute Database; Grant, 2007)

How does Novus measure lying time?

Data loggers recorded lying times of 40 cows (randomly selected from assessment pen)

- At 1-min intervals
- Averaged over 3 days

Lying Time by Region



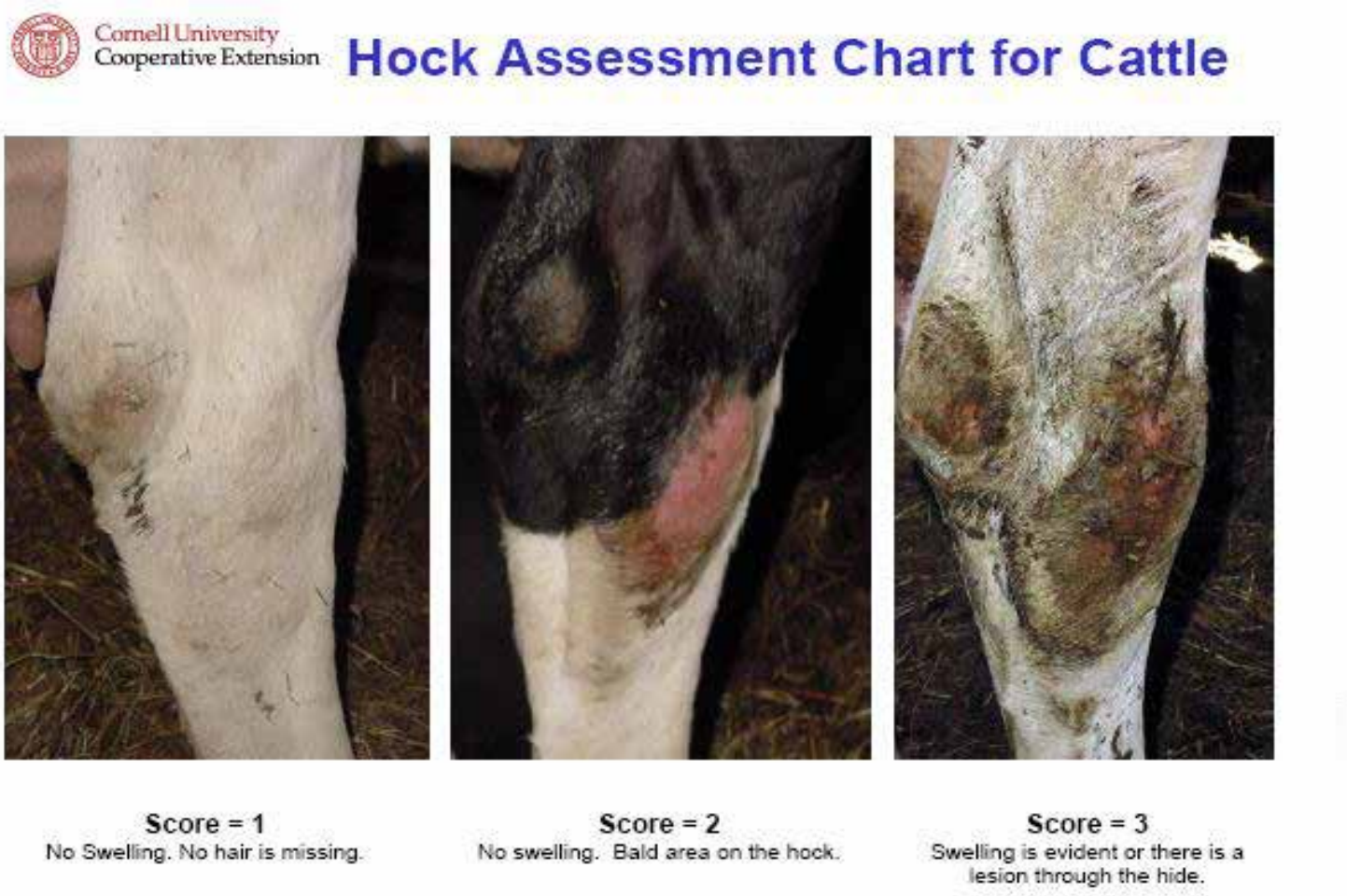
(von Keyserlingk et al., 2012; Novus C.O.W.S. data)

HOCK EVALUATIONS

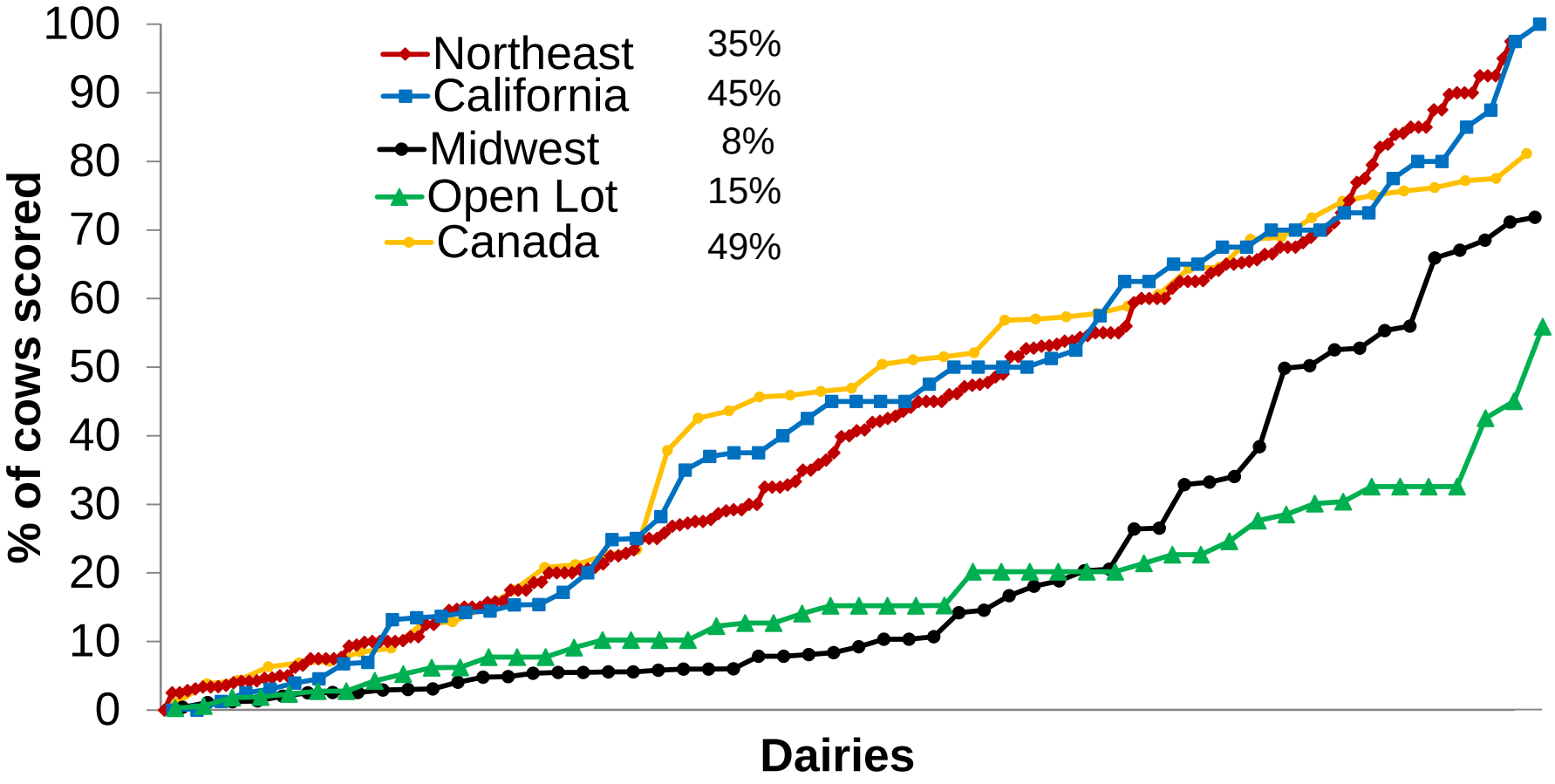
NOVUS

How does Novus score hocks?

Every cow in the assessment pen was scored for hock injuries

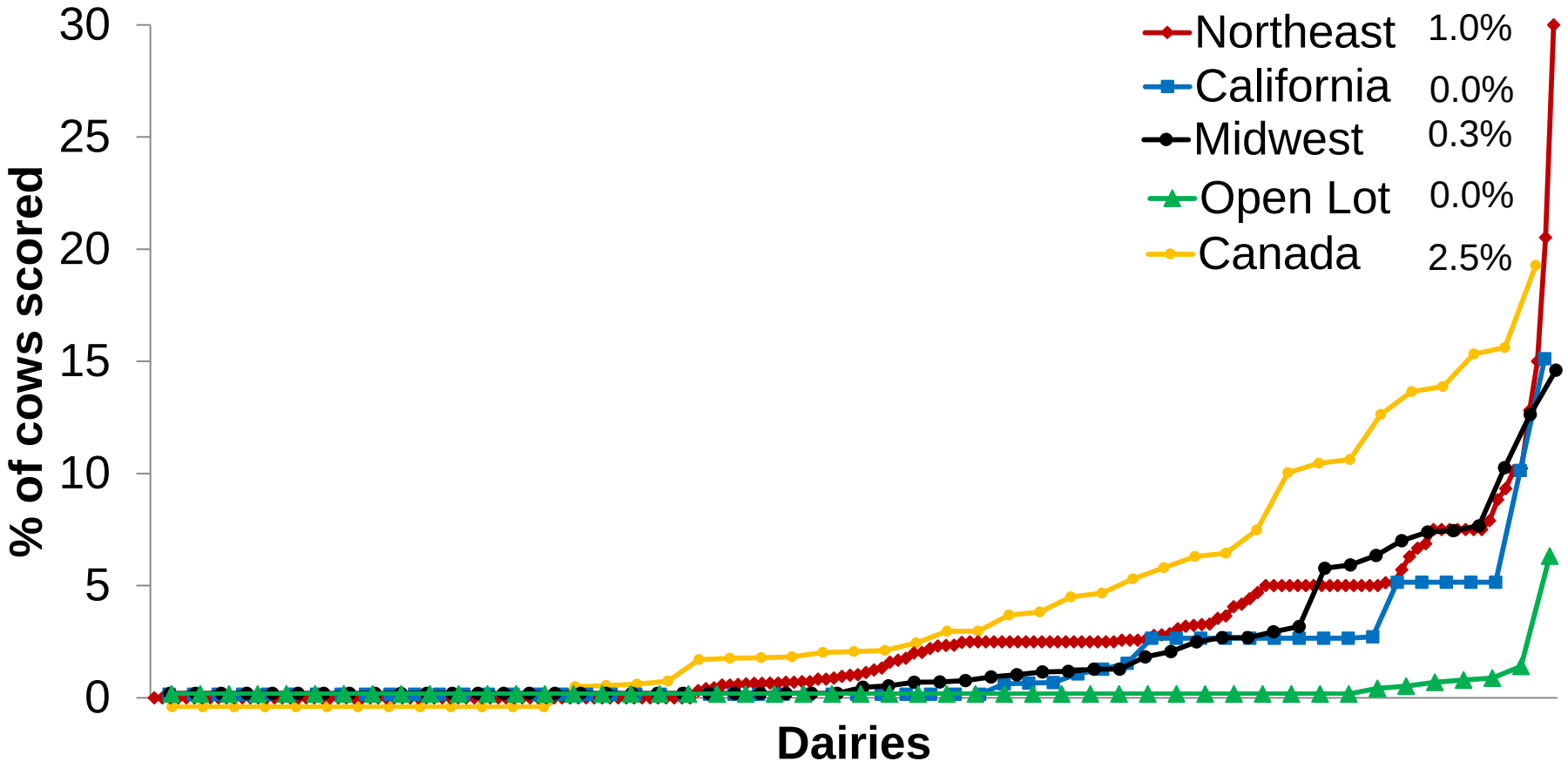


Overall Hock Injury Prevalence by Region



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

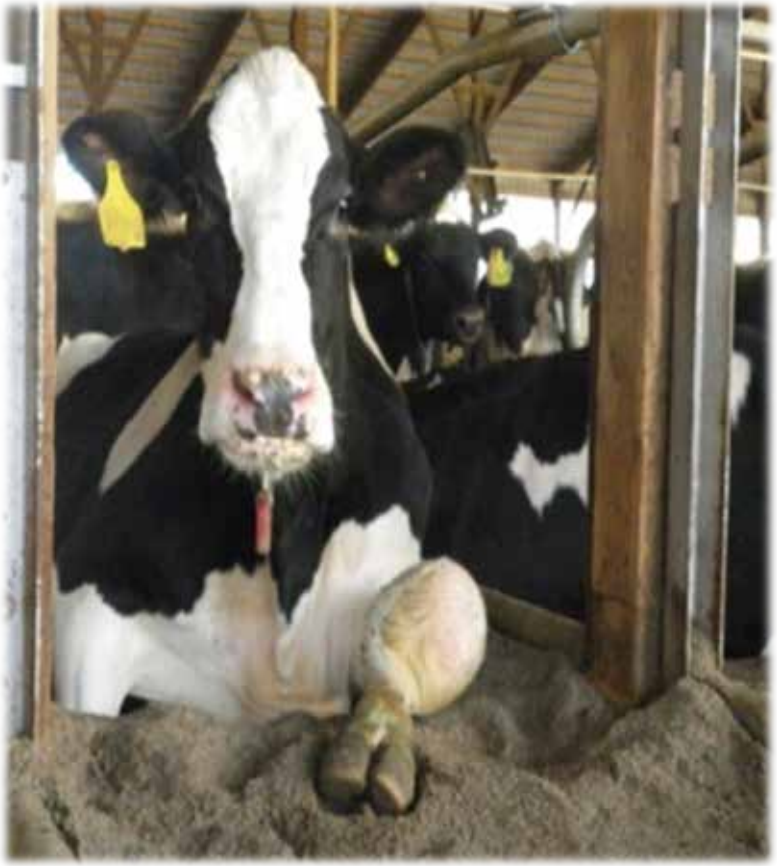
Severe Hock Injury Prevalence by Region



NOVUS

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

KNEE EVALUATION



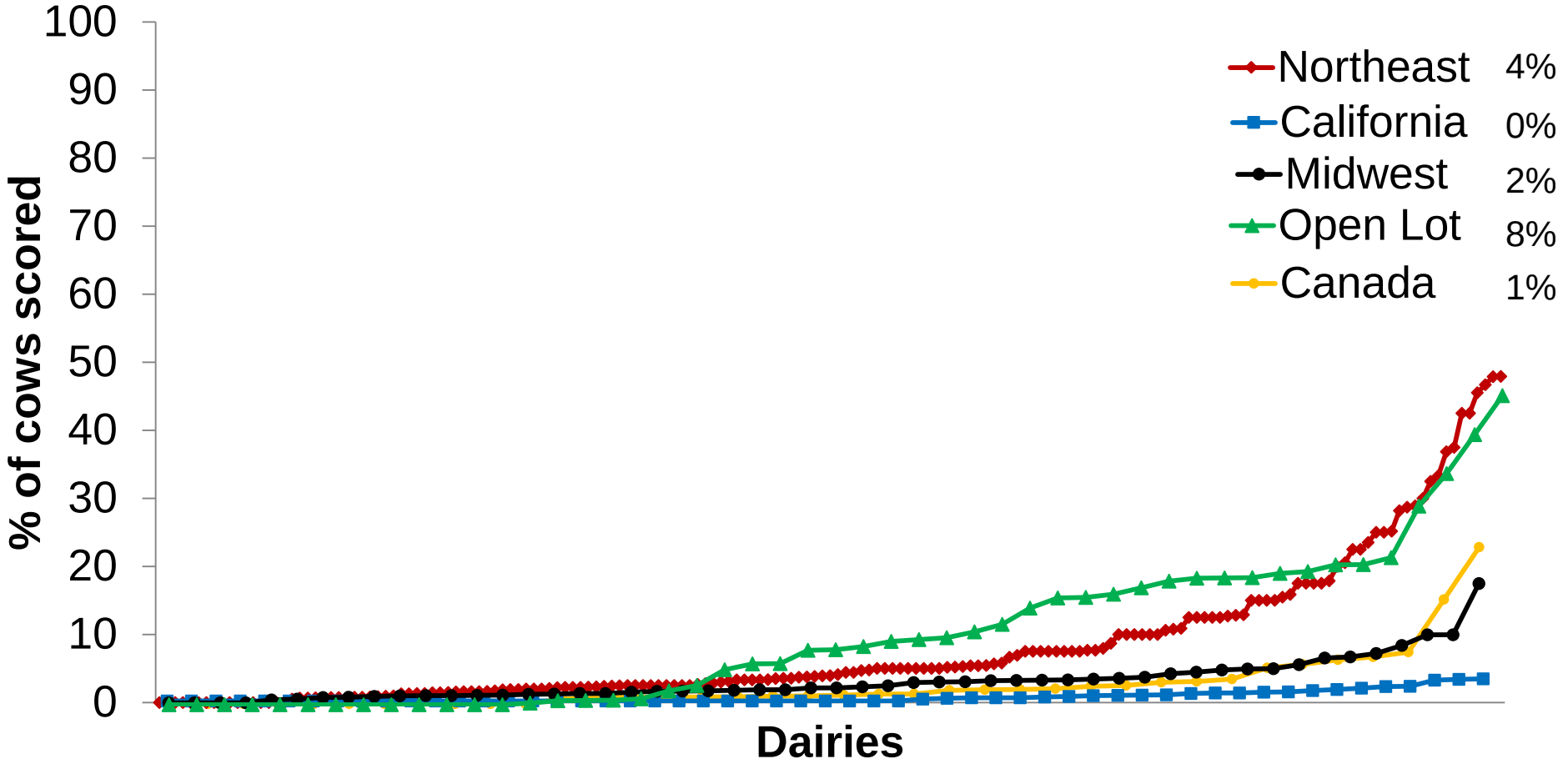
How does Novus score knees?

Every cow in the assessment pen was scored for knee injuries

Not swollen/injured

Swollen and/or injured

Knee Injury Prevalence by Region



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

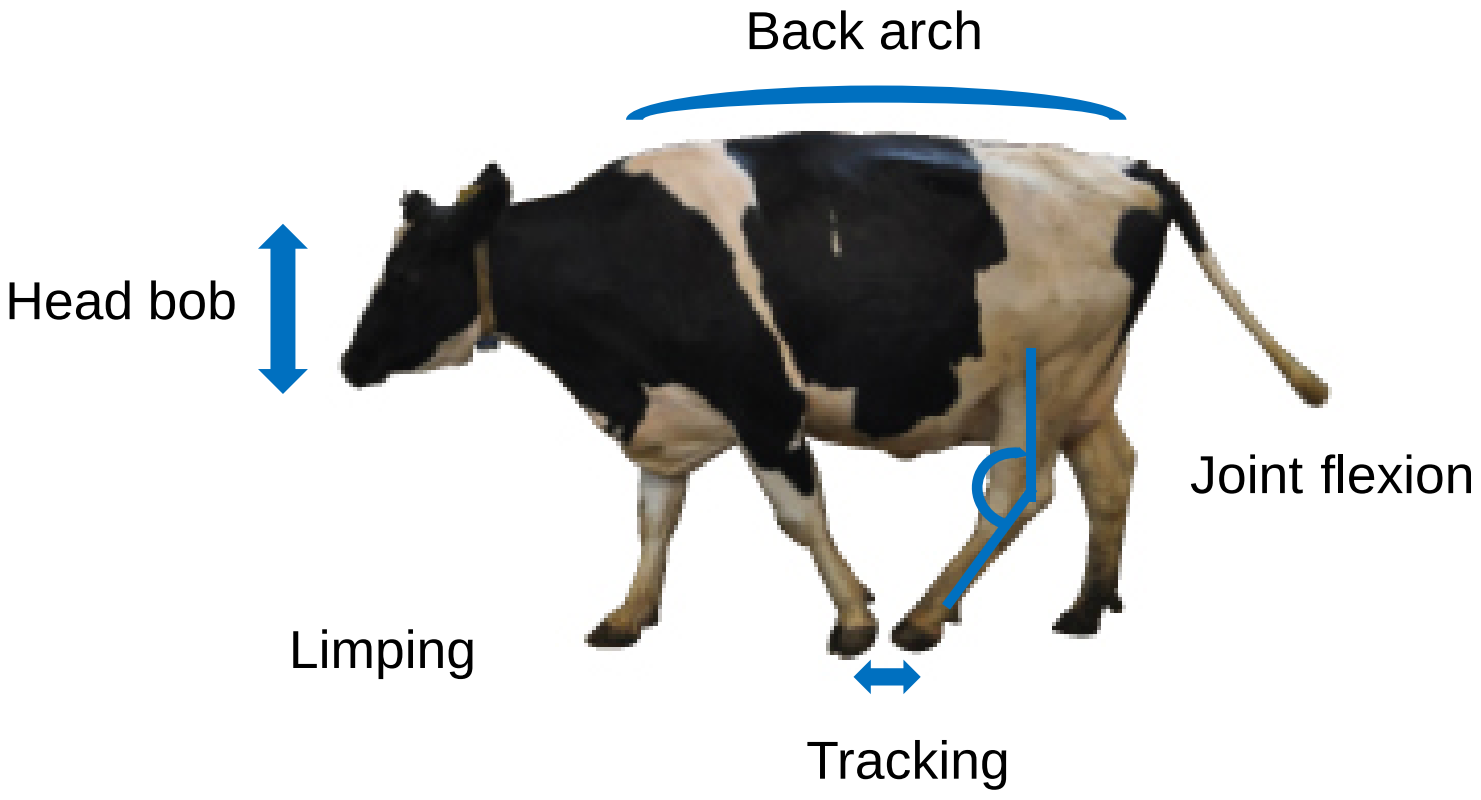
LAMENESS

Lameness is a costly problem

- 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)
  - 800 to 900 lb over lactation
- Welfare implications (Whay et al., 2003)

How does Novus score lameness?

Every cow in the assessment pen was scored for lameness



(Adopted from Flower and Weary, 2006)

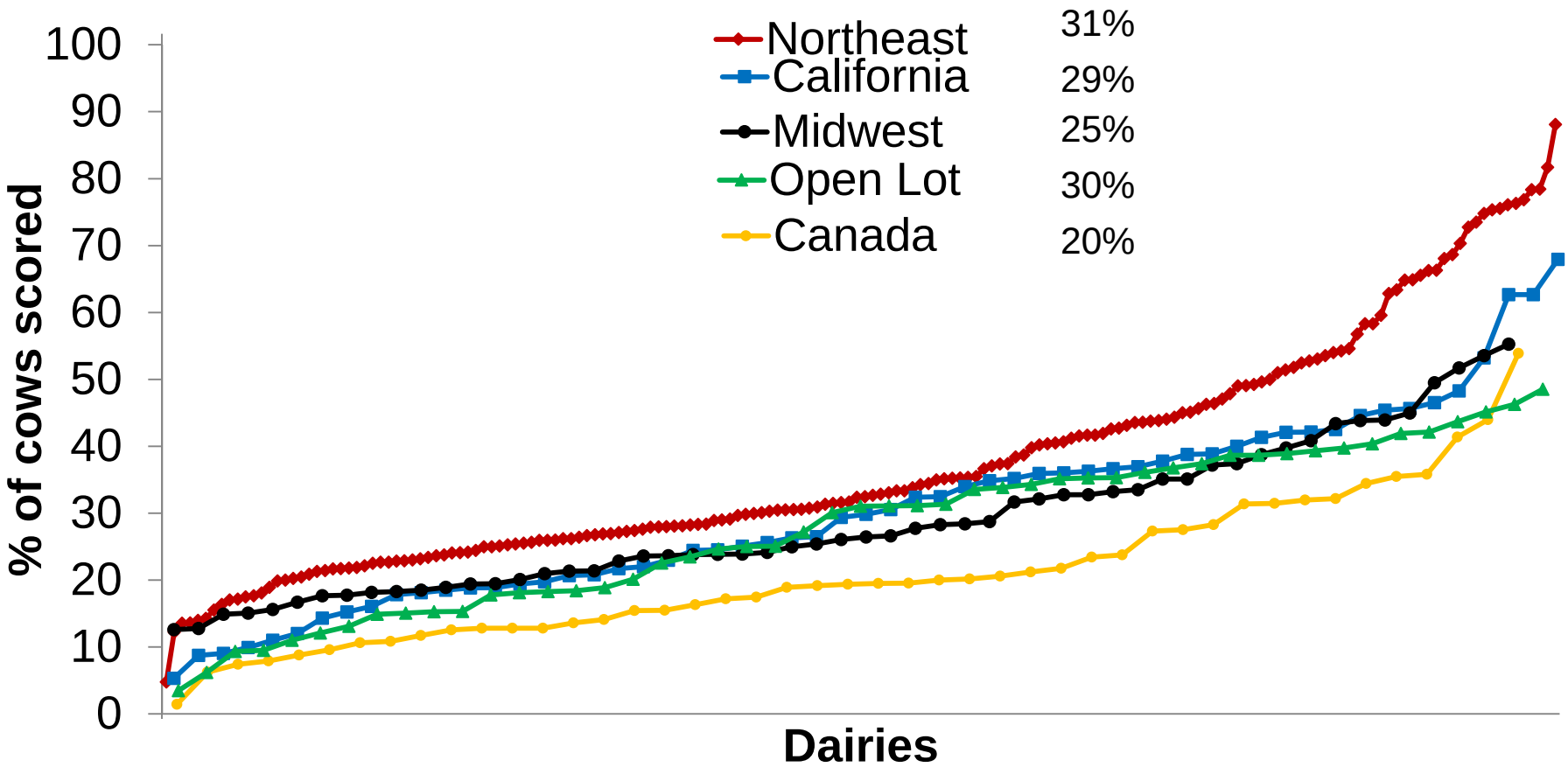
How does Novus score lameness?

Gait Score	Category	Description
1 (Sound)	**Not lame**	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 no limp.
3 (Mildly lame)	**Mildly lame**	Walks with shortened strides, a slight limp, and possibly an arched back.
4 (Moderately lame)	**Severely lame**	Walks with an obvious limp, an arched back and a jerky head bob.
5 (Severely lame)		Unwilling to bear weight on one limb and/or must be vigorously encouraged to stand or move.

NOVUS

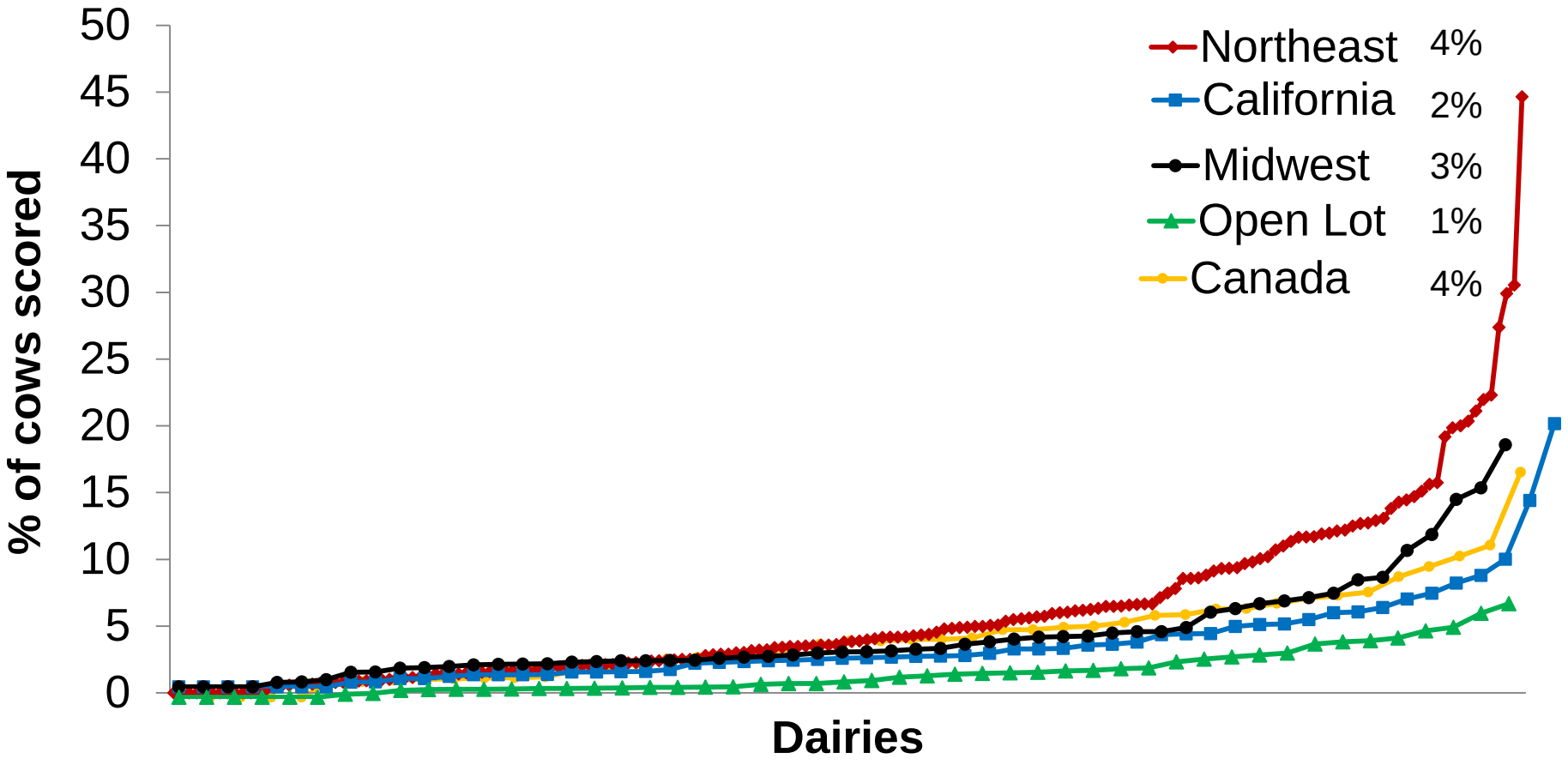
(Adopted from Flower and Weary, 2006)

Overall Lameness Prevalence by Region



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

Severe Lameness Prevalence by Region

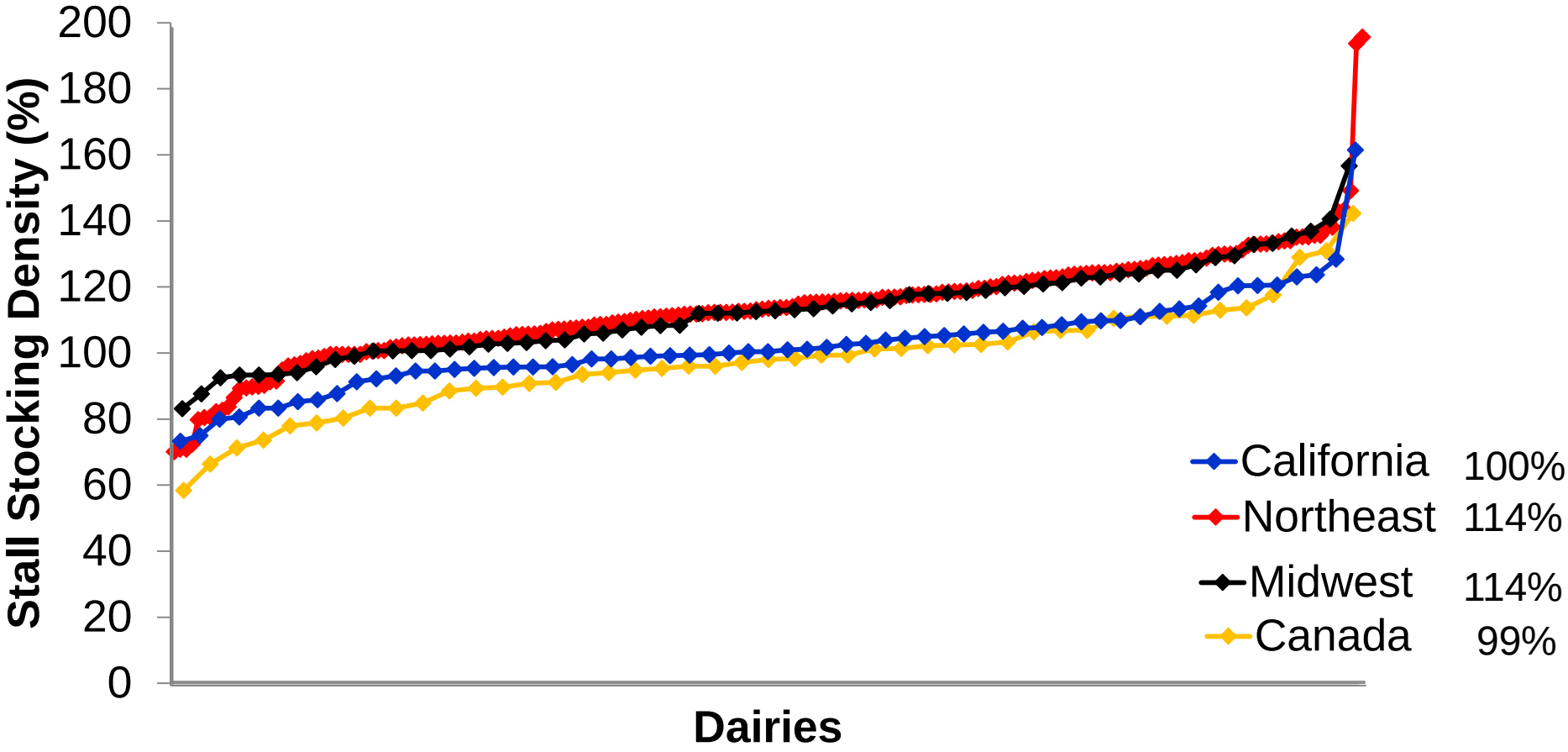


(von Keyserlingk et al., 2012; Novus C.O.W.S. data)

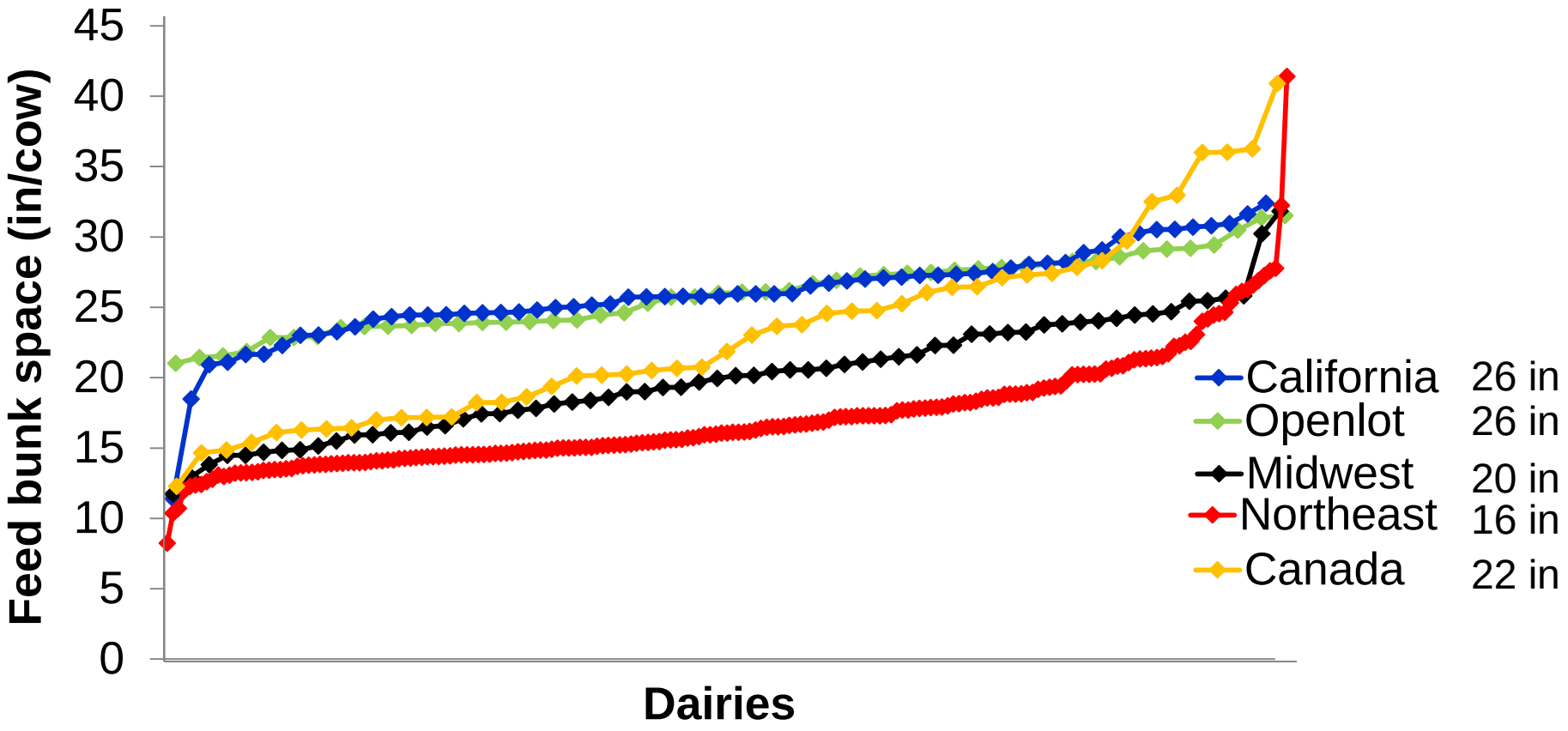
Part B: Management and Facility Measures

1. On-farm assessment
   - A: Cow-based measures
     - Lying time
     - Hock & knee injuries
     - Lameness
   - B: Management/facility measures
     - § Stall design
     - § Bedding quality
     - § Stocking density, etc.

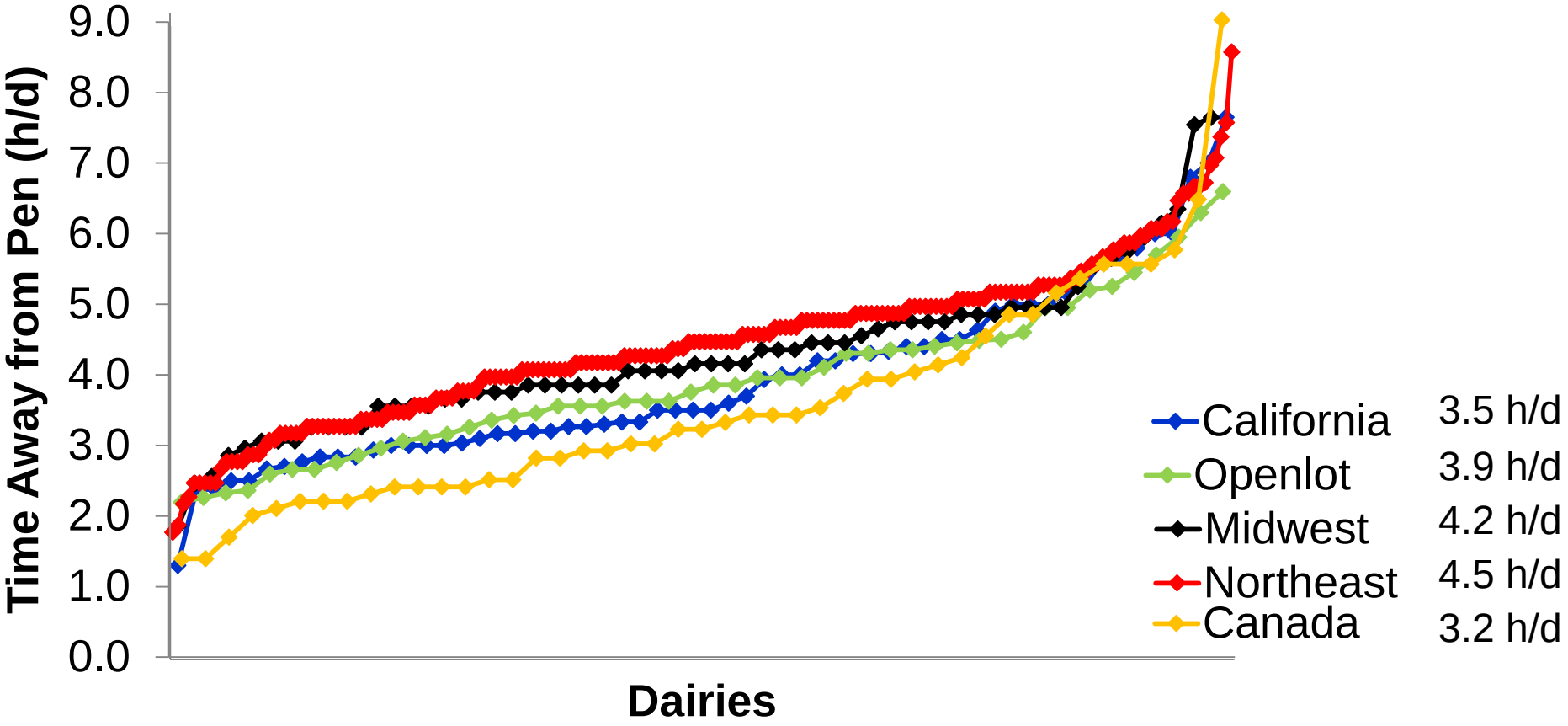
Stall Stocking Density by Region



Feed Bunk Space by Region



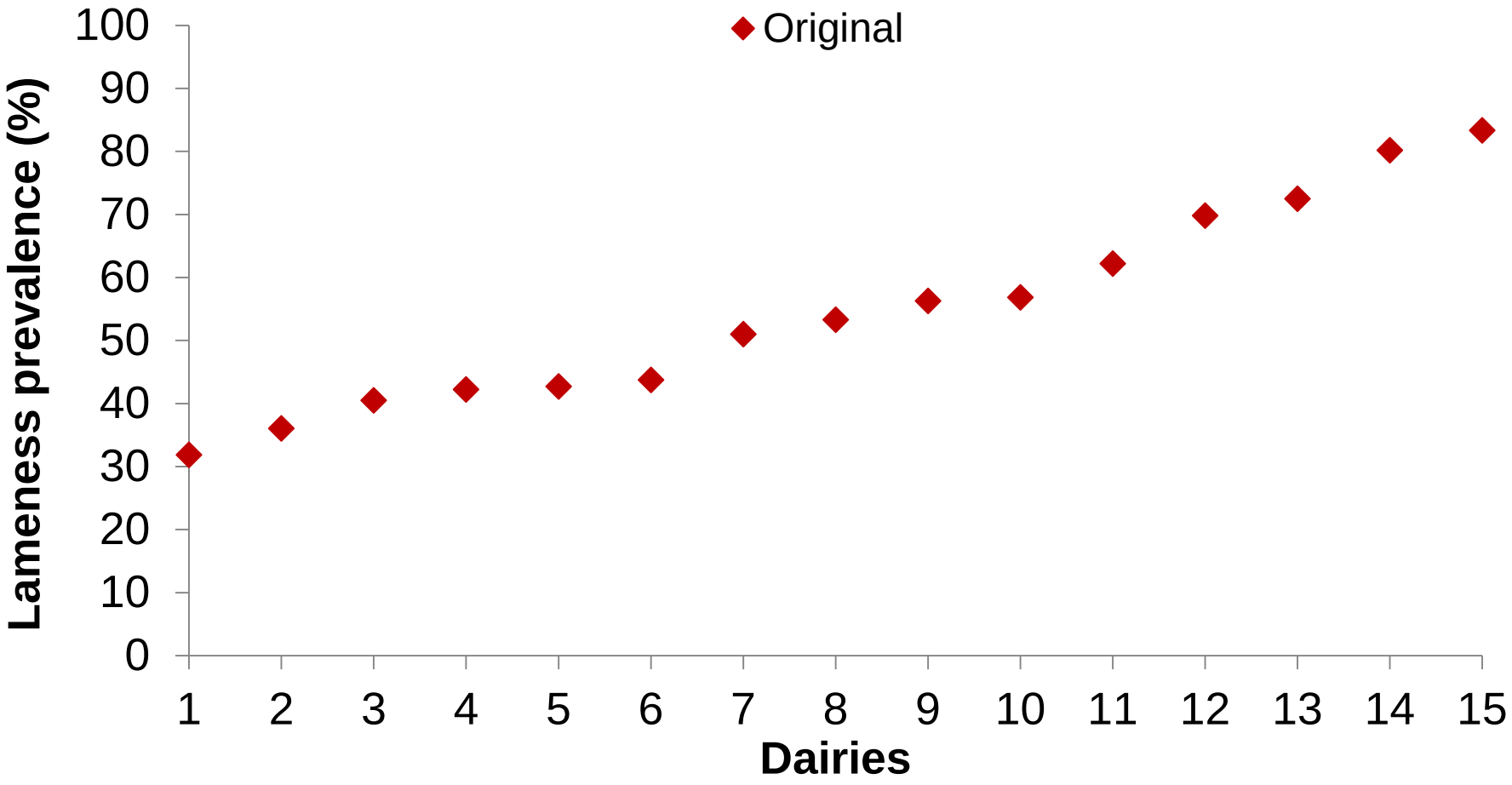
Time Away from Pen by Region



Making changes

- Identifying and unlocking bottlenecks to performance is different on each farm
- Even small changes to management or facility measures can have a large impact on cow comfort and productivity
- Improvements have been seen in:
  - Lying time, lameness, and leg injuries
  - Milk production and components
  - Reproduction
  - Culling rates
  - Feed efficiency

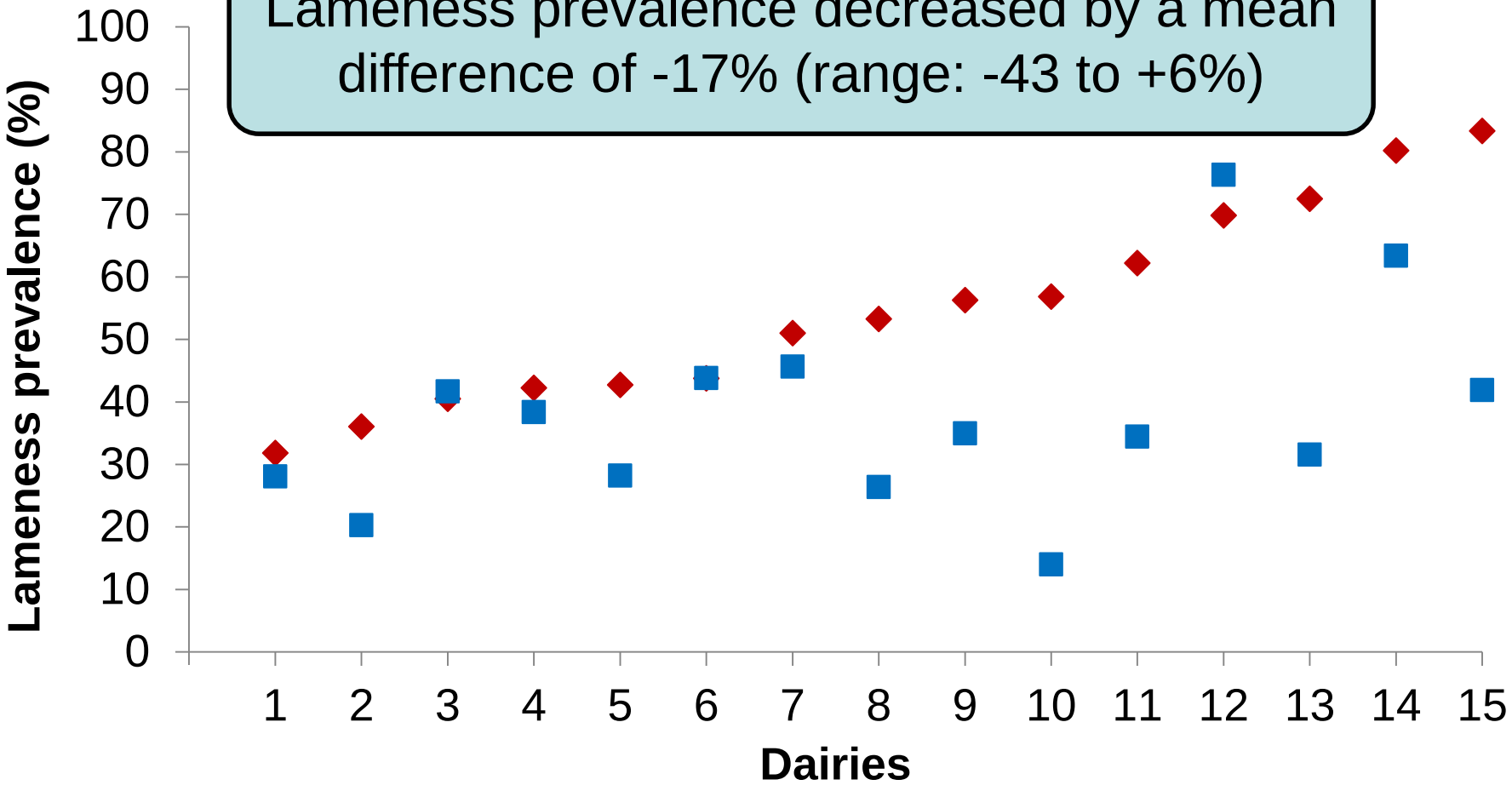
Novus C.O.W.S. herds that made changes showed improvements in lameness



(Chapinal et al., 2014)

Novus C.O.W.S. herds that made changes showed improvements in lameness

Lameness prevalence decreased by a mean difference of -17% (range: -43 to +6%)

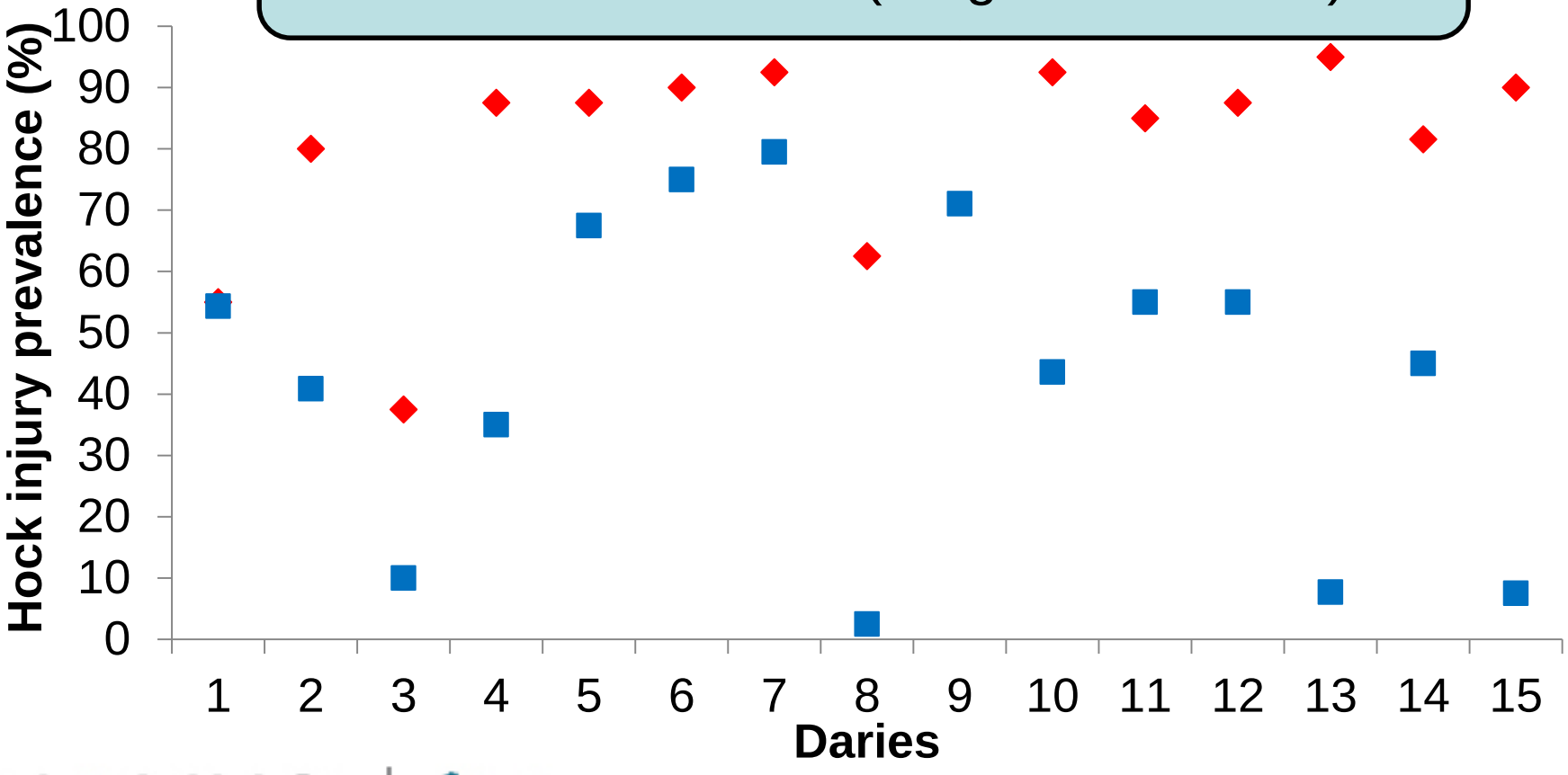


NOVUS

(Chapinal et al., 2014)

Novus C.O.W.S. herds that made changes showed improvements in hock injuries

Hock injury prevalence decreased by a mean difference of -38% (range: -87 to -1%)



NOVUS

(Chapinal et al., 2014)

Novus C.O.W.S. Case study

- 600 milking cows
- Novus C.O.W.S. assessment: Oct 2012
- Report delivery: Dec 2012

- Results
  - wanted increased parlor through-put
  - wanted lower TAFP (time away from pen for milking)
    - Pen 1: 175 cows, 4:52 h/d
    - Pen 3: 200 cows, 5:12 h/d

Novus C.O.W.S. Case Study
Changes Implemented

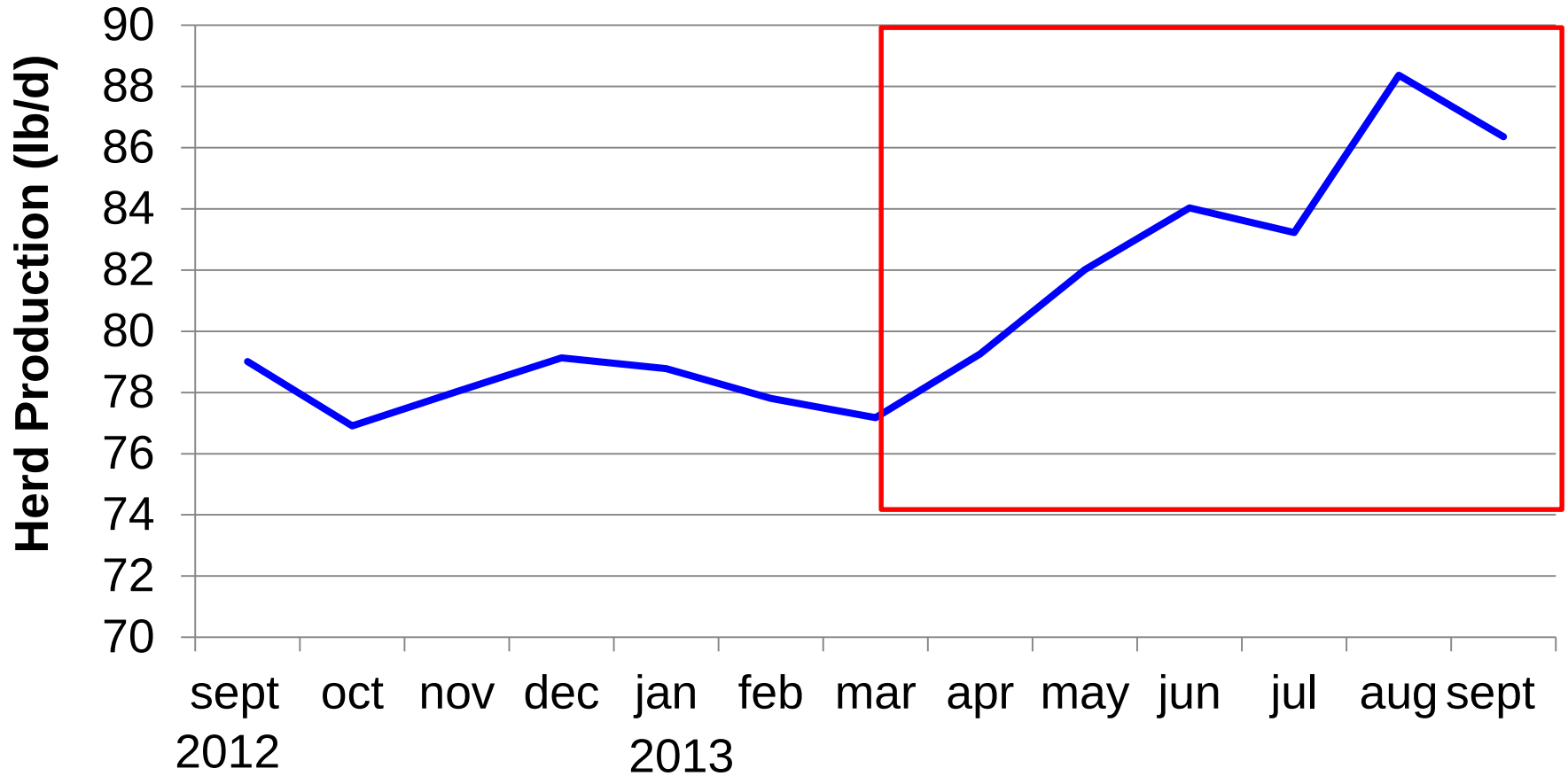
- Before making change, one owner helped pushed cows to see if parlor through-put and TAFP would improve

- Changes made early March 2013:
  - Went from 1 full milker and 1 milker/pusher to 2 full milkers and 1 separate pusher

- Total herd milk time per shift was reduced by 2.5 hrs (7½ hrs down to 5 hrs)

Novus C.O.W.S. Case Study

Changes in parlor efficiency results



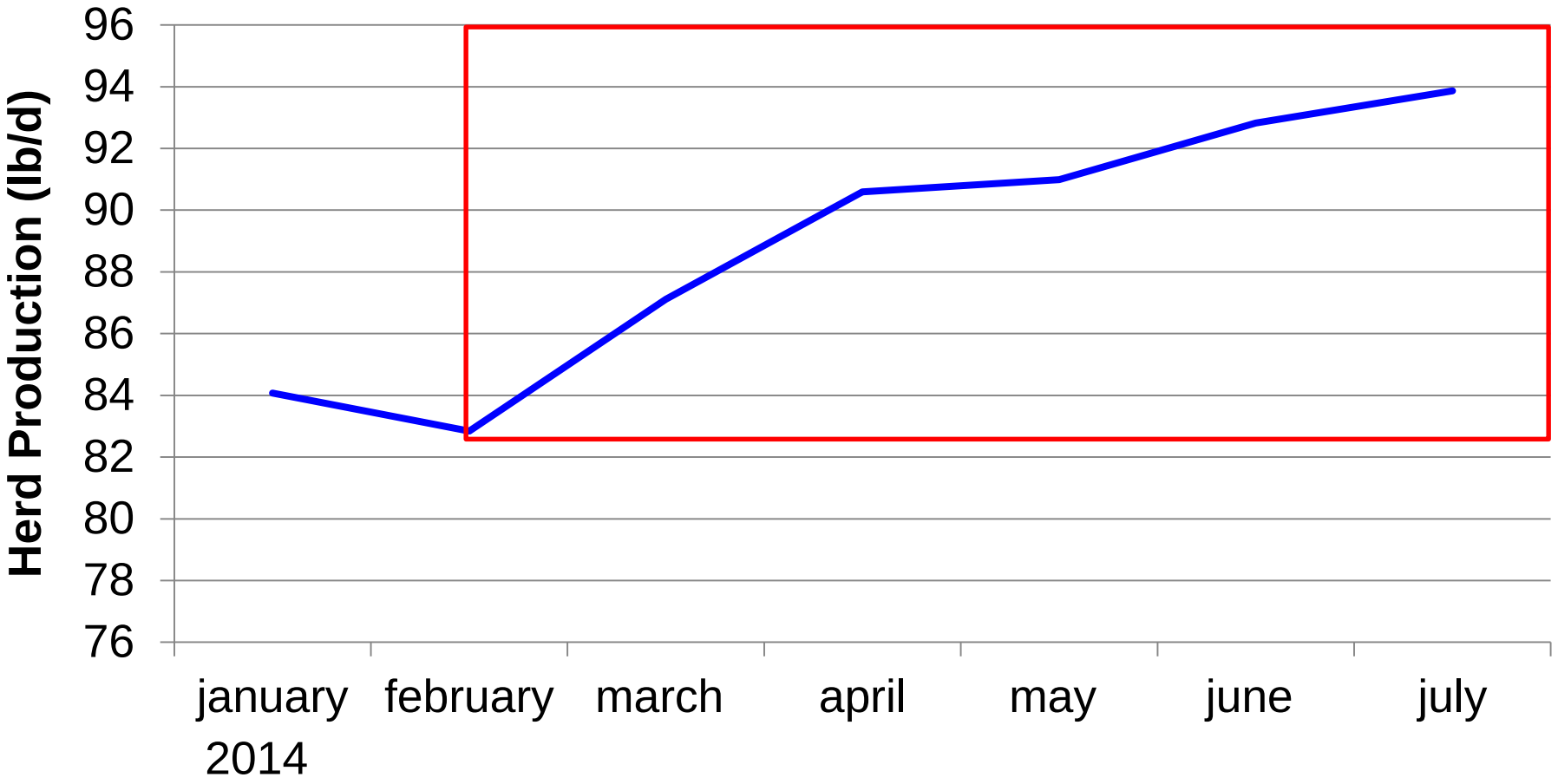
Novus C.O.W.S. Case Study

- The following year cows were up in production so much and parlor through-put was low enough that the dairy made the decision to go 3x
- “cows were telling us they needed 3x milking by leaking between 2x milkings”

- Split pens in ½ for milking to keep TAFP low
- Can milk these smaller split pens in 45 mins each
- Switched to 3x on Feb 25, 2014

Novus C.O.W.S. Case Study

Changes from 2x to 3x milking



Summary

- Novus C.O.W.S. Program is providing valuable feedback to producers on cow comfort on their farm relative to regional benchmarks
- In each region, there are dairies with cow comfort issues and dairies that have good cow comfort
- Cow comfort bottlenecks and solutions are multi-factorial
  - Look at the system as a whole
  - Changes in one area can affect many areas (even small changes can have huge impacts on improving cow comfort and the bottom line)

Questions?