Lameness scoring: improving consistency, accuracy and managing expectations

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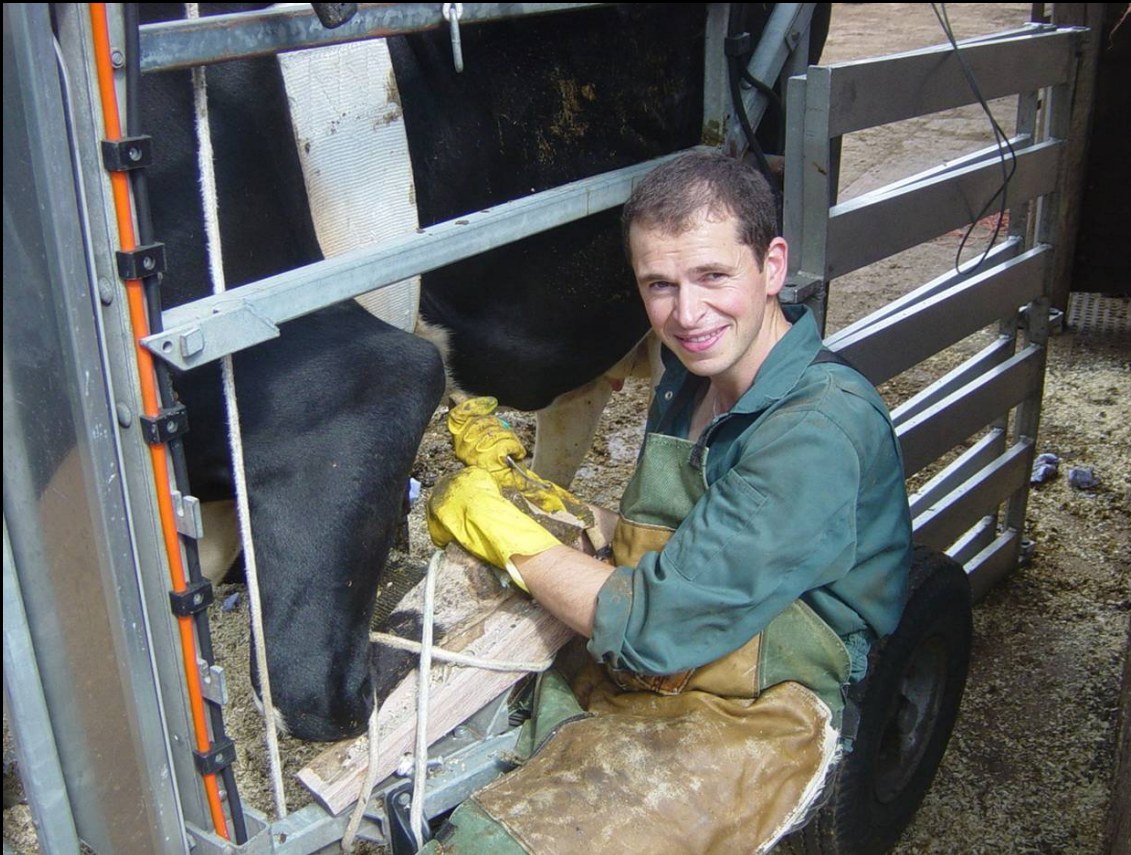
European College of Veterinary Specialists

Topics

- Lameness scoring creates a valuable metric

- Standardisation can't be self-taught

- Most classic lesions are advanced, end-stage disease.

- Expectations need managing

Early detection, prompt effective treatment reduced prevalence of severe lameness

Bell et al 2009 (vet journal)

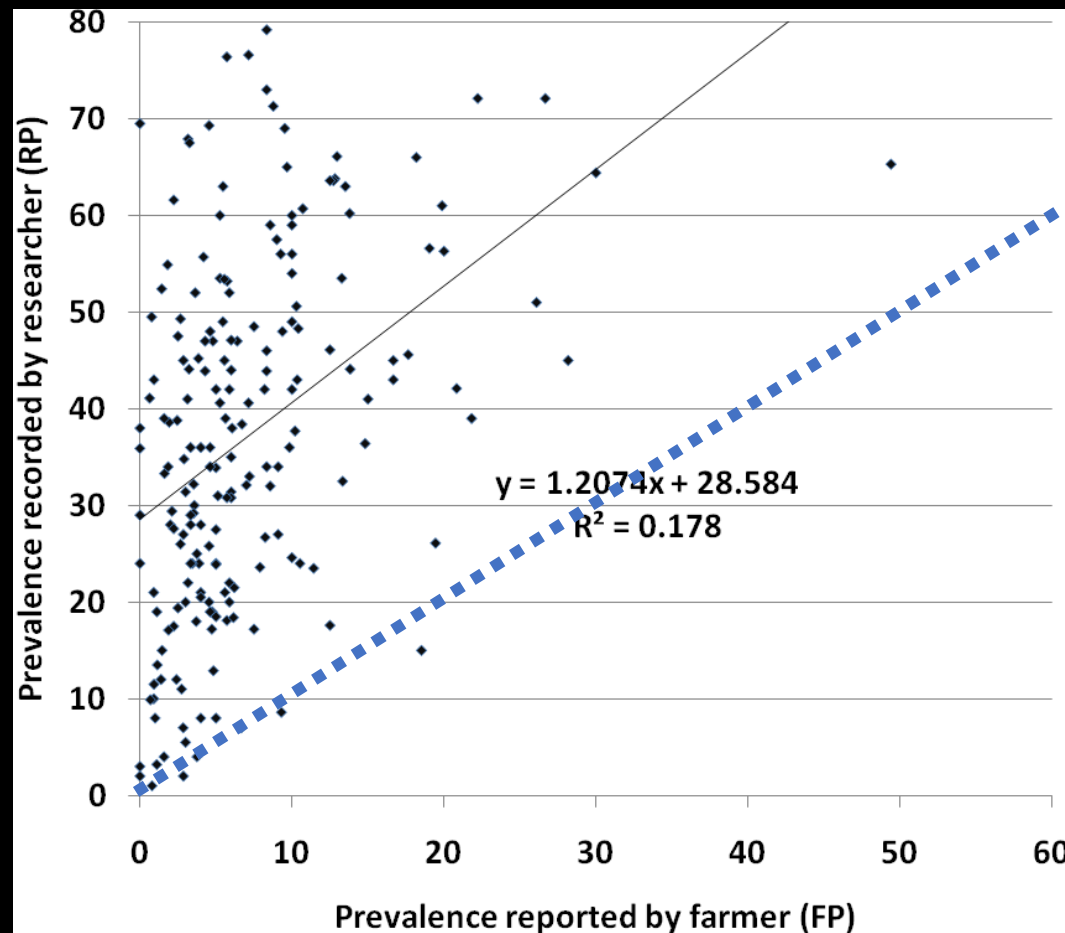Bell and Main 2011 (Livestock)

Groenevelt et al 2015 (Vet Journal)

No room for guesswork

- Benchmarks – prevalence/severity
- Trends (monthly)
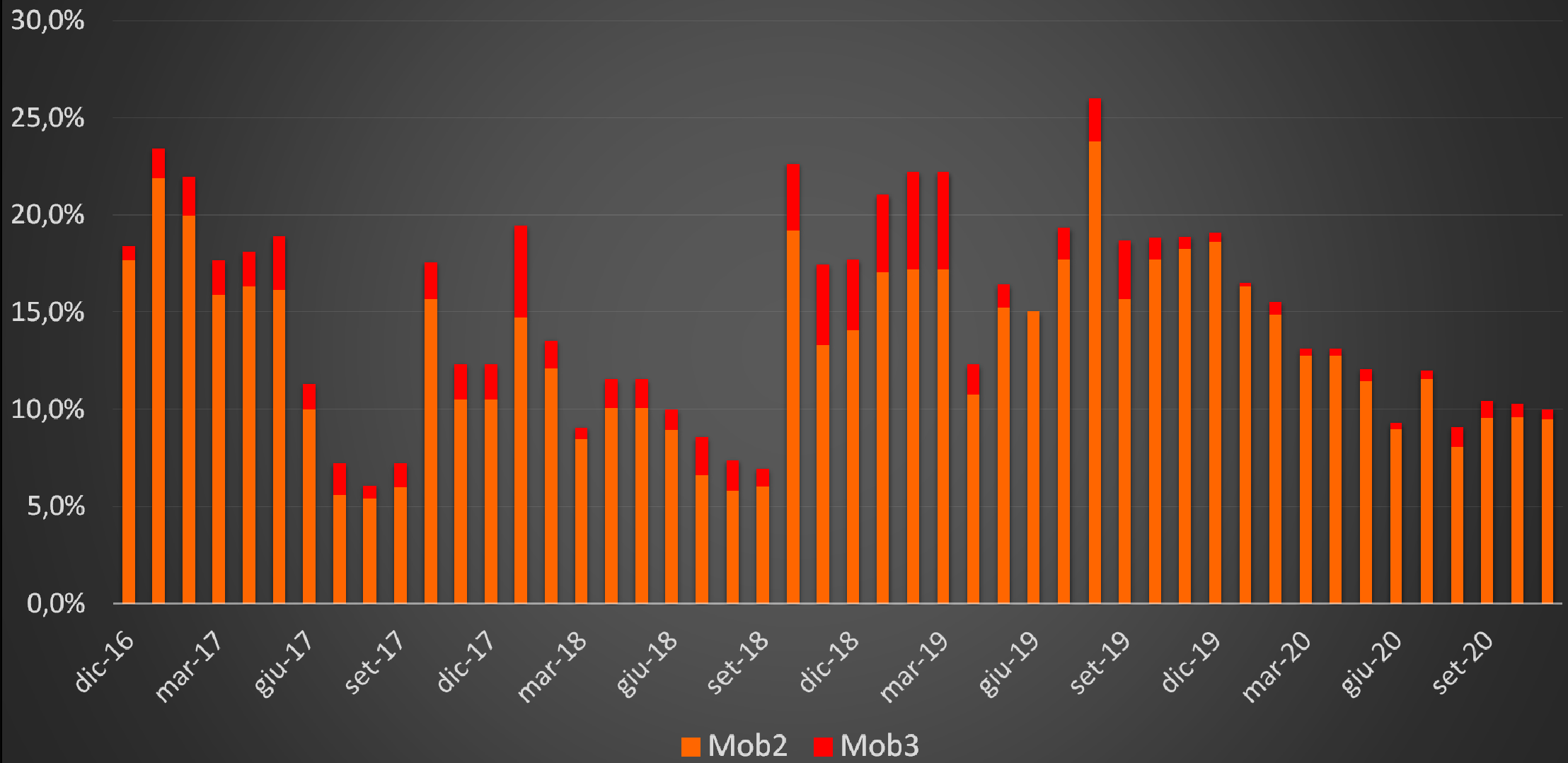- Screening (1-2 weeks)
- Treatment success (5wk)

Discrepancy between perceived lameness levels (and has potential to upset)
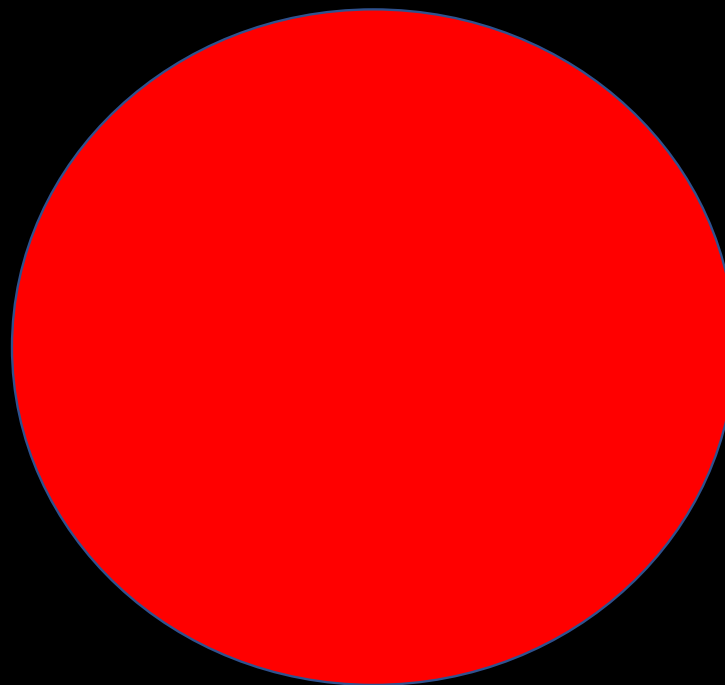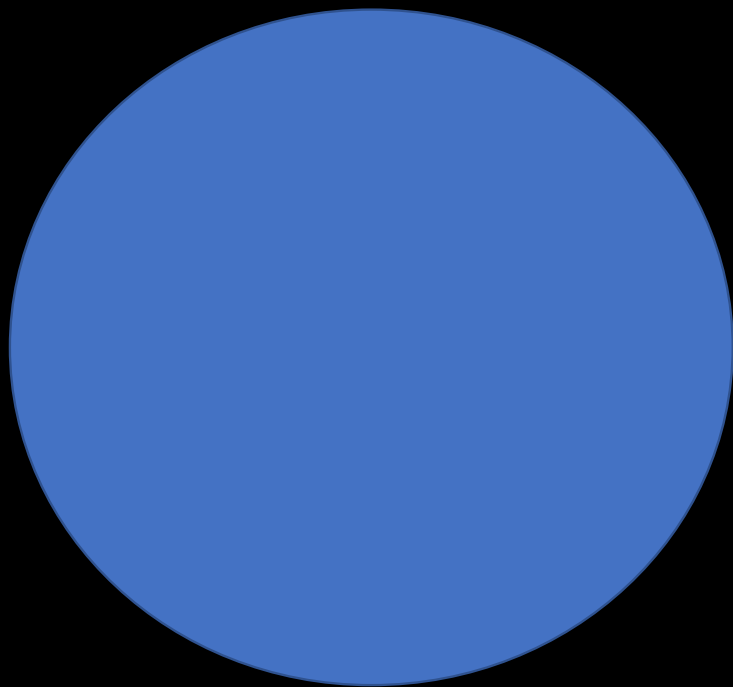

Leach et al 2012

Lameness scores

Polling question: Is she lame?

Thank you
Sara Pedersen

Standardisation essential

Some behaviours are more predictive

Table 3 Chi^2 analysis of the distribution of posture scores, within each behaviour category, associated with mild, moderate or severe foot lesions.

Posture	Lesion severity	1	2	3	4	5	Chi^2 value	P value
Overall locomotion	Mild	0	8	9	4	0		
	Moderate	0	17	34	24	6		
	Severe	0	10	30	48	25	36.86	< 0.0001
Spine	Mild	4	6	3	8	0		
	Moderate	2	16	25	32	6		
	Severe	3	13	23	56	18	38.49	0.0001
Speed	Mild	0	10	6	5	0		
	Moderate	4	22	24	29	2		
	Severe	7	14	37	40	15	28.69	0.0044
Tracking	Mild	0	2	10	9	0		
	Moderate	4	3	24	47	1		
	Severe	2	4	24	56	25	44.54	< 0.0001
Head carriage	Mild	0	7	9	4	0		
	Moderate	7	31	22	18	0		
	Severe	11	14	21	50	7	45.07	< 0.0001
Abduction/adduction	Mild	0	6	5	10	0		
	Moderate	0	16	31	28	4		
	Severe	4	9	37	42	16	34.05	0.0007

O'Callaghan et al 2003

Clinical lameness behaviours

Thank you
Sara Pedersen

Clinical lameness behaviours

Thank you
Sara Pedersen
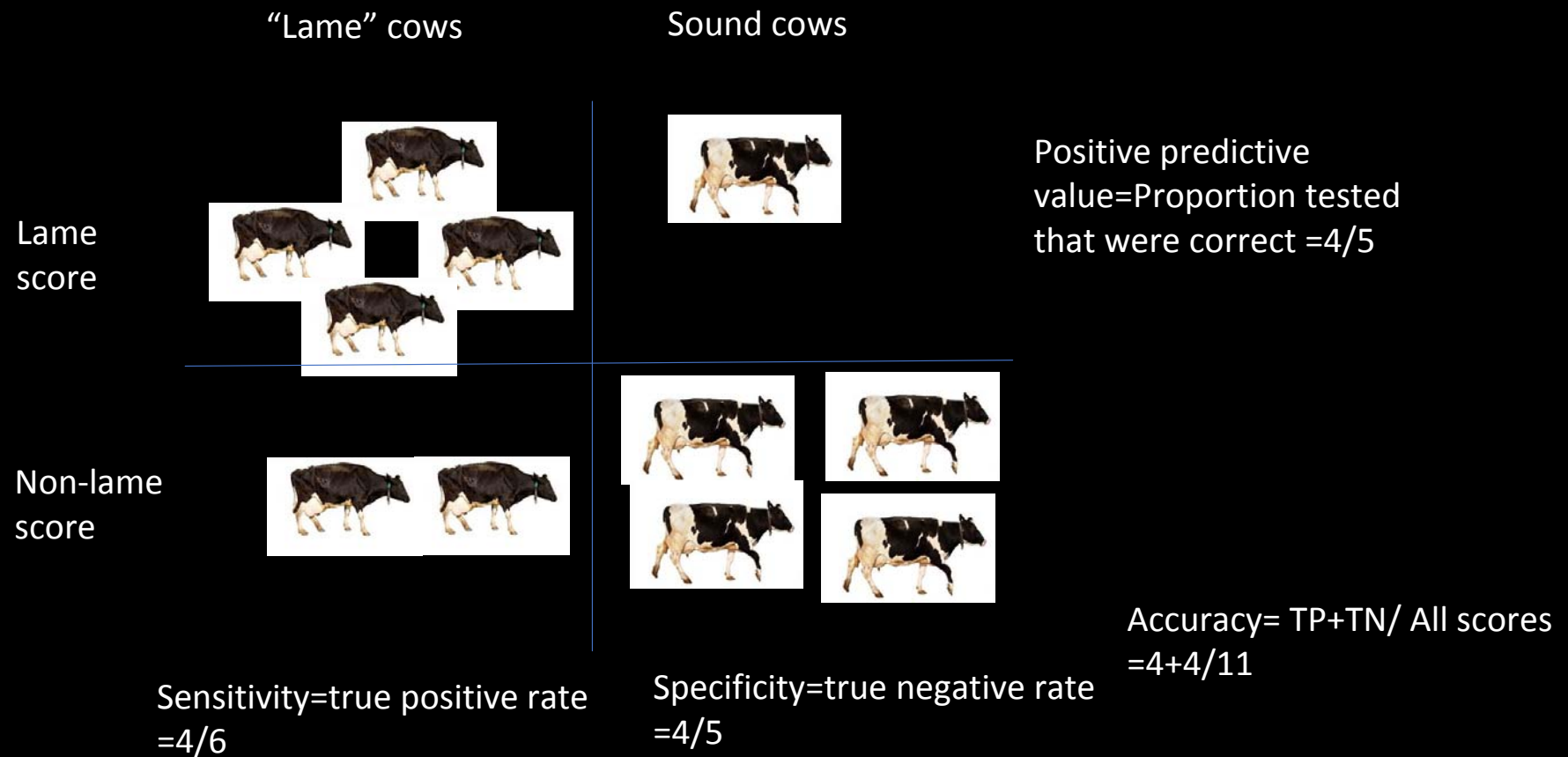
Clinical lameness behaviours

Standardisation requires

- Training

- Video footage for directed discussion of the behaviours

- Time on farm scoring to build up numbers (500cows) and confidence

- Lifting feet to confirm lesions

- Performance benchmarking

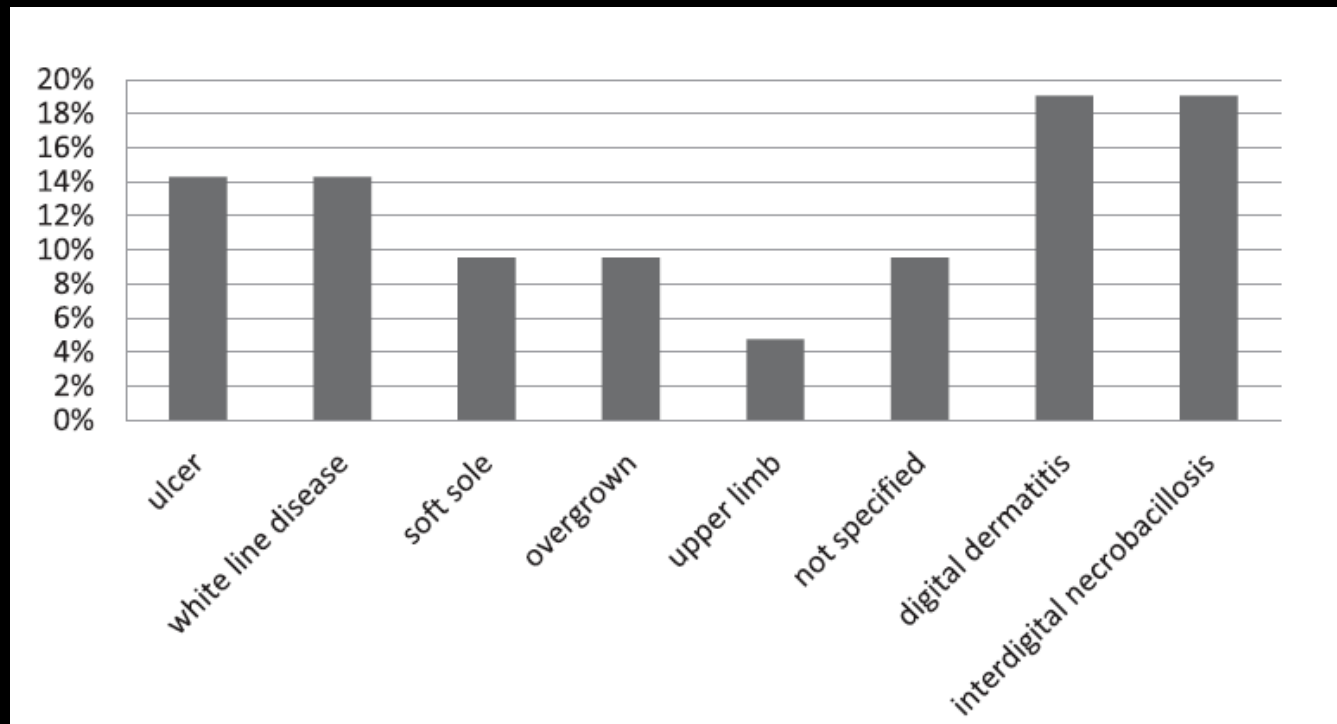- Regular (at least annual) checks for observer drift

Observer	Experience	Score 0	Score 1	Score 2	Score 3	Lame	Agreement Lame/Not	Exact agreement
1	Active	23.4%	30.3%	38.3%	8.0%	46.3%	89.6%	81.3%
2	Clinical	19.4%	41.3%	31.3%	8.0%	39.3%	74.6%	55.1%
3	Active	12.4%	43.8%	37.3%	6.5%	43.8%	88.1%	75.7%
4	Senior researcher	6.0%	48.3%	39.8%	6.0%	45.8%	82.1%	65.9%
5	Historic, non-UK	15.9%	47.3%	34.3%	2.5%	36.8%	62.2%	46.3%
6	Historic	13.4%	28.4%	39.3%	18.9%	58.2%	79.6%	60.3%
7	Senior researcher	23.4%	21.9%	41.3%	13.4%	54.7%	88.1%	69.6%
8	Recent active	16.4%	33.8%	40.3%	9.5%	49.8%	87.1%	68.7%
9	Historic, non-UK	10.4%	39.3%	41.8%	8.5%	50.2%	74.6%	61.7%
10	Clinical	12.4%	38.8%	38.3%	10.4%	48.8%	86.1%	73.8%
Overall		15.3%	37.3%	38.2%	9.2%	47.4%	81.2%	65.8%
Minimum		6.0%	21.9%	31.3%	2.5%	36.8%	62.2%	46.3%
Maximum		23.4%	48.3%	41.8%	18.9%	58.2%	89.6%	81.3%

Measuring accuracy

"Lame" cows   Sound cows

Lame
score

Positive predictive
value=Proportion tested
that were correct =4/5

Non-lame
score

Accuracy= TP+TN/ All scores
=4+4/11

Sensitivity=true positive rate
=4/6

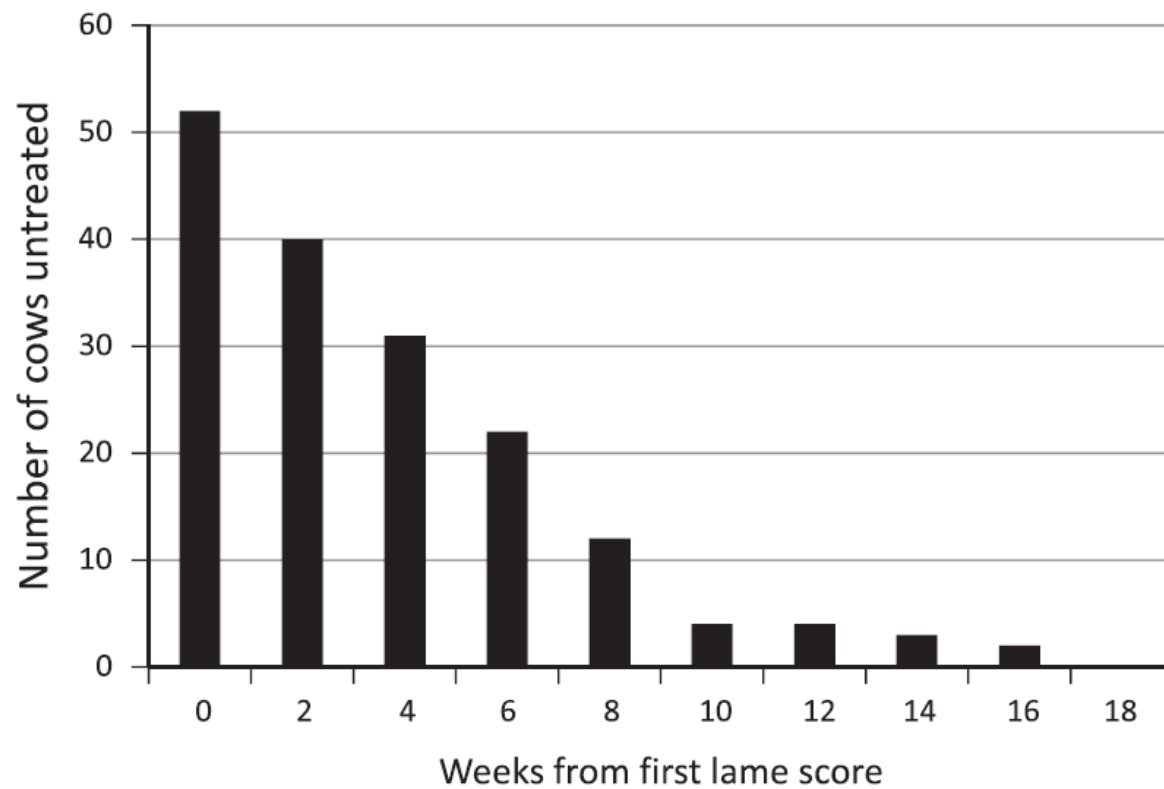Specificity=true negative rate
=4/5

Bell and Walker 2015

What farmers expect is actually end stage disease
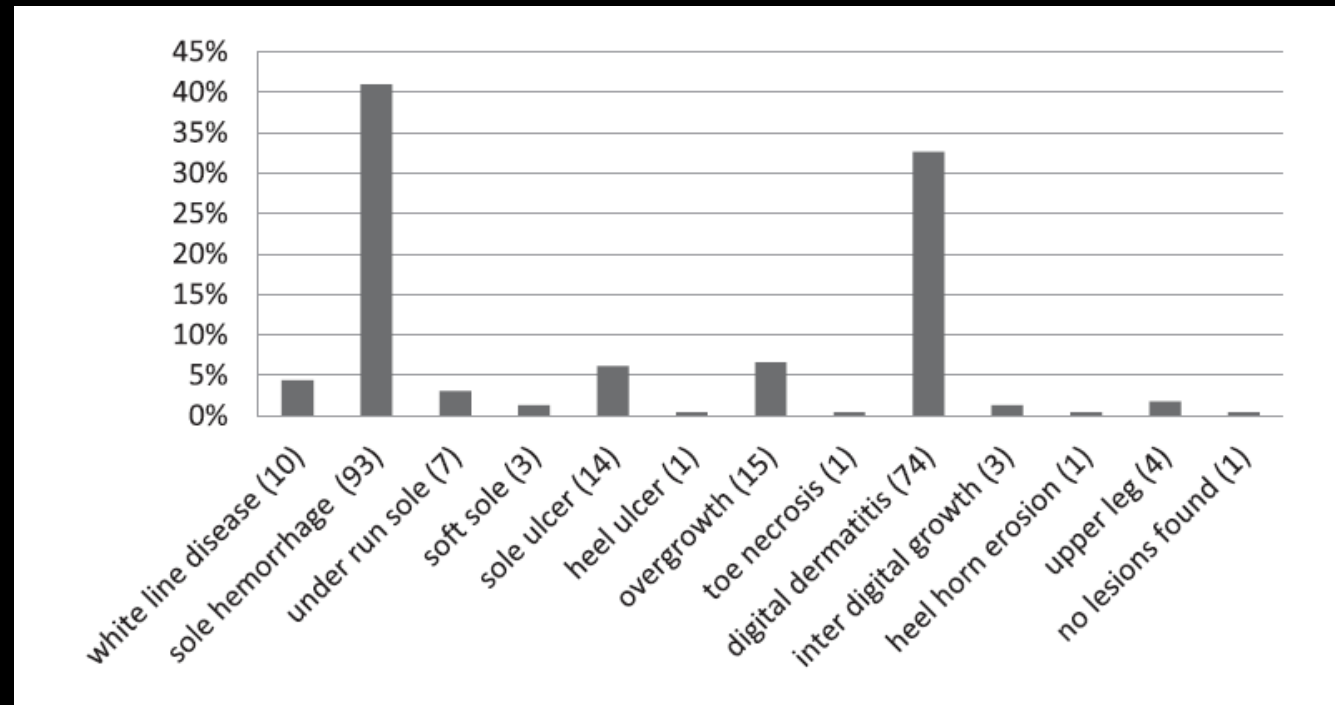

Groenevelt et al 2015 (Vet Journal)

Median 65 days from first observable change to treatment

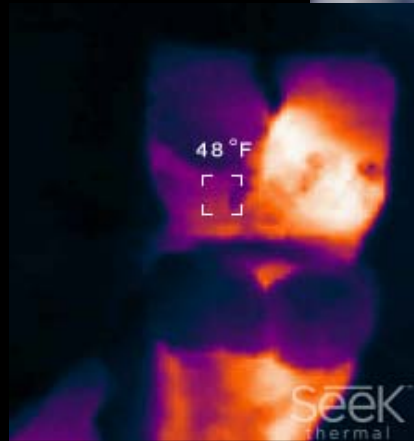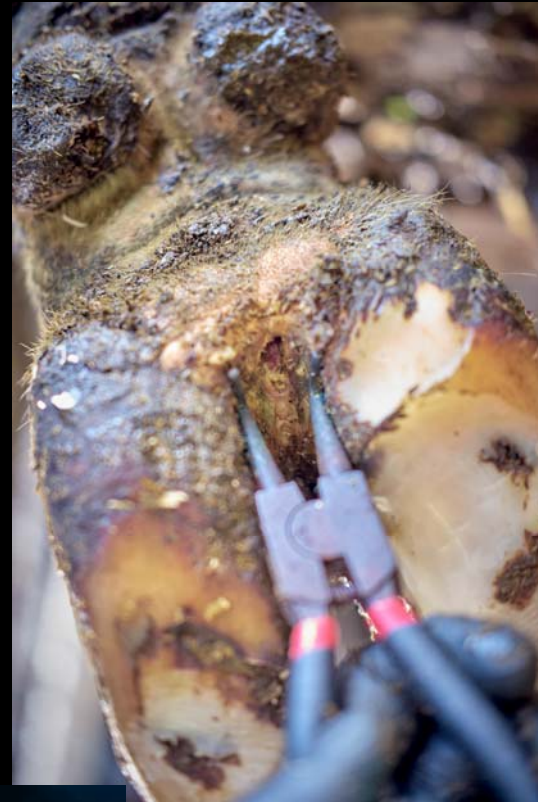Leach et al 2012 (Veterinary Journal)

Sole haemorrhage (bruising) the most common claw lesion

Groenevelt et al 2015 (Vet Journal)

Accuracy requires

- Confidence in recognising lameness behaviours

- Ability (senses) to recognise early onset disease to confirm successful detection
  - 5 cardinal signs of inflammation
  - Signs of infection
  - Visible lesions

Summary

- Lameness scoring creates a valuable metric, invariably higher than expected

- Standardisation can't be self-taught thresholds, especially with multiple behaviour component scores

- Most classic lesions are advanced, end-stage disease. The early lesions causing lameness are easy to miss

- All these expectations need managing

Acknowledgements

- ICAR
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