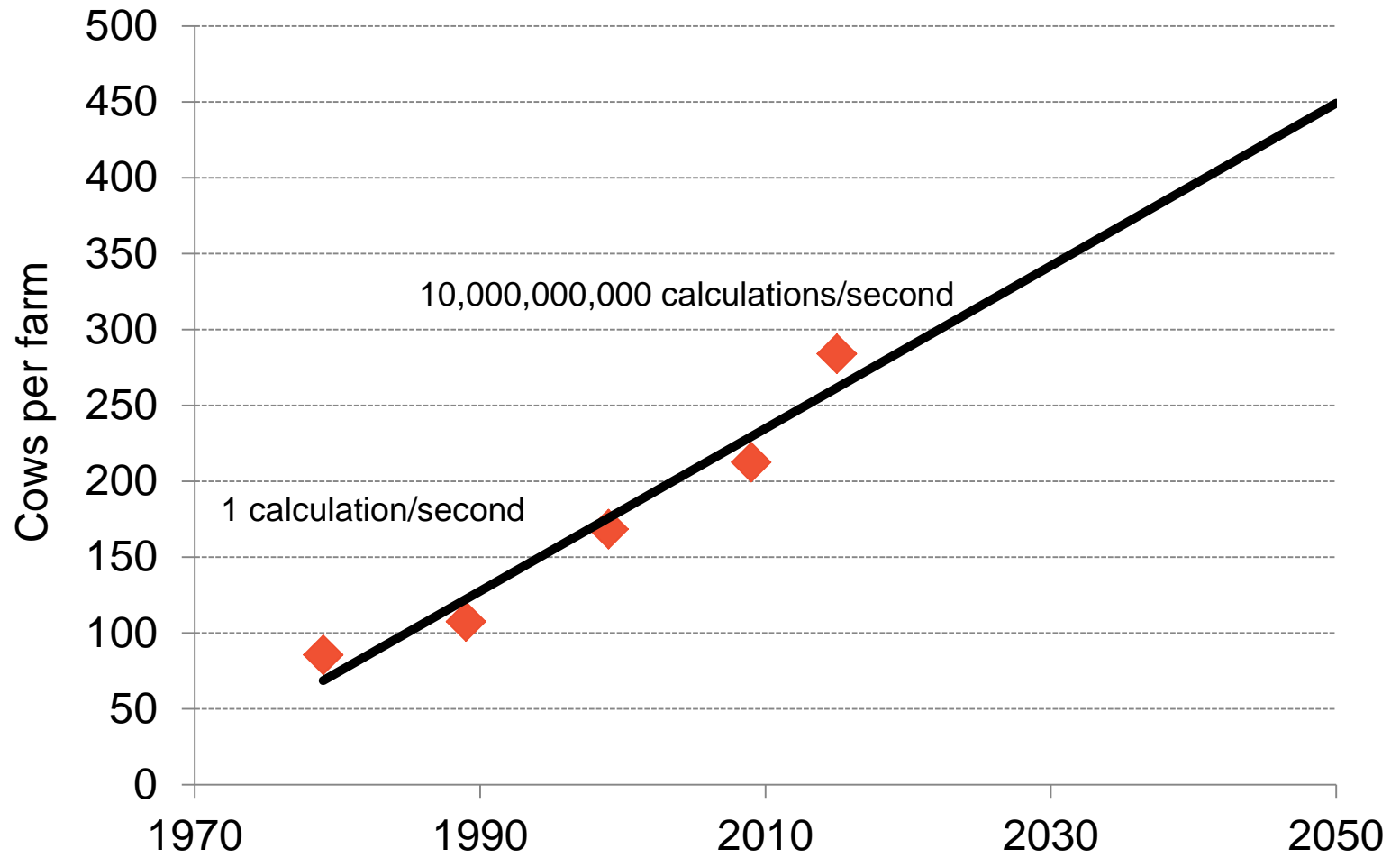


Use of new sensor derived data in Australian dairy systems

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The University of Sydney,
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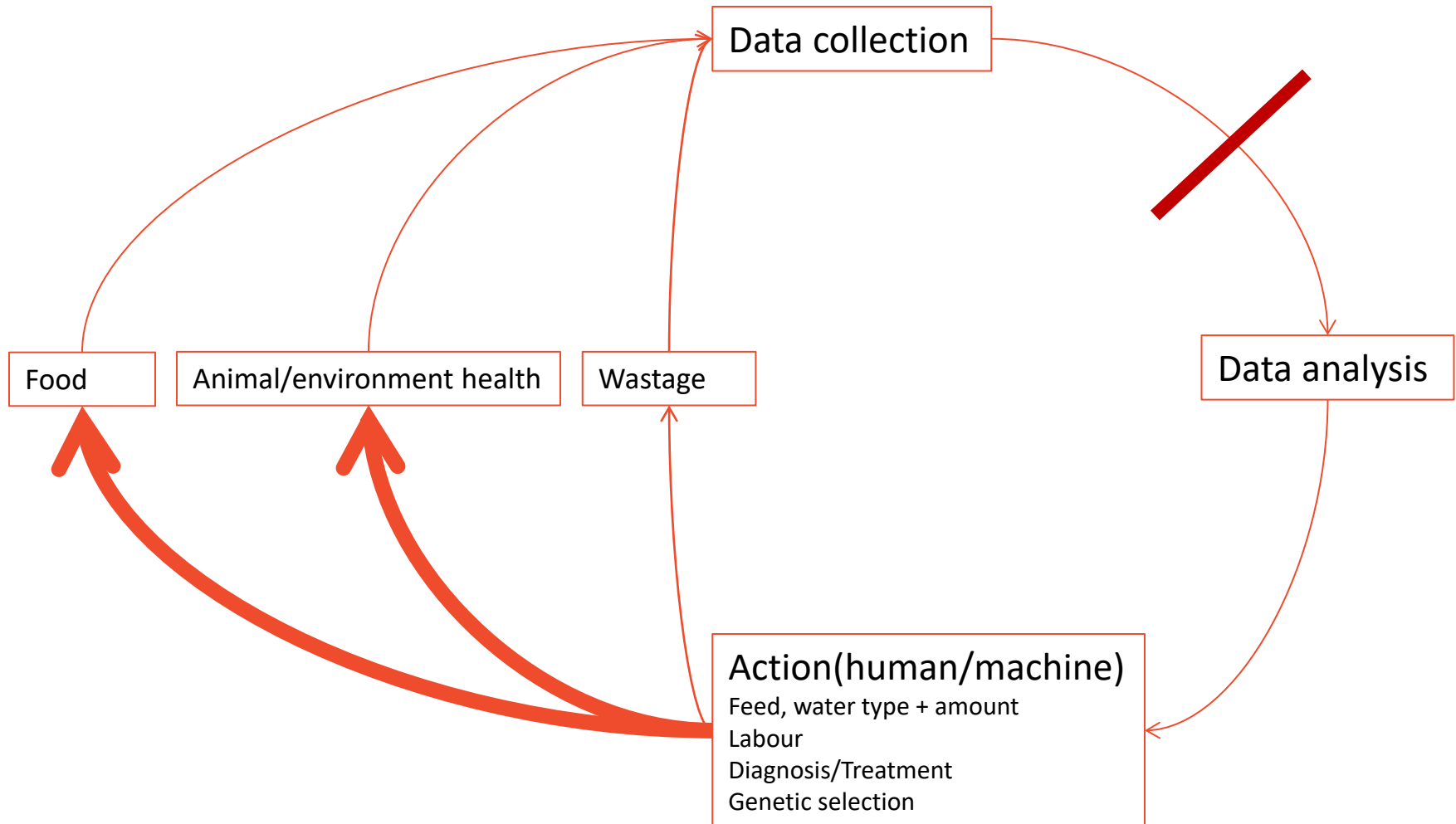




‘The speed of technological advancement has outpaced (by a long way) our ability to turn data into better actions on farm’

(C. Clark, EAAP 2016)

The bleeding edge of dairy farming



A dairy farmer's day



Group vision and the Z generation



Turning data in actions

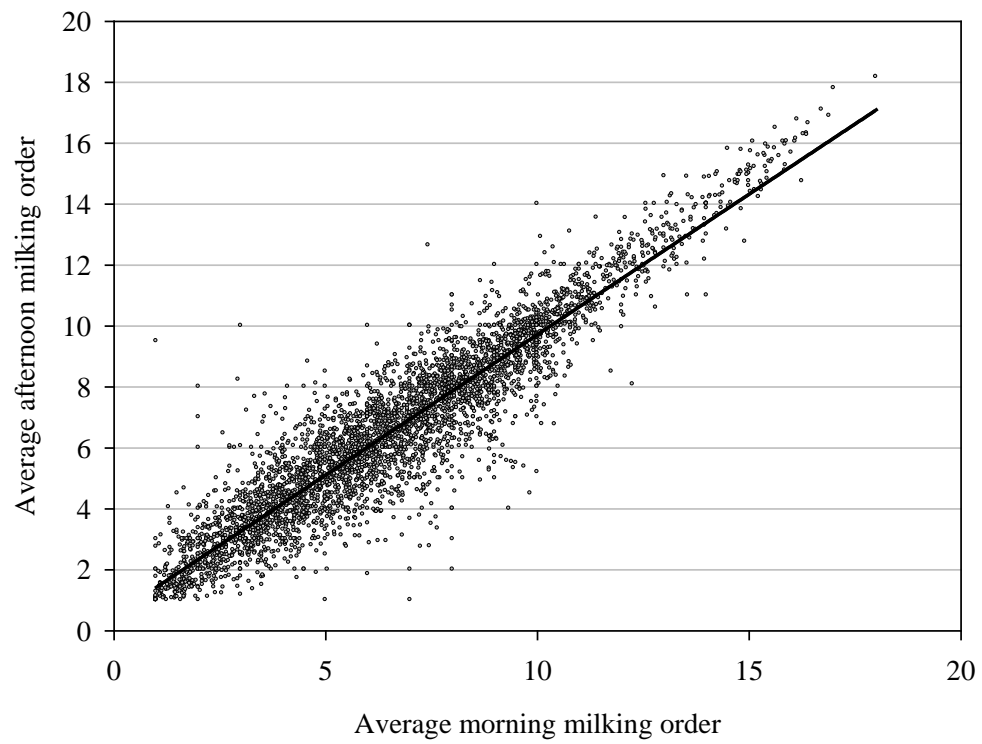
1. Currently available data: Feed to profit
 - Cattle ID and milking order
2. Data from new technology
 - Cattle accelerometer sensors and health phenotypes
3. Our data future
 - Forward to the past
 - Individual animal attention

Currently available data: Feed to profit

Data: Milking order

Research question: *What is the impact of milking order on milk production and composition?*

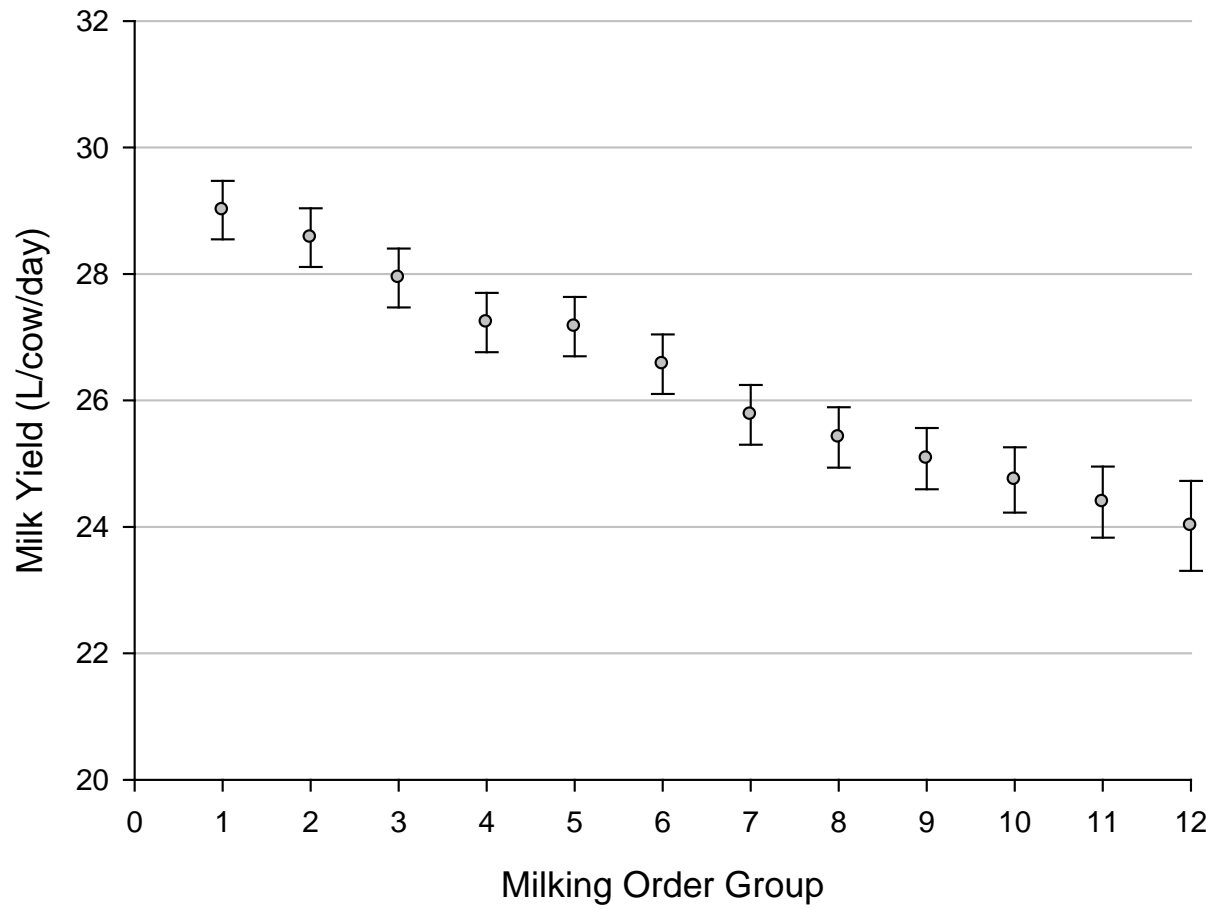


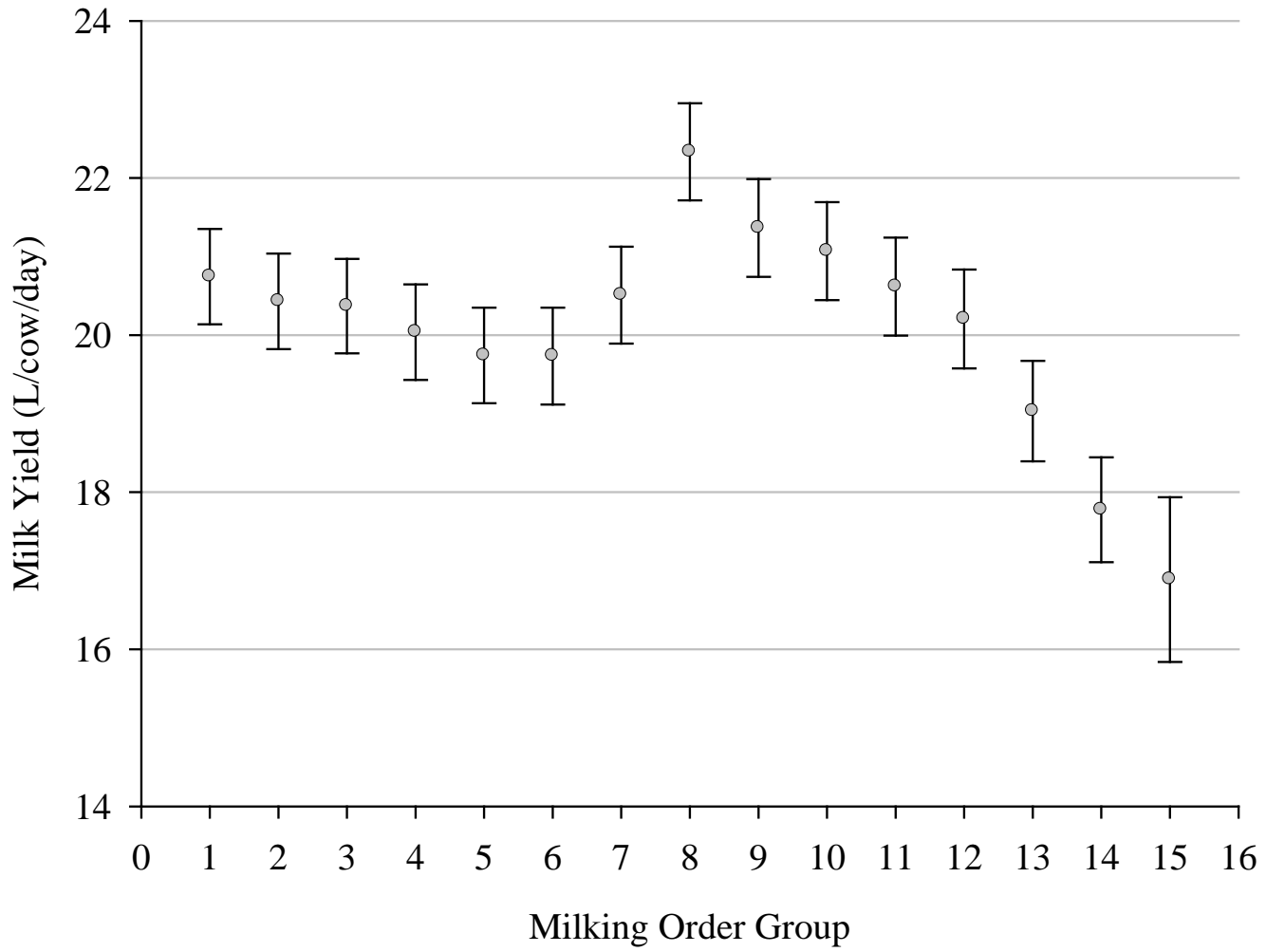


Time after entry (min)	CP (%)	NDF (%)	ADF (%)	Fraction length (cm)
0	19	60	26	42
15	19	60	26	42
30	18	62	27	37
45	17	63	28	34
60	16	64	29	31
75	15	65	30	27
90	15	65	29	28
105	15	65	30	26
SED	1.3	3.13	2.32	2.454



(Scott et al., 2014)





Large herds: Creating value from data

Farm	MYdif (%)	MYdif (L/cow/day)	Cows	
			Average	SD*
1	17.2	-5	476	115
2	18.6	-3.9	568	172
3	29.1	-7.5	700	111
4	15.1	-4.1	776	118
5	14.4	-2.3	618	82
6	16.0	-3.4	763	210
Av	18.4	-4.4		

***SD: Standard deviation**

Question: Can we increase the efficiency pasture nutrient conversion to \$ through simple changes in management?

Question: Are there high environmental impact cows?

Turning data in actions

1. Currently available data: Feed to profit

- Large herds project
- Voluntary cow traffic

2. Data from new technology

- Health phenotypes

3. Our data future

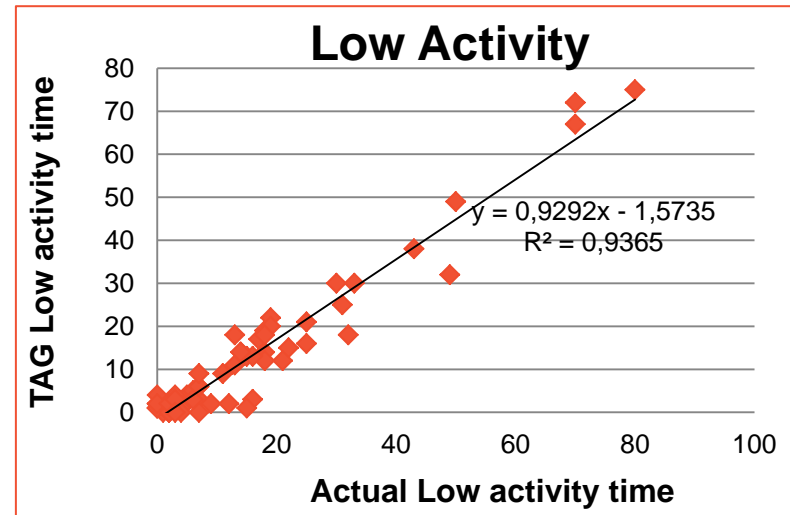
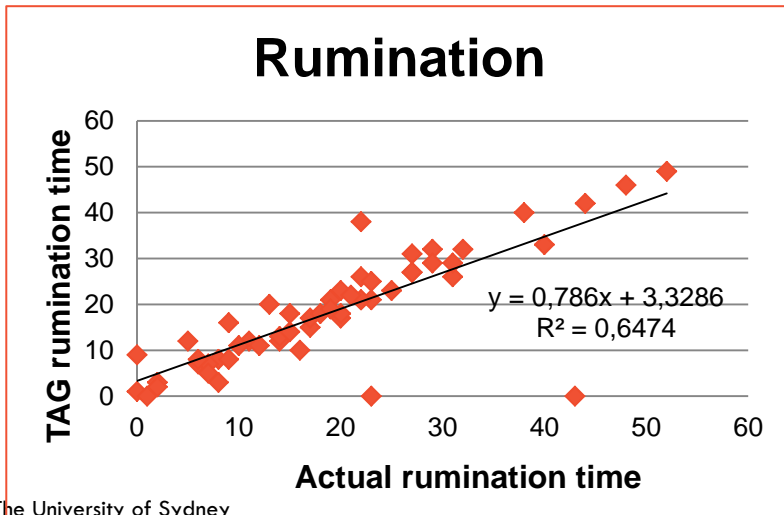
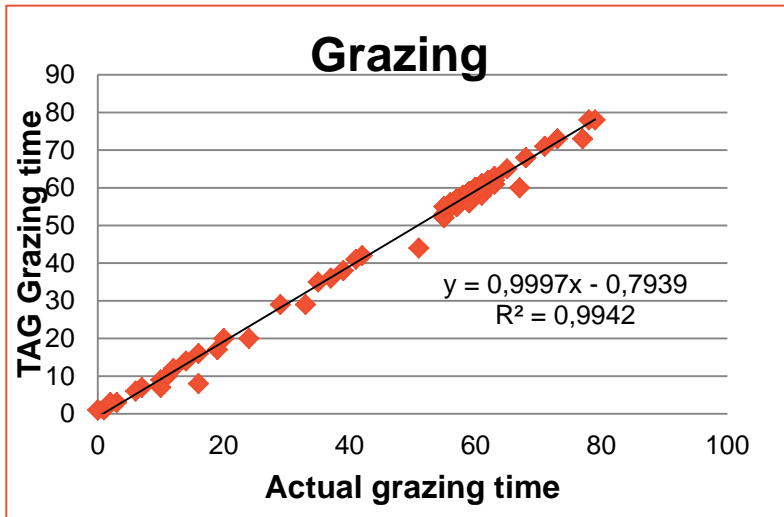
- Forward to the past
- Individual animal attention

Data from new technology: Health phenotypes

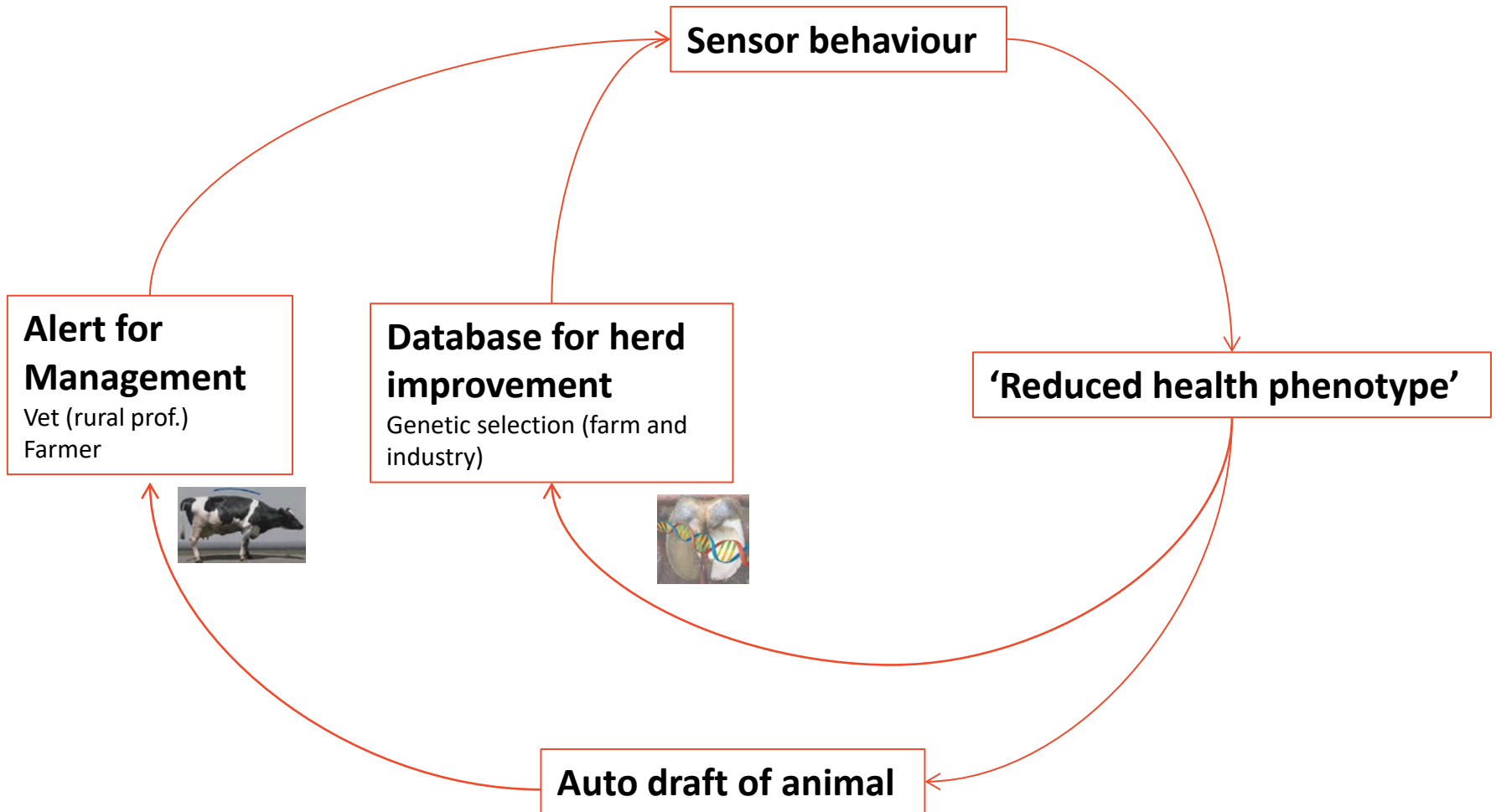
Obtaining real-time behaviour of dairy cattle at a sub-minute level is available to research (and for commercial farms) now.



Data from new technology: Health phenotypes

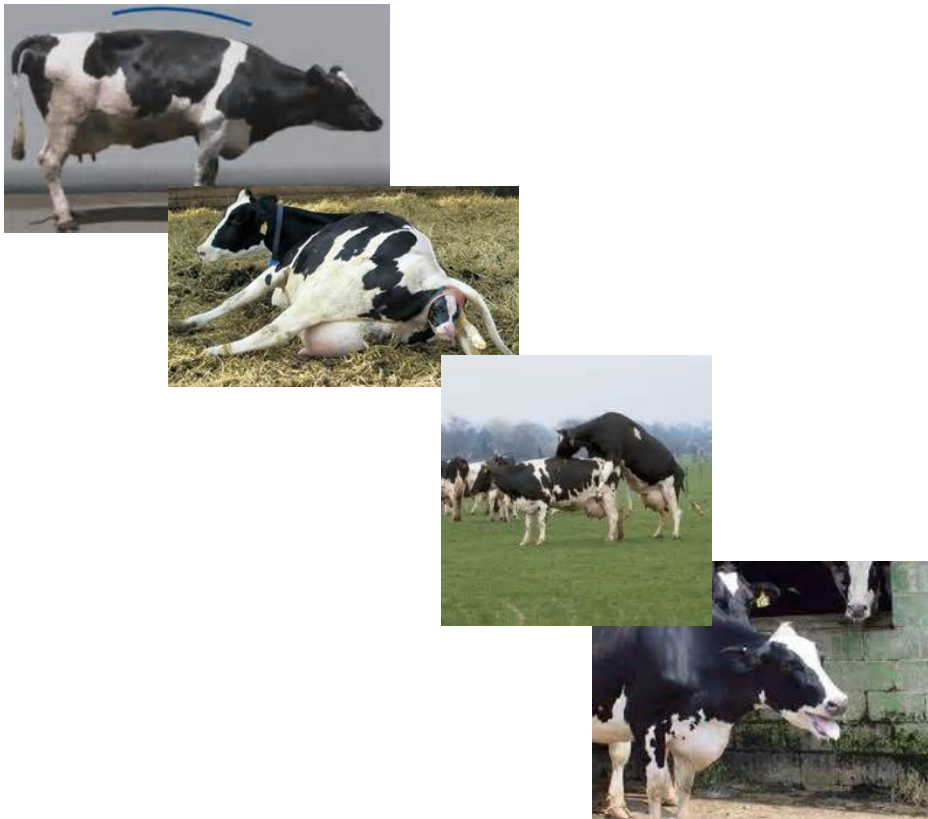


Data from new technology: Health phenotypes



'Health phenotypes'

- Behaviour phenotype



'Oestrus phenotype'



'Oestrus phenotype'



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journal homepage: www.theriojournal.com



Evaluation of infrared thermography body temperature and collar-mounted accelerometer and acoustic technology for predicting time of ovulation of cows in a pasture-based system



S. Talukder^{a,*}, P.C. Thomson^b, K.L. Kerrisk^a, C.E.F. Clark^a, P. Celi^a

^aDairy Science Group, Faculty of Veterinary Science, The University of Sydney, Camden, New South Wales, Australia

^bReproGen-Animal Bioscience Group, Faculty of Veterinary Science, The University of Sydney, Camden, New South Wales, Australia



'Oestrus phenotype'



- Standing to be mounted
- Interval
- Duration
- Intensity
- Expression of behaviours...?
- Interaction herd mates

'Calving phenotype'



'Calving phenotype'

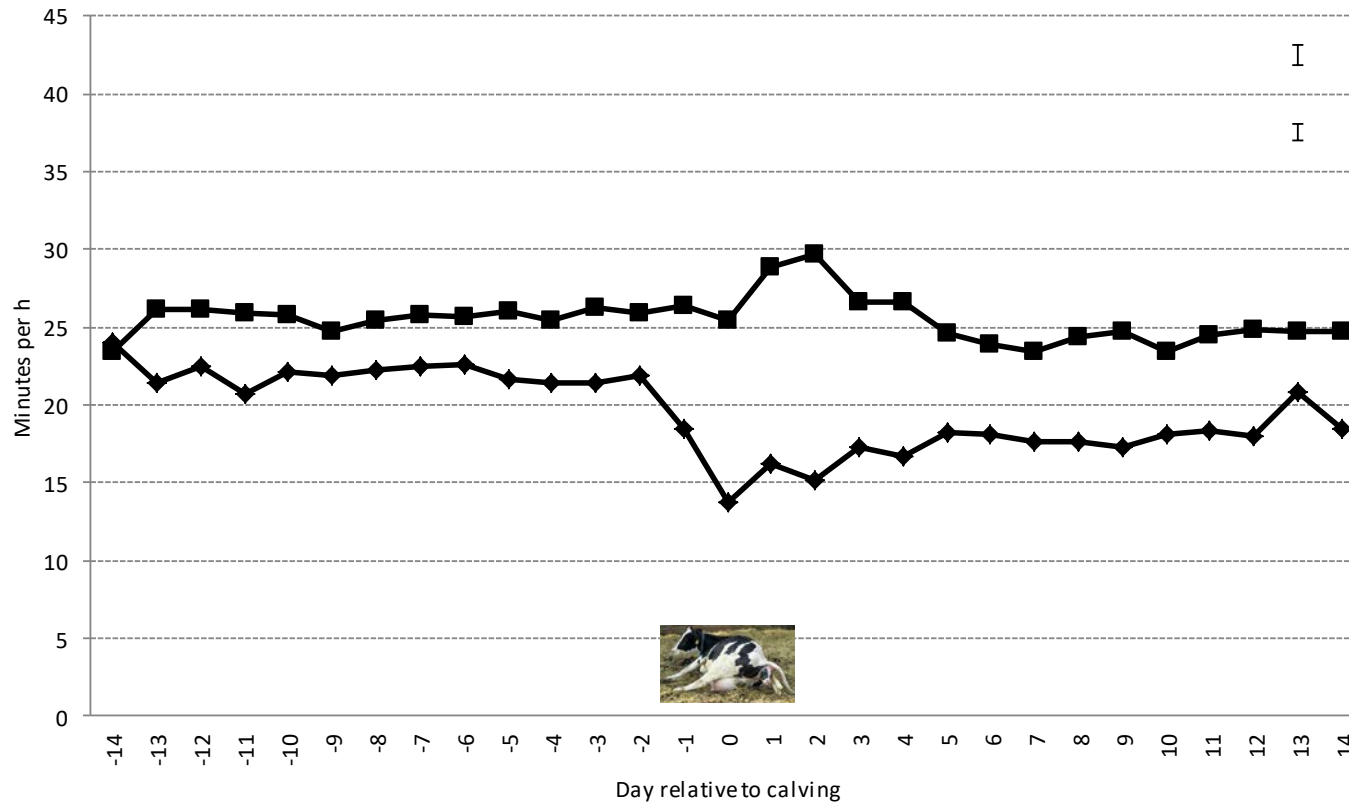
Animal (2015), 9:4, pp 691–695 © The Animal Consortium 2014
doi:10.1017/S1751731114003127



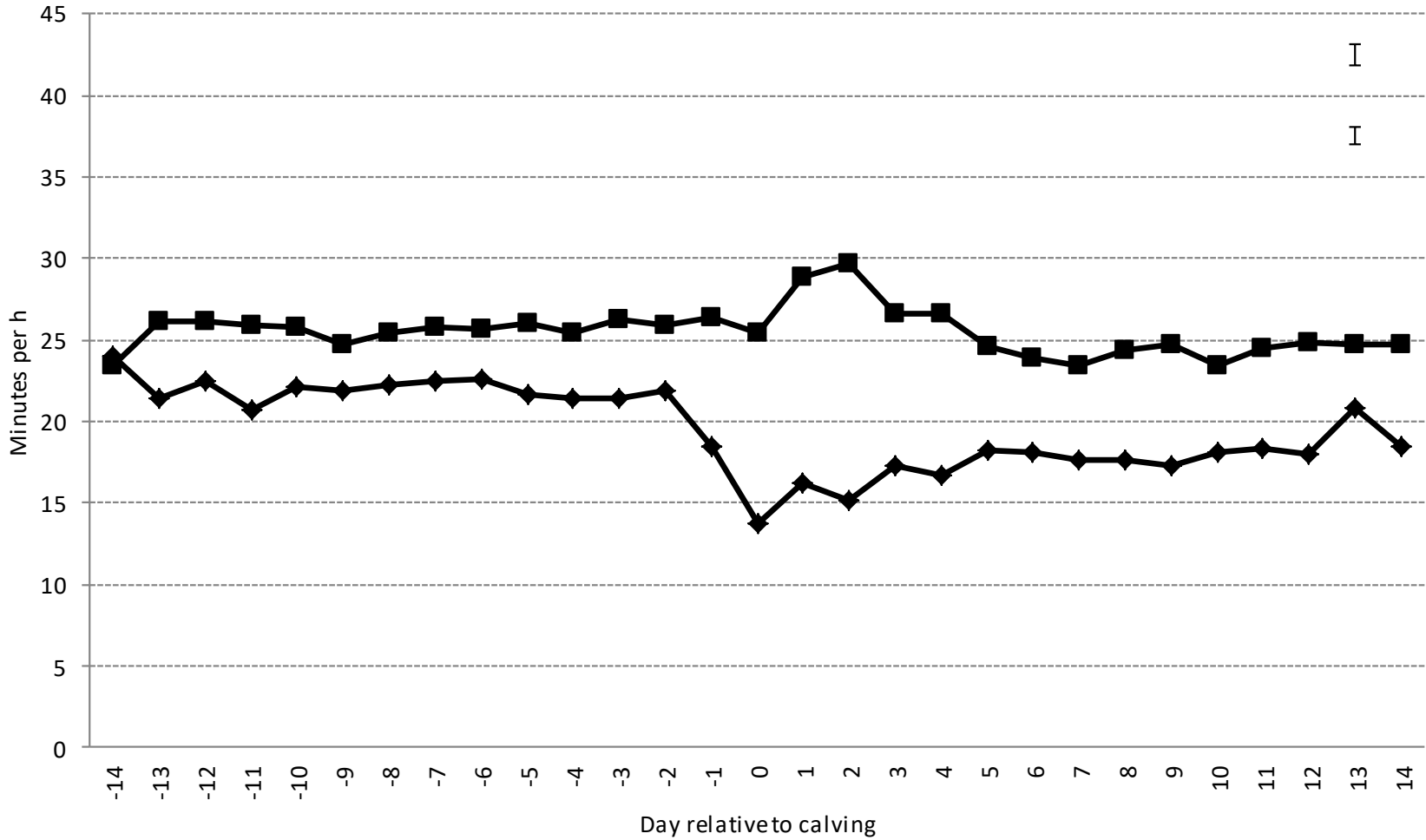
Rumination and activity levels as predictors of calving for dairy cows

C. E. F. Clark^{1†}, N. A. Lyons², L. Millapan³, S. Talukder¹, G. M. Cronin¹, K. L. Kerrisk¹ and S. C. Garcia¹

¹Dairy Science Group, University of Sydney, Camden 2570, NSW, Australia; ²Dairy and Intensive Livestock Industries, NSW Department of Primary Industries, Elizabeth Macarthur Agricultural Institute, Menangle NSW 2568, Australia; ³Department of Animal Production, Faculty of Agronomy, University of Buenos Aires, Buenos Aires 1417, Argentina



'Transition cow phenotype'



‘Lameness phenotype’

School of Engineering and Faculty of Veterinary Science collaboration

PhD: *“Advanced Perception in Precision Livestock Robotics: Lameness”*



THE UNIVERSITY OF
SYDNEY



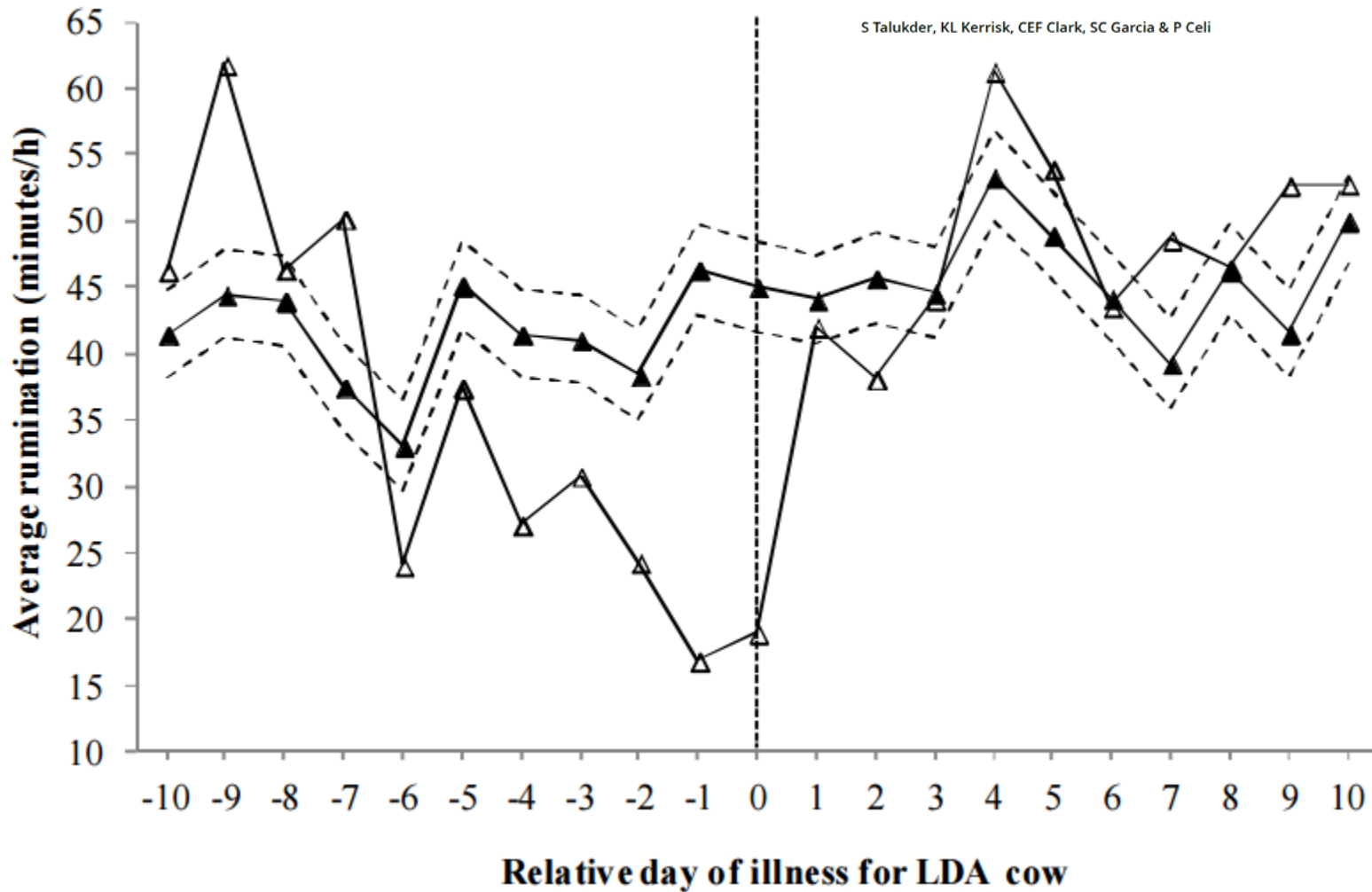
**Dairy
Australia**

Your Levy at Work

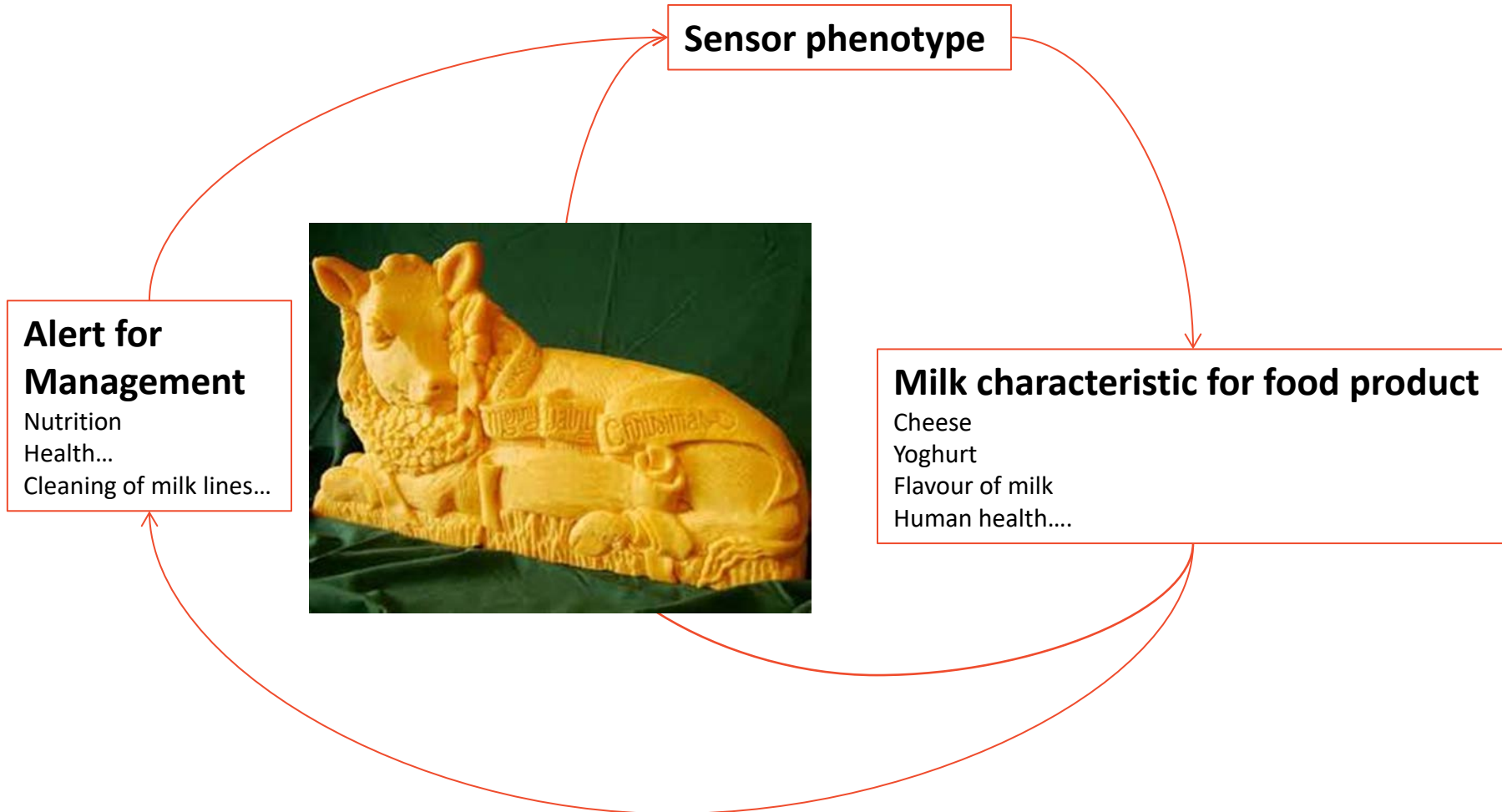
'LDA phenotype?'

Rumination patterns, locomotion activity and milk yield for a dairy cow diagnosed with a left displaced abomasum

S Talukder, KL Kerrisk, CEF Clark, SC Garcia & P Celi



Data from new technology



Turning data in actions

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Our data future: Forward to the past

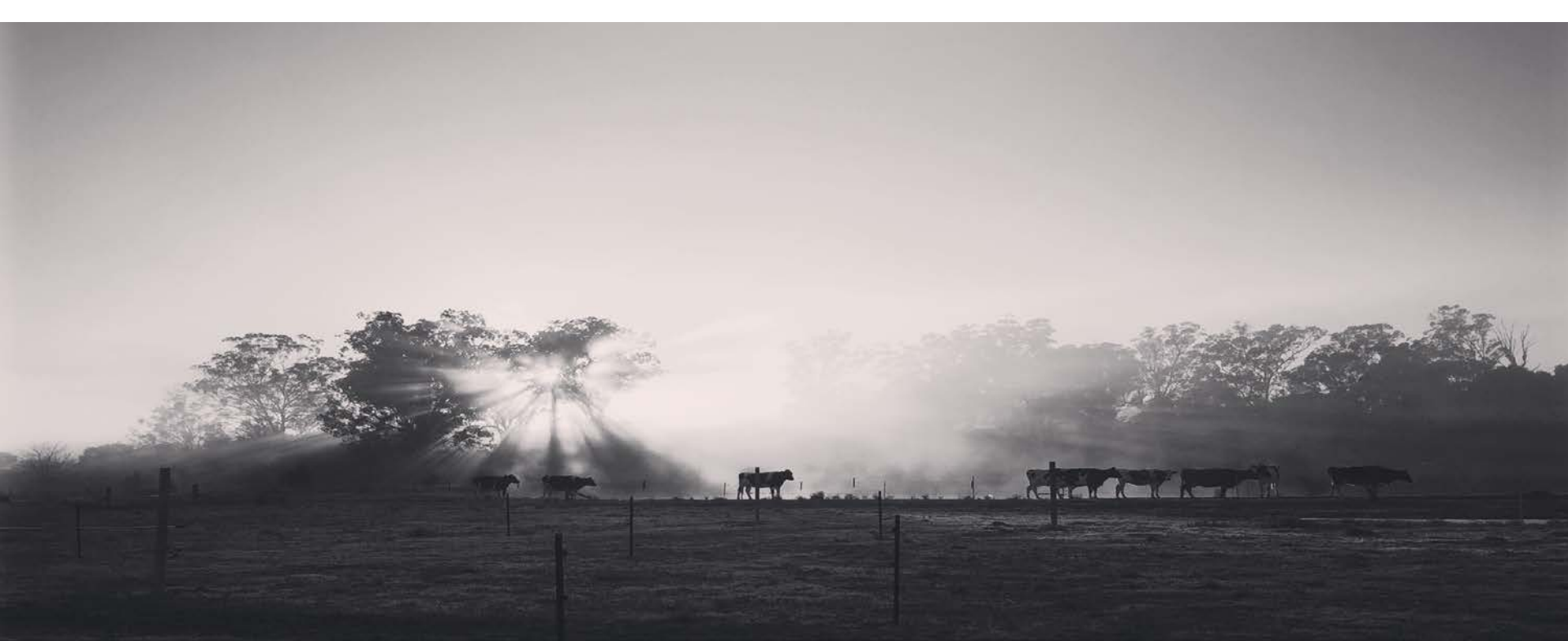


Herd management boundaries set by farmers
- System optimisation for health and profit

The sound of 'moosic': The language of cattle (PhD A. Green)







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