Monitoring Animal Health and Welfare of Australian Livestock Exported by Sea

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Sep 29, 2023
Japan

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MEAT & LIVESTOCK AUSTRALIA

Murdoch University

Outline

Background

Study Aims

Methods

Results

Application to WOAH

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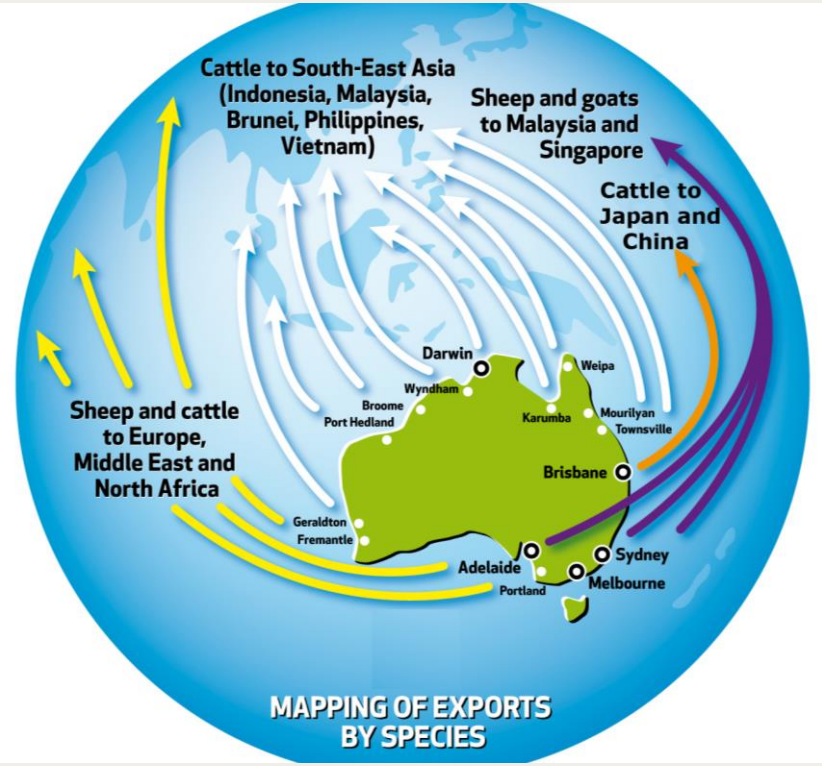
Background:

Australia exports ~ 2 million cattle and sheep by sea each year.



Aus Standards Export of Livestock (ASELv2.3) and AMSA MO p43

- Improve regulatory oversight
- International cooperation

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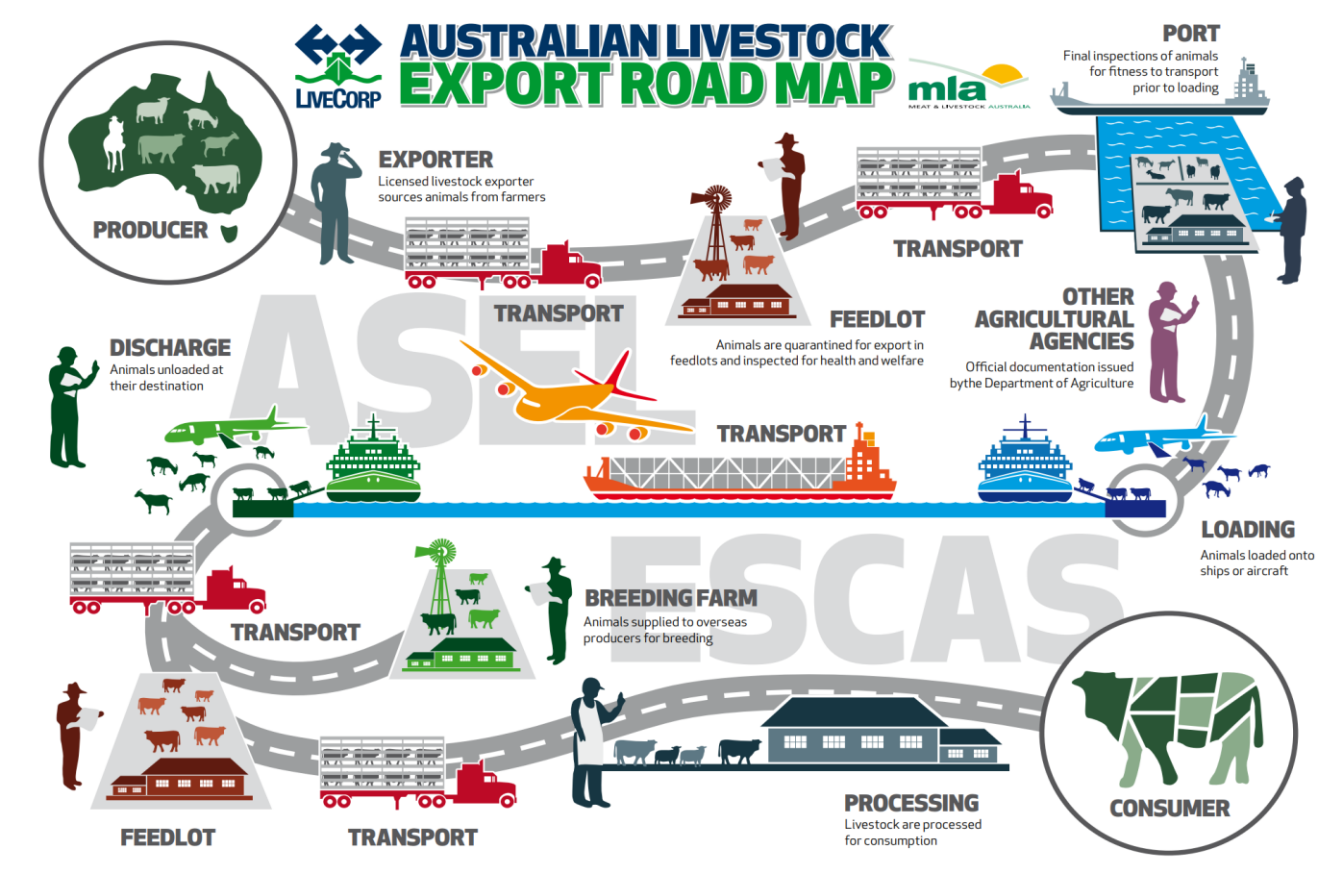
An evidence-based welfare monitoring protocol is needed to demonstrate the animal perspective

Source: www.agriculture.gov.au

Welfare monitoring for the Australian livestock export industry



Source: MLA/Livecorp

- Intensive care of large # animals
- ~ 3,000 – 15,000 cattle and/or
  10,000 -60,000 sheep per shipment
- Animals encounter changes in facilities, environment, feeding, handling etc
- <u>Whole of supply chain</u> approach to monitoring

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Understanding animal welfare

…'the physical and mental state of an animal in relation to the conditions in which it lives and dies'…

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Why is it important?

- Social Licence
- Responsibility and transparency for all
- Identifying sustainable practices

Less than 40% of Members in Europe cooperate with the country of destination before, during or after the journey.

Benefits to welfare monitoring

- Understand the welfare outcomes of journeys
- Allows proactive rather than reactive change
- Improve risk mitigation
- Benchmarking of performance
- Transparency
- Regulatory benefits
- BUT its complex!

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Methods: Identifying welfare measures

Welfare indicators must be:

- feasible
- valid
- reliable

Animal Outcomes:

- Mortality
- Health
- Behaviour (Activity and Demeanour)

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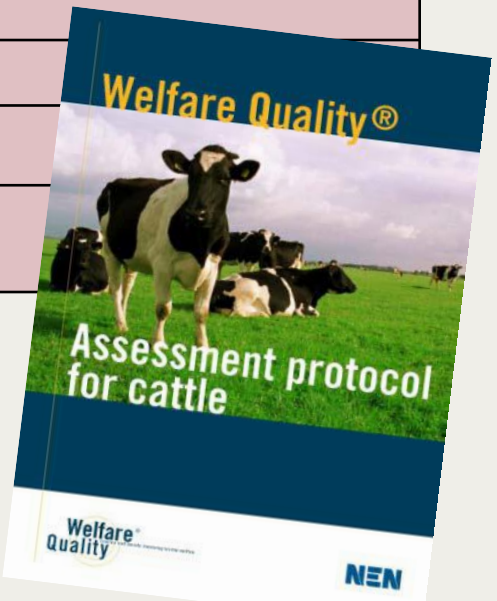
Five Domains	Welfare principles	Welfare criteria	
1. Nutrition	Good feeding	1	Absence of prolonged hunger
		2	Absence of prolonged thirst
2. Environment	Good housing	3	Comfort around resting
		4	Thermal comfort
		5	Ease of movement
3. Health	Good health	6	Absence of injuries
		7	Absence of disease
		8	Absence of pain induced by management procedures
4. Behaviour	Appropriate behaviour	9	Expression of social behaviours
		10	Expression of other behaviours
		11	Good human-animal relationship
5. Mental state		12	Positive emotional state



The Five Domains (Mellor and Beausoleil 2015)
Welfare Quality® protocols (Blokhuis et al. 2010).

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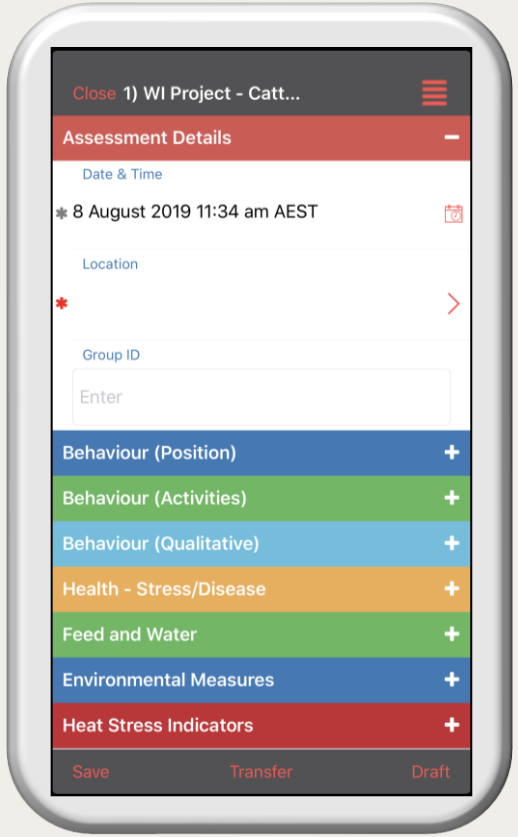
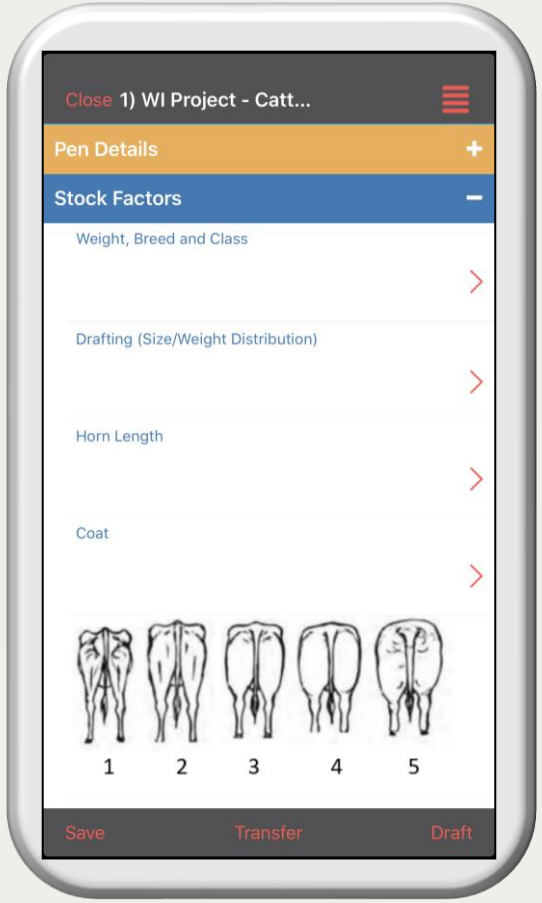
Pen Side Assessments

- Select representative pens to sample
- Record the measures onto a digital data platform
- *? How many pens to sample? How frequent? Time of day?*
- *? Effect of breed and deck location?*





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- 7 consignments
  (x4 to South-East Asia, x3 to Middle East)
  - **On-farm, at feedlot, on vessel, destination trader pens**
  - **All measures taken as pen-side observations**

C. Livestock details

Measure	Frequency	Collection Point	Societal Concern
Body Condition Score	Once at beginning and at end of supply chain	On-farm OR pre-export registered establishment AND once at destination facility	Animal care, Quality of Life
Species and breed	Once per consignment	On entry to the supply chain	Animal comfort, animal care, Quality of Life

D. Animal Behaviour

Measure	Frequency	Collection Point	Societal Concern
Reactivity Index	On entry and exit at each sector	On-farm, pre-export registered establishment, vessel and destination facilities	Animal care
Posture	Twice daily on elected days	Pre-export registered establishment, vessel and destination facilities	Animal comfort, Quality of Life
Resting			
Ruminating			
Negative engagement			
Positive engagement			
Demeanour (9 qualitative terms)			
Panting score			

E. Animal health

Measure	Frequency	Collection Point	Societal Concern
Nasal discharge	Once daily on elected days	On-farm, pre-export registered establishment, vessel and destination facilities	Positive health, animal care
Ocular discharge			
Pink eye			
Coat/fleece contamination			

F. Resource access

Measure	Frequency	Collection Point	Societal Concern
Roughage availability	Once daily on elected days	Pre-export registered establishment, vessel and destination facilities	Animal care, Quality of Life

G. Pen environment

Measure	Frequency	Collection Point	Societal Concern
Manure pad moisture /depth	Once daily on elected days	Pre-export registered establishment, vessel and destination facilities	Animal care, animal comfort, Quality of Life

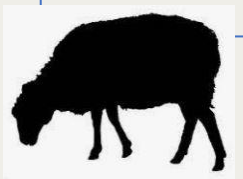
Results: Health Outcomes

Sheep (Australia – Oman)

Total of **1047** sheep over two sea voyages

Condition	Cases	Prevalence
Scabby mouth	40	3.8%
Pink eye	37	3.5%
Illthrift:	6	0.6%
Wounds	4	0.4%
Heat Stress	4	0.4%

4 x sheep removed for treatment
2 x mortalities

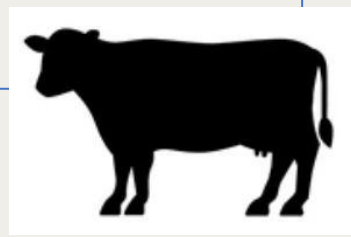


Cattle (Australia – Israel)

Total of **826** cattle over two sea voyages

Condition	Cases	Prevalence
Lameness	18	2.2%
Bloat	16	1.9%
Ocular lesions	12	1.5%
Illthrift	10	1.2%
Wounds	5	0.6%

18 x cattle removed for treatment
3 x Mortalities



Results: Analysis of outcomes during sea voyages

- Principal Component (PC) analysis used to combine data for **animal behavioural outcomes**
- PC Behaviour & health measures tested against environmental conditions and resources using Generalised Linear Mixed Model (GLMM) & Tukey's
- Test differences in animal outcomes by
  - Voyage day
  - Time of day
  - Type of livestock
  - Pen location on board the vessel

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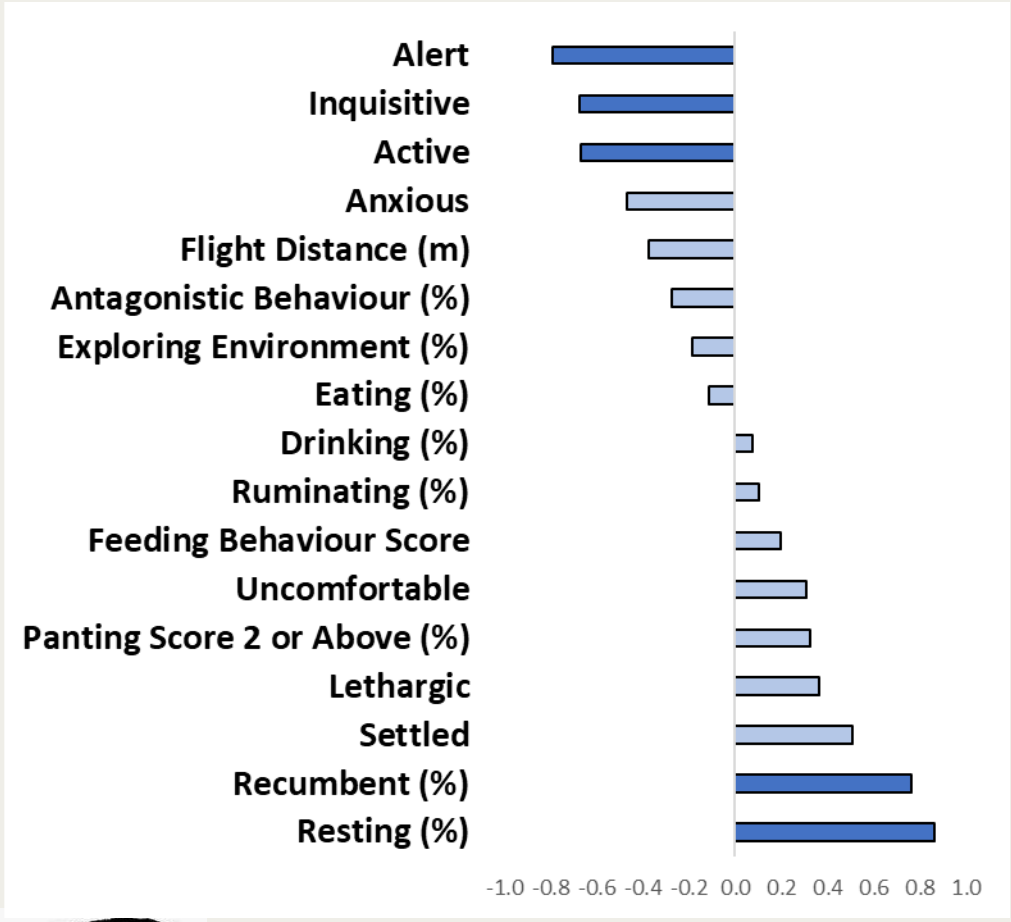
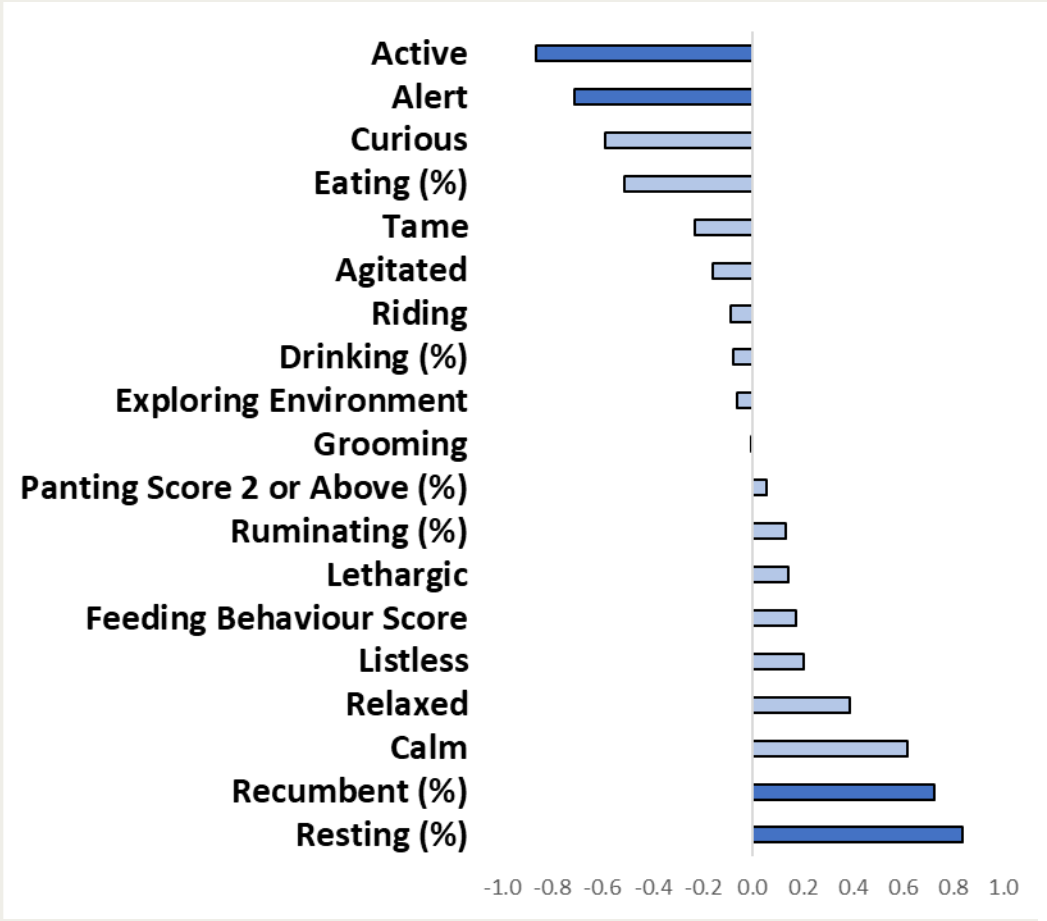
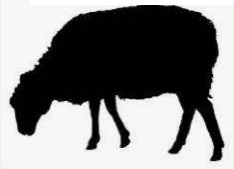
Results: PC 1 (Activity and Rest)

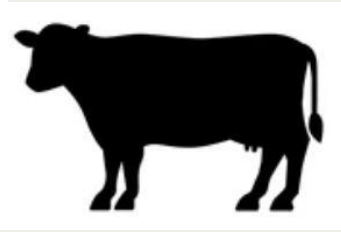




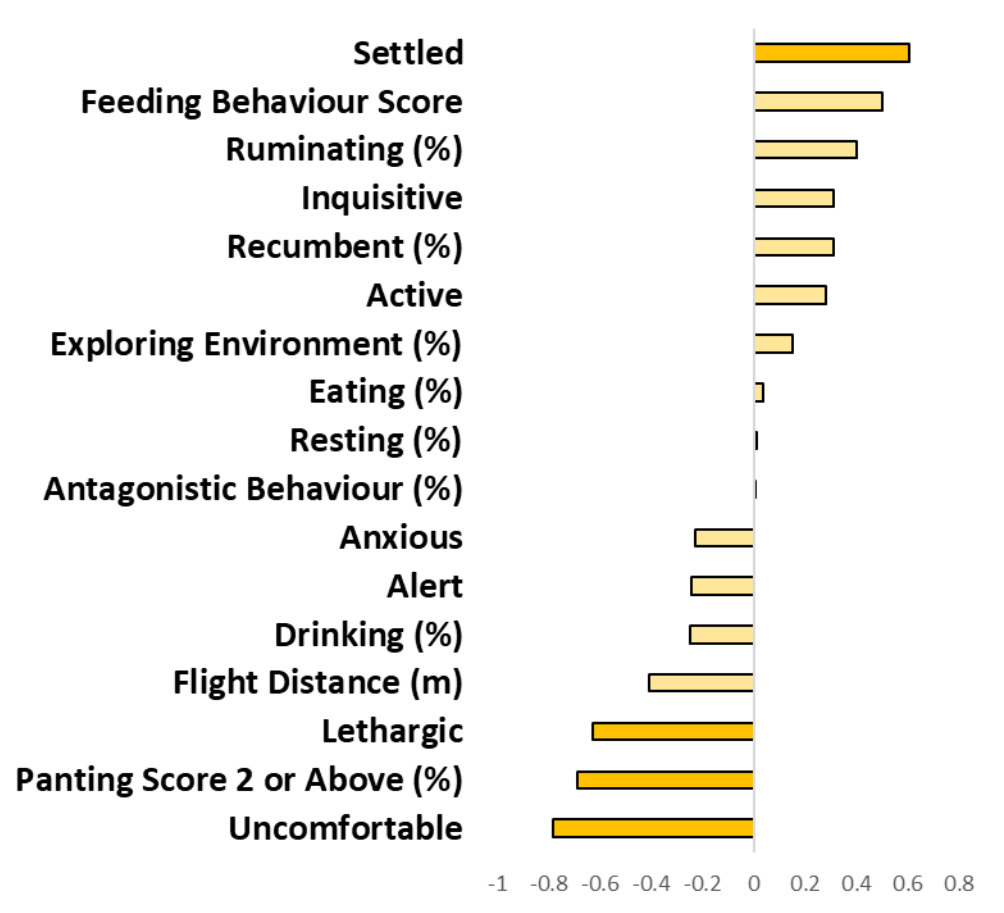


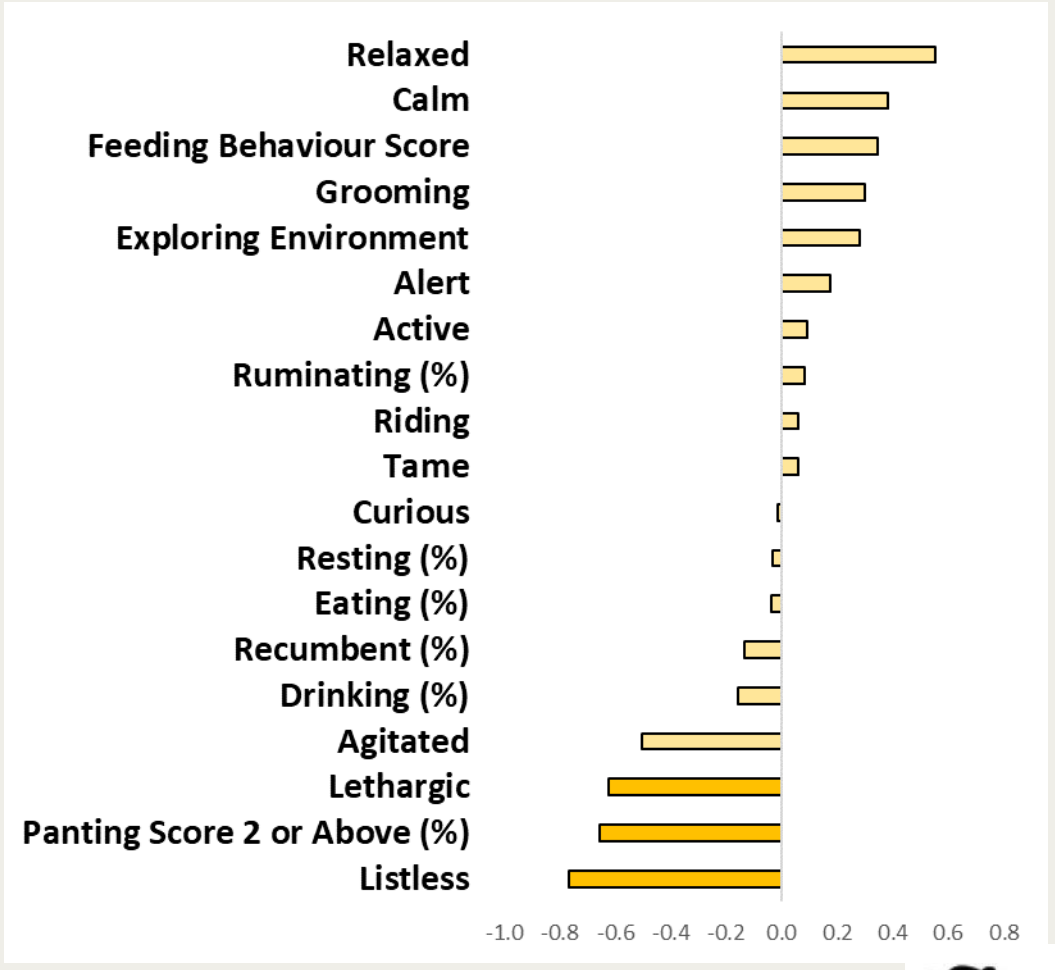
Sheep (Fremantle – Oman)

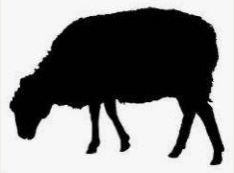
Cattle (Fremantle – Israel)



Results: PC 2 (Heat responses)

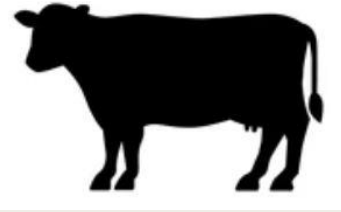






Sheep (Fremantle – Oman)

Cattle (Fremantle – Israel)



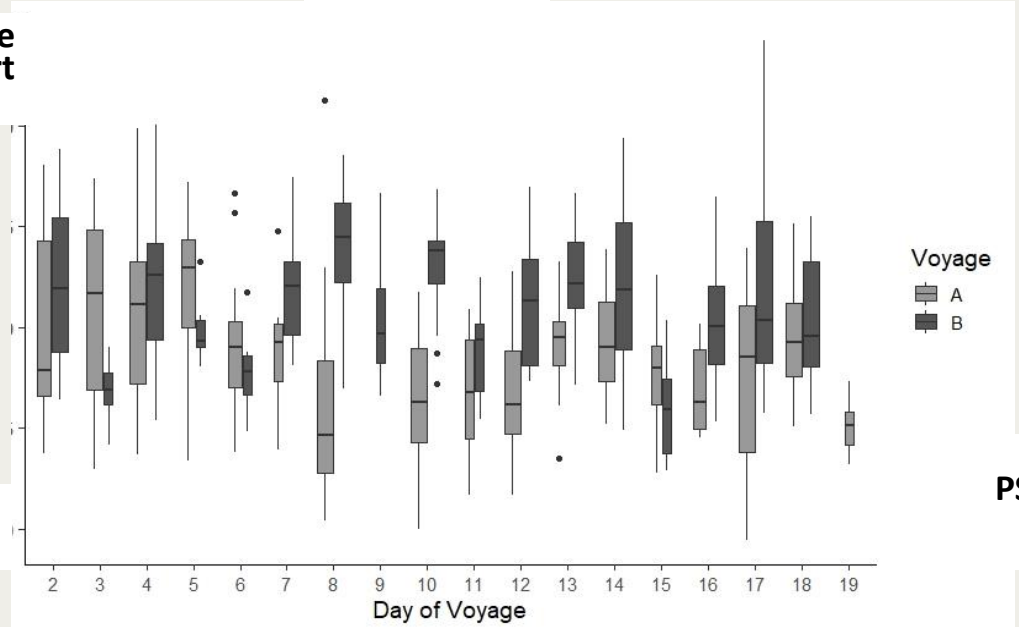
Results: Frequency of assessments (voyage day)

Cattle (Fremantle, Aus. – Eilat/Haifa, Israel)

PC Factor 1

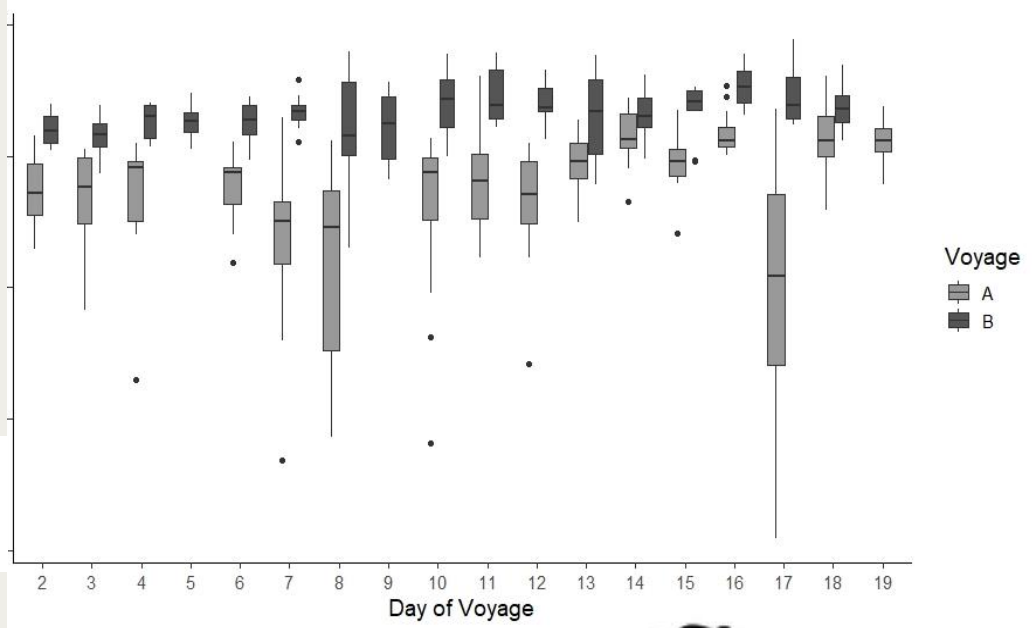
Active Alert

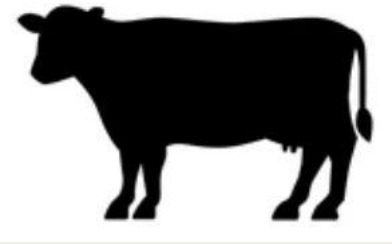
Resting Recumbent



PC Factor 2

Listless PS 2 or Above Lethargic

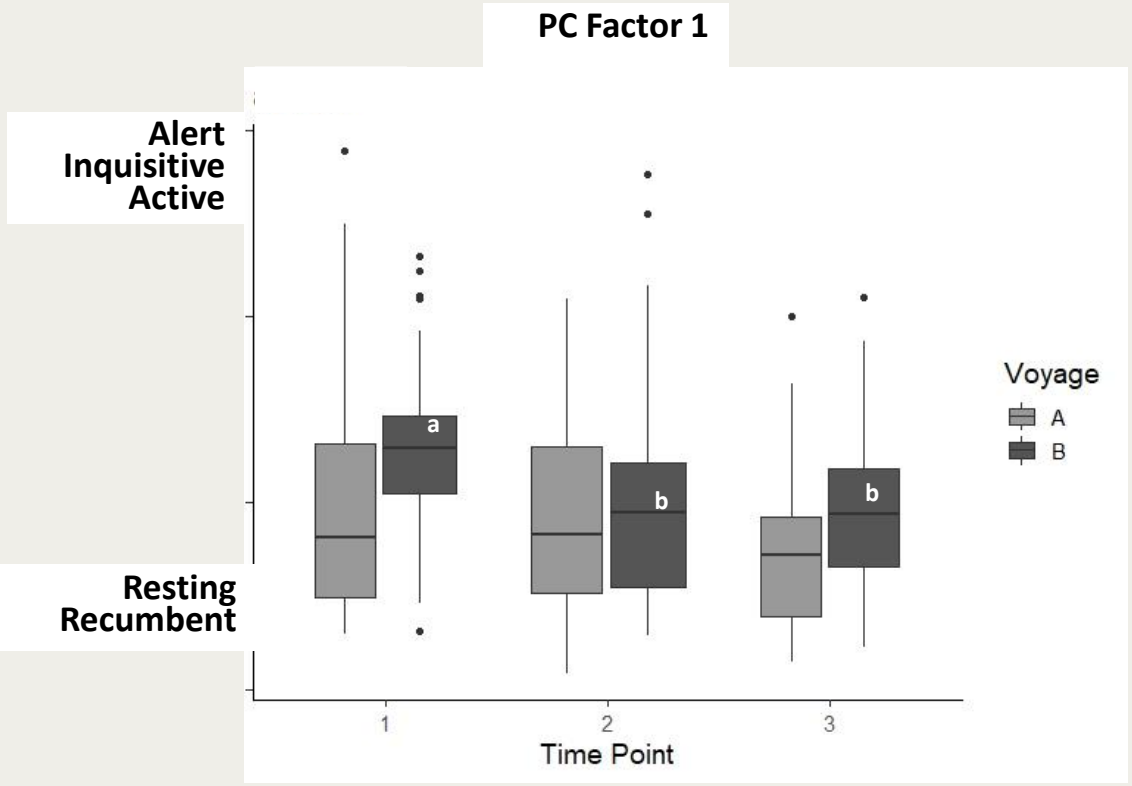




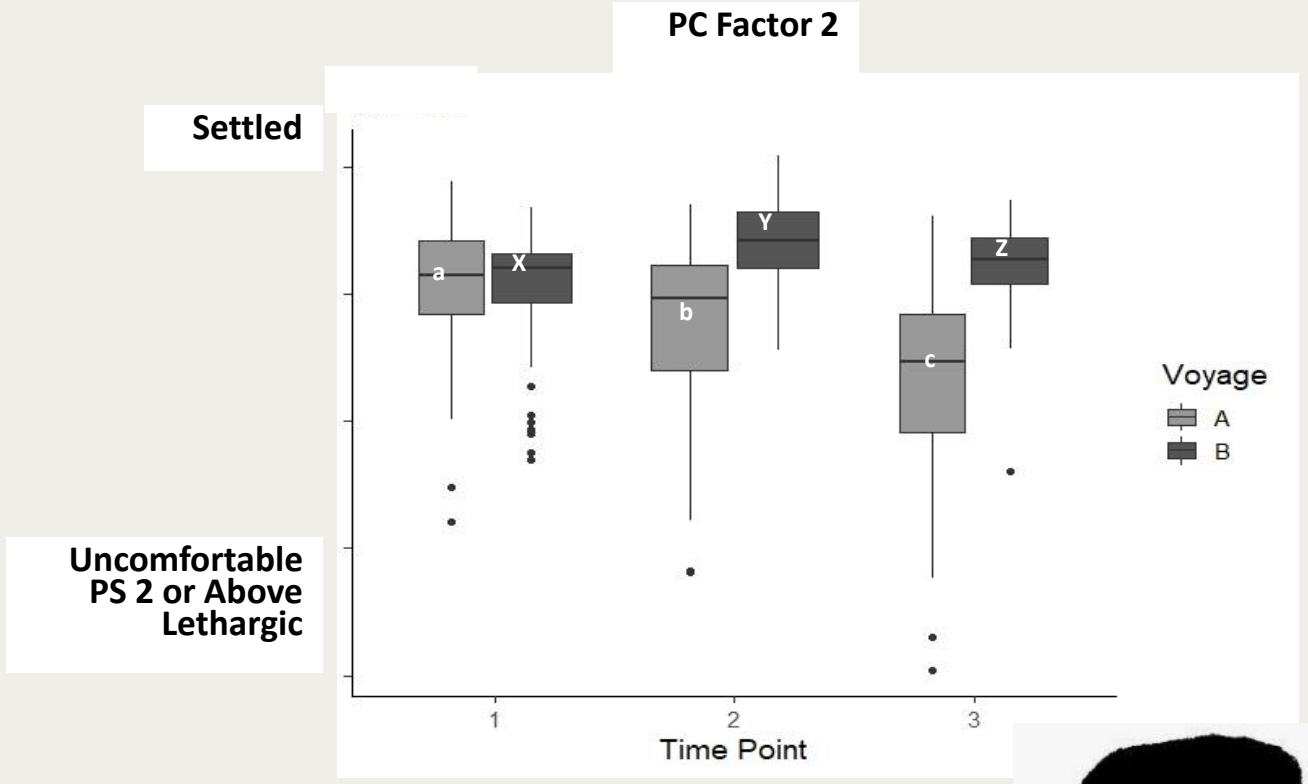
Results: Frequency of assessments (time of day)

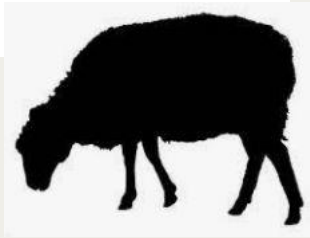
Sheep (Australia – Oman)

PC Factor 1



PC Factor 2





Responses to Environment and Resources

GLMM comparisons for **cattle** voyages (Australia – Israel)

	PC 1 (Activity and Rest)	PC 2 (Heat Responses)
Wet Bulb Globe Temp. (°C)	0.10	**21.72*** **
Feed consumption (% BW/head/day)	**9.08****	**15.97*** **
Roughage access	0.00	**12.75*** **
Water availability (hours)	**35.41*** **	**7.86****
Manure pad moisture	**13.97****	**14.36*** **
Manure pad depth	**34.13****	0.49

F Values with significant variations highlighted in bold (* = $p < 0.05$, ** = $p < 0.01$, *** = $p < 0.001$)

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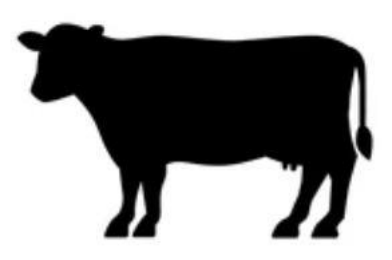

Industry application

- Data on each day required to depict responses to changing environments
- Data at more than one time point required to show activity / resting and daily heat load/ respite
- Outcomes varied between lines of livestock (data not shown)
- Recommend that behaviour should be recorded by industry, as were applicable across supply chain
- Consider Staff training and reporting tool to standardise data

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Acknowledgements:

- Staff from export companies, shipping companies and overseas facilities
- MLA Livecorp, Aus government
- Murdoch research team

Thank you!

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