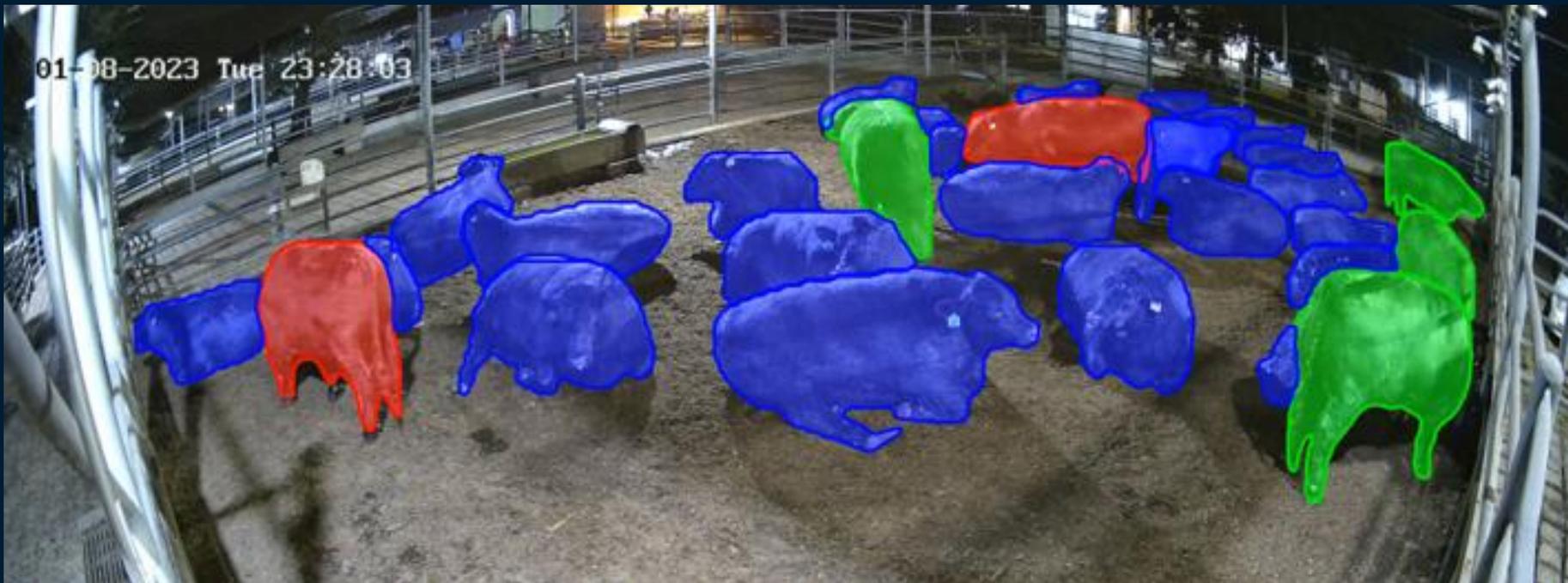




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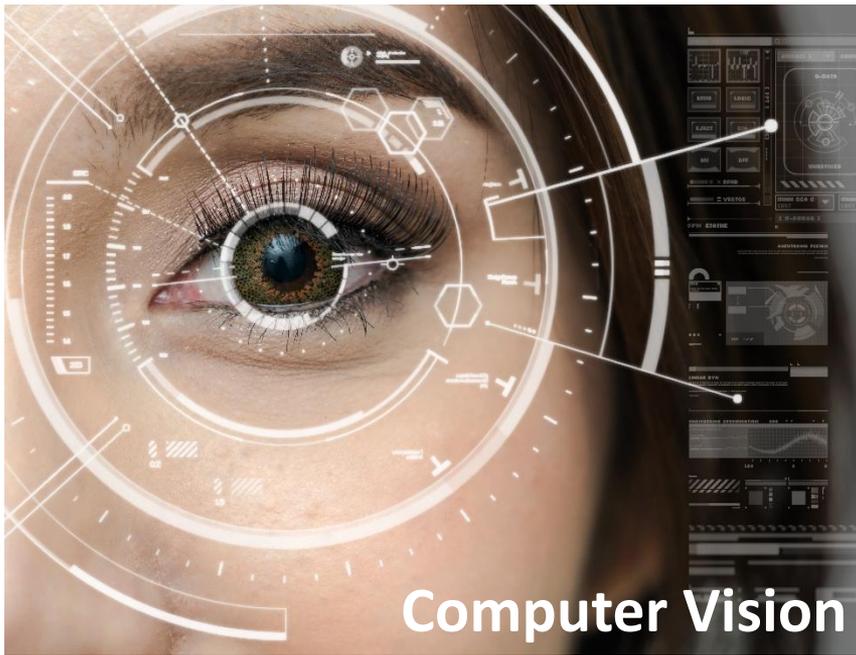
Artificial intelligence in the abattoir to improve welfare outcomes



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Definitions





Cattle in Lairage



'Australian Livestock Processing Industry Animal Welfare Certification System' - AAWCS



Animal Welfare

Short, but critical time period in an animal's life

- Care for the animals
- Meat quality implications
- Economic consequences



18-07-2023 Tue 23:55:08



pen 120 Cam1 top left



Applications of Computer Vision Monitoring

- Real-time alerts for personnel to intervene
- Longer-term assessment of management/husbandry changes for welfare improvement
- Regulatory/assurance compliance

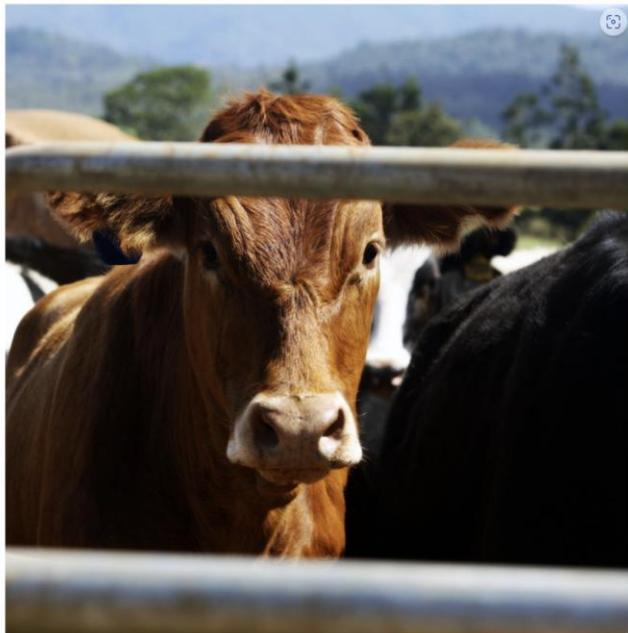




Mandatory CCTV from 2026

Processors move to mandatory CCTV surveillance in abattoirs

Beef Central 30/01/2025



Media centre

RSPCA welcomes inclusion of mandatory video surveillance in updated Animal Welfare Certification System

Today, the RSPCA commends the Australian Meat Industry Council (AMIC) for the inclusion of mandatory video surveillance into the updated Australian Livestock Processing Industry Animal Welfare Certification System (AAWCS) in red meat processing facilities.



RSPCA Australia

Thursday, 30 January 2025

Subscribe to our media centre

01-08-2023 Tue 23:28:01



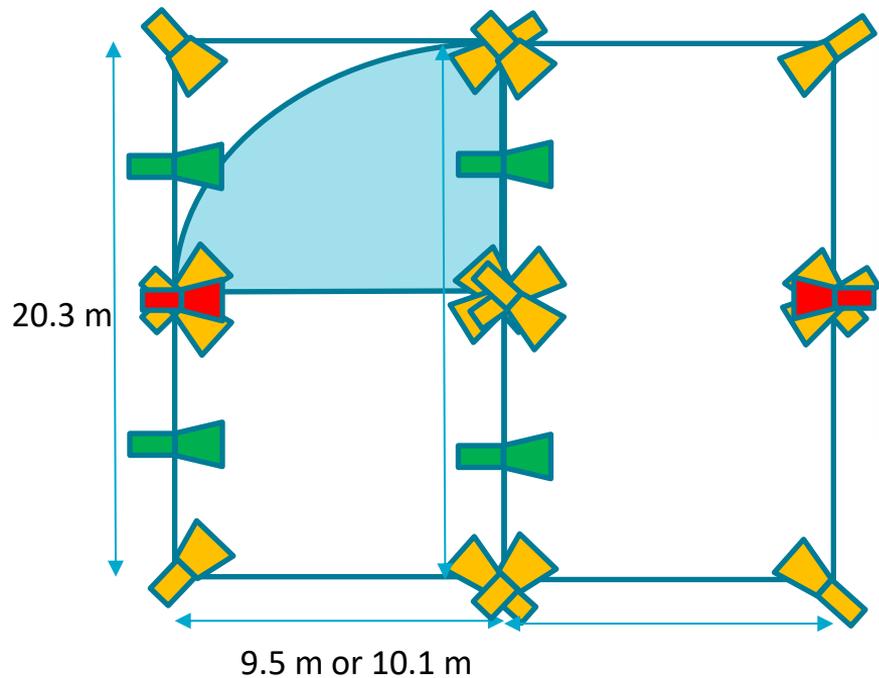
walking: 6.67%
standing: 13.33%
lying down: 80.00%

Count: 10

pen 120 Cam1 top left



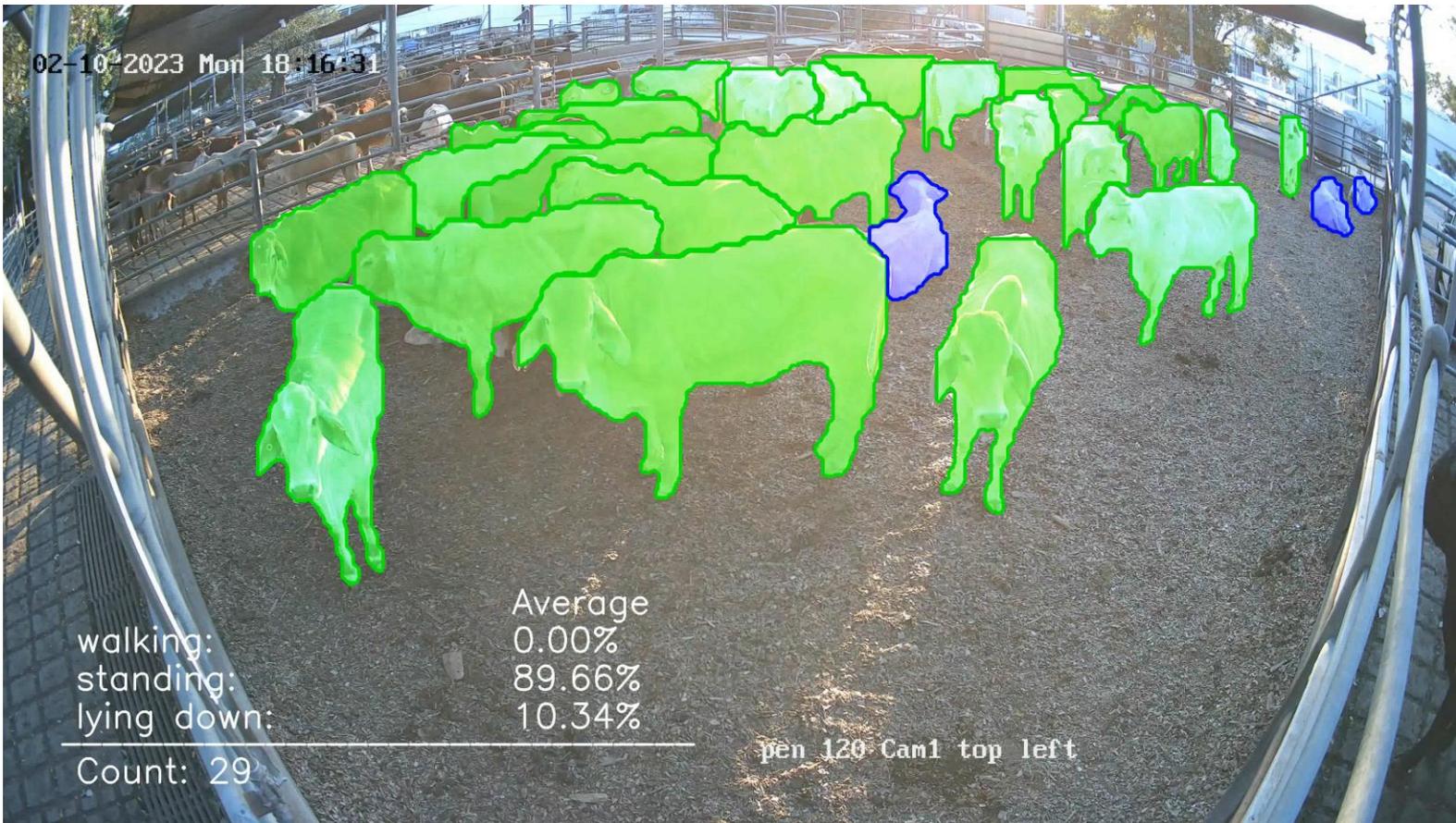
Camera Installation in Two Lairage Pens



-  Water trough camera
-  Program controllable PTZ camera
-  Animal monitoring camera



Posture and Movement Behaviour



-  Walking
-  Standing
-  Lying

walking:	0.00%
standing:	89.66%
lying down:	10.34%
<hr/>	
Count:	29

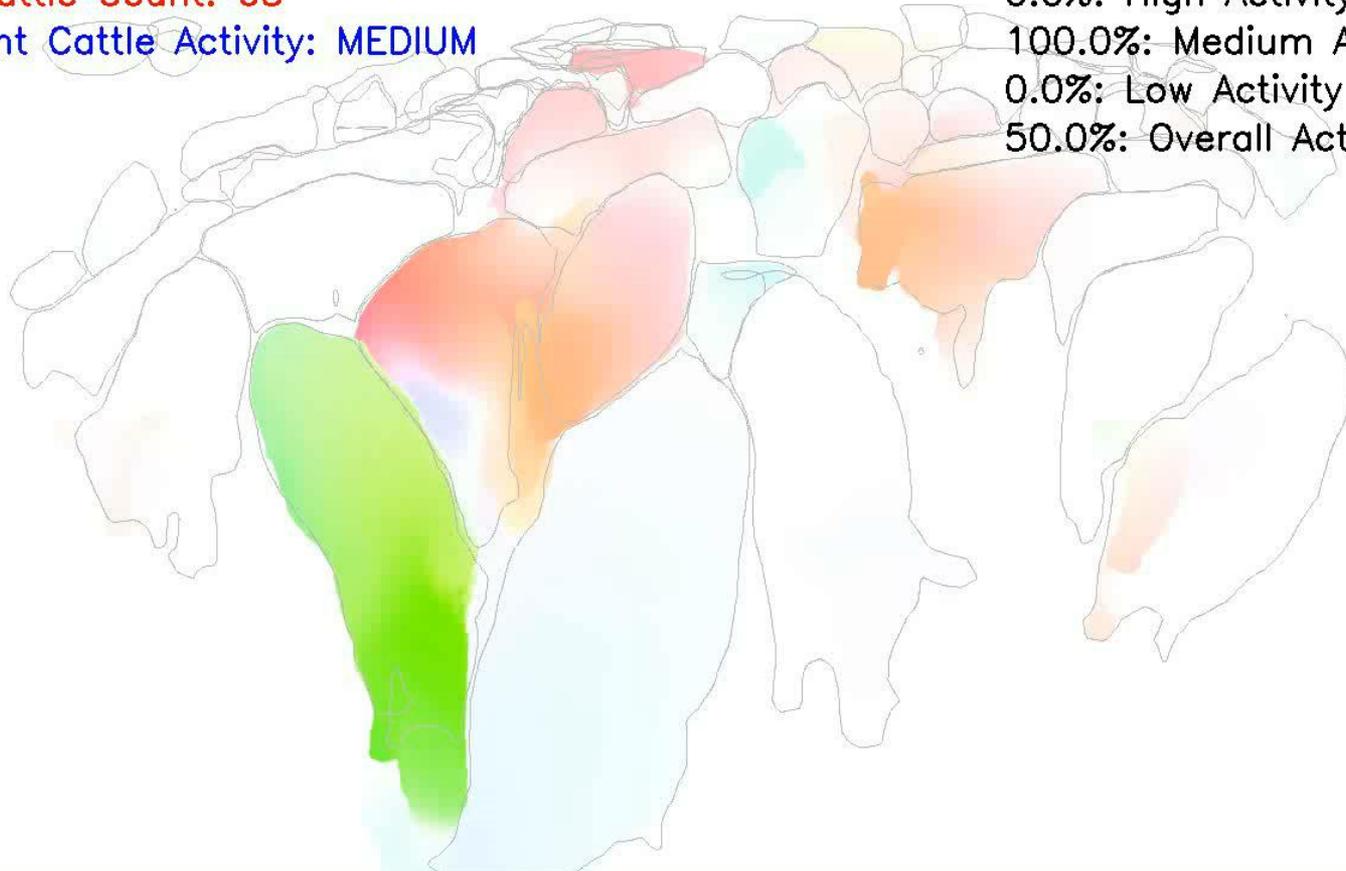
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Animal Activity Level Estimation

Avg Cattle Count: 63
Present Cattle Activity: MEDIUM

0.0%: High Activity
100.0%: Medium Activity
0.0%: Low Activity
50.0%: Overall Activity





Drinking Behaviour



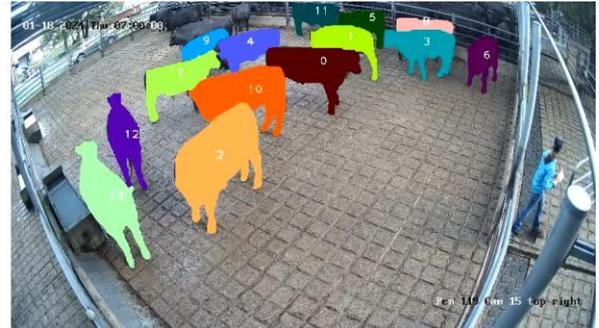
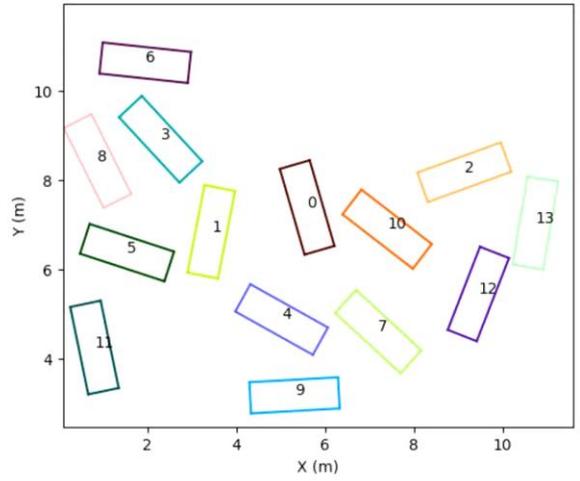
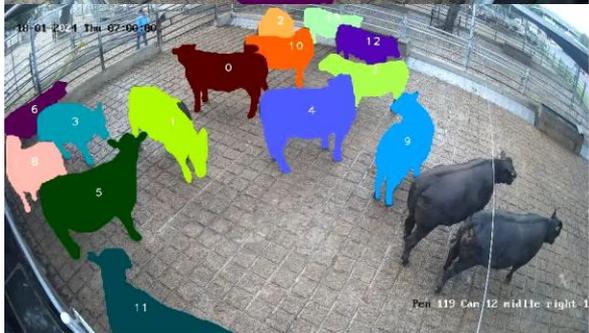
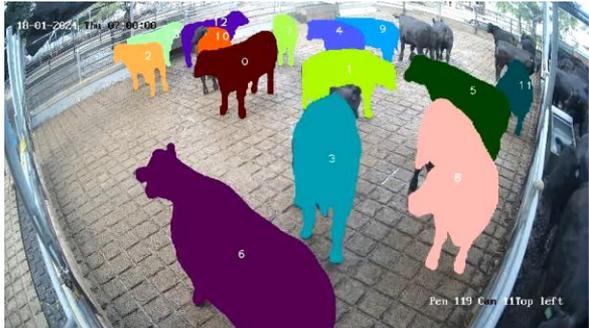


Lameness and Eye Temperature





3D Multi-View Matching Based Cattle Movement





Synthetic Data Creation - Digital Twins

Behaviour

Angle

Flooring

Illumination

Weather

Size

Species

Pose





Applications

Behaviour	Welfare state	Standard	Management	Meat Quality
Lying	Comfort and recovery	AAWCS (stocking density)	Floor bedding, stocking density	Dark cutting
Drinking	Hydration	AAWCS (access to drinkable water)	Access, water quality	Dark cutting
Lameness	Pain and injury	Fit to load (MLA), Transport standard	Pre-transport preparation, remove animal	Downgrading
Activity	Social stress	AAWCS (mixing unfamiliar)	Remove bully	Dark cutting



Lairage Research

- Lying is important for cattle
- Stocking density affects lying as well as substrate

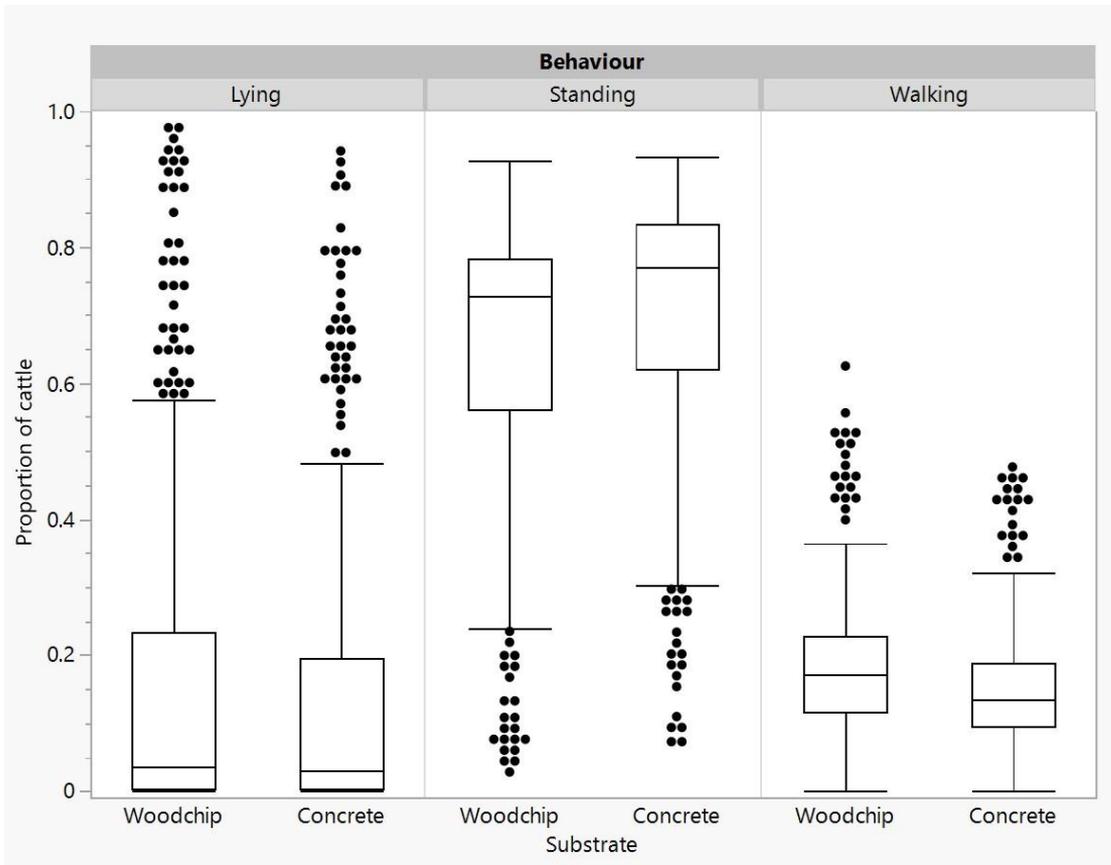


Cockram, M.S., 1990. Some factors influencing behaviour of cattle in a slaughterhouse lairage. *Anim. Sci.* 50, 475-481. doi:10.1017/S0003356100004955

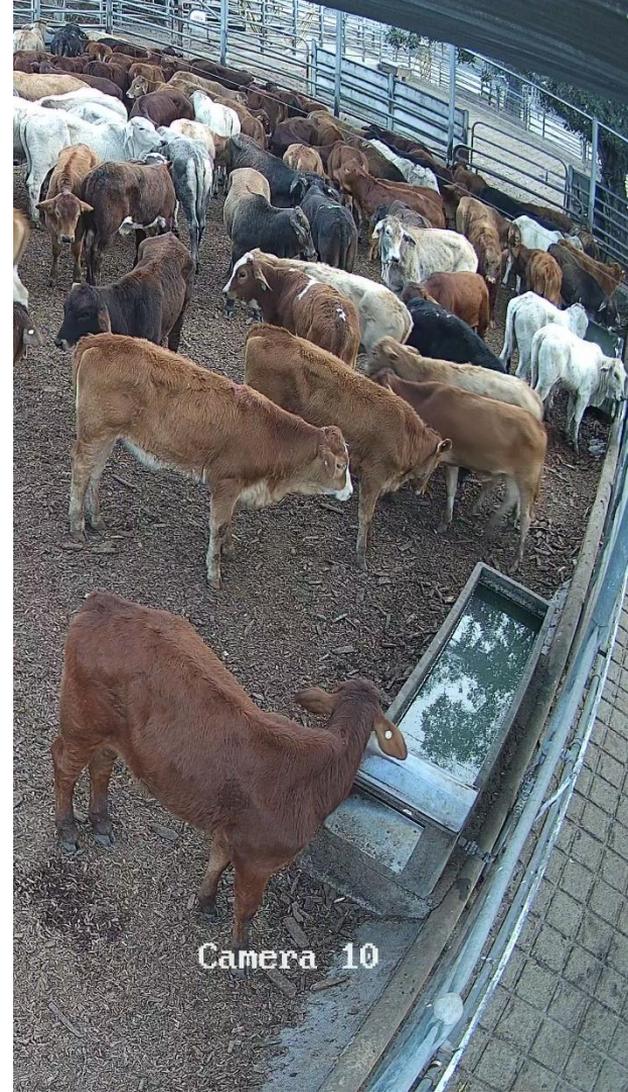
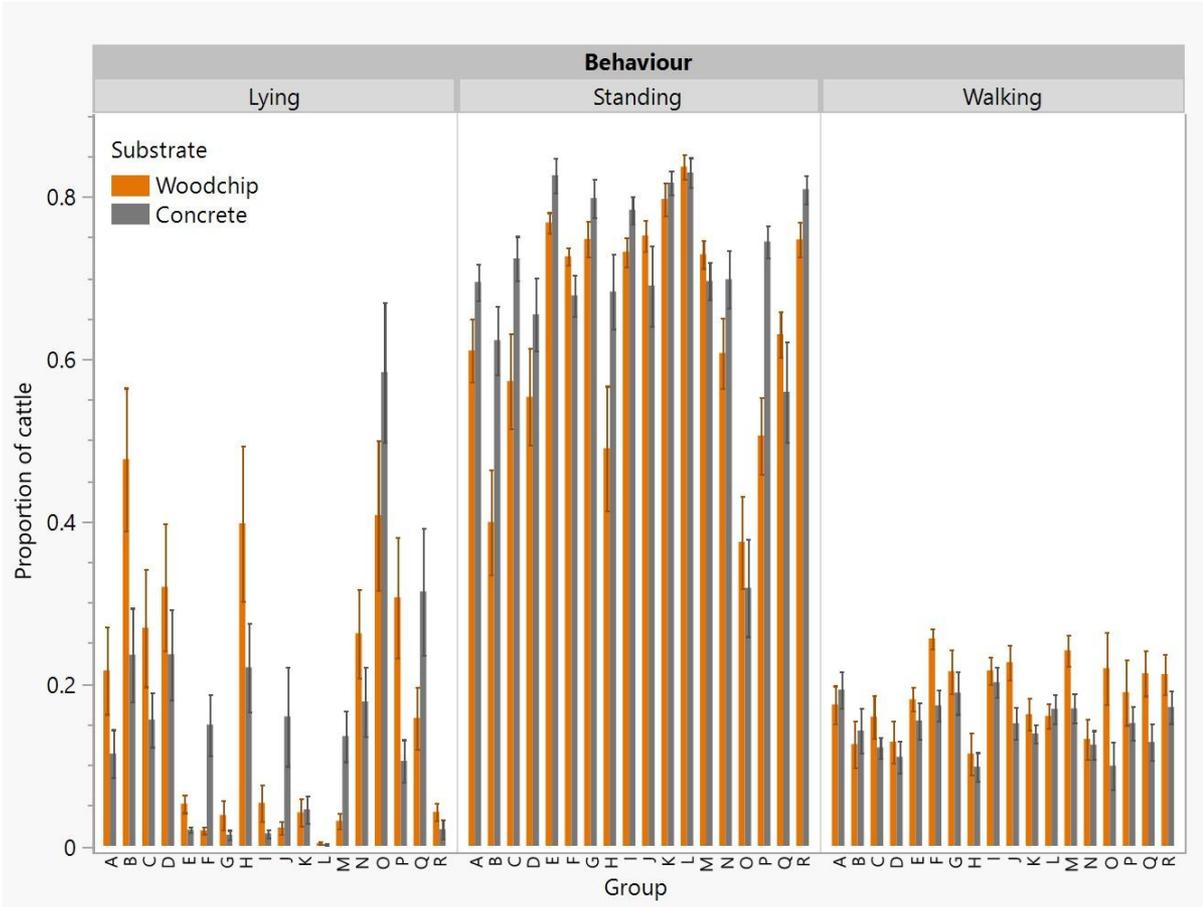
Cockram, M.S., 1991. Resting behaviour of cattle in a slaughterhouse lairage. *Br. Vet. J.* 147, 109-119. [https://doi.org/10.1016/0007-1935\(91\)90100-2](https://doi.org/10.1016/0007-1935(91)90100-2)

Tucker, C.B., Jensen, M.B., de Passillé, A.M., Hänninen, L., Rushen, J., 2021. Invited review: Lying time and the welfare of dairy cows. *J. Dairy Sci.* 104, 20–46. <https://doi.org/10.3168/jds.2019-18074>

Floor Substrates



Group Variability





Where to from here?

- Interpreting automatically detected behaviours
- Setting thresholds
- Sending alerts
- When to intervene

- Incorporating other variables
- Relationship with meat quality





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Stuart Anderson
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Xinlong Guan



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commercial partner facility**

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