Assessing real time tracking technologies to integrate with identification methods and national traceability requirements

Associate Professor Mark Trotter, Dr Amy Cosby,
Dr Jaime Manning and Dr Elle Fogarty

Mud-map

- Introduction
- Why explore this?
- Lit Review results – what's out there?
- Proposed future platforms, what could they be?
- Applications of the proposed systems to traceability functions

Who are we?

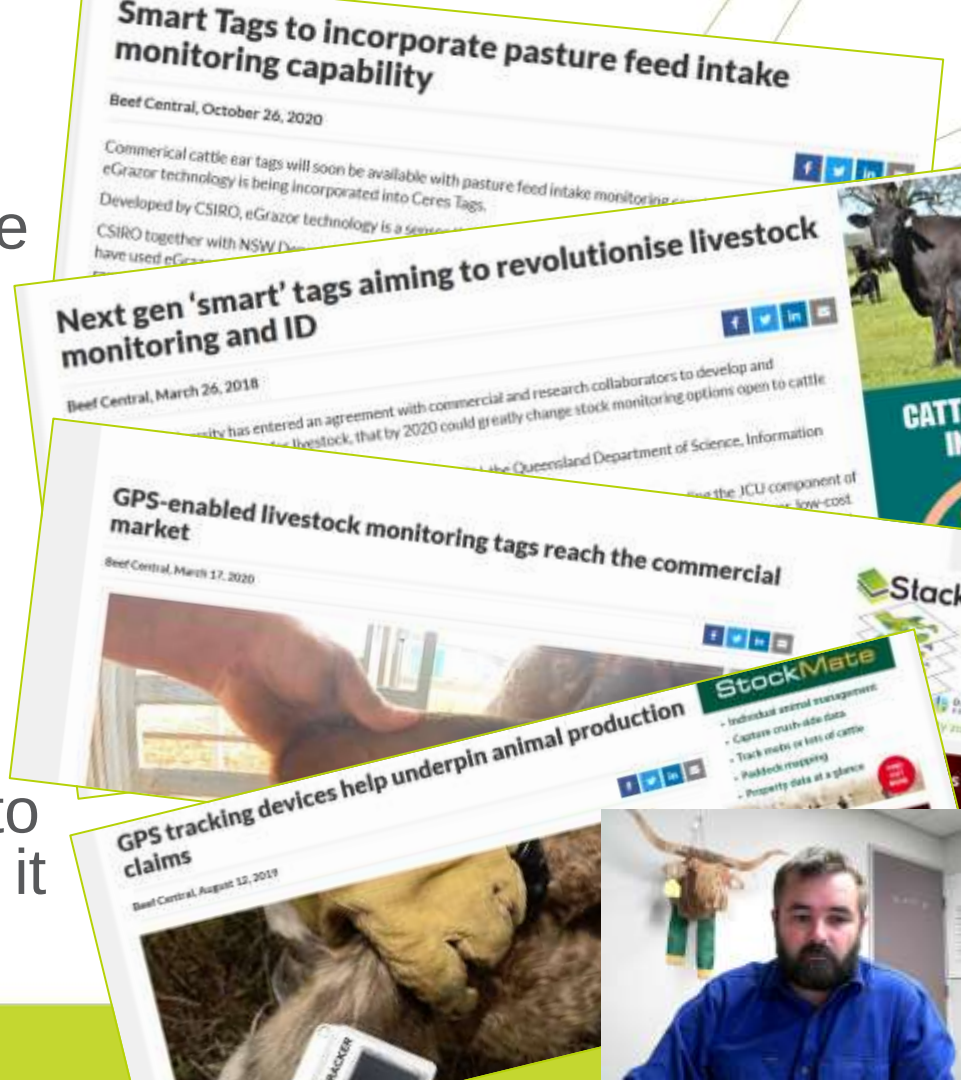
- CQUniversity Australia
- Institute for Future Farming Systems
- Precision Livestock Management Group





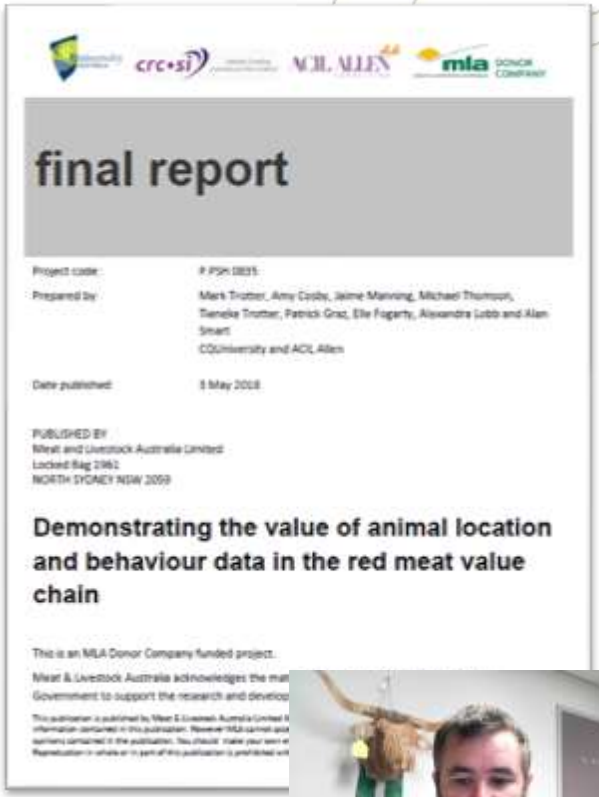

Why explore this?

- The developments in mobile technologies and human fitness tracking has developed interest
- “Smart tags” have been promoted widely in the industry
- There seems at face value to be an opportunity to leverage this technology into traceability schemes, but is it really likely???



Not about the applications used by producers

- Red-meat producers have a range of applications they want to use “smart-tags” for!
- This is about the potential uses in the current and future traceability scheme



final report

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Prepared by: Mark Trotter, Amy Cozzio, Jaime Manning, Michael Thomson, Tieneke Trotter, Patrick Graz, Elle Fogarty, Alexandra Lobb and Alan Smart
CQUniversity and ACIL Allen

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Demonstrating the value of animal location and behaviour data in the red meat value chain

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Literature review -

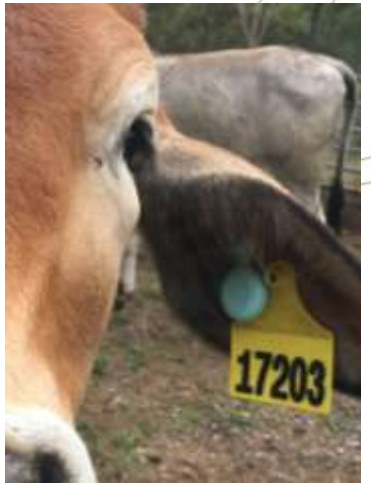
- Identification technologies
  - Physical animal adjustments, visual tags, RFID, biometric…
- Tracking technologies
  - Sensors
    - Location (where is the animal): GPS, radio beacon triangulation
    - Attribute tracking (what is the animal doing, what state is it in?): motion, location, internal, physiological…
  - Data communication
    - Short, medium and long range options: Bluetooth to satellite!
- Conclusion: right now, a “smart ear tag” does look like the best option to deliver the required location and attribute data.

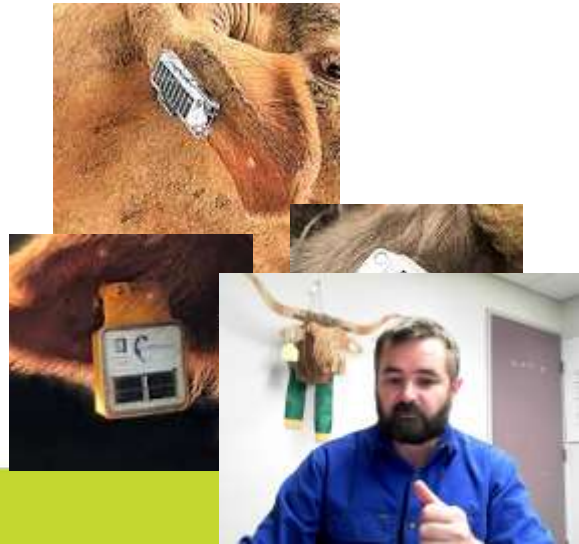
What could the future look like?

- Level 1 - Future platform that continues to use current RFID technology as the core identification platform along with more advanced tag and reader technologies
- Level 2 - Future platform that incorporates active RFID technology with ability to broadcast to greater distances

What could the future look like?

- Level 3 - Future systems that incorporate basic animal activity monitoring technologies (e.g. accelerometer)
- Level 4 - Future systems that incorporate advanced location and activity along with remote communication capabilities





But how would that actually create benefit?

For current traceability functions:

- Biosecurity
  - Notifiable diseases (FMD & BSE)
  - Significant diseases (Foot rot, three-day sickness)
- Food safety
  - Residues (pharmaceuticals and metals)
  - Product authenticity claims (e.g. Pasture-fed Cattle Assurance Scheme)

Tobin, Colin, et al. "**Sensor based disease detection: A case study using accelerometers to recognize symptoms of Bovine Ephemeral Fever**." *Computers and Electronics in Agriculture* 175 (2020): 105605.

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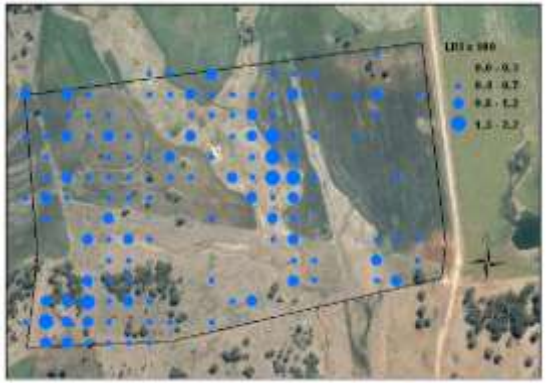

For future traceability functions?

- Sustainability
  - Environmental stewardship
  - Animal welfare
- Industry insights
  - The large data set would enable industry insights to further bolster traceability

Fogarty, E. S., et al. "**A systematic review of the potential uses of on-animal sensors to monitor the welfare of shee evaluated using the Five Domains Model as a framework**." *Animal Welfare* 28.4 (2019): 407-420.

Tobin, Colin, et.al. "**Tracking and sensor-based detection of livestock water system failure: A case study simulation** *Rangeland Ecology & Management* 77 (2021): 9-16.

The challenges…

- It seems so easy, just hang a mobile phone off a cow??? Buts it really difficult!
- Keeping a ear tag on the animal
- Long term testing is required
- Turn data into useful information
- But remember, we've only just begun!

We are here now!

Thanks!

Integrity Systems

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