Pathways to Market:
Transforming Food Industry Futures through Improved Sensing, Provenance and Choice

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Funded by

- Australian Research Council
- Industries
- Government agencies
- Universities
To transform value chains, through a holistic use of ‘intelligent’ information that powers food industry competitiveness, environmental sustainability, and innovation

- from producer to consumer
A Big Data Project
Sense-T is creating a digital view of Tasmania by combining spatial, historical and real-time sensor data.
## Research Streams

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## Project Team

### Partner Organisations
- Australian Bureau of Agricultural and Resource Economics and Sciences
- Australian Bureau of Statistics
- Commonwealth Science and Industrial Research Organisation
- Greenhams Meats
- Grey Innovation
- International Finance Organisation (World Bank)
- National Australia Bank
- Southern Rock Lobster
- Tasmanian Farmers and Graziers Associations
- University of South Australia (Institute for Choice)
- University of Sydney
- University of Tasmania

### Post-Doctoral Fellows
- Ardeshiri
- Azad
- Mirowski
- Powell
- Wills

### PhD students
- Aktar
- Amuno
- Bamgboje
- Moshina
- Chowdhury

### Chief Investigators
- Ancev (UniSyd)
- Arundel (UTAS)
- Bonney (UTAS)
- Chinthammit (UTAS)
- Duh (UTAS)
- Swait (UniSA)
- Tamplin (UTAS)
- Turner (UTAS)

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**5-year timeline**
‘Clean-Green-Safe’

- Important *brand*
- Eco-tourism
- Food tourism
- Market niche
Research Supply Chains
Beef Supply Chain

Cape Grim Beef
Tasmania
capegrimbeef.com.au

Pure Beef
Made by Nature
Beef Supply Chain Objectives

Present a data-rich story to customers about the product, its provenance, sustainability, safety and quality.

**Desired outcomes**

- Increase $ per kg
- Value land stewardship ("Natural Capital Accounting")
- Enhance quality and productivity
- Increase ‘valued’ cooperation in supply chain
- Drive market access
- Demonstrate innovation
Key Elements of an Extended Australian Premium Beef Supply Chain

- National Livestock Identification System (NLIS)
- Breed Variety development
- Growing (e.g. LPA)
- Fattening
- Transport (e.g. TruckCare)
- Primary processing (e.g. AQIS)
- Consumption (end-users)
- Marketing & distribution
- Secondary processing (e.g. AusQual)
- Transport
- Raw meat & by-products

Traceability within and between parts of the supply chain
Natural Capital Accounting: objectives

• Determine the effect of natural capital on farm productivity.

• Develop the framework, methods and models to evaluate the dynamics of natural capital in farm production.

• Quantify the rate of change in natural capital (how sustainable natural capital assets are used in farm production over time).
On-farm data

Farms

- soil-water quality
- weather
- grass growth
- animal weight
- animal breed
Beef quality models to measure supply chain performance

![Diagram showing temperature and log total viable count over time.](image)

- Packed, chilled storage at processors
- Load-out
- Cold storage
- Unloaded at retail

Temperature (C) vs. Time (hours) vs. Log (total viable count)
Smart-Trace Container Network
- Self organizing, self healing
- Star and Mesh topologies
- 900MHz ISM band spread spectrum
- Close metal barrier tuned antennas
- Using Iridium
- Fully self-sufficient, independent
Consumer Choice: objectives

Determine factors that influence how consumers make choices about beef purchases.
Consumer Choice Dashboard
Consumer visualisation: objectives

• Design consumer-engaging experience for premium beef buyers using a mobile application

• Test and evaluate the effectiveness of the mobile application on its functionalities and consumer perceptual values
Value chain analysis and enhancement

• What farmer characteristics predict high levels of downstream cooperation?
• How do farmers use and value quality information within the chain?
• How do different value chain participants contribute and capture value?
• To what extent do the proposed ‘enhancements’ improve the performance of the chain as a whole?
Producer – Processor Interface
Producer – Processor Interface

and charts of Average Weight, Average Price, MSA compliance and Average MSA Index.
Future Supply Chain Manager Modules

- Animal management
- Environmental monitoring
- Food stability
- Consumer-facing elements
Gracias!