REGIONAL UNIVERSITIES NETWORK

Santiago, Chile March 2024

CQUNIVERSITY AUSTRALIA

CQUniversity AUSTRALIA

RESEARCH WITH IMPACT

CRICOS: 00219C | TEQSA: PRV12073 | RTO: 40939

30 YEARS
as a university and 50+ years providing higher education

30 000+ STUDENTS
We're dedicated to growing our diverse student community

200+ COURSES
from certificate to PHD level

AUSTRALIA'S MOST INCLUSIVE
and engaged university

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CQUniversity's Pillars

PEOPLE	PLANET	PARTNERSHIPS
We recognise that we need to create transformative life opportunities through fostering the talents and enhancing the potential of our students, staff, alumni, and communities.	We recognise that we need to contribute positively to our world by embedding sustainability, enhancing our digital and physical campus footprint, and driving research and innovation to address the challenges of our time.	We recognise that we need to actively connect and collaborate to share knowledge and ideas that drive impact with mutual and wider benefit from our regions to the world.
Students **Staff** **Society**	**Sustainability** **Place and Presence** **Research**	**First Nations Commitment** **Strategic Partnerships** **Regional Commitment** **Global Reach**

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UN Sustainable Development Goals

3 GOOD HEALTH AND WELL-BEING	90th	10 REDUCED INEQUALITIES	57th	16 PEACE, JUSTICE AND STRONG INSTITUTIONS	101-200
4 QUALITY EDUCATION	=79th	12 RESPONSIBLE CONSUMPTION AND PRODUCTION	101-200	17 PARTNERSHIPS FOR THE GOALS	64th
5 GENDER EQUALITY	12th	14 LIFE BELOW WATER	14th	SUSTAINABLE DEVELOPMENT GOALS	=74th
8 DECENT WORK AND ECONOMIC GROWTH	101-200	15 LIFE ON LAND	101-200	7 AFFORDABLE AND CLEAN ENERGY	13 CLIMATE ACTION

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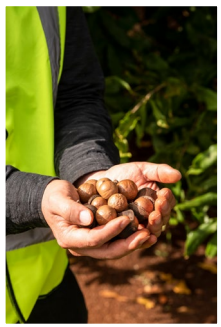
Bundaberg

- Bundaberg Rum
- Queensland's 'Food Bowl': Avocado, Tomatoes, Macadamia, Citrus, Sweet Potatoes, Chillis, Sugarcane, … Brussel Sprouts!
  - •Hinkler Ag-Tech Precinct
  - •Mon Repos Turtle Sanctuary



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Gladstone

- Southern Great Barrier Reef
- Gladstone Ports:
  - World's fourth largest coal export terminal
  - Queensland's largest multi-commodity port

Shell ORICA Boyne Smelters nrg

CEMENT AUSTRALIA RIO TINTO ConocoPhillips Santos

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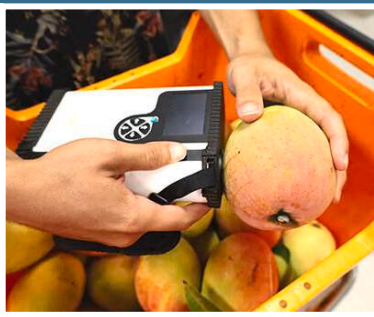
Rockhampton

- Tropic of Capricorn
- 'Beef Capital' of Australia
- Stanwell Power Station
- Coal Mines to the West
- Australia's largest catchment flowing into GBR – the Fitzroy River
- Agriculture – Mango, Pineapple, Sesame







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Research Priorities

Key Research Theme Areas:

- Sustainable Agriculture and Agricultural Technologies
- Environmental Management
- Supply Chains and Regional Workforce Development
- Community Health, Wellbeing and Social Licence
- Green Hydrogen & Renewable Energies

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Institute for Future Farming Systems

MINIMISING CALF LOSS IN NORTHERN BEEF HERDS

How technology can help to better understand the causes of calf mortality

The CalfAlive project is using precision livestock sensors to monitor cows before and after calving to help understand how behaviour impacts calf survival in northern Australia.

GPS devices inserted into collars that can be worn by cattle are being used to track distance travelled, while accelerometer sensors are being used to measure activity levels and thermometers to detect heat stress.

The on-animal sensors have been deployed on animals at 12 different properties across Northern Australia.

The information gathered from these devices will allow researchers to understand how environmental factors like shade, wild dogs and water availability impact cow behaviour and in turn what that means for calf survival.

Figure 1: CQUniversity Researcher Thomas Williams will be investigating how technology can help to improve calf survival in northern Australian beef herds.

This research is part of a wider collaboration between University of Queensland, Queensland Alliance for Agriculture and Food Innovation, Northern Territory Department of Industry, Tourism and Trade, Queensland Department of Agriculture and Fisheries and more than a dozen producer partners across Nothern Australia.

The CalfAlive partners are investigating the impacts of a range of other factors, such as maternal nutrition, environmental extremes, and cow-calf behaviours have on calf survival in Australia's nothern beef herds.

Significance to industry

Calf loss costs the northern Australian beef industry more than $53 million a year.

Reducing calf loss is therefore an essential step in improving animal wellbeing and achieving long-term sustainability for northern breeding businesses.

Technology overcomes the tyranny of distance

Most cattle breeding properties in northern Australia are in remote locations and cover large areas, limiting the interaction between animals and humans. This makes it difficult for producers to closely monitor their animals at critical times, like calving.

Remote and on-animal sensors offer researchers and producers the opportunity to monitor the behaviour of animals,

THERE'S SOMETHING IN THE WATER: MINIMIZING METHANE IN NORTHERN BEEF HERDS

How soluble compounds can help cattle cut back on belching

The 'Water-Based Livestock Methane Mitigation' project will examine a range of methane-reducing compounds determine if they can be safely and effectively be delivered to cattle via automated water systems to decrease enteric methane emissions.

The compounds will be delivered in the same way as fluoride is added to human drinking water or as additives are mixed in fuel for engine efficiency – measured doses dissolved in the water supply via automated technology.

Led by CQUniversity Australia in partnership with DIT AgTech, the Queensland Government and Meat and Livestock Australia, the three-year project will begin with lab trials of both proven and novel methane-reducing compounds to determine which are most soluble and stable in water using in vitro systems.

The next stage will investigate if these are palatable to the animals and if they cause any adverse impact to production. Stage three will examine the optimal dose rate, and in the fourth and final stage, large-scale field trials will be conducted to evaluate and demonstrate how the method can be established within commercial extensive grazing systems such as those in northern Australia.

Figure 1: CQUniversity Senior Researcher Diogo Costa and DIT AgTech CEO Mark Peart discuss how direct water injection technology is installed in troughs.

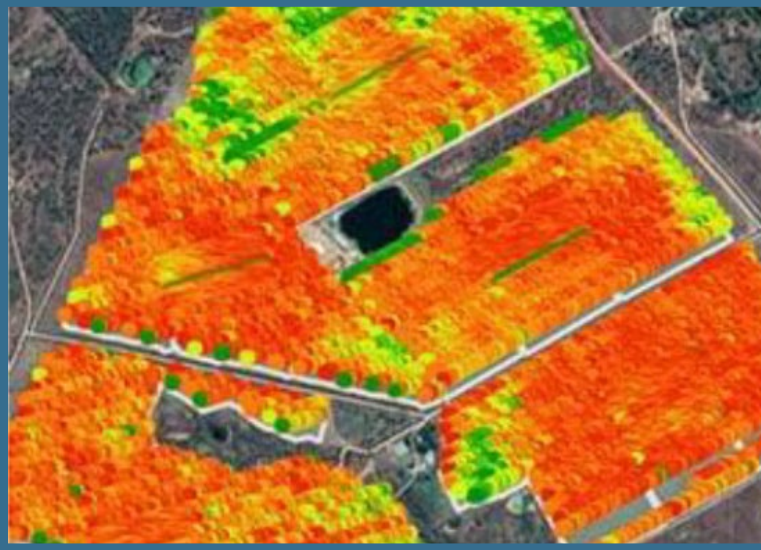
Significance to industry

Methane emissions from livestock account for about 70% of the greenhouse gas emissions in Australia's agriculture sector.

Under its 'CN30' plan, Australia's red meat industry has set a target of carbon neutrality or zero net emissions by 2030. By reducing methane from livestock through water-based supplementation, northern Australia's beef producers can be part of the climate solution.

Technology for the extensive operations of northern Australia

A range of feed additives and supplements have been proven to suppress methane emissions in livestock, but the majority are suitable only for intensive production systems like feedlotting and dairy systems, where controlled



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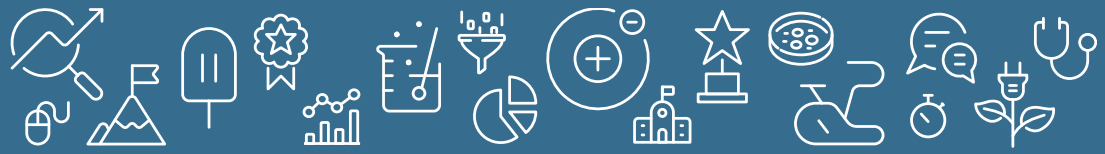
Centre for Hydrogen and Renewable Energy

Centre for Railway Engineering

CQ-H2



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2024 International Research Opportunities

- Cotutelle PhD program
- Offshore Phd, Masters
- Onshore Phd, Masters
- PhD Industry
- Researcher Exchange
- Research Collaboration
- CIRCAS Program

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Thankyou

Gracias!

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