final report

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Prepared by: E Charmley

CSIRO Livestock Industries

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Meat & Livestock Australia Limited
Locked Bag 991
NORTH SYDNEY NSW 2059

Demonstration projects for on-farm practical methane management strategies: Lansdown

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Abstract

There has been considerable investment in research to mitigate methane emissions from livestock, but directed at incremental increases in productivity and adoption has been market-driven. Practical, cost-effective technologies or practices that give a reduction in emissions while maintaining productivity are required for the northern beef industry to remain viable.

Methane (CH_4) emissions associated with beef production systems in northern Australia are yet to be quantified. Livestock production systems are highly variable due to seasonality of pasture production and quality and the most effective abatement measures will be unique to each production system and between seasons. Methodologies are available to measure individual emissions, but application in extensive grazing environments is challenging. Commercial development and adoption on-farm will require regional sites for validation and practical demonstration. A range of demonstration sites have been established to promote industry acceptance and adoption of methane measurement and mitigation practices.

Lansdown Research Station is located approximately 45 km south of Townsville in the Burdekin Catchment. The site is 638 ha of native and improved pastures and has been chosen as a demonstration site to facilitate industry adoption of practices and technologies resulting in methane mitigation and improved on-farm measurement methodologies relevant to northern Australia.

Executive Summary

There has been considerable investment nationally and internationally in research to reduce methane emissions from livestock. Until recently this has largely been directed at incremental increases in productivity, recognising that methane essentially represents energy lost from ruminant animals, and adoption has been market-driven. However, there has been no significant mitigation options identified and there are currently no practical, cost-effective technologies or practices that give a substantial reduction in emissions while maintaining productivity. Livestock production systems in Australia are highly variable and the most effective abatement measures will be unique for different production systems. Commercial development and adoption on-farm will require regional sites for validation and practical demonstration and a range of demonstration sites have been established across Australia as part of Theme 6 *Farming Systems Research* to ensure commercial applications and to promote farmer acceptance and adoption. Lansdown Research Station is located approximately 45 km south of Townsville in the Burdekin Catchment. The site is 638 ha of native and improved pastures. The site has now been under the management of CSIRO Livestock Industries for almost two years. Field days and forums hosted at Lansdown include the Northern Australian Beef Research Council, an inaugural field day attracting about 120 visitors and the Strategic Agriculture Flagship leadership team. Activities at the site have generated 14 press releases, 20 television and radio features and 24 internet headlines.

Currently a number of methodologies are available to measure livestock Greenhouse Gas (GHG) emissions; respiration chambers, SF_6 (sulphur hexafluoride) tracer technique, or have been suggested; blood methane concentration, whole body thermography, but these are difficult to use other than at an individual animal level. Northern subtropical and tropical regions account for 54.5% of the national beef cattle herd. The smallest unit of measure to characterise livestock GHG emissions across land and pasture types, bio-agronomic regions and or seasons may be at the herd scale. On farm methodologies are required to generate reliable baseline emission data and to assess the effect of mitigation activities at the herd scale. Suitable methods for measuring emissions for the northern beef herd are yet to be fully validated and communicated to the industry, yet measurement is a critical component for mitigation and a carbon farming framework. This project was conducted to demonstrate and communicate research activities and results to the northern beef industry.

Contents

1. Background

The rangelands of northern Australia encompass vast and diverse grazing environments. No single property can encompass the variability in land type, seasonality and production system. Lansdown Research Station is located approximately 45 km south of Townsville in the Burdekin Catchment. The site is 638 ha of native and improved pastures. Average annual rainfall (1975-2008) is 809 mm. Soils are predominantly alluvial over grey clays. The property has principally been used to conduct conventional animal production/tropical pastures research and has been chosen because of its proximity to a large number of Queensland commercial cattle producers and road and air links. Because of its modest size it is well suited to demonstration of measurable impacts of various mitigation strategies. The site is the base for a range of ruminant methane research including measurement techniques, mitigation strategies, and state of the art monitoring systems.

Methane from farmed livestock accounts for ~10.7 % (CO_2-e) of Australia's total Greenhouse Gas (GHG) emissions (AGEIS, 2008) of which almost 95% originate from enteric sources. Factors affecting CH_4 production are poorly understood for Australia's northern beef production systems (Charmley *et al.,* 2008). This reflects not only the limited number of studies conducted on enteric CH_4 emissions from cattle fed tropical forages (McCrabb and Hunter, 1999; Tomkins *et al.,* 2011), but also the adoption of industry to measure or estimate GHG emissions.

The Reducing Emissions from Livestock Research Programme aims, through an integrated Research, Development and Demonstration programme, to achieve the Australia's Farming Future outcome: Primary producers are equipped with the knowledge, tools and strategies to manage their emissions including the ability to respond to the commercial imperatives arising from emissions trading. In order for the Programme to show that research outcomes can be developed for commercial applications, and to promote uptake by the industry, demonstration sites have been established to engage with livestock producers and ensure that the research is directed to practical on-farm practices and measures. The Programme has been based on existing and pipeline projects and capturing collaborative activities with industry groups, state agencies, local farmer or other RELRP projects to identify and promote pathways of impact from research outcomes and technology development towards commercial applications. These activities are aimed to promote a consistent message on methane mitigation, measurement and evaluation for adoption by the industry.

The principal objectives of the Lansdown component of the project were to demonstrate on farm measurement and mitigation practices relevant to the northern beef industry, facilitate

engagement with producers at the site in extension activities related to methane abatement strategies, facilitate awareness and information delivery related to emissions abatement outputs from the *RELRP,* and the outputs of other programmes within the Australia's Farming Future Climate Change Research Programme

2. Project Objectives

This project was principally intended to support the transition of outcomes of the applied research and development activities in the *Reducing Emissions from Livestock Research Programme* through to demonstration of practical commercial measurement and mitigation technologies.

To achieve this objective a series of activities were conducted on Lansdown Research Station showcasing research activities directly related to livestock GHG emissions.

Milestone 9 criteria were to report on:

- Number of Field days, Advisor and Farmer Forums and evaluation from participants
- Information session held for DAFF CCRP staff at a demonstration site
- Plan for continued support of adoption of new technologies and practices from RELRP
- Financial report on expenditure for the period

Lansdown Research Station – Demonstration farm sign

3. Field days, Advisor and Farmer Forums and evaluation from participants

A number of field days and forums were conducted in 2011-12.

- 14 January 2011. Tom Davidson visits site inspecting facilities and pastures

- 15 March 2011. Northern Australian Beef Research Council visit, inspection of Lansdown and CSIRO staff/NABRC evening BBQ.

- 27 May. A field day was conducted on the site which attracted about 120 visitors from CSIRO (Local and Brisbane sites), James Cook University, Industry and state agencies. The day show cased ongoing work and site development including open-circuit respiration chambers, poly tunnel for field measurements, Open-path and FTIR laser technologies for measuring green house gas emissions on farm and wireless sensor networks for extensive animal monitoring. Considerable print media attention was generated by the event. In addition the Field Day featured heavily in an ABC Landline show on 12 June 2011 www.**abc**.net.au/**landline**/content/2010/s3241932.htm. Footage was also taken for MLA Feedback TV. Radio interviews were also given to local and national radio. Evaluation forms were distributed during the day and although few were returned (<20%) the general response was positive and indicated that future events would be welcome.

- 22-24 August. CSIRO Leadership team meeting from the Strategic Agriculture Flagship (SAF) included a visit to Lansdown. The intent of the meeting was to engage in SAF relevant science dialogue through Lansdown site visit and science talk/s to identify livestock, coastal cropping, tropical soils and irrigation research opportunities for the site. The SAF leadership team, including the Director, Deputy Directors, Communication, Finance and project Support Managers, and Programme Leaders inspected facilities and were briefed by staff on research activities being conducted on site.

- 2 May 2012. Primary Industries Adaptation Research Network Master Class will visit the site and hold a one day workshop and tour. This is being facilitated by DAFF. This group represents key stakeholders from across the country including representation from academia, industry, agribusiness and research. The workshop will include a presentation from Ed Charmley about the mitigation research conducted at Lansdown and the tour will showcase the research in action.

- Key visitors to Lansdown in 2012 have included.
    - Dr Martin Cole, Chief Food and Nutritional Sciences CSIRO
    - Mr Andrew Bubb, Manager Monitoring and Evaluation. Ninti One Ltd. NT.

3. Information session held for DAFF CCRP staff

Although explicit meetings with DAFF CCRP staff were not conducted on Lansdown during the life of this project all events conducted during 2011 included DAFF CCRP staff.

Presentation of research findings to NABRC March 2011 by Dr Carlos Ramirez in animal house facilities, Lansdown Research Station

4. Plan for continued support of adoption of new technologies and practices from RELRP

Continued support for existing and new projects is planned for 2012/13 and beyond including RELRP activities, Sustainable Agriculture flagship cluster and externally funded projects.

The recently signed CSIRO Flagship Collaboration Fund Cluster is a $7 million project over 3 years led by the University of Melbourne and includes collaboration from University of New England, University of Western Australia, University of Wollongong, RMIT, University of Alberta and Agriculture and AgriFood Canada, AgResearch New Zealand and CSIRO. A significant proportion of this work will be conducted at the Lansdown research Station and will build on the demonstration theme established under the current project.

A total of four projects were submitted to DAFF under the Carbon Farming Initiative “Filling the Research Gap” project. One of these has received MLA support. Total funding sought is in the vicinity of $4 million. One of these projects is aimed directly at continuing the demonstration capability of Lansdown through the establishment of a total Carbon balance monitoring programme using wireless technologies.

Funding was secured from QLD Smart State programme to develop Lansdown as a ‘Digital Homestead’ (2012 to 2014). The project will develop applications and demonstrate the benefits from sensors and information technologies for farms having access to the NBN. This project complements existing wireless sensor network capability by adding more sensors and taking advantage of connectivity across rural communities.

There is also ongoing development of the wireless sensor network at Lansdown with new vegetation sensors and cattle monitoring devices planned for the next 2 years. User friendly interfaces are being developed for remote monitoring of the property with wider access to the information.

Continued support for ongoing projects include;

- The evaluation of limits to scanning open-path laser and FTIR technologies for improved design of grazing research protocols relevant to quantifying GHG emissions from livestock
- The development and application of an open-path laser methodology to measure CH_4 emissions from animals given access to supplement blocks. This project will also use existing EID technology to gauge source strength (animal number) and access to supplement blocks.

- The extension to this demonstration project B CCH 1037 “Managing carbon in livestock systems: modelling options for net carbon balance” has supported the further development of an animal based modelling framework to estimate spatially explicit methane emissions from cattle in northern Australia. It has also provided datasets to Hutton Oddy’s synthesis project to compare the different tools across diverse production systems and environments in Australia. Meetings have also been held with Ian Johnson (IMJ Consultants) to determine the possibility of a synthesis project linking our northern work with his southern “sustainable grazing Systems” model.
- The direct comparison between open-circuit respiration chambers and existing micrometeorological methods for increasing the confidence in field based measurements. This work will include developing interconnectivity between representative samples of animals in a herd carrying intra-ruminal boluses and interfaced with the LI-COR wavelength modulation spectroscopy (WMS) system. This would allow the first real-time measurement of free ranging beef cattle in northern Australian conditions.
- The development of new measurement strategies for GHG emissions using eddy covariance methods in association with LI-COR WMS system and cavity ring-down spectroscopy (CRDS) techniques under field conditions.
- The direct comparison between open-circuit respiration chambers and a novel technique based on a blood assay for individual animal methane concentrations. This work is also planned to include an open-path laser methodology to measure CH_4 emissions at a herd scale.
- This project purchased a field-scale methane chamber which comprises of a polythene tunnel that allows for total methane balance across small numbers of grazing ruminants. This was demonstrated at several Lansdown events and has now been set up in Western Australia where it is engaged on the Ridgefield Property of UWA and is involved in that property’s demonstration remit.
- May 2013. School student visit. This will be the first of what we plan to build into a biennial event to demonstrate sustainable cattle production and farming practices to young Australians. Negotiations are in place with AgForce Queensland to bring this initiative under their outreach programme.

Polyethylene tunnel installed at Ridgefield Research Farm WA

Measuring methane emissions from sheep using a polyethylene tunnel

5. Appendices

5.1 Financial report

Available April 2012 to include all expenses for March 2012.

5.2 Summary report, Feedback/Frontier article, Web Abstract, draft and published scientific papers

Summary Report

Methane (CH_4) emissions from cattle grazing pastures characteristic of northern Australia are yet to be reliably quantified. Poor quality pastures, marked seasonal rainfall and low animal productivity are characteristic of northern Australia. There are no suitable methods for measuring emissions for the northern beef herd, yet measurement is a critical component in mitigation and a carbon farming framework. A number of methodologies measure individual emissions, however the smallest unit of measure to characterise livestock greenhouse gas emissions for northern Australia may be at the herd scale.

Commercial development and adoption on-farm will require regional sites for validation and practical demonstration. A range of demonstration sites have been established as part of Theme 6 *Farming Systems Research* to promote commercial application and industry acceptance and adoption.

Methodologies are available to measure individual emissions, but application in extensive grazing environments is challenging. Lansdown Research Station is located approximately 45 km south of Townsville in the Burdekin Catchment. The site is 638 ha of native and improved pastures and has been chosen as a demonstration site to facilitate industry adoption of practices and technologies in methane mitigation and improved on-farm measurement methodologies relevant to the northern beef herd.

Feedback/Frontier articles/general media coverage

- Feedback TV Episode 15 October 2011. Cutting emissions: boosting production

●Newspaper	Distribution	Date	Reporter	Headline (print)
Courier Mail	Brisbane	27-May	Peter Michael	Excuse us! Science gives bum steer on gassy cows
Townsville Bulletin	Townsville	30-May	John Anderson	Burping Brahmans backfire on boffins
Queensland Country Life	QLD	2-Jun	Julian Luke	Methane predictions fall
Queensland Country Life	QLD	2-Jun	Julian Luke	Top field day at Townsville
North Queensland Register	North QLD	2-Jun	Julian Luke	Environmental win-win possible
The Land	NSW	2-Jun		Methane emissions down
Farm Weekly	WA	30-Jun		Zeroing in on livestock methane emissions
The Land	NSW	30-Jun		Zeroing in on livestock methane emissions
Stock & Land	Vic	30-Jun		Zeroing in on livestock methane emissions
Stock Journal	SA	30-Jun		Zeroing in on livestock methane emissions
Queensland Country Life	QLD	30-Jun		Zeroing in on livestock methane emissions
North Queensland Register	North QLD	30-Jun		Zeroing in on livestock methane emissions
Countryman	Perth	7-Jul		Methane figures don't add up: research
Farm Weekly	WA	14-Jul		CSIRO discovers there's more moo than phew

●TV Channel	Programme	Region	Date	Interviewees
Seven	Seven Local News	Townsville	27-May	Ed Charmley and Sandra Eady
Seven	Seven Local News	Rockhampton	27-May	Ed Charmley and Sandra Eady
TV NZ	World News	NZ	27-May	
SBS	World News Australia	Australia	28-May	
Seven	Seven Local News	Bundaberg	30-May	Ed Charmley and Sandra Eady
Seven	Seven Local News	Cairns	30-May	Ed Charmley and Sandra Eady
Seven	Seven News Mackay	Mackay	30-May	Ed Charmley and Sandra Eady
ABC	Landline	Australia	12-Jun	Ed Charmley, Sandra Eady (footage of Nigel Tomkins speaking)

●Radio Channel	Programme	Region	Date	Interviewee(s)	Headline/Online access
ABC North Queensland	12:30 News	Townsville	27-May	Ed Charmley, CSIRO	
ABC Southern Queensland	Qld Country Hour	Toowoomba	27-May	Ed Charmley, CSIRO	Qld Country Hour podcast 27/5/11
ABC Radio National	The World Today	Australia	27-May	Ed Charmley, CSIRO; Tom Davidson, MLA	Scientists correct cattle methane emission figures
ABC North Queensland	Drive	Townsville	27-May	Ed Charmley, CSIRO	
ABC Far North	Drive	Cairns	27-May	Ed Charmley, CSIRO	
4BC	Drive	Brisbane	27-May		
Radio New Zealand	Midday Rural News	New Zealand	30-May	Ed Charmley, CSIRO	Podcast: News from the rural and farming sectors
ABC South Coast WA	06:30 News	Albany	31-May		
ABC Riverland SA	07:30 News	Renmark	31-May		
ABC 774	07:45 News	Melbourne	31-May		
ABC Darwin	09:00 News	Darwin	31-May		
ABC Tropical North	12:30 News	Mackay	31-May		

●Internet Websites	Date	Country	Headline/Link
North Queensland Register	27-May	Australia	Northern beef herd sheds new light on methane
Yahoo! 7 News	27-May	Australia	Lasers measure cows' methane emissions
Reuters	27-May	International	Australia's burping cows more climate friendly than thought
Vision, News from Reuters	27-May	International	Australia's burping cows more climate friendly than thought
The Conversation	27-May	Australia	Get a whiff of this: northern cows emit less methane than first thought
The BeefSite	27-May	International	Research sheds new light on methane emissions
Sun 2 Surf	27-May	Malaysia	Aussie cows more climate friendly than thought
The Malaysian Insider	27-May	Malaysia	Australia's burping cows more climate friendly than thought
PhysOrg.com	27-May	Australia	Research sheds new light on methane emissions from the northern beef herd
Science 2.0	27-May	International	Sorry vegetarians, cow burps are not causing (as much) global warming
EcoDiario.es	27-May	Spain	El ganado australiano emite menos metano de lo pensado
Daily Mirror	28-May	UK	Burping cows more climate friendly than thought
Gulf Times	28-May	Qatar	Burping cows more climate friendly than thought, says study
Free Republic	28-May	International	Australia's burping cows more climate friendly than thought
Alwatan Daily	29-May	Kuwait	Australia's burping cows more climate friendly than thought
Manila Bulletin Publishing Corporation	30-May	Philippines	Australia's burping cows more climate friendly than thought
Industry Search	30-May	Australia & NZ	Research sheds light on methane emissions from cattle
Planet Ark	30-May	International	Australia's burping cows more climate friendly than thought
Enterprise Post News	30-May	International	Belching cows less harmful to climate: Study
Red Orbit	30-May	International	Belching cows less harmful to climate than thought
Yid with Lid	1-Jun	Blog	Good news! Cow flatulence can be made non-toxic to environment
The US Daily	5-Jun	USA	Australia's burping cows more climate friendly than thought
Primicias Rurales	5-Jun	Argentina	El ganado australiano emite menos metano de lo pensado
Farm Weekly	19-Jun	Australia	Less hot air in northern herd

MEDIA MONITORS


LIVESTOCK
'Poitrel' cross prospers
50 YEARS

The Land
02/06/2011
Page: 75
Section: General News
Region: Sydney Circulation: 48126
Type: Rural
Size: 27.00 sq.cms
Frequency: ---T---

Methane emissions down: New CSIRO research indicates the amount of methane emitted from cattle fed on tropical grasses in northern Australia is up to 30 per cent less than figures now used to calculate the northern cattle industry's contribution to Australia's greenhouse gas accounts

Speaking at a field day near Townsville, Queensland, CSIRO research leader, Ed Charmley, said the findings would help to refine the nation's greenhouse gas accounting.

The northern cattle industry is now calculated to contribute about 4.5pc of national greenhouse gas emissions.

Farm Weekly
14/07/2011
Page: 70
Section: General News
Region: Perth Circulation: 13447
Type: Rural
Size: 196.00 sq.cms
Frequency: ---T---

CSIRO discovers there's more moo than phew

NEW CSIRO research indicates the amount of methane emitted from cattle fed on tropical grasses in northern Australia is up to 30 per cent less than figures currently used to calculate the northern cattle industry's contribution to Australia's greenhouse gas accounts.

Speaking at the Lansdown field day near Townsville, Queensland, CSIRO research leader Dr Ed Charmley said the findings would help to refine the nation's greenhouse gas accounting.

"Measurements from cattle in CSIRO's custom-built respiration chambers show that Brahman cattle fed a wide range of tropical grasses emit up to 30pc less methane than previously determined," Dr Charmley said.

"While you always have to be cautious in extending lab data to the field and across an industry, we have been able to cross-check our findings with methane detecting laser systems used in the field.

"These findings, while not changing the actual emissions, could have significant implications for calculating the emission footprint of the northern cattle industry and also for Australia's greenhouse gas accounts.

❒ Beef cattle emit around 200 grams of methane a day, or about 1.5 tonnes of CO_2 equivalents a year, as a by-product of digesting plant material.

"Methods used to determine these national greenhouse gas accounts are regularly reviewed and if the new data is confirmed via this review process, future accounts will be adjusted to reflect the lower emissions for the northern beef herd."

With about half of the nation's beef herd located in northern Australia, current greenhouse gas accounts indicate that methane from the northern cattle industry contributes about 4.5pc of Australia's greenhouse gas emissions.

As a by-product of digesting plants, ruminant livestock such as sheep and cattle produce methane and of those, beef cattle produce the most, about 200 grams a day, or about 1.5 tonnes of CO_2 equivalents an animal every year.

"CSIRO research also shows that northern cattle fed on a diet of predominantly Leucaena, a legume tree, emit less methane than cattle grazing on tropical grasses," Dr Charmley said.

"What this nutrition research is showing is that there can be win-win scenarios for the industry and the environment if we can redirect the breakdown of plant material in a way that reduces the amount of methane produced while improving the amount of energy or weight gain that animals get from their feed.

"We are addressing cattle methane emissions from several angles by examining the gut microbes that produce methane from ingested pasture and alternative diets, to a landscape focus on northern Australia's extensive grazing systems using technologies such as lasers and wireless sensor networks, to measure and model cattle methane emissions under tropical conditions."

MEDIA MONITORS

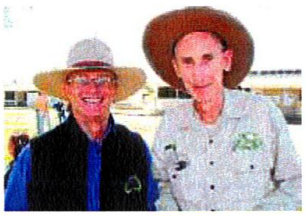
Queensland Country Life
02/06/2011
Page: 105
Section: Town and Country - Central and North
Region: Brisbane Circulation: 32940
Type: Rural
Size: 169.00 sq.cms
Frequency: ---T---

Top field day at Townsville

ABOUT 120 producers, industry, government and members of the general public descended upon CSIRO's Lansdown Research Station near Townsville last Friday for a field day.

There were field displays and a number of guest speakers discussing the latest research the station is undertaking.

Queensland Country Life **attended the day.** – Pictures: JULIAN LUKE.



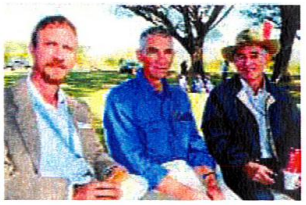
Geoffry Fordyce, University of Queensland St Lucia, with Alf Collins Collins Belah Valley, Marlborough.

Mandy Flintham, Mei Bail and Ombeline Chapolard, CSIRO, with Travis Naylor, University of Wollongong.

Bob Shepherd, DEEDI, Charters Towers, Mark Stoneman, NQ Dry Tropics, Bill Holmes, DEEDI, Townsville, and Scott Crawford, NQ Dry Tropics.

Justin Little, Christine Hall, Chris Gardiner and Jos Vermunt, James Cook University, Townsville.

Michael and Sharryl Whiting, Townsville, with Jenny Stanford, DEEDI, Townsville.



Nigel Tomkins, CSIRO, Lansdown Research Station, Doug Pollock, Coopers Animal Health, Townsville, and David Coates. CSIRO. Townsville.

MEDIA MONITORS

Courier Mail
27/05/2011
Page: 12
By: Peter Michael
Section: General News
Region: Brisbane Circulation: 201687
Type: Capital City Daily
Size: 297.00 sq.cms
Frequency: MTWTFS-

Excuse us! Science gives bum steer on gassy cows

Peter Michael
NORTH QUEENSLAND CORRESPONDENT

BEEF cattle have been getting the bum steer over methane emissions and global warming, research shows.

A study of northern Australia's beef cattle herd found it produces one-third less methane – through burping and passing wind – than previously calculated on the nation's greenhouse gas accounts.

Northern Australia, which has about half of the nation's beef herd, had previously been linked to 4.5 per cent of Australia's greenhouse gas emissions. The new findings suggest the real figure is around 3 per cent.

In the latest hiccup in the cow burp blame game, CSIRO scientists tested livestock in high-tech chambers, collecting the equivalent of a 44-gallon drum of methane emissions per beast every day. That equates to the same annual greenhouse impact as a family car.

As gas emissions go, they're silent but deadly.

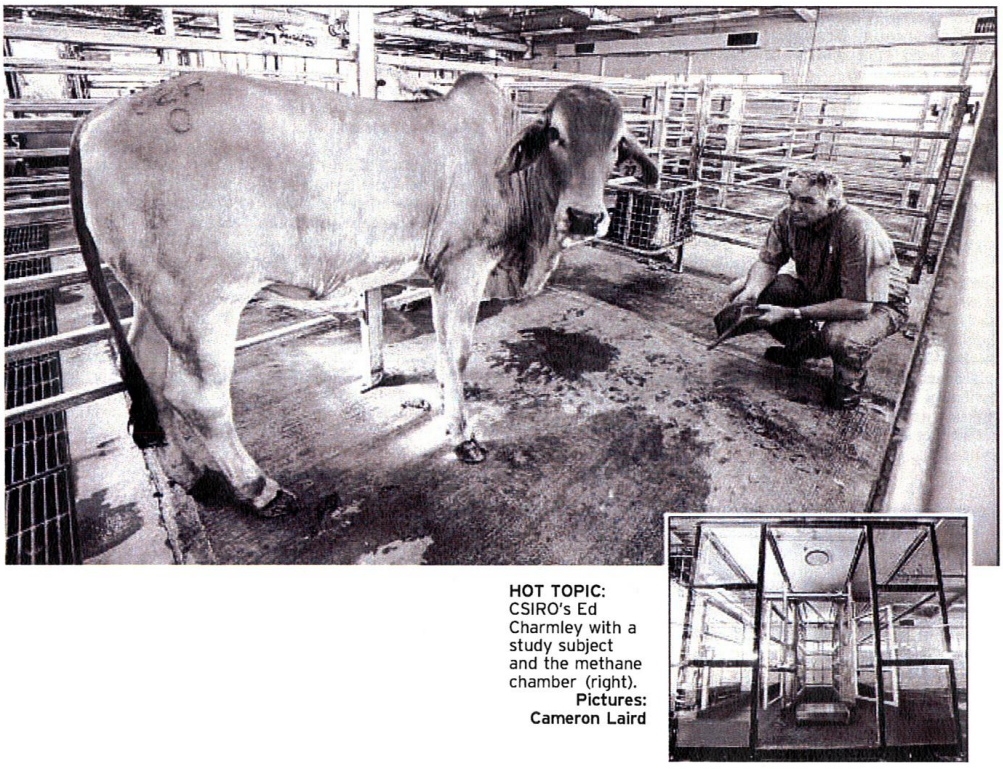
"It (cattle) is such a huge, billion-dollar industry in northern Australia," CSIRO research leader Ed Charmley said. "The fact we can demonstrate emissions are lower will reduce the nation's overall footprint."

He also said any successful attempts to cut emissions from cattle could yield a profitable spin-off for graziers.

"If we can reduce methane then potentially a producer can use that as an offset under a carbon farming initiative scheme," Dr Charmley said.

"If a grazier reduces their footprint by 10 per cent that is carbon that can be sold into a voluntarily market."

CSIRO's Lansdown Research Station, outside Townsville, has been using respiration chambers, infra-red laser beams and wireless sensor networks as part of the five-year project to reduce methane emissions on farms.



HOT TOPIC: CSIRO's Ed Charmley with a study subject and the methane chamber (right). Pictures: Cameron Laird


Methane predictions fall

Queensland Country Life
02-Jun-2011
Page: 15
General News
By: Julian Luke
Market: Brisbane
Circulation: 32940
Type: Rural
Size: 499.00 sq.cms
Frequency: ---T---

ducers, industry and government representatives, and members of the public, attended the field day.

Included was Alf Collins, a grazier based at Collins Belah Valley, Marlborough. Mr Collins has collaborated with CSIRO on a number of different projects in previous years, and said it was great the Lansdown Research Station had opened its doors to the public.

Mr Collins said while the research was essential, it needed to translate back to tools producers could use to reduce methane emissions.

"Research that doesn't have net gain is of no interest to us. Good on-farm management will probably reflect a lot of what we heard today," he said.

Mr Collins said analysis and productivity were key for producers.

"We've got probably the most thoroughly analysed Brahman herd in the world because we're really fair dinkum about analysis and productivity," he said.

The field day also covered the potential benefits of carbon sequestration, which NQ Dry Tropics chief executive officer Scott Crawford told *Queensland Country Life* was of particular interest to his natural resource management organisation.

"Carbon is on everybody's mind at the moment and there is a lot of interest about potential carbon sequestration in the rangelands and the dry tropics, and this is a really good way of getting a bit of good background information on it," he said.

"There are actually carbon benefits from a grazier improving land condition on their property."

The objective is to reduce our emissions as much as possible through our research.

CSIRO Livestock Industries Lansdown Research Station research leader Dr Ed Charmley with Livestock Industries chief, Professor Alan Bell.

MEDIA MONITORS

Townsville Bulletin
30/05/2011
Page: 6
By: John Anderson
Section: General News
Region: Townsville QLD Circulation: 26563
Type: Regional
Size: 344.00 sq.cms
Frequency: MTWTFS-

Burping Brahmans backfire on boffins

by John Andersen

john.andersen@townsvillebulletin.com.au

NEW scientific research has found North Australia's 16 million-strong Brahman cattle herd "not guilty" of excessive burping.

In what is being hailed as a major breakthrough, the research found that the North's herd puts 30 per cent less methane into the atmosphere than previously thought.

North Australian cattle, instead of standing around embarrassed with hooves over their mouths mooing "excuse me", should be asking the scientific community how come they've been given such a bad rap for so long.

If cows could talk, they'd probably ask the boffins to "please explain".

The fact they burp 30 per cent less than previously thought is good news for the cows, but even better for producers who were being portrayed as merchants of doom as far as global warming was concerned.

At a field day near Townsville last week, CSIRO scientist Dr Ed Charmley said that methane was about 23 times more effective at increasing global warming than carbon dioxide.

He said that the new research indicated that the amount of methane from cattle fed on tropical grasses in northern Australia was up to 30 per cent less than previously thought.

Dr Charmley said the finding would help to refine the nation's greenhouse gas accounting, which in the past had pointed a heavy finger blame at the northern herd.

"These findings, while not changing the actual emissions, could have significant implications for calculating the emission footprint of the northern cattle industry and also for Australia's greenhouse gas account," he said.

Dr Charmley said 90 per cent of methane produced by cattle was emitted in burps.

He said about half the nation's herd, located in northern Australia, contributed about 4.5 per cent of the country's greenhouse gas emissions via methane.

He said ruminant livestock such as cattle produced about 200 grams of methane a day, equivalent to 1.5 tonnes of Co2 per animal a year.

He said the methane was produced by microbes living in the animal's gut.

He said examining those microbes, along with looking at alternative dietary arrangements for cattle could reduce methane emissions even further.

According to figures produced by the Kangaroo Industry Association of Australia, there are an estimated 57 million kangaroos in Australia.

This is more than double the nation's cattle herd numbers. There is no point however in blaming kangaroos for polluting the atmosphere with methane.

Dr Charmley said that due to a different fermentation pathway in their gut, kangaroos did not produce methane.

Ref: 00103641814

Queensland Country Life
02-Jun-2011
Page: 15
General News
By: Julian Luke
Market: Brisbane
Circulation: 32940
Type: Rural
Size: 499.00 sq.cms
Frequency: ---T---

Methane predictions fall

By JULIAN LUKE
in Rockhampton
(07) 4927 9422

NEW research shows the amount of methane emitted from cattle feeding on tropical grasses in northern Australia – figures used in the compilation of the nation's greenhouse gas accounts – is up to 30 percent less than previously thought.

The research was unveiled at a CSIRO Livestock Industries field day at its Lansdown Research Station south of Townsville on Friday.

Lansdown Research Station research leader Dr Ed Charmley said the new figures were compiled through research using custom-built respiration chambers.

"While you always have to be cautious in extending lab data to the field and across industry, we have been able to cross-check our findings with methane-detecting laser systems in the field," he said.

"These findings, while not changing the actual emissions, could have significant implications for calculating the emission footprint of the northern cattle industry and also for Australia's greenhouse gas accounts."

The northern Australia beef industry contributes about 4.5pc of the nation's greenhouse gas emissions.

Dr Charmley said further CSIRO research also showed that northern cattle fed on a diet of predominantly leucaena emit less methane than cattle grazing on tropical grasses.

"What this nutrition research is showing is that there can be win-win scenarios for the industry and the environment if we can redirect the breakdown of plant material in a way that reduces the amount of methane produced, while improving the amount of energy or weight gain that animals get from their feed," he said.

The research has been undertaken as part of the Reducing Emissions from Livestock Research Program (RELRP), which is funded by Federal Government and a raft of other industry groups across Australia, including Meat & Livestock Australia (MLA).

MLA climate change research and development manager Dr Tom Davison told *Queensland Country Life* while study into the science of reducing methane emissions was in its infancy, such research as that unveiled on Friday was essential.

"The challenge is that this research, this science is very young," Dr Davison said.

"Methane research has been forgotten about for decades because people thought there was not much they could do about it.

"It has come back onto the map big time because of the greenhouse gas implications."

He said at this stage, there was no goal for a reduction in methane emissions from Australia's cattle herd.

"The objective is to reduce our emissions as much as possible through our research program," he said.

Dr Davison said the research was looking at a range of ways of monitoring and reducing methane emissions from cattle.

"Up until now, we have not even known the heritability of methane going from one generation to another," he said.

"What is the heritability figure of methane in sheep and cattle? What's the repeatability of that across generations? This is all new stuff."

Dr Davison said further rumen research showed that changing the diet of an animal could potentially reduce methane emissions. "We know if we stick oils or fats in the diet, we can reduce methane emissions, and the basic relationship is for every 1pc you go up with fat in the diet, you reduce methane emissions by 3.5pc," he said.

Dr Davison recognised that while the research was important, it ultimately needed to translate back to practical steps producers could take, on the ground.

"The great story here is that there is a win-win. Because methane is a by-product of digestion ... pretty much anything you do to reduce methane will improve productivity or profitability," he said.

"What we know right now is that the things which reduce methane emissions are the things that will make money.

"For example – faster growth rates, earlier time to turnoff, higher reproductive performance.

"Our challenge is what we can do in addition to that through genetic selection, additives, manipulation, rumen bugs and through new plant species, and how do we then combine those different ideas into systems that work practically.

"That's our challenge."

Dr Davison said the $28 million RELRP program would finish in June 2012.

"(The program) is dead unless the Federal Government continues putting significant money into it," he said.

"We think there will be big payoffs for both producers and government by doing that – it's a win-win for producers, industry and government."

About 120 people, including pro-

MEDIA MONITORS

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Environmental win-win possible

NEW CSIRO research indicates that the amount of methane emitted from cattle fed on tropical grasses in northern Australia is up to 30 percent less than figures currently used to calculate the northern cattle industry's contribution to Australia's greenhouse gas accounts.

Speaking recently at the Lansdown Field Day near Townsville, CSIRO research leader Dr Ed Charmley said the findings would help to refine the nation's greenhouse gas accounting.

"Measurements from cattle in CSIRO's custom-built respiration chambers show that Brahman cattle fed a wide range of tropical grasses emit up to 30pc less methane than previously determined," he said.

"While you always have to be cautious in extending lab data to the field and across an industry, we have been able to cross-check our findings with methane-detecting laser systems used in the field.

"These findings, while not changing the actual emissions, could have significant implications for calculating the emission footprint of the northern cattle industry, and also for Australia's greenhouse gas accounts.

"Methods used to determine these national greenhouse gas accounts are regularly reviewed, and if the new data are confirmed via this review process, future accounts will be adjusted to reflect the lower emissions for the northern beef herd," Dr Charmley said.

With about half of the nation's beef herd located in northern Australia, current greenhouse gas accounts indicate that methane from the northern cattle industry contributes about 4.5pc of Australia's greenhouse gas emissions.

As a by-product of digesting plants, ruminant livestock such as sheep and cattle produce methane and, of those, beef cattle produce the most – about 200 grams a day, or about 1.5 tonnes of CO_2 equivalents per animal every year.

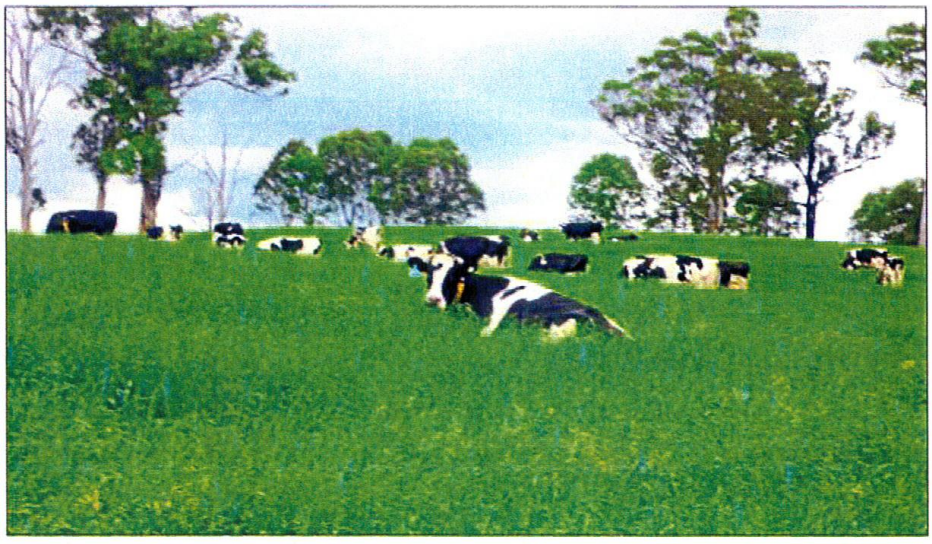
"CSIRO research also shows that northern cattle fed on a diet of predominantly leucaena, a legume tree, emit less methane than cattle grazing on tropical grasses," Dr Charmley said.

"What this nutrition research is showing is that there can be win-win scenarios for the industry and the environment if we can redirect the breakdown of plant material in a way that reduces the amount of methane produced, while improving the amount of energy or weight gain that animals get from their feed.

"We are addressing cattle methane emissions from several angles – from examining the gut microbes that produce methane from ingested pasture and alternative diets, to a landscape focus on northern Australia's extensive grazing systems using state-of-the-art technologies, such as lasers and wireless sensor networks, to measure and model cattle methane emissions under tropical conditions."

The Lansdown Research Station is a key part of CSIRO's broader research programs on livestock production and emissions reduction in agriculture.

Lansdown Research Station is funded by the Australian Government's Climate Change Research Program, Meat and Livestock Australia, and CSIRO, and is one of five national research hubs and demonstration sites for practical methane management on-farm.



Methane from the northern cattle industry contributes about 4.5 percent of Australia's greenhouse gas emissions.

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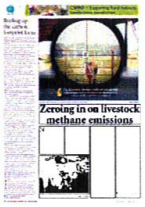

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Zeroing in on livestock methane emissions

NEW technologies and techniques are enabling CSIRO scientists to zero in on actual levels of livestock methane emissions and develop solutions for a more productive, profitable and greenhouse gas friendly industry.

With a carbon market and the Carbon Farming Initiative on the horizon, about 120 cattle producers and interested members of the public visited CSIRO's Lansdown Research Station near Townsville, Queensland, recently to see respiration chambers, gas detecting lasers, infra-red and wireless sensor technologies and to hear about the latest research.

CSIRO research leader, Dr Ed Charmley, announced extensive research conducted in the high-tech respiration chambers was showing Australia's northern beef herd was actually more methane-friendly than previously thought.

"What we have found, through a large number of experiments in these closely monitored animal chambers, is that Brahman cattle fed on a wide range of tropical grasses and legumes emit up to 30 per cent less methane than previously determined," he said.

"These findings, while not changing the actual emissions, could have significant implications for calculating the emission footprint of the northern cattle industry and also for Australia's greenhouse gas accounts," Dr Charmley said.

Some of the techniques being developed at Lansdown and in northern Australia will be important for calculating the amount of methane being released by livestock across Australia.

Lansdown is one of five national demonstration sites for on-farm methane management co-ordinated through Meat and Livestock Australia and funded by the Department of Agriculture, Fisheries and Forestry under the Australian Government's Climate Change Research Program.

"While it is not viable to measure the emissions from all cattle on every property, the laboratory chambers combined with the field technologies such as the lasers are allowing us to zero-in on the real level of emissions," Dr Charmley said.

"This work is enabling us to establish the baseline methane emissions levels that will be needed before real emission improvements can be demonstrated and rewarded under a potential carbon offset scheme."

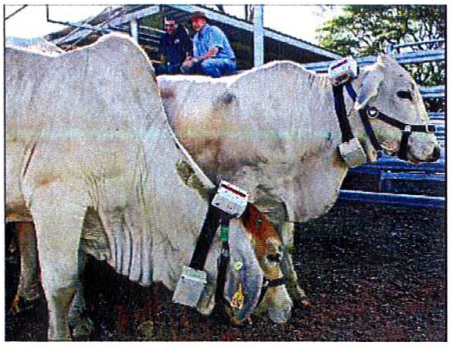
CSIRO research at Lansdown and other sites including the measurement and mitigation work, rumen microbiology and nutritional studies is also highlighting some possible opportunities for farmers under a carbon offset scheme like the Carbon Farming Initiative.

"It will be a difficult challenge in the short term to reduce the amount of methane coming out of the rumen or to develop methane-friendly cattle breeds, but there are some strong opportunities over the next few years to reduce methane emissions by improving productivity."

Initiatives that improve productivity also tend to lower the quantity of methane released per kilogram of beef produced according to Dr Charmley.

"One opportunity will be to improve growth rates through use of high energy feeds such as high quality grasses and legumes. Combining a number of strategies such as feeding Leucaena and rotational grazing could produce a greater impact."

■ For more information visit www.csiro.au/science/livestock-methane-emissions.html



Wireless sensors are being used to track methane emissions to cattle movement and behaviour. **Photo: CSIRO**

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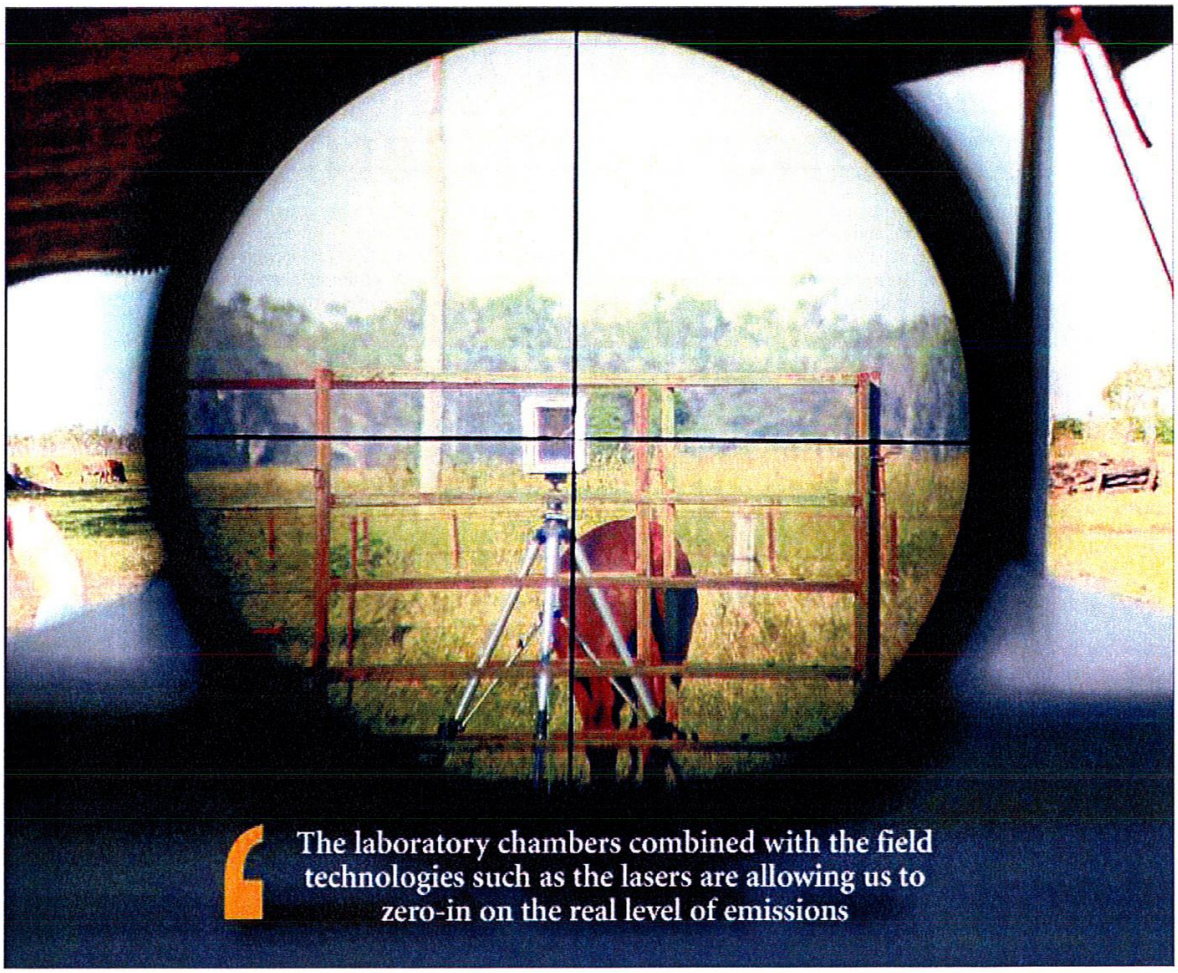
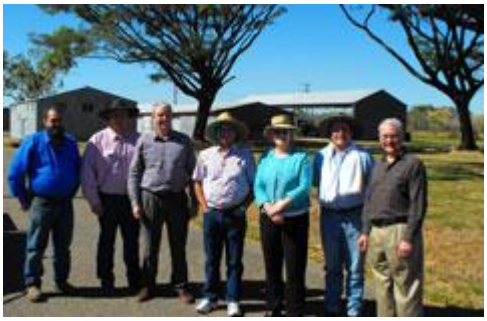


Open path lasers are being used to detect methane emissions in the paddock.

Photo: CSIRO

CSIRO Livestock Industries Staff News July 2011



Celebrating new facilities in the North

Chief Executive Megan Clark visited CLI's Lansdown Research Station last week, in conjunction with the official opening of CSIRO's new 'home' in Townsville – the Australian Tropical Sciences and Innovation Precinct (ATSIP).
Built to foster collaboration between CSIRO and the James Cook University (JCU) to develop solutions for sustainable use of natural resources in Australia's tropics, the state-of-the-art research centre was officially opened nine months after it became the new 'home' for our northern colleagues.
The opening speeches, on the stately front steps of ATSIP, included addresses from the JCU Vice-Chancellor and President, Professor Sandra Harding; Australia's Innovation Minister, Senator Kim Carr; CSIRO Chief Executive, Megan Clark; and other university and state officials.
'While some choose to deny the evidence, the Government is determined to fight climate change,' Senator Kim Carr said. 'That is why the Government provided $14 million to CSIRO and James Cook University for construction of this vital research hub, which will house researchers from the two organisations.'
A further $18.4 million was provided by the Queensland Government and James Cook University itself.
In her speech, Megan spoke about the importance of CSIRO's research in the tropics. She made a special mention of CLI's Station Manager at Lansdown, Wayne Flintham, complementing him on how he handled the challenging situation during cyclone Yasi in January when he was stuck at the property for several days without power.
She also had the opportunity to thank Wayne for his efforts in person when she paid a visit to Lansdown Research Station, accompanied by CLI's Programme Leader in Townsville, Ed Charmley; Chief Alan Bell and the CSIRO Officer-in-Charge of ATSIP, Ian Watson (CES).
Ed said the visit allowed Alan, Megan and CLI staff to discuss research directions in the context of CSIRO's Strategy for 2011-2015, and to tour CLI's research capability and facilities at Lansdown.
'It was good for us to hear about the new CSIRO Strategy first-hand,' Ed said. 'Megan also appreciated the opportunity to see Lansdown and meet some of our staff, especially Wayne – as she was very concerned for him during Yasi.'
The group guided Megan through the buildings and discussed the research being done there. Wayne, together with CLI researchers Carlos Ramírez and Luciano González, also took her for a drive around the property.
'We talked about upcoming experiments and where we see Lansdown in the future,' Wayne said. 'I got the impression she was happy with how we are progressing.'

Web abstract

Practical, cost-effective technologies or practices that give a substantial reduction in emissions while maintaining productivity are required for the northern beef industry to remain viable. There has been considerable investment in research to reduce methane emissions from livestock, but this has been directed at incremental increase in productivity and adoption has been market-driven. Methodologies are available to measure individual emissions, but application in extensive grazing environments is required.

Commercial development and adoption on-farm will require regional sites for validation and practical demonstration. A number of demonstration sites across Australia have been established to validate commercial application and to promote industry acceptance and adoption.

Lansdown Research Station is located approximately 45 km south of Townsville in the Burdekin Catchment. The site is 638 ha of native and improved pastures and has been chosen as a demonstration site to facilitate industry adoption of practices and technologies resulting in methane mitigation and improved on-farm measurement methodologies for northern Australia.

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