

Katherine Rural Review

DEPARTMENT OF PRIMARY INDUSTRY AND RESOURCES



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Sweet Spot Project kicks off (gets moo-ving) across the north

Robyn Cowley, Senior Rangeland Scientist, DPIR Darwin

The Cash Cow project found that there was an opportunity to improve breeder performance in some areas of Northern Australia. Previous research has focused on disease, herd management and genetics, but little is known about how different levels of pasture utilisation impact breeder productivity. The Sweet Spot project will address this knowledge gap and find the *sweet spot* of pasture utilisation to ensure long term optimal breeder performance in northern Australia. The project is funded by Meat Livestock Australia (MLA) and brings together pasture and cattle scientists, and modellers from across the north. The \$2M project, over four years, is led by the Northern Territory Department of Primary Industry and Resources, collaborating with the Queensland's Department of Agriculture and Fisheries, and Department of Environment and Science.

The project will use existing breeder datasets to ask new questions, increasing the value of previously funded research.

"There is an untapped gold mine of breeder production data from sites across northern Australia. By bringing together these existing datasets we will gain new insights into how to manage breeders to improve reproduction" Dr Robyn Cowley said.

The project aims to develop tools to predict the impact of pasture utilisation on reproduction, so producers can optimise pasture use to maximise kilograms turned off, while maintaining the resource base.

The project team had their first meeting in August. The first phase of the project is searching across the north for suitable breeder datasets that can be collated and modelled.

For more information call Dr Robyn Cowley, Senior Rangeland Scientist, on 0419 829 493 and Dr Kieren McCosker, Senior Livestock Scientist, on 08 8973 9771.



Better paddock utilisation without more fences - can it be done?

Dionne Walsh, Rangeland Program Manager, DPIR Darwin

What is Self Herding?

Self Herding is a livestock management approach that uses positive reinforcement to influence grazing behavior. We are doing a trial at Kidman Springs to see whether Self Herding techniques can be used to create new grazing patterns within a paddock, thus creating a form of rotational grazing that does not rely on permanent fencing.

How are we testing the method in the Northern Territory?

We selected a paddock that has large contrasts in land condition created by historical grazing patterns.



Figure 1: We are testing whether we can attract cattle to use areas that have previously been under-utilised whilst reducing the usage of those areas that have poor land condition. Photos: Caz Pettit

What Self Herding tools are we using?

We are using feed attractants paired with signals to encourage cattle to make choices in response to positive behavioural and/or nutritional feedback. We use a mobile “attractant station” to achieve managed movements of cattle throughout the paddock. The frequency and distance that the attractant station is moved around the paddock is very flexible. During busy times, the attractant station can be left for several days before being moved. At other times, the property manager may wish to have more frequent interactions with the cattle to achieve specific management outcomes.



Figure 2: Our attractant station comprises four small feed tubs paired with a visual cue (witches hats placed near the tubs and on a nearby road or firebreak) and an audible cue (a wind chime placed in a tree near the attractant station). Photos: Dionne Walsh

Each tub has a small amount of a supplementary feed added to it. Three of the tubs contain familiar feed items (e.g. urea, coarse salt, “Bruce’s Brew”, which is a mixture of locally-sourced wood ash and charcoal). The fourth tub is reserved for the intermittent placement of highly attractive energy-rich “jackpots” such as shipper pellets or molasses. The jackpots are paired with a unique sound cue, which in our case, is a whistle blown loudly at the time the jackpot is delivered. The whistle signal triggers a clear behavioural response with some animals moving with intent to obtain the reward when they hear the signal. The intermittent use of jackpots keeps the cattle highly motivated to return to the attractant station, on the off-chance that a particularly attractive food reward might be there.

Many producers already move lick around their paddocks, but this method amplifies that approach by offering a *variety* of attractants and using intermittent and unpredictable timing. This has the effect of increasing interest for a broader range of animals in a mob.

Early results

Data from GPS collars showed that in the first few weeks, the trial heifers demonstrated a very strong attraction to the historically overgrazed areas of the paddock. We think that they were responding to existing landscape cues such as old cattle pads, shorter patches of previously grazed pastures and freshly graded tracks. In response, the research team increased the frequency of the feed rewards at locations distant from the overgrazed areas. We have been able to demonstrate that the techniques have been able to draw cattle into areas that have traditionally not been used very much. We have also discovered very different day time and night time paddock usage patterns.

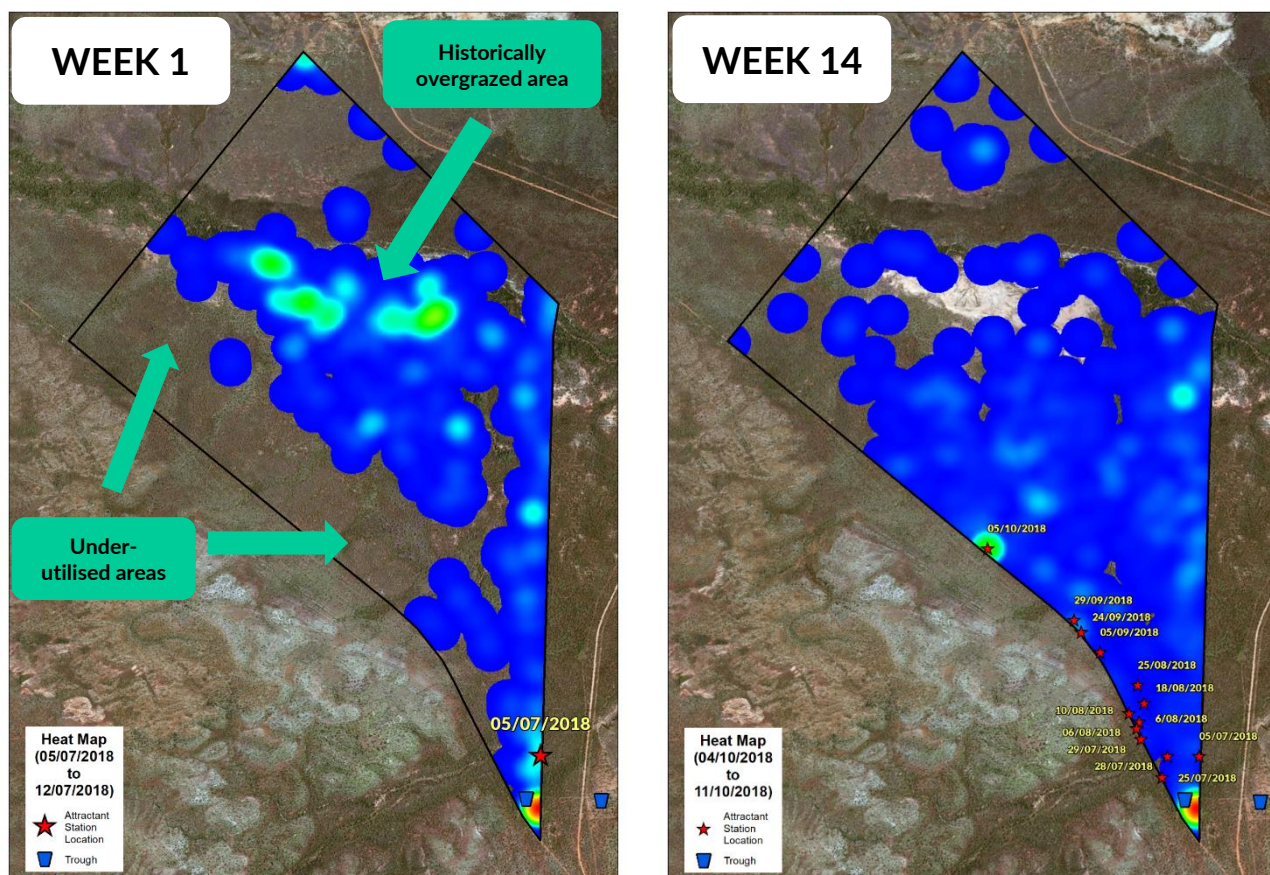


Figure 3: GPS collar “heat maps” show that Self Herding techniques have influenced grazing patterns in the trial paddock
Images: Dionne Walsh.

At the conclusion of the trial in mid-2019, we will be reporting on:

- paddock and pasture utilisation patterns
- cattle productivity and behaviour
- costs of labour, vehicle and feed rewards
- an economic comparison to using fencing to achieve rotational grazing.

Want to know more about Self Herding?

Self Herding for the rangelands has been developed by Dr Dean Revell (Revell Science) and Bruce Maynard (Stress Free Stockmanship). More information can be found at [Dean and Bruce's website](#)¹.

Acknowledgements: This project is a collaboration between Revell Science, Stress Free Stockmanship, Department of Primary Industry and Resources (Northern Territory), Rangelands Natural Resource Management (Western Australia), Territory Natural Resource Management and Oxley Grazing. Funding support has been provided by Meat & Livestock Australia.



Territory NRM has been successful in obtaining a Smart Farms Small Grant through the Australian Governments National Landcare Program. The grant will be used to initiate an NT Soil Consortium to build land manager capacity and knowledge in soil health and conservation. The Consortium will bring land managers from various industries and soil experts together through workshops, symposiums, and networking, to ensure knowledge passes in an effective manner.

The NT Soil Consortium encourages everyone who has an interest in the land and their soil to be involved. From backyard gardeners, to horticulturists, to pastoralists, the Consortium will benefit everyone. The advantages of peer-to-peer, farm-to-farm learning is the basis of the Consortium. The opportunities that come from networking, training, and learning will allow the Northern Territory to become resilient against challenges facing those who work on the land.

For further information and if you wish to be involved, join the Facebook Group '[NT Soil Consortium](#)' or please contact:

Jacob Betros
Territory Natural Resource Management
T: 0438 756 481 E: jacob.betros@territorynrm.org.au



¹ <http://selfherding.com/>

What the experts think will happen to northern Australia rainfall in the future due to climate change

Robyn Cowley, Senior Rangeland Scientist, DPIR Darwin

When it comes to predicted climate change in northern Australia, there is a lot of uncertainty about how rainfall might change, which is not very helpful, because rainfall is the most important driver of agriculture!

So I was very interested to see a recent webinar on future rainfall in northern Australia that provides new insights in this area. Visit the [Earth Systems and Climate Change Hub website](#)².

Dr Josephine Brown from the Bureau of Meteorology modelled future rainfall (2070 to 2099) for northern Australia. She used 35 different global climate models and looked at a number of emissions scenarios – basically different estimates of what carbon dioxide levels might be in the future.

There was a big variation in future rainfall predictions between the different models. 43% of models predict it will be drier and 37% wetter, with the remainder, not much change. This study investigated why the models differed in their rainfall predictions to work out what is more likely.

- The models that predicted a much drier future were not very good at simulating tropical climate patterns, so are probably unreliable. This left the models that predicted no change or wetter.
- She then looked at the effects of aerosols on future rainfall (this is the first time I have seen this included in climate change projections for our region).
- Aerosols (pollution from fires, cars, power generation and industry) are very important in predicting rainfall because 1) they cool the planet by scattering and absorbing incoming radiation and 2) water vapour condenses on the aerosol particles (condensation nuclei), creating clouds, which increases rainfall.
- Some climatologists think pollution over Asia may have contributed to recent higher rainfall over north-western Australia (VRD – Kimberley) since the 1970s (e.g. see boxes below), but whether the higher rainfall is due to natural variability, or aerosols, or both is still an active area of research.
- They think pollution over Asia has contributed to the relative cooling and drying of that region. When climate change models assume that aerosols will decline in the future due to better pollution controls in Asia, the Australian monsoon gets drier and the Asian monsoon gets wetter again, i.e. back to what it was like around 50 years ago.
- Most of the modelled future increases in rainfall in north Western Australia are in response to regional climate warming. But if pollution decreases over the Asian monsoon region, a warmer Asian monsoon region would draw rainfall northwards away from Australia. This would offset any increases in rainfall in north western Australian due to warming due to climate change.
- Hence the models that predict the greatest increase in rainfall do not fully include the effects of future declining pollution and aerosols, and may be overly optimistic about future rainfall projections.
- In summary, the reason there is such a wide variation in predicted future rainfall for north Australia between different climate models is that some just aren't very good at modelling climate in our part of the world (they predict a much drier future) and some don't include the effect of aerosols (they predict a much wetter future).
- This leaves us with probably little change in future rainfall in northern Australia.

² <http://nespclimate.com.au/how-will-rainfall-change-in-northern-australia-over-the-coming-century/>

What does this mean?

- It probably won't get wetter in the future.
- Don't assume the recent higher rainfall in the VRD and Top End (last 40 years) is here to stay.
- Nobody knows how much and when future rainfall will change, so adjust stock numbers to the seasons so that you don't get caught out as the climate fluctuates or changes.

How has rainfall increased in north-western Australia?

- To better understand what has caused increased rainfall in north-western Australia, scientists investigated how wet season rainfall regimes (e.g. localised thunderstorms, monsoonal lows, or tropical cyclones) have changed in the last 50 years (see papers below). They compared whether the different rainfall regimes now occur more often, or if the daily rainfall of the different rainfall regimes has increased.

What's changed in the last 50 years?

- Both studies found that the average rainfall per day (rainfall intensity) during each of these rainfall regimes has not changed much in the last 50 years. However the frequency of the heavier rainfall regimes, monsoonal lows and cyclones, has increased; while the frequency of isolated thunderstorms has declined. Combined, this has led to higher average rainfall.
- The wet season in Darwin also now starts earlier (November) and persists longer (April). On average the wet season in Darwin is now 33 days longer than in 1950. At the same time rainfall in September and October has declined.

What does this mean?

- There are now more days with heavier rainfall systems during the wet season, leading to higher annual rainfall. Where rainfall is already high (>900mm), this probably means more runoff, and not much more native pasture growth, due to nutrient limitations to growth. However the lengthening of the wet season has probably been beneficial for cattle production with pasture staying green for an extra month of the year. In areas with rainfall in the 500 to 700mm rainfall zone, the higher rainfall probably means more pasture growth, but with lower pasture quality.
- Although we know that rainfall has increased in the Top End and VRD, no-one knows if this wetter period is a permanent change, or whether drier times will return. If they do, pasture growth is likely to decline especially in the central to southern VRD.

Catto, J.L., Jakob, C., and Nicholls, N. (2012) The influence of changes in synoptic regimes on north Australian wet season rainfall trends. *Journal of Geophysical Research: Atmospheres* **117**(D10).

<https://agupubs.onlinelibrary.wiley.com/doi/pdf/10.1029/2012JD017472>

Clark, S., Reeder, M., and Jakob, C. (2018) Rainfall regimes over north Western Australia. *Quarterly Journal of the Royal Meteorological Society* **144**(711), 458-467.

The Northern Australia Climate Program – gaining a better understanding of our climate

Anne Marie Huey, Climate Mate for the East Kimberley and Victoria River District, USQ

Northern Australia is noted for its distinct wet/dry seasons – but how much do we really know about the key climate drivers that affect our region and therefore influence our weather?

To better understand our climate, the Northern Australia Climate Program (NCAP) has been launched. This project aims to bring the best climate scientists, advisors and cutting-edge researchers together with northern beef producers to better manage the impacts of operating in a variable climate.

The project is being run by the University of Southern Queensland (USQ), the Bureau of Meteorology (BoM) and the Department of Agriculture and Fisheries (Queensland), along with program partners Department of Primary Industry (Northern Territory), the Department of Primary Industry and Regional Development and Rangelands Natural Resource Management (Western Australia).

In practical terms, six 'Climate Mates' have been appointed (with two more to come) across Queensland, the Northern Territory and northern Western Australia, to liaise with pastoralists to determine what the industry wants and needs, in relation to climate information, seasonal outlooks and decision-making tools.

A significant advantage of this program is that the design and delivery will be very much driven by what local producers want. Options include workshops, webinars, regular e-mail updates, one-on-one property visits or any other practical format requested.

The information delivered will also be dictated by pastoralists. There is a huge amount of climate information currently available – the trick is knowing where to look, how to interpret it and how to assess the reliability and relevance of the information.

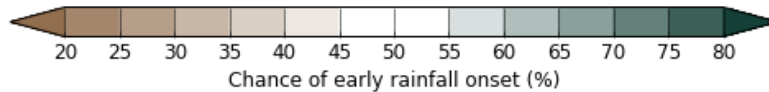
This is where I come in. As the Climate Mate for the East Kimberley and Victoria River District, my job is to work closely with interested pastoralists to navigate the various web-sites and apps, so that you can find existing information. If you would prefer just to receive neatly packaged updates on a seasonal basis, that's OK, too.

At this time of year, many producers are wondering when the wet will arrive. The BoM web-site has a handy model that attempts to answer this question and it is available for everyone to use at any time. The following map (Figure 1) shows the likelihood of having an early onset of the wet (defined as more than 50mm of rain accumulated after September 1st) across northern Australia.

The models predict there is a 35 – 45% chance of an early wet in the East Kimberley and VRD. Clearly, this means that there is a 55 – 65% chance of not having an early break. While this may not be particularly good news for most, it is also critical to assess the accuracy and reliability (also known as 'skill') of this forecast before making any investment decisions.

Chance of observing early Northern Rainfall Onset

Product of the Bureau of Meteorology



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<http://www.bom.gov.au/climate>

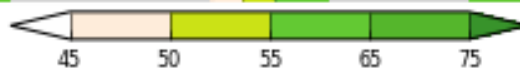
Model Run: 26/08/2018
Issued: 30/08/2018

Figure 4 shows there is a 35 – 45% chance of having an early wet season break across the East Kimberley and VRD – or a 55 – 65% chance of not having an early break. Source: Bureau of Meteorology

Figure 5 shows the past 'skill', or reliability, of the model based on actual historical observations. In this case, for parts of the East Kimberley the consistency rating is less than 50%, and therefore not much better than a toss of the coin. Further east in the VRD, the consistency rating increases up to 75% and the forecast is more reliable.

Northern Rainfall Onset (above/below median) Percent consistent - Aug21

Product of the Bureau of Meteorology



<http://www.bom.gov.au/climate>

© Commonwealth of Australia 2015, Australian Bureau of Meteorology

Issued: 17/06/2015

Figure 5 shows the past 'skill' is low for the East Kimberley but improves further east. Source: Bureau of Meteorology

The project partners are very keen to hear how pastoralists envisage incorporating this sort of knowledge into the running of their properties to make more informed business, herd and land management decisions. Additionally, if you are looking for information or tools that are not currently available, this can be fed back to BoM who will then investigate whether the tools requested are feasible to develop.

This is a unique opportunity for producers in the north to shape the future direction of climate research. The greater the interest we can demonstrate from this part of the world, the more resources will be directed to increasing the understanding of the key climate drivers and how they interact across northern Australia. This will in turn result in more accurate and reliable forecasts.

I strongly encourage anyone interested in finding out more about seasonal climate forecasting, local climate drivers or tips, tools and apps to get in touch either through email at annemarie.huey@usq.edu.au or by telephone on 08 9191 7069.

Please note, the Climate Mate for Barkly region is Alison Kain, who can be reached via Alison.kain@usq.edu.au or by telephone on 0409 281 649.

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ian.biggs@nt.gov.au Jo Miller – Katherine Research Station – P: 8973 9730 E: joanna.miller@nt.gov.au NT FARMERS. A joint initiative between Department of Primary Industry and Resources, Department of Environment and Natural Resources and NT Farmers Association."/>

NT Agriculture: Pathways to Potential

DATE CLAIMER - Field Days 2019

More information to be released early in the new year

Mark these dates in your calendar now! Be part of this opportunity to spend the day with local pastoralists, growers and industry experts to get the latest information on: non-pastoral use permits, changes to the water act, promoting agricultural industry development and new research in livestock, cropping, horticulture, and improving your pastures!

There will be something for everyone! A mixture of formal presentations and getting out in the paddock to look at on the ground applications of livestock research, crop and pasture varieties, and horticultural advances. Also there will be trade displays relevant to all industries attending the day.

When: Tuesday 9th April 2019
Where: Katherine Research Station

OR

When: Wednesday 10th April 2019
Where: Douglas Daly Research Farm

For enquiries please contact:
Ian Biggs – Katherine Research Station – P: 8973 9711 E: ian.biggs@nt.gov.au
Jo Miller – Katherine Research Station – P: 8973 9730 E: joanna.miller@nt.gov.au

NT FARMERS

A joint initiative between Department of Primary Industry and Resources, Department of Environment and Natural Resources and NT Farmers Association

New faces at Katherine Research Station:

Jo Miller

I started my role of pastoral extension officer with the Department of Primary Industry and Resources (DPIR) in mid-July this year, joining the livestock industries team based out of the Katherine Research Station. I grew up on a mixed farming property in Central West New South Wales (NSW) and completed a Bachelor of Livestock Science at the University of New England. Since graduating I have held various beef/livestock extension positions within Queensland and Central NSW. While I have not lived in the Territory before, both my husband and I are no strangers to the Top End, having been on a number of trips for both work and pleasure.

I have a keen interest in beef cattle production, particularly reproduction and nutrition, as well as transferring research outcomes into practical on-ground applications.

I would like to encourage all those working in the pastoral industry, as well as the broader agriculture industry, to engage with myself and other DPIR staff. We are here to assist you and provide knowledge, information, events and support across all facets of your beef business. If you have a thought, idea or a burning questions please do not hesitate to contact me.

I look forward to meeting and working with you.

Jo Miller, Pastoral extension officer, Katherine

Tel: 08 8973 9730 Mob: 0417 890 200 Email: joanna.miller@nt.gov.au

Gretel Bailey-Preston

My name is Gretel Bailey-Preston and I started work with DPIR in Katherine based out of the research station with the Livestock Industries team in mid-October, 2018. I am originally from central NSW and have been in the Territory for four and a half years, including Katherine for three of those. I am about to graduate with honours in a Bachelor of Rural Science with the University of New England, which I have done by distance education. I have also worked on Northern Australian cattle stations for three years, which has provided me with practical skills and a deep understanding of the northern cattle industry.

At the moment I am currently spending the majority of my time managing the day to day logistics of the phosphorus (P) progeny pen trial. This trial involves 60 Brahman weaners that were derived from cows involved in the Kidman Springs P trial, with half of the weaners born from cows with adequate P during pregnancy and half born from cows depleted in P during pregnancy. For approximately the last 10 weeks these weaners were randomly allocated to either a high or low P diet and fed daily, with their growth and weight gain monitored weekly. So far all the weaners on the P diet are increasing in weight. Relative to the low P group, the weaners on the high P diet are showing increased weight gains. Although interestingly, and despite being of similar age, the weaners born from cows depleted in P have not displayed as much compensatory growth as expected. The trial will be completed in early December and it will be very interesting to see the final results showing the impact of P on growth and development of young *Bos Indicus* cattle.

Gretel Bailey-Preston, Pastoral technical officer, Katherine

Tel: 08 8973 8431 Email: gretel.baileypreston@nt.gov.au

Melissa Wooderson

I started as a technical officer for DPIR in Katherine based out of the research station with the Livestock Industries team in October this year. I came to Katherine from Charters Towers in north Queensland, where I had worked for a number of years in the Animal Health and Welfare division of the Queensland Department of Agriculture and Fisheries.

I grew up on my grandfather's small beef property in south-east Queensland and completed a Bachelor of Applied Science at the University of Queensland, Gatton. I am also currently undertaking a Masters degree. The main focus of my study is to explore the effect of analgesia and haemostasis on beef calves during dehorning in northern Australia.

My new role with the Katherine livestock team is to assist with research trials, and I feel very lucky to be a part of a team that is working towards the continued development of the northern beef industry through increased knowledge and innovation.

Melissa Wooderson, Pastoral technical officer, Katherine
Phone: 08 88973 8476 Email: melissa.wooderson@nt.gov.au



Figure 6: (L-R) Gretel Bailey-Preston, Jo Miller & Melissa Wooderson

Profitable Grazing Systems

Over the years MLA and other organisations have run numerous field days, workshops and other training events to share information but many producers have indicated that they would like more support to build their skills and implement what they've learnt into their business. The new 'Profitable Grazing Systems' initiative from MLA is designed to provide that.

The aim of the program is to develop tailored short courses, delivered over 6 to 18 months which allow you to develop and practice your skills with small groups of like-minded producers. The course will be delivered by an accredited coach or facilitator, assisted by specialist technicians where relevant.

Delivery is flexible and may include a mix of online webinars, teleconferences, workshops and one-on-one property visits. There are a number of existing courses already available across the key topic areas of nutrition, breeding, grazing land management, people and business. These can be tailored to meet the needs of a group in the NT or a completely new, unique course can be developed to provide the specific skills you need.

Subsidies are available to help cover the cost of the course.

Three good reasons to get involved in Profitable Grazing Systems:



1. It takes a whole-of-farm business approach to improve business performance and drive profit.



2. It customises and tailors industry research findings and management options to your local environment



3. You work with small groups of like-minded producers with an experienced coach to support you.

What participating producers say

130 producers have already participated in Profitable Grazing Systems and say the benefits include:

- learning new skills and applying them to their individual farming systems
- seeing and hearing what other producers are doing
- making decisions based on tangible numbers.



Stuart and Anja Croft Heywood, Victoria

One of the top learnings from being involved in the program was the identification of loss drivers. We discovered our cattle enterprise is not economically viable because it's not the main focus of the business, but still requires infrastructure and supplementary feeding in hard times



Sam and Cassie Bassingthwaite, Dalby Queensland

One of the key learnings from the program was the importance of pasture identification to determine the percentage of 3P (palatable, productive, perennial) grasses. As a result of the program, we identified areas of non-palatable grasses, and destocked and strategically burned these areas to create a range of palatable grasses to encourage even grazing



To find out more, contact the NT State Coordinator – Rebecca Mohr-Bell

Phone: 08 8977 0134 Email: rebecca@argyllconsulting.com.au

Nominations open for Rural Women's Award

Territory women can nominate now for the 2019 Agrifutures™ Rural Women's Award.

The Rural Women's Award recognises the essential role women play in rural industries, businesses and communities.

It provides a platform to inspire Australian women to use their skills to benefit their industries and communities and is an amazing opportunity to further your leadership development, make a tangible difference and inspire others.

The Territory winner will receive a \$10,000 bursary for innovative projects, and access to professional development opportunities and the alumni network.

The award also links recipients with a positive and powerful alumni network of like-minded women across the country who are passionate about rural industries and rural Australia.

The award is open to all women involved in rural industries, rural and regional businesses and communities.

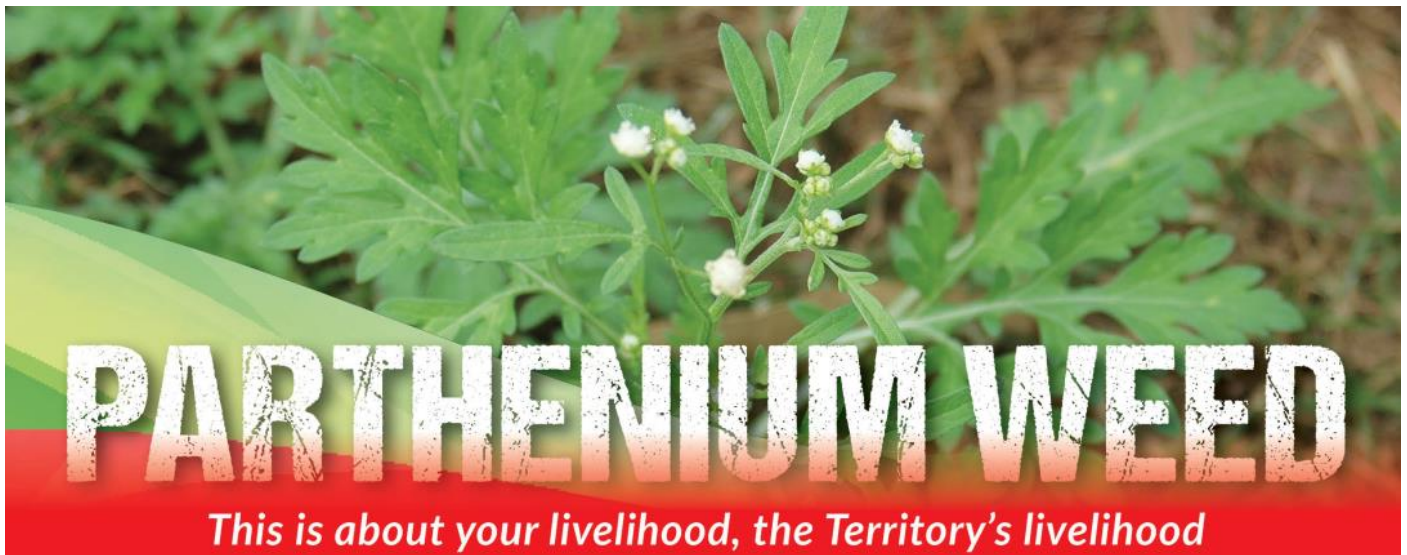
Northern Territory applicants have until 10.30pm Australian Central Time on 27 January 2019 to nominate for the award.

More information on the awards and how to submit an application is available on the [Department of Primary Industry and Resources website](#)³.

The Rural Women's Award is proudly supported by the Northern Territory Government and coordinated in the Northern Territory by the Department of Primary Industry and Resources.



³ <https://dpi.nt.gov.au/primary-industry/NT-Rural-Womens-Award>



Toxic weed alert - we need your help

A parthenium weed (*Parthenium hysterophorus*) incursion has been identified in the Katherine region.

Information about where the parthenium weed could have spread to indicates there is a risk to pastoral properties in the Katherine and Barkly regions.

The Territory Government's Weed Management Branch needs your help. Officers will be in contact with individual properties which may be at risk of parthenium weed exposure to conduct a survey. This will help lessees and managers to understand the areas at greatest risk.

It is important that land managers contact the Weed Management Branch on 8973 8857 if they think they might have parthenium weed.

Did you know?

Parthenium weed easily spreads by water, vehicles and machinery, livestock, feral animals, humans and hay and readily establishes in disturbed areas. It's also toxic to livestock and can cause health problems for humans.

Where to look for parthenium weed:

- Homestead complex
- Cattle yards
- Fence lines
- Watering points
- Areas where hay is cultivated, stored and fed
- Vehicle and machinery storage and wash down areas
- Any other disturbed sites

Remember to protect your property with good biosecurity practices. Parthenium weed has tiny seeds that can hide easily in vehicles, machinery, equipment, socks and boots!

Animal Health

DEPARTMENT OF PRIMARY INDUSTRY AND RESOURCES

December 2018

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New Principal Veterinary Officer

BVSc, BSc, DipSc, MSc, MBA, MRCVS, MANZCVSc

Dr Anthony Kettle (Tony) is a graduate of Massey University in New Zealand and had his own practice in Sydney for 10 years before moving to practice in Brunei for three years, and Oman for four years. He then spent more than 10 years in Dubai involved with the international movement of horses, quarantine and biosecurity in the United Arab Emirates, before joining Equine International Consultancy Free Zone Limited Liability Company in 2015 as the Executive Director.



For the last three years Tony has been advising governments on the conditions for international movement of horses, biosecurity and contingency planning. He is a consultant for the World Organization for Animal Health (OIE) and has served on multiple specialist adhoc groups for the OIE including Glanders, Surra, Biosecurity and the High Health High Performance (HHP) protocols. Tony is a published author on Glanders (a disease closely related to Melioidosis seen commonly in northern Australia), and Shipping Fever in horses.

Tony is the Secretary of the International Movement of Horses Committee and a member of the Welfare Committee of the International Federation of Horse Racing Authorities in Paris. In addition to science and veterinary degrees, he holds a Master of Business Administration from Heriot-Watt University in Financial Risk Management.

While in Brunei, Tony wanted to buy property in Australia with a similar climate to Brunei and bought property in the Northern Territory (NT) more than 16 years ago. He visited every year before finally making the decision to commit full time to the NT. Tony welcomes the opportunity to contribute to biosecurity, animal health and welfare in the NT through the Department of Primary Industry and Resources (DPIR).

Livestock disease investigations

The department provides a free disease investigation service to livestock owners for diagnosis of notifiable emergency, exotic and endemic disease, including zoonotic diseases. Berrimah Veterinary Laboratories provide free diagnostic testing for exclusion of notifiable diseases for all disease investigations, and subsidies are available for producers to contact private veterinarians for significant disease investigations in livestock.

During July to September 2018, 83 livestock disease investigations were conducted to rule out emergency diseases or investigate suspect notifiable diseases across the NT.

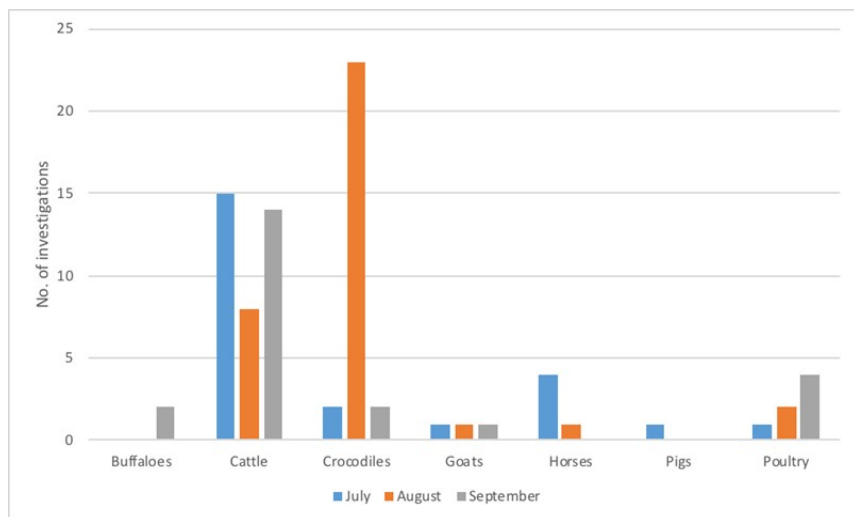


Figure 1: Livestock disease investigations in the NT, July to September 2018

Tick fever in bulls in a holding yard

A large group of age-cull bulls from multiple properties were being held in a holding yard in the cattle tick-infected zone prior to sale during June and July. Over this period, the manager noticed some bulls had diarrhoea, and seemed tucked up and lethargic before showing an uncoordinated gait and tremors. The manager became concerned when a number of these bulls died, and contacted the government who attended the property the same day to conduct autopsies.

A private and a government veterinarian conducted autopsies on two bulls from two consignments. One bull had died over 12 hours previously. The carcass was severely decomposed making it difficult to interpret cause of death. A full range of samples were collected and submitted to the laboratory as the first case. The autopsy on the second bull a week later showed mild jaundice, port wine-coloured urine and haemorrhages on a number of mucosal surfaces. There were small fragments of ironwood leaves in the rumen content.

Laboratory testing of the decomposed bull showed no explanation for any of the signs noted. Referral testing was performed on brain and kidney samples and was positive for *Babesia bovis* (*B bovis*) and *B. bigemina*. Tick fever was suspected but could not be confirmed due to the lack of findings given the decomposed state of the carcass. Test results for the second case revealed significant parasitism with *B. bovis*, confirming a diagnosis of babesiosis (Figure 3). Due to the neurological signs seen before death, transmissible spongiform encephalopathy (TSE) was excluded in both bulls.

Babesiosis or 'tick fever' is a disease of cattle caused by blood parasites that are transmitted by the cattle tick. On further questioning it became apparent that the bulls affected had originated in a cattle tick-free zone and not been treated for ticks before moving to a holding property, which was in a tick-infested zone.

Cattle born and raised in areas where cattle ticks are endemic can develop natural immunity through exposure to ticks infected with tick fever. Cattle raised in areas free from cattle ticks are at risk of tick fever if introduced into areas where ticks are present. The bulls were vaccinated ('blooded') as young bulls. Juvenile bull vaccination is no guarantee of life-long protection against the tick fevers. Other classes of cattle did not show any apparent disease which may be due to their genetics or some less apparent factor.

In this case, management advice was given to treat and remove ticks from affected cattle and there were no further losses. The property where the bulls had originated was also given advice to ensure that any at-risk cattle are blooded (vaccinated for tick fever) prior to moving them into the tick zone in the future.

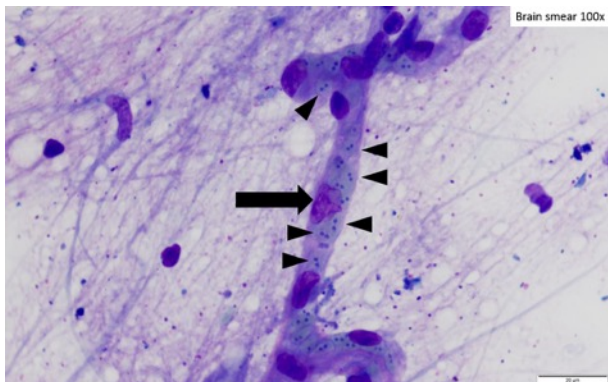


Figure 2: A blood vessel containing red blood cells and basophilic intra-erythrocytic pear-shaped organisms consistent in size and shape with *Babesia bovis*. Arrow heads point to blood cells containing organisms.

Annual Symposium Emergency Animal Disease (EAD) Highlights Report

The 5th Annual Emergency Animal Disease Symposium was held at the Australian Animal Health Laboratory Geelong, on 17 and 18 October 2018 with more than 100 attendees over the two days. The following are a few highlights from the symposium which is important not only for updating participants in the latest trends in EAD research, but also for the face-to-face networking opportunity for EAD prevention colleagues and livestock industry participants.

Dr Debbie Eagles highlighted recent trends in vector borne diseases and reminded participants that global warming was likely to have a major effect on vector borne diseases such as bluetongue. The maintenance of the sentinel herd programs and vector collection in northern Australia is an essential component of our early warning system for transboundary disease incursions.

Dr Cameron Stewart gave a very informative presentation on emerging approaches to disease diagnosis. Recent work on microRNAs in Hendra and mastitis in cattle had produced encouraging results in the early detection of Hendra and mastitis in cattle that could be made before the onset of clinical signs.

Dr Jeff Hammond updated the symposium participants on foot and mouth disease. There was marked long distance spread of the virus, especially from India, with the movement of people as a significant feature. This eastern spread of the virus from India was perceived as a major threat to Australia and constant vigilance was necessary to prevent an incursion of this virus.

Dr David Williams described the situation with African swine fever (ASF), which is a serious threat to Australia's pig industry especially if introduced into the estimated 20 million feral pigs in Australia. The

southward movement of ASF from China through both direct, and indirect transmission by people, was a major concern. NT livestock biosecurity efforts have focused on ASF awareness in 2018.

Bucks for Brains

Do you have cattle that are displaying any of the following signs?

- changes in behaviour and neurological signs
- excessive licking of the nose and flanks
- poor coordination (circling, staggering and falling)
- muscle tremors
- abnormal posture (abnormal ear position and abnormal head carriage)
- difficulty in rising (downer)
- paralysis
- excitability
- increased or decreased sensitivity to sound, pain, heat, cold or touch.

If you do, you may be eligible for an incentive payment under the 'Bucks for Brains' initiative.

Bucks for Brains is an initiative of the National Transmissible Spongiform Encephalopathies Surveillance Project (NTSESP) run through Animal Health Australia. Transmissible spongiform encephalopathies are rare, fatal diseases that cause gradual deterioration in the brain and other central nervous system tissues. Bovine spongiform encephalopathy (BSE), commonly known as 'mad cow' disease is the form found in cattle, scrapie is the form found in sheep.

The NTSESP helps Australia meet guidelines set by the World Organisation for Animal Health to demonstrate Australia's freedom from BSE and scrapie. To ensure that these guidelines are met, Australia must continue to collect, examine and test eligible cattle and sheep samples.

The clinical signs of BSE can be common to many other diseases, which is why specific testing is required.

The program provides payments to producers who submit eligible cattle brains for national testing. Producers receive \$300 per eligible cattle submission, for a maximum of two animals per veterinary investigation.

Eligible cattle need to meet the following criteria:

- be older than 30 months
- be less than nine years
- display signs consistent with BSE (listed above).

Please contact your Regional Field Veterinary Officer or Livestock Biosecurity Officer if you have cattle displaying any of the signs.

Source: [Animal Health Australia 2016, Bucks for Brains, Animal Health Australia, accessed 20 November 2018](#)¹

¹ https://www.animalhealthaustralia.com.au/wp-content/uploads/2015/11/Bucks-for-Brains_Jun16_WEB.pdf

The Golden Calf: suspected novel metabolic storage disease in a Brahman heifer

Megan Pickering, Katherine Region Veterinary Officer, DPIR.

This report describes the findings in an approximately six month old Brahman heifer calf from a property near Katherine, with progressive nervous system signs. The calf first came to the attention of the producer at around two months of age when she presented at mustering with an odd coat colouring; this was reported as appearing golden and abnormally shiny. The golden coat faded progressively with age, but was still partly visible on the inner surfaces of the limbs at six months. The calf was recognised as a poor doer, and was brought into the house paddock with the dam for supplemental feeding and monitoring. Poor weight gain persisted, despite this intervention.



Over the next four months, the calf was noted in the yard to have increasing difficulty rising, developed a staggering gait and was seen to “plait” the hind limbs. When veterinary investigation was requested, the calf was unable to stand without assistance, and in poor condition despite intense supplementary feeding over the preceding several weeks. The calf was euthanised on humane grounds and a full post-mortem performed.

There are a number of established inherited nervous system diseases in young cattle. In cases where disease results from a genetic fault – also known as an inborn error of metabolism - chemicals that are by-products of normal metabolic processes build up, and are not removed, because cells cannot produce an essential enzyme. Although such faults often occur widely across different cell types in the body, most of the visible abnormalities are due to effects on the brain and spinal cord. Affected animals are typically normal at birth, but begin to show signs of nervous system disease in the first weeks or months of life¹.

In this calf, apart from a lack of body fat, there were no abnormalities that could be seen with the naked eye during the post mortem. Laboratory examination of the tissues however, showed that the calf had severely abnormal fluid regulation in the brain and spinal cord, leading to electrolyte imbalances and swelling in the cells. Swelling of brain cells for any reason is likely to progress to early death of the affected animal, either through progressive damage to the brain and lack of ability to perform basic functions (eating, drinking, standing and walking) or death from misadventure, secondary to disability. Tests performed on other tissues and blood were essentially normal.

In northern Australia, beef herds are dominated by Brahman, Brahman cross and Shorthorn breeds, in which Pompe’s disease, or Generalised Glycogenosis², has been documented. Affected calves have difficulty rising, lose condition and typically die by 6-12 months of age. Also known to be heritable in Brahman cattle is Congenital Myasthenic Syndrome⁴; affected calves are normal at birth, but become progressively weak over the first week of life and are generally destroyed within a few weeks.

Inherited metabolic storage diseases described in cattle breeds other than the Brahman, include; alpha-mannosidosis (Angus, Murray Grey, Simmental, Galloway, Holstein), neuronal lipodystrophy (Angus, Beefmaster), citrullinaemia (Friesians), shaker calf syndrome (Hereford), maple syrup urine disease (Hereford, Shorthorn)₃ and neuraxial oedema (Hereford, Hereford-Friesian X). The course of the disease and the examination of tissues in this case, however, is not consistent with any of these well-described inherited nervous system diseases, and is also inconsistent with bovine spongiform encephalopathy (mad cow disease).

Therefore, this case is either the result of a random genetic fault, or may prove to be a new disease; we would be very interested to investigate any cases of nervous system disease, particularly in young cattle. The “golden” coat colouring is interesting and may perhaps be a visible signpost for identifying future cases.

Sources:

[Metabolic Storage Disorders and Inborn Errors of Metabolism](#)²

Aust Vet J. 1981 May;57(5):227-9. Generalised glycogenosis in Brahman cattle.

O'Sullivan BM, Healy PJ, Fraser IR, Nieper RE, Whittle RJ, Sewell CA

Aust Vet J. 1989 Feb;66(2):46-9. Maple syrup urine disease in calves: a clinical, pathological and biochemical study. Harper PA¹, Dennis JA, Healy PJ, Brown GK.

Thompson, P.N. et al 1998: Congenital myasthenic syndrome of Brahman cattle in South Africa, Veterinary Record 143:526-529

² <https://www.merckvetmanual.com/metabolic-disorders/metabolic-disorders-introduction/metabolic-storage-disorders-and-inborn-errors-of-metabolism>

Livestock Biosecurity Branch

2018 audit of NT brands register – commenced July – ongoing

2018 Audit paperwork has been sent out to registered owner/s of NT Brands, to the last known address listed in the NT Brands register.

If you have NOT, received the 2018 Audit form please advise via Email adele.kluth@nt.gov.au so that the Audit form can be emailed to you ASAP.

If you have received the 2018 Audit form please ensure you complete all the sections, sign and date, then return form for processing ASAP.

YES even if your details have NOT changed, you still need to complete the Audit form and return it for processing ASAP.

Email: adele.kluth@nt.gov.au

Fax: 08 8999 2089

Postal: Brands Clerk, GPO Box 3000, Darwin NT 0801

Please check your details on your Certificate/s of Registration and/or in the NT Brands Directory (please ✓):

- Is the property listed on your Certificate of Registration and/or in the NT Brands Directory still current? If no longer the property you are using your brand on, then you MUST complete a Request to Change the Run form.
- Are the names of the Registered Owner/s of the Brand/s still correct or have they changed? (ie by marriage, by death, business or company) If changed, then you MUST complete an Application for Transfer of Brand.

Please remember to discuss all changes or issues with your Regional Livestock Biosecurity Officer first.
All relevant information and forms are located at: <https://nt.gov.au/industry/agriculture/livestock>

To ensure your NT Brands details are correct, please complete this Audit form and Return to:
LISA / Brands Clerk - Email: adele.kluth@nt.gov.au OR BAW, DPIR, GPO Box 3000, DARWIN NT 0801

Registered Owner/s of Brand - Please complete ALL relevant details

Brand Registered in the name/s of: _____ (As stated on Certificate/s)
_____ ABN: _____

Three-Letter Brand: _____ Earmark: _____ Distinctive Numeral/s: _____

Distinctive (symbol) Brand/s: _____

Branding Positions: Cattle: _____ Horses: _____

Brand Registered for Use on: _____ (Run/Property where brand used - eg Property Name, NT Portion No., Section No., Hundred of, etc)

I/We have current original Certificates: Yes | No | Brands only used on Run/Property it's registered to Yes | No

Postal Address of Owner: _____ PO Box or PMB etc _____ Town / City _____ Post Code _____

Telephone: _____ Fax: _____

Mobile: _____ Email: _____

Audit Completed by Registered Owner/s of Brand: _____ Date Audit completed & returned: _____

Print Name If Company (Director etc)	Print Name If Company (Director etc)
Signature	Signature

Contact the Livestock Biosecurity team

Darwin

Regional Livestock Biosecurity Officer 08 8999 2034

Livestock Biosecurity Officer 08 8999 2030

Katherine

Regional Livestock Biosecurity Officer 08 8973 9767

Livestock Biosecurity Officer 08 8973 9765

Tennant Creek

Principal Livestock Biosecurity Officer 08 8962 4458

Livestock Biosecurity Officer 08 8962 4492

Alice Springs

Senior Field Veterinary Officer 08 8951 8181

Regional Livestock Biosecurity Officer 08 8951 8125

More livestock information can be found on the [NT Government website](https://nt.gov.au/industry/agriculture/livestock)³.

³ <https://nt.gov.au/industry/agriculture/livestock>



Live Exports via Darwin Port – OCTOBER 2018

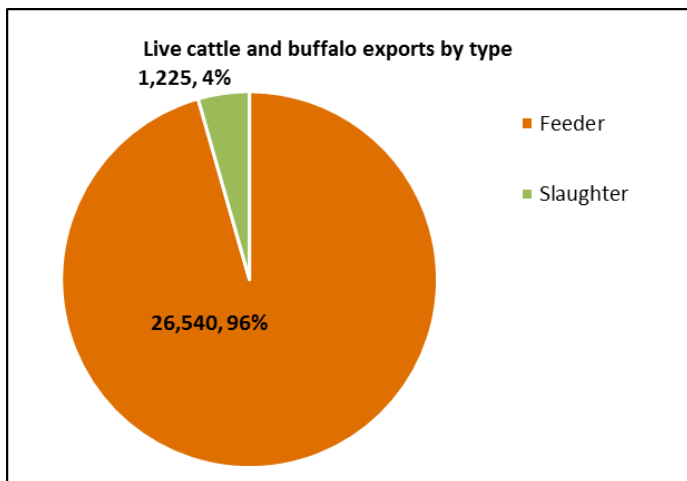
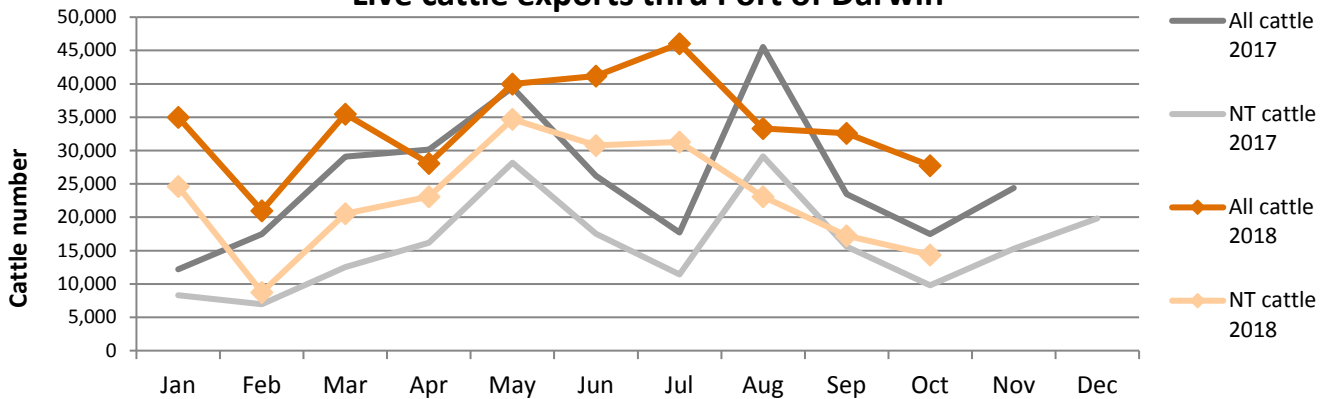
Please note: figures are for stock exported through the Port of Darwin only; some NT stock are exported through interstate ports

Please note: the NT Cattle figures here have been rounded respectively and may not tally to totals.

The figures listed below are correct as at **October 31 2018** and are subject to change as further data becomes available.

Destination	Export of ALL CATTLE (including interstate)							Export of NT CATTLE (estimate only)						
	2016	2017	Last year to 31/10/17	YTD to 31/10/18	Oct	Last month	Difference	2016	2017	Last year to 31/10/17	YTD to 31/10/18	Oct	Last month	Difference
Brunei	3,379	3,872	2,972	3,653	0	365	-365	2,314	2,423	1,859	2,292	0	253	-253
Indonesia	305,761	245,544	208,342	271,110	25,211	30,147	-4,936	192,957	150,489	124,313	179,703	13,034	20,924	-7,890
Philippines	7,598	0	0	10,482	1,404	0	1,404	5,179	0	0	7,262	726	0	726
Sabah	0	2,640	1,500	0	0	0	0	0	1,680	967	0	0	0	0
Sarawak	1,200	2,743	2,743	1,110	0	0	0	843	1,594	1,594	963	0	0	0
Malaysia	10,979	13,257	10,934	11,813	0	0	0	7,476	8,109	6,655	7,848	0	0	0
Vietnam	39,107	39,989	31,513	41,408	1,150	2,782	-1,632	24,783	25,884	19,716	29,739	595	1,931	-1,336
Egypt	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thailand	1,461	800	800	800	0	0	0	1,023	535	535	658	0	0	0
Cambodia	2,766	0	0	0	0	0	0	1,936	0	0	0	0	0	0
TOTAL	372,251	308,845	258,804	340,376	27,765	33,294	-5,529	236,511	190,715	145,858	228,466	14,355	23,108	-8,754

Live cattle exports thru Port of Darwin



OTHER LIVESTOCK

Destination	Buffalo		Goat		Camel	
	YTD	Oct	YTD	Oct	YTD	Oct
Brunei	417	0	0	0	0	0
Indonesia	2,884	0	0	0	0	0
Philippines	0	0	0	0	0	0
Sabah	0	0	0	0	0	0
Sarawak	0	0	0	0	0	0
Malaysia	1,465	0	0	0	0	0
Vietnam	1,841	0	0	0	0	0
Egypt	0	0	0	0	0	0
Thailand	0	0	0	0	0	0
Cambodia	0	0	0	0	0	0
TOTAL	6,607	0	0	0	0	0

LIVESTOCK MOVEMENT STATISTICS

Reports for livestock movements from NT to Interstate, within NT and Interstate to NT are updated biannually - see www.dpir.nt.gov.au/primary-industry/primary-industry-strategies-projects-and-research/livestock-movement-statistics

Total of ALL CATTLE through Port of Darwin							Total of NT CATTLE through Port of Darwin						
2011	2012	2013	2014	2015	2016	2017	2011	2012	2013	2014	2015	2016	2017
269,617	246,990	359,616	493,958	510,860	372,251	308,845	253,797	234,249	308,784	324,477	295,738	236,511	190,715

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