

Final report

Grassfed beef (N Australia) consultancy 2019-2021

Project code: B.GBP.0047

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Abstract

The majority of profitable 'beef only' enterprises and more than two thirds of the national beef herd are located in northern Australia. However, the level of expertise and technical support available contrasts starkly to the importance of the northern industry or to the level of support available to producers in the south. This consultancy contract provided evidence based advice that allowed fund managers to be confident and to be prudent managers of the levy dollars as well as develop quality extension material that is relevant and applicable to extensive beef operations in the adverse conditions of the dry tropics. The project addressed all KPI's and delivered in other important areas such as the animal welfare strategy for south east Queensland, the P challenge and the technical working group on the national cattle statistics. Important literature reviews identified exciting pathways for MLA programs - NB2 & CN30. These findings include (a) positive cost benefits and productivity gains of post weaning supplementation with true protein, (b) demonstrating that the main productivity impact of wet season P supplementation is improved feed intake and (c) that increased grazing pressure is impacting the size of the national herd. All outcomes were delivered well within budget.

Executive summary

Northern beef cattle account for two thirds of the national beef herd and represent the most profitable ‘stand alone’ beef businesses in Australia. While it seems there is no shortage of qualified specialists prepared to provide advice on intensive pastoral grazing systems in southern Australia, the number and availability of professional and technical advice is somewhat limited in the north for various reasons identified.

As a manager of industry funds for research and adoption agencies, it is essential that MLA are prudent custodians of the industry levy dollars. While some project components of research are published in reputable journals which are peer reviewed, a significant number of MLA funded projects never reach publication in respectable journals and often the internal review process within the relevant research organisations is the only review of the work undertaken. Nevertheless all MLA projects must be accompanied by a final report which is available to the public on the MLA website and these reports are often referenced in other project work. Similarly, quality extension material must be produced that is relevant and practical and which will encourage adoption.

The external co-ordinator position presented a practical and economical solution to ensure some of the expected gaps in expertise can be covered efficiently in a quick and reliable manner.

The following objectives were developed for the project:-

By 30th June 2021:

1. Evaluate proposed R&D and PDS projects/ areas of interest within the guidelines provided under the consultative framework and/or the MLA program manager.
2. Provide review and comment of milestone and final reports to ensure MLA requirements of technical and editorial quality are met.
4. Provide on-going review of the validity of projects and advise MLA on issues and strategies to deliver program objectives.
5. Liaise with beef producers, R&D providers and other stakeholders as required by MLA.

Three KPIs were then identified for this consultancy

1. 2019-2020 – provide guidance and assistance in completing revisions to three MLA publications, namely the P manual, Weaner handbook and Guide to growing leucaena. Outputs will be hard copy synopsis and pdf version of each.
2. Co- ordinate the “P Challenge” activities for 2020 (calendar year) to raise awareness of supplementation practices and expand P data base for benchmarking purposes.
3. Update and/or generate eight Tips and Tools materials as directed by R&D project Manager.

Despite the severe travel restrictions and changed work practices brought about by the COVID19 pandemic, the Grassfed beef (N Australia) consultancy 2019-2021 position was able to achieve outcomes over and above that which was specified in the work contract and

which are listed in the results section of this report. All objectives were met, the KPI's achieved and 8 new Tips and Tools developed along with a number of other publications. However, it was the flexibility to support and ensure that other important MLA initiatives and projects could commence and operate effectively that demonstrated the value proposition for this role. The technical working group on livestock statistics, the QDAF animal welfare taskforce during the drought of 2019/20, the Northern Beef Efficiency project (NB2) and the P Challenge have all benefited from the experience and technical expertise provided by the consultant.

Possibly the most significant achievements were literature reviews.

- (1) The comprehensive review of all the recent Phosphorus work and the ability to demonstrate yet again that the main impact of Phosphorus in beef cattle production is to drive dry matter intake over the wet season and that the Plasma Inorganic phosphorus test is the best diagnostic test to determine if the diets of animals need supplementation.
- (2) A similar review on the role of compensatory growth rates and the potential impact that supplementation of weaners post weaning where long dry seasons are experienced is possibly a game changer for enterprises in the dry northern tropics. These findings will have far reaching positive impacts for CN30 and NB2 programs.

The project was able to operate under the allocated budget for both number of days employed and operating funds required.

While there will always be a requirement for corporate knowledge and a need to address ongoing issues when they arise – especially if the technical expertise is not readily available within the organisation, the future activities and recommendations for this consultancy role is outside the confines of this report. It is best for those within the organisation to see if, and how the position can be used in future activities and evaluate if the value proposition applies. The outcomes demonstrated in this report should assist in illustrating pathways and possibilities in the future.

Table of contents

Abstract	2
Executive summary	3
1. Background	7
Northern beef represent the most profitable beef enterprises.....	7
Deficiency of technical expertise in northern beef	7
Prudent managers of levy funds	8
Production of evidence based extension material.....	8
2. Objectives.....	9
By 30th June 2021:	9
Three KPIs have been identified for this consultancy	9
3. Methodology.....	9
4. Results	10
Review Final Reports.....	10
Meetings.....	11
Reviews	11
Secondments	11
Travel.....	11
Literature development	12
Tips and Tools Developed	12
Draft tips & Tools prepared for editing	12
Other Publications Developed	12
Other activities within MLA	13
Animal welfare taskforce SE Qld.....	13
Technical Working Group on Livestock Statistics	13
P Challenge 2019 and 2020	13
Review cost benefits of protein supplementation post weaning	13

Interim co-ordinator for NB2.....	14
5. Conclusion	14
6. Future activities and recommendations	14
7. Appendices	15
1. Major scientific reviews of recent MLA research	15
Wet season phosphorus supplementation increases grazing pressure.	15
Protein supplementation for weaners – reassessing the role in northern beef herds. 15	
<i>Niethé G¹, Poppi DP², Holmes P³, McLennan SR², Callaghan M⁴ and Quigley SP²</i>	15
Outcomes of the Technical Working Group on Livestock Statistics in the red meat industry – Progress Report 1.....	16
The last 50 years of pastoralism – what impact drought strategies?.....	16
2. Tips and Tools produced 2019 to 2021.....	18
3. Other new publications and extension material	21
The ‘8’ Pager publications	21
Specific material produced for Producer Demonstration Sites	21
Girl power manual for participants.....	21
The heifer management and participation certificate with goals.	22
4. Photo Gallery.....	23
Workshops and Field Days	23

1. Background

Northern beef represent the most profitable beef enterprises

Not only is northern Australia home for around two thirds of the total Australian cattle herd, the majority of profitable 'beef only' enterprises are found in northern Australia and are operated on scales not familiar with many southern counterparts. The importance of scale on profitability was highlighted dramatically in the northern beef report of 2014.

Table 2: Long-term performance by herd size

	200–800hd	800–1,600hd	1,600–5,400hd	5,400hd +
Average performance				
Profit per AE	(\$122.11)	(\$4.24)	\$39.28	\$35.92
Asset Value/AE	\$5,947	\$4,083	\$3,204	\$2,034
Operating Return	(2.5%)	(0.1%)	1.3%	1.9%
Price Received (\$/ kg LW)	\$1.76	\$1.78	\$1.77	\$1.76
Cost of Production (\$/kg LW)	\$2.89	\$1.82	\$1.41	\$1.31
Operating Margin (\$/kg LW)	(\$1.13)	(\$0.04)	\$0.36	\$0.46
Top 25% Performance				
Profit per AE	(\$13.71)	\$50.74	\$91.46	\$75.43
Asset Value /AE	\$5,732	\$3,975	\$2,671	\$1,502
Operating Return	(0.3%)	1.6%	3.8%	5.3%
Price Received (\$/kg LW)	\$1.78	\$1.83	\$1.78	\$1.82
Cost of Production (\$/kg LW)	\$1.88	\$1.45	\$1.06	\$0.97
Operating Margin (\$/kg LW)	(\$0.10)	\$0.38	\$0.72	\$0.85

Deficiency of technical expertise in northern beef

Historically most of the undergraduate veterinary and agricultural schools have been located in southern Australia and consequently this has indirectly led to an imbalance in the proportion of consultants and graduates with experience in these extensive beef production systems and a preparedness to operate from outback locations. It seems that while there is no shortage of qualified specialists/advisors prepared to provide advice on intensive pastoral grazing systems in southern Australia, the situation in northern Australia offers a whole new set of challenges, such as: -

- Understanding the production advantages of the bos indicus cattle in the endemic tick zone
- The inability to get clean musters
- The distances and time required to get stock to yards
- The minimal activity of stock work over the wet season when temperatures exceed 40°C for months of the year
- The lower digestibility of C4 pastures and lack of legumes in general
- The low phosphorus levels in much of northern rangelands and associated botulism

- The difficulty of implementing controlled mating
- The lack of opportunities for yearling mating
- The poor 'wet cow' conception rates in the far north
- The lack of export abattoirs and processing facilities
- The cost of finding and affording suitable energy supplements for most of the north
- The role of early weaning
- The ability to find suitable markets for cull cows less than 400 kgs
- The distances stock need to travel to reach final destinations
- Even just finding technicians and professionals to perform the simplest of procedures eg take a blood sample for Phosphorus or do a faecal egg count.

All of the above issues are often not serious considerations in southern beef operations.

Prudent managers of levy funds

As a manager of industry funds for research and adoption agencies, it is essential that MLA are prudent custodians of the industry levy dollars. All activities undertaken must ultimately align with the Meat Industry Strategic Plan, be performed according to industry requirements and the accompanying reporting process be fully transparent and importantly, be evidence based. In some projects, components of research are published in reputable journals which are peer reviewed but, in every instance, MLA must accept milestone and final reports prior to any external review process occurring so that funds are able to flow through to research agencies and that proper budgeting processes can be adopted. A significant number of MLA funded projects never reach publication in reputable journals and often the internal review process within the relevant research organisations is the only review of the work undertaken. This can be limited due to staffing constraints or availability of suitable expertise within the organisation itself. Very few project reports however ever progress through the MLA system without some modification or requirement for additional information in order that reporting is performed at a level acceptable to MLA's requirements. On the other hand, some projects have to be modified or terminated as they have failed to deliver or comply with their schedule. Notwithstanding all MLA projects must be accompanied by a final report which is available to the public on the MLA website and these reports are often referenced in other project work. It is essential therefore to ensure the best possible outcomes are achieved at all times.

Production of evidence-based extension material

An obvious sequel to managing research funds and the production of the latest findings and recommendations that arise from these activities is the increasing focus on the need to translate positive research findings into profitable practice change. Therefore similar issues of quality assurance also apply to the review and production of extension and adoption material that MLA generates to support practice change as this material must also represent the best available advice to industry at the time of publication.

Because of the diverse portfolio of work being funded by MLA, it is impossible to be able to always find the relevant expertise within the company. The external co-ordinator position presents a practical and economical solution to ensure some of the expected gaps in expertise can be covered in a quick and reliable manner. The consultant position is responsible to the MLA program manager for On Farm Innovation and Adoption Grassfed beef and is available at short notice to provide technical information and recommendations when required. However, opportunities arise where advice on other issues such as animal welfare, national herd statistics and herd modelling have been required.

2. Objectives

By 30th June 2021:

1. Evaluate proposed R&D and PDS projects/ areas of interest within the guidelines provided under the consultative framework and/or the MLA program manager.
2. Provide review and comment of milestone and final reports to ensure MLA requirements of technical and editorial quality are met.
4. Provide on-going review of the validity of projects and advise MLA on issues and strategies to deliver program objectives.
5. Liaise with beef producers, R&D providers and other stakeholders as required by MLA.

Three KPIs have been identified for this consultancy

1. 2019-2020 – provide guidance and assistance in completing revisions to three MLA publications, namely the P manual, Weaner handbook and Guide to growing leucaena. Outputs will be hard copy synopsis and pdf version of each.
2. Co- ordinate the “P Challenge” activities for 2020 (calendar year) to raise awareness of supplementation practices and expand P data base for benchmarking purposes.
3. Update and/or generate eight Tips and Tools materials as directed by R&D project Manager.

3. Methodology

Fulfilling the purpose and direction for the position of working with the Grassfed beef R&D project manager and undertaking the following duties of:-

- Reviewing milestone and final reports relating specifically to the program area
- Advising on future areas of work relevant to the Australian beef industry
- Managing relationships with industry stakeholders
- Conducting dedicated activities as directed and to represent MLA at approved producer facing activities,

requires the following attributes:-

- An in depth knowledge of the northern beef industry enhanced by experience and hands-on application so that research solutions can be practical and cost effective.
- Relevant qualifications and post graduate training along with an extensive library and access to scientific papers.
- Developed networks and lines of communication between current and past researchers and industry leaders.
- An active Continuing Professional Development (CPD), membership of relevant associations such as the Australian Cattle Veterinarians and Australian Association of Animal Sciences (AAAS) and the Australian Association of Animal Production (ASAP) and attendance at relevant conferences and industry forums.
- A willingness and confidence to present evidence based science and to travel to all regions where the beef industry operates within Australia.

4. Results

For the duration of the project, regular meetings with the program and project managers were conducted either in person, via Zoom or by teleconference (weekly if possible) to address outstanding issues and to develop a work program going forward. In addition to the major activities listed below, the co-ordinator role involved providing assistance and guidance on a multitude of issues when requested.

Review Final Reports

Final Report - B.GBP.0005:- Target dry season weight gains for weaner heifers

Final Report - B.GBP.0050:- Scoping the development of high value beef production from dairy bulls using forage-based systems

Final Report - P.PSH.1233:- Beef Links

Final Report - G.SBP.012:- Dark Cutting Final Report

Final Report - L.NAB.1903:- Northern Breeding Business: NB2 Strategic Partnership Development

Final Report - P.PSH.0894: - KPCA – Innovation, Adoption and Extension Officer

Final Report B.GBP.0033:- Scoping the viability, feasibility and capacity for a Northern beef centre of excellence

Final Report P.PSH 0857:- Optimising supplement use in Australia's northern beef industry

Final Report B.GBP.0049:- Coordinating the MLA response and engagement for flood recovery and growing resilience of the northern beef herd

Final Report :- P Economics – M. Wellington

Final Report AE Final Report:- - Re-defining animal unit equivalence for grazing ruminants in the northern Australian grazing industries – Stu McLennan

Final Report:- Breeding EDGE material

Meetings

Breeding EDGE Update and Zoom meetings
Corporate Benchmarking - take minutes and attend when MLA staff unavailable
Dairy 2 Bull Meetings at airport
FIN Meeting at Rydges
PGS Zoom Meetings with Desiree Jackson
Pollinate w/shop - Red Meat SP
RMAC strategic planning Toowoomba
Teleconference A. Boulton - heifer management calving histogram
Teleconference PGS and T&T draft
Teleconferences P
Zoom meeting - Angela Lees and PGS

Reviews

Assess AE Paper - Trudi Atkinson
Assist the Bell /Sangster NB2 literature review
Bred Well Fed Well feedback
Feedback articles - review eg Cull Cows, seasonal recommendations etc.
Review draft lit review for Alan Bell
Review Report "Improving the performance of beef production systems in northern Australia"
Reviews Articles on Future Beef Website relating to female reproduction in northern Australia
The Phosphorus Manual – update with latest research findings
The Weaner Manual – include updated research findings

Secondments

ABS modelling and prepare Final Report V.VCS.0013 A pathway to improve quality of national beef statistical data.
Acting co-ordinator for Breeder Efficiency Project in initial start-up phase of the project.
Phosphorus Challenge co-ordination, dispatch of equipment, consumables, feedback letters
QDAF Animal Welfare Taskforce to handle animal welfare concerns with 2019 drought
- field days & workshops

Travel

Lakeland Downs & "Blackfella Beef" w/shop
Barcaldine - Presentation on heifer management
Aramac - Girl Power workshop
NBRUC Conference

Literature development

Abstract for ASAP Conference - Rethink on cost benefits of True Protein supplementation post weaning 2022

Abstract for P Paper - Rangelands Conference 2021

Assist with PDS on Heifer management and develop Girl Power Manual

Breedcow Plus modelling and literature review on protein supplementation

Develop PP for Webinar on P and Podcasts with Stephanie Coombes

Drought planning and recovery forum - prepare paper with co-author Phil Holmes

Tips and Tools Developed

NB2 Calf Loss – Do I have a Problem

NB2 Producer Flier

NB2 Selecting Bulls Fact sheet

NB2 What Causes Calf Loss – fact sheet

NB2 How to do a calf necropsy

NB2 Assessing Animal Health Status.

Dark cutting Tips and Tools

Infographs – Phosphorus – NB2

Infographs – Minerals NB2

Draft tips & Tools prepared for editing

T&T Cross Breeding

T&T Spay Selection

T&T Protein Supplementation

T&T Understanding Adult Equivalents

Other Publications Developed

Weaner Management in Northern Beef Herds (8 Pager)

Why Do Cattle need Phosphorus (8 pager)

Mating Wheel

Girl Power “A Producer’s Guide of Principles and Best Management Practice of Replacement Heifers in the Rangelands”

Northern Breeding Business (NB2) – information for producers’ prospectus

Other activities within MLA

Animal welfare taskforce SE Qld

While the co-ordinator's role focused mainly on northern beef, the activities extended to other sectors in MLA such as Southern Beef, Animal Health, Producer Demonstration Sites and Animal Welfare. During the extended drought over the summer of 2019, MLA was able to make an immediate response and worthy contribution to developing an animal welfare strategy in peri-urban drought affected areas of SE Qld in conjunction with a Queensland Department of Agriculture and Fisheries (QDAF). The expertise and recognition of having a past president of the Australian Veterinary Association provided the needed reassurance to the public and industry that the issues were being addressed adequately. Being able to speak at drought workshops throughout southern Queensland and produce relevant extension material to accompany such activities provided added support to the cause.

Technical Working Group on Livestock Statistics

The need for accurate and transparent national herd statistics is obvious as the industry moves to validate progress towards CN30 targets, and to assess outcomes of large programs like NB2. Participation on behalf of MLA in the Technical Working Group on Livestock Statistics in the red meat industry which brought together ABS, ABARE, Integrity Systems and MLA created an opportunity to demonstrate methods to improve the accuracy of the national herd data base.

P Challenge 2019 and 2020

Although plagued by drought in 2019 and then COVID19 in 2020, the P Challenge was able to raise awareness of the value of the Plasma Inorganic Phosphorus test as the most accurate and definitive way to determine if pastures are indeed deficient in phosphorus. The co-ordinator's contract was amended to ensure that the necessary disposables and equipment were sourced and distributed, and that serological testing could be conducted during the P Challenge. Taking a serological test into a field situation with few technical assistants to collect and process samples, coupled with issues of sample transport all presented major challenges which had to be resolved during the course of the challenge. The results had to be individually interpreted after diet quality results were available and all participating producers received feedback as to the P levels in their pastures. The Phosphorus research over the past 30 years was reviewed outlining the impact of P on dry matter intakes during the wet season. This paper will be presented at the Australian Rangelands Society Conference in October 2021.

Review cost benefits of protein supplementation post weaning

After reviewing the final report (B.GBP.0005) "Target dry season weight gains for weaner heifers" and examining the trial results, it became obvious that full compensatory gain in weaners during extended dry seasons is highly unlikely to occur. A full literature review of the protein work that has been funded by MLA over the past two decades together with

supplementation effects on reproductive efficiency in maiden heifers demonstrated that significant cost benefits are available for many northern breeder properties. The modelling was performed on Breedcow Plus and the contribution to programs such as CN30 and NB2 are potentially enormous. The work is currently being reviewed externally and it is planned to submit a full review paper to the Australian journal of Animal Science.

Interim co-ordinator for NB2

To ensure that NB2 could be commenced and that steps could be put into place to promote and support the project, the Grassfed beef consultancy role was provided in the form of an interim co-ordinator until a permanent project co-ordinator could be appointed. The role involved development of the initial prospectus along five Tips and Tools related to calf loss and disease investigations. In addition, a glossary of terms was created for the project.

5. Conclusion

Despite the severe travel restrictions and changed work practices brought about by the COVID19 pandemic, the Grassfed beef (N Australia) consultancy 2019-2021 position was able to achieve outcomes over and above that which was specified in the work contract, and which are listed in the results section of this report. All objectives were met, the KPI's achieved and 8 new Tips and Tools developed along with a number of other publications. However, it was the flexibility to support and ensure that other important MLA initiatives and projects could commence and operate effectively that demonstrated the value proposition for this role. The technical working group on livestock statistics, the QDAF animal welfare taskforce during the drought of 2019/20, the Northern Beef Efficiency project (NB2) and the P Challenge have all benefited from the experience and technical expertise provided by the consultant. Possibly the most significant achievements were the comprehensive review of all the recent Phosphorus work and the ability to demonstrate yet again that the main impact of Phosphorus in beef cattle production is to drive dry matter intake over the wet season and that the Plasma Inorganic phosphorus test is the best diagnostic test to determine if the diets of animals need supplementation. A similar review on the role of compensatory growth rates and the potential impact that supplementation of weaners post weaning where long dry seasons are experienced can be a game changer for enterprises in the dry northern tropics and will far reaching positive impacts for CN30 and NB2 programs.

6. Future activities and recommendations

While there will always be a requirement for corporate knowledge and a need to address ongoing issues when they arise – especially if the technical expertise is not readily available within the organisation, the future activities and recommendations for this consultancy role is outside the confines of this report. It is best for those within the organisation to see if, and how the position can be used in future activities and evaluate if the value proposition applies. The outcomes demonstrated in this report should assist in illustrating pathways and possibilities in the future.

7. Appendices

1. Major scientific reviews of recent MLA research

Wet season phosphorus supplementation increases grazing pressure.

(For Australian Rangelands Conference 2021 - Longreach)

G. E. Niethe. (B.V.Sc., MVS)

Abstract

The need to adjust grazing pressure when using NPN supplementation over the dry season is well recognised. Recent MLA funded pen studies in both steers and breeding females on diets replicating wet season pastures, demonstrated that dry matter intakes can be doubled where acute phosphorus deficiencies exist. These trials demonstrated that the clinical signs associated with a phosphorus deficiency of reduced fertility, decreased growth rates, decreased milk production and increased mortality are all secondary outcomes to decreased feed intake. Other signs such as lameness (peg leg) and bone chewing (pica) occur when dietary intake of phosphorus is insufficient to supply the animal's demands for growth, pregnancy and lactation. Skeletal reserves of phosphorus are then mobilised to meet the shortfall. This mobilised phosphorus does not impact dry matter intakes. To gain full responses from supplementation, phosphorus must be provided at all times to all animals on a positive plane of nutrition. The increased grazing pressure that occurs with wet season supplementation must be recognised in pasture management. The plasma inorganic phosphorus test was found to still be the most accurate test to determine when supplementation will be cost effective in above maintenance diets.

INCREASED INTAKES - WET SEASON – MOBILISED PHOSPHORUS – GRAZING PRESSURE – PLASMA INORGANIC PHOSPHORUS

Protein supplementation for weaners – reassessing the role in northern beef herds.

Niethe G¹, Poppi DP², Holmes P³, McLennan SR², Callaghan M⁴ and Quigley SP²

(For AAAS conference July 2022 - Cairns)

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²The University of Queensland, Gatton, QLD 4343

³Holmes & Company, University of New England, Armidale, NSW, 2350

⁴Ridley AgriProducts, Toowong, QLD, 4306

Increasing breeder efficiency and increasing annual liveweight gain present the best opportunity for maximising profitability in northern Australian cattle herds. However, productivity is constrained by low pasture quality during the protracted dry season. Meeting liveweight targets for sale steers and critical mating weights for heifers is difficult if weaning weights are <190 kg and annual liveweight gain is 100 kg. It is generally accepted that compensatory gain in the first wet season following weaning erodes most of the benefits of post-weaning supplementation. A review of recent research suggests that the degree of

compensation is far from complete and is influenced by animal liveweight, and duration and severity of the restriction during the dry season and the opportunity for re-alimentation during subsequent wet seasons. Growth rates of 0.3 kg/day achieved by feeding protein meals at 0.5% liveweight to weaners for 6 months can ensure that around 70% of steers achieve target sale weights after the first wet season and replacement heifers reach critical threshold weights for mating. The earlier sale of steers and the increased reproduction rate of young breeders significantly impact herd structure and productivity, with potential to increase profitability. A sensitivity analysis was conducted to establish the economic boundaries of protein supplementation across a range of cattle prices and supplementation costs. These results provide a framework for decision making and evidence to support the potentially huge benefits of protein supplementation in the first dry season after weaning on the productivity and profitability of cattle systems in northern Australia.

Outcomes of the Technical Working Group on Livestock Statistics in the red meat industry – Progress Report 1

S. G. Wiedemann (Integrity Ag and Environment) Chair, Technical Working Group on Livestock Statistics Co-Authors: G. Niethe N. Thompson (ABARES) N. Gibson (ABS), R. Walter (ABS).

Executive summary This report outlines the work undertaken by the Red Meat Statistics Technical Working Group to assess the current state of data and statistics related to the Australian beef cattle herd and suggest actions that have the potential to improve the quality and sustainability of these activities. Several modelling exercises and workshops led the TWG to conclude that significant inaccuracies are present in official statistics. These inaccuracies limit the ability of government and industry to make effective decisions that are essential for the beef cattle sector to operate as productively and profitably as possible. In response, the TWG has developed two approaches to address these inaccuracies, both of which align with the principles outlined in the Roadmap to improve the agricultural statistics system developed by ABARES and ABS. Steering Committee members are requested to consider the recommendations and actions to progress the initial blueprint outlined here.

The last 50 years of pastoralism – what impact drought strategies?

G.E. Niethe & P.R. Holmes

Proceedings of the Royal Society of Qld, A Rangelands dialogue towards a sustainable future Vol 127 2020.

Conclusion: It would appear that despite advances in transport, feed options and livestock management, grazing strategies used in European systems cannot be successfully applied to a highly variable rainfall environment that exists in arguably the driest continent on earth. Drought is not a novel phenomenon but the impact of successive droughts, the lack of resilience and the apparent loss of land condition present new challenges that need to be addressed by the pastoral industries in the 21st century. Examples exist which demonstrate how this can be achieved. It is paramount therefore that custodians and managers of the

rangelands develop sound drought management plans that focus primarily on preserving native pastures and land condition – similar to biosecurity requirements. Assistance packages and drought relief should embrace measures that demonstrate prior planning and ‘best practice’ grazing management.

2. Tips and Tools produced 2019 to 2021



TIPS & TOOLS

NORTHERN CATTLE

Calf loss – do I have a problem?

Calf loss relates to all reproductive losses that occur after a breeding cow has been categorised as being pregnant, right through to weaning.

- It includes:
- foetal losses (abortions)
 - perinatal calf losses (newborn calves)
 - weaner-aged calves prior to weaning.

There are many factors and infectious agents that can cause calf loss in a breeder herd. The first question that needs to be addressed is, 'do I have a problem?'

How do I know if I have a calf loss problem?

There are several indicators beef producers can use to assess whether they have a calf loss problem.

Presence of an aborted foetus or a dead calf

This is a highly reliable indication in small beef breeding operations where livestock are observed on a regular basis or where carcasses are observed, for example, around a watering point.

In the majority of circumstances across northern Australia, dead calves or aborted foetuses are rarely seen. Therefore, other methods to determine if calf loss is a problem should be explored.

Losses after pregnancy diagnosis

In breeding herds where diagnosis of pregnancy is routinely undertaken and non-pregnant females are culled, the number of calves weaned in relation to the number of pregnant cows retained provides a good indication as to whether calf loss is a problem.

Any inaccuracies are generally related to multiple births or initial misdiagnosis during pregnancy testing. Many producers calculate their weaning percentage based on cows retained in the herd. If only pregnant cows are retained after testing, then this provides an accurate indication of calf loss (for e.g. 92% calves weaned from pregnant cows retained is actually a calf loss of 8%).

Assessing the lactation status of each cow at weaning (i.e. is she producing milk?) further improves accuracy of the data and will determine if multiple births are the cause of any errors.

What if pregnancy status wasn't assessed?

Determining if you have a calf loss problem is a bigger challenge if routine pregnancy diagnosis was not performed.

It's difficult to determine the extent of calf loss simply by the number of weaners produced or the number of cows lactating when weaned.

A lower than expected weaner percentage can be due to calf loss, but can also be associated with failure to conceive or embryonic loss (early abortion). The cause of lower than expected weaner numbers has been mainly attributed to failure to conceive (infertility).

If pregnancy diagnosis wasn't performed, best practice is to use body condition scoring in combination with lactation and udder assessment (see Figure 1).



TIPS & TOOLS

NORTHERN CATTLE

How do I select and manage bulls?

Selecting the right bulls for your breeding objectives and managing them effectively is key to ensuring the long-term productivity and profitability of your herd.

Producers can use these Tips & Tools to understand the importance of appropriate bull selection techniques and to implement best practice management strategies on-farm.

Selection

Selecting which bulls to buy is one of the most important decisions producers make every year – but why is it so important and what do you need to consider?

The importance of picking a performer

Genetic composition

The bull you purchase today will impact the genetic composition of your herd for the next 12–16 years.

While a bull will directly affect progeny performance for as long as he's servicing a herd (roughly four years), the herd's replacement weaner heifers that are joined to new sires can still produce progeny with performance traits of the original bull 8–10 years after his removal.

Genetic improvement

Sire selection drives genetic improvement and is approximately 10 times more important than heifer selection. For example, a bull could produce around 120–180 progeny over his time in the herd but an individual breeder cow may only produce 6–8 progeny.

A bull with the genetics required to direct the herd towards your breeding goals is often referred to as a 'herd improver'. While a 'herd improver' will increase genetic gain, a bull with inferior genetics will take your herd backwards.



MLA's pocket guide *How to shop for a high-performing sire* provides valuable insights on sire selection. To download the guide, visit genetics.mla.com.au

Key considerations

BREEDPLAN

BREEDPLAN – a modern genetic evaluation system for beef cattle – enables producers to accelerate genetic progress in their herds through the use of Estimated Breeding Values (EBVs) for a range of important production traits such as weight, carcass and fertility. By seeking stud breeders who measure and record performance data in their herds via the BREEDPLAN database, producers can select sires that directly align with their breeding objectives. For example, if you're looking to improve female fertility, it's important to purchase bulls with EBV traits such as 'days to calving'. For more information on using breeding values to find sires, visit mla.com.au/using-ebvs

BULLCHECK

A BULLCHECK examination provides assurance to the bull buyer that at the time of examination, the bull was reproductively sound. However, bulls will still need to be monitored for injury, disease and nutrition status, which may affect fertility after the examination.

BULLCHECK examinations are carried out by an accredited veterinarian:

- prior to sale or purchase
- annually for herd bulls – especially single sire groups and short-controlled mating systems.

Once the veterinarian has deemed a bull 'sound', they will provide an Australian Cattle Veterinarians (ACV) BULLCHECK Certificate of Approval and a summary of the tests will be provided in the bull sale catalogue (see example in Figure 1).



How do I select and manage bulls?

1



TIPS & TOOLS

NORTHERN CATTLE

What causes calf loss?

Calf loss can be a significant contributor to reproductive inefficiency in a breeder herd. It includes losses that occur after a breeding cow has been categorised as being pregnant, right through to weaning.

The best approach to maximise the number of calves from birth to weaning is:

- determine if a problem exists (see MLA fact sheet: *Calf loss – do I have a problem?* at mla.com.au/calf-loss)
- identify at what stage the losses may be occurring
- diagnose the cause of the losses (if possible)
- implement time-bound strategies to address the problem.

Numerous factors can contribute to calf loss – in fact, multiple factors can often be apparent in the same herd.

Calf loss can be described under two distinct categories:

1. **Maternal factors** directly associated with the breeder cow.
2. **Offspring factors** relating specifically to the calf.

Many of the maternal factors affecting calf loss in northern Australia have been identified via the MLA-funded 'Cashcow' (mla.com.au/cashcow) and 'Calf wastage' (mla.com.au/calf-wastage) projects.

Maternal factors

Lactated in the previous year

The MLA Cashcow project found cows that failed to rear a calf the previous year were more likely to lose their calf again in the subsequent pregnancy. These present as fat cows (usually pregnant) and are potential carriers of ongoing health issues/diseases in the herd.

Body condition score (BCS) at pregnancy diagnosis

Cows in low body condition when they're pregnancy tested (usually when their current calf is around 4–7 months old) are more likely to lose the calf. Low body condition at pregnancy testing is directly related to:

- poor body condition at calving
- poorer quality colostrum for the newborn calf
- less milk available on an ongoing basis.

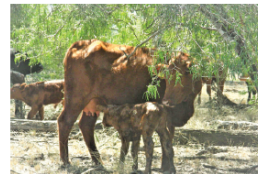
Calves born in drought conditions are also more likely to develop calf scour. Stocking rates, supplementation and weaning options need addressing to minimise the number of cows in low body condition at pregnancy testing.

Cow age

Both maiden (calving for the first time) heifers and aged cows have higher rates of calf loss than mature breeders. Maiden heifers are regarded as a high-risk group because they are:

- more susceptible to viral diseases which impact reproductive performance
- at a higher risk of having birthing difficulties (dystocia) and mothering issues
- mothering ability is less developed first time round.

Aged cows are also considered high risk as they're generally less likely to maintain body condition.



Maiden heifers need extra time to develop a strong cow-calf bond after birth. They're also more prone to dystocia because their pelvic opening has not reached its maximum size.



TIPS & TOOLS

NORTHERN CATTLE

Assessing animal health status

All livestock owners in Australia have a duty of care under animal welfare legislation to ensure reasonable protection from disease for all animals they own or manage. It's important stockowners know the enemy (disease) to demonstrate compliance.

The on-farm biosecurity plan recommends 'report unusual signs of disease as soon as possible to your vet or local animal health authority'. While this is by far the best solution, in practice it seldom happens due to:

- failure to recognise a problem
- distance
- cost
- dead animals found too late
- availability of suitably qualified personnel.



The goal is to identify the causes of disease and poor performance so that animals can be provided with reasonable protection from disease, and necessary control and management measures can be implemented.

More disease problems remain undiagnosed from 'not looking' rather than 'not knowing' – animals don't die without a reason. The challenge is to find the cause. The most effective way of keeping animals healthy is to prevent new or exotic diseases brought onto the farm in the first place.

Note: If a serious exotic disease is suspected,

Precautionary measures prior to starting

Wear protective clothing at all times such as disposable gloves, rubber boots and overalls. After the necropsy, incinerate gloves and thoroughly wash boots and overalls.

Treat every animal assigned to a necropsy as infectious to animal and man.

If you live in the anthrax belt and an animal dies suddenly with dark blood discharging from the nose and/or anus – **do not open the carcass.**

Perform the necropsy as soon as possible after the death of the animal. Post-mortem decomposition sets in quickly in large animals and the problem is exacerbated further in hot climatic conditions.

Eating, drinking and smoking are prohibited at the necropsy.

Prior to starting the necropsy, check the necropsy kit thoroughly to ensure all the necessary items are present for the job. A sharp knife, steel and an axe/pruning shears/saw are essential. A bucket of water, soap, brush, disinfectant, notebook and a digital camera or phone are also necessary components. Having a second person on-hand to take notes and photographs will prevent small details from being missed.

After the necropsy, dispose of the animal's remains according to your biosecurity plan.



TIPS & TOOLS

NORTHERN CATTLE

How to do a calf necropsy

Valuable information can be obtained from a calf that has recently died. If no veterinary services are available, the following tips may assist in finding the cause. It's important to develop a logical and methodical approach when performing a calf necropsy.

Precautions and helpful hints

Before completing the calf necropsy, follow these precautions.

1. Avoid direct contact with tissues and body fluids to limit the risk of contracting zoonotic diseases such as Leptospirosis. The minimum personal protective equipment (PPE) should be elbow-length disposable gloves and a transparent facial shield.
2. Check to see where the mother of the dead calf is, as cows may become aggressive when their calf is being interfered with.
3. Identify the mother so that samples can be collected retrospectively (if needed) next time she is yarded.
4. Select a good spot for disposal (burial or burning) of the carcass when the examination is completed.
5. Refer to *Tips & Tools Assessing animal health status* when performing the necropsy. Follow the methodical steps outlined to ensure all major systems are examined.
6. Observe carefully, take notes and plenty of photographs. If collecting samples, use zip top plastic bags or small clean jars and keep chilled. Record other information such as approximate time of death, seasonal and environmental conditions.
7. If uncertain about doing your own necropsy, place the freshly dead calf in a clean bag, keep as cool as possible and take to your local veterinarian or laboratory if close by.

How to complete a calf necropsy

Step one: Determine the foetal age

Has the calf been aborted or is it full term? A foetus <8 months of age will have no hair. Foetus size can provide an idea of foetal age (see Table 1).

Table 1: Determining foetal age (months) by foetus size

Month	Foetus size similar to
2	Mouse
3	Rat
4	Cat
5	Small dog
6	Medium dog
7	Large dog
8	Calf (with hair)



Step two: Determine if the full-term calf has been born dead or alive

A necropsy will determine if the calf has breathed air. If the lungs are:

- pink and spongy (and float when a section is placed in water), the calf has breathed air
- dark red and meaty, the calf hasn't breathed air.



Step three: Determine if the calf has died during a difficult birth (dystocia)

A difficult birth is most common in maiden heifers that deliver their first calf and can be characterised by:

- puffy head
- swollen tongue
- froth in windpipe
- bruising
- haemorrhages and hernias.



How to do a calf necropsy

1



Northern Breeding Business (NB2) Information for producers

NB2 is an initiative developed by MLA to address:

- calf loss in northern breeding herds
- low profitability of many northern beef enterprises
- low adoption of proven management practices and technologies.



The project has set the ambitious target to deliver an estimated \$20 million/year in net benefits by 2027 to 250 northern beef enterprises.

NB2 will focus on several key pillars:

<p>Herd management Enhancing breeding herd performance through improved systems and interventions</p>	<p>Feedbase Optimising feed production and supply for the breeding herd</p>	<p>Environment Exploring issues in rangeland management, the environment and the long-term sustainability of the northern beef industry</p>	<p>On-farm practice change Turning R&D successes into practice change on-farm</p>
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Benefits to producers

NB2 will provide multiple benefits to northern producers and the wider beef industry, including:

- a 5:1 return on investment by improving reproductive rates, decreasing mortality, increasing turn-off weight and improving

Get involved

Four regionally diverse pilot producer groups will be established across northern Australia to provide direction and insight for the NB2 project:

- one group from the Kimberley, WA.



TIPS & TOOLS

SOUTHERN CATTLE

Dark cutting

Improving MSA compliance from the pasture up

Peak times for non-compliance to Meat Standards Australia (MSA) requirements for pH levels of beef, which must be <5.71, can vary between regions depending on seasonal conditions. The most challenging periods for high pH levels are when pasture availability and quality are at their lowest. These are:

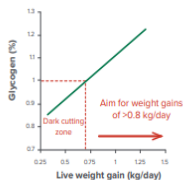
- in **temperate pastures** – late summer to early winter
- in **tropical pastures** – late autumn to spring
- in **drought** – any season.

Understanding the causes of dark cutting, how to manage and supplement stock and prepare pastures to guard against it, will ensure that money is not being lost from non-compliant carcasses.

What causes dark cutting?

Every animal has a certain amount of energy contained in its muscles in the form of glycogen. Post-slaughter, this muscle glycogen converts to lactic acid, which causes the meat's pH to fall. Insufficient muscle glycogen hinders the production of lactic acid, which results in high pH and the classification as a 'dark cutter'. Therefore, producers must ensure that muscle glycogen levels are optimised before slaughter to avoid non-compliance.

Muscle glycogen storage vs weight gain



Tips for optimising muscle glycogen

- Provide cattle with a rising plane of nutrition, particularly in the 30 days prior to slaughter.
- Ensure there is enough Food on Offer (FOO) – > 1500 kg/ha.
- Maintain animals in their social groups in the 14 days prior to slaughter.
- Ensure livestock always have access to water prior to consignment.
- Identify if low magnesium (subclinical grass tetany) and mycotoxin levels in temperate pastures exist.
- Reduce stress during handling and transportation to abattoirs.

Acceptable supplements to improve feed gaps

There are several forage products and supplements producers can feed during periods of low pasture quality and availability to manage against dark cutting. All supplements listed are compliant with the Pasture-fed Cattle Assurance Scheme (PCAS).

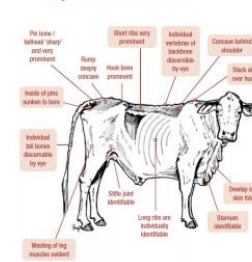
Forage products:

- lucerne cubes and pellets
- forages, forage cubes and grass cubes or pellets
- hay or silage from any forage without grain
- leucaena.

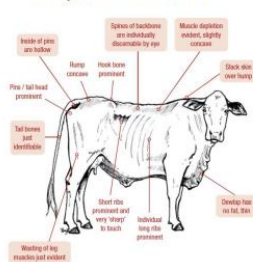
WHEN EUTHANASIA IS THE BEST OPTION!

Where feed requirements for livestock are not being met due to a drought or other reasons, the person in charge/owner must provide supplementary feed and/or agist or sell livestock that are fit to transport. Animals that are not fit to transport and cannot be treated must be humanely destroyed. It is not lawful or humane to allow animals to starve to death. Both body condition and visual signs of fatigue are excellent tools to assist decision making.

Body Condition Score 0



Body Condition Score 1



(Similar descriptors apply for other animal species as well e.g. horse, sheep, goats, alpacas etc – palpate if excess wool or hair impacts visual assessment)

BCS 0 - Unable to be transported without prolonged intensive management




BCS 1 - Unlikely to be transported without feeding & rest

To be eligible for travel

- The property must have a Property Identification Code (PIC) and be accompanied by a National Vendor Declaration (NVD) form except horses.
- Cattle, sheep and goats must be identified with a National Livestock Identification Scher (NLIS) tag/device – in addition all cattle (except calves) must be branded.
- Stock must be in body condition score >1 and must not be showing signs of fatigue – ie panting, steady gait, show flight zone response, no signs of trembling and able to stand unassisted.
- Must meet the health and residue requirements of the property of destination ie satisfy tick Biosecurity plan eg if moving to a tick free area, animals must be treated prior to movement

NB: Stock in body condition score <2 are of no value for slaughter

(QDAF Publications prepared by MLA)

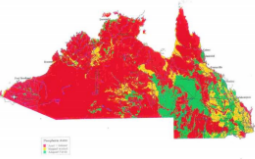
Northern Breeding Business (NB2)
Information for Producers

Phosphorus supplementation.

A wet season problem with consequences usually only observed in the dry season.

A REAL GAME CHANGER IF YOU ARE OPERATING IN P DEFICIENT COUNTRY.

The areas shaded red on the map provide a rough indication of the extent of Phosphorus deficient country in northern Australia



MAIN IMPACT IS DECREASED FEED INTAKE WHEN CATTLE ARE ON GREEN FEED.

THESE FLOW ON EFFECTS ARE THEN SEEN AT THE START OF THE DRY SEASON:-

1. Breeder cow weights up to 100kgs less.
2. Steers & heifers weights up to 60 kgs less.
3. Pregnancy rates 30-50% lower.
4. Weaner weights 30-40 kgs lighter.
5. Mortality rates increased by 3-5%

THE BEST TEST - A BLOOD TEST AT THE END OF THE WET SEASON IS THE BEST INDICATOR OF WHETHER A PHOPSHORUS SUPPLEMENT WILL BE COST EFFETIVE.

Phosphorus content of the pastures is driven by soil P. Once the P status of a paddock is established, a phosphorus management plan can be implemented.

All stock will perform to their potential over the wet season with adequate P in their diet. Supplement needs to be provided over the entire growing season.

Lactating and late pregnant breeders need a P supplement over the dry season to prevent mobilization of phosphorus from their bones which leads to 'peg leg', broken bones and bone chewing.

For more information see [MLA publications:-](#)

"Why do cattle need phosphorus? A guide for northern beef producers"

"Feeding phosphorus to northern beef cattle"

(Draft Only)





Northern Breeding Business (NB2)
Information for Producers

Mineral & trace element deficiencies in the breeder herd.

A wet season problem with consequences usually only observed in the dry season.

What comes after energy, protein and fibre?

Correct diagnosis & supply of missing nutrients when they are most needed!



MINERALS AND TRACE ELEMENT DEFICIENCIES ARE WET (GROWING) SEASON PROBLEMS IN WHEN THE GRASS IS GREEN

MACRO MINERALS

CALCIUM	PHOSPHORUS	MAGNESIUM	SODIUM + SULPHUR
The major mineral found in bones Deficiencies not common - found around calving with high milk production -> MILK FEVER AND TETANY Most grasses & pastures contain adequate levels. High oxalate plants may increase risks.	Second major mineral in body Deficiency commonly seen in north Australia. Deficiency in pastures -> decreased feed intake over the growing season. DECREASED BODY WT., PREGNANCY, SURVIVAL & MILK. Diagnose & supplement over the wet season	In bones & teeth but also cellular oxidation Not commonly seen in tropical pastures - in temperate regions -> GRASS TETANY. High potassium fertilizer & high protein levels in grass dominant improved pastures increase risk. Collect urine and serum samples to make diagnosis.	Sodium deficiencies not commonly seen. Salt (NaCl) is included in most supplements & found in bore water Both -> DECREASE FEED INTAKE Sulphur deficiencies can occur in basalt country - also in mulga (tannins bind sulphur) Ensure N:S ratio is about 10:1 when preparing supplements

(Correct diagnosis essential) **MICRO MINERALS** (Overdosing -> toxicities)

Copper Decreased growth in young cattle, diarrhoea, infertility and sandy tinged coat in black cattle Sandy coastal soils and granite/plicone soils High Molybdenum and Sulphur -> decreased Cu availability Liver samples better than blood.	Selenium White muscle disease (WMD) in young animals and infertility Lush spring clover dominated pastures Vit E deficiency also causes WMD - on stubble and dry pastures Glutathione Peroxidase levels diagnostic.	Cobalt Ill thrift, lacrimation, anaemia, low body condition and ketosis in lactating cows Usually seen on coastal calcareous sands. Problems in lush spring pastures. Diagnosis best done on Vit B ₁₂ levels in pre-ruminant calves.	Iodine Clinically enlarged thyroids in young animals Effects reproduction, growth and metabolism High rainfall hilly country during spring and summer Goitrogenic clovers and feedstuffs containing goitrogenic substances.	Zinc & Manganese Deficiencies rare in extensive grazing conditions. Zn deficiency -> reduced intake and feed efficiency, skin and hoof disorders and testicular growth Mn deficiency -> skeletal disorders, muscular weakness, irregular oestrous cycles.
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(Draft Only)

3. Other new publications and extension material

The '8' Pager publications



Why do cattle need phosphorus?

A guide for northern beef producers



Weaner management in northern beef herds

An introduction



Specific material produced for Producer Demonstration Sites

Girl power manual for participants.

GIRL POWER



A Producer's Guide of Principles and Best Management Practice of Replacement Heifers in the Rangelands

Funded by Meat and Livestock Australia through the Producer Demonstration Site (PDS) Program, The Girl Power Project is a Desert Uplands Committee initiative, Partnering with Central Highlands Regional Resources Use Planning and Beef Producers of the Desert Uplands.

CONTENTS

GIRL POWER	1
PROJECT DETAILS.....	2
IMPORTANCE OF HEIFER MANAGEMENT	4
PROPORTION & PERFORMANCE	
THE TWO FOLD AFFECT	
THE GOAL OF HEIFER MANAGEMENT	5
TWO CRITICAL TARGETS	
THE GREEN DATE & THE JOINING DATE	
CRITICAL MATING WEIGHT	
JOINING PERIOD	
DEVELOP YOUR OWN CMW	
KNOW YOUR COUNTRY.	9
LIVEWEIGHT PERFORMANCE	
PROTEIN SUPPLEMENTATION	
THE LEAST COST CALCULATOR	
PADDOCK CARRYING CAPACITY	
FORAGE BUDGET	
DUNG SAMPLING	
PHOSPHORUS	
BLOOD SAMPLING	
INTERNAL PARASITES.	16
FACEAL EGG COUNTS	
EXTERNAL PARASITES.....	18
POISONOUS PLANTS.....	19
MINERALS & TRACE ELEMENTS.	20

The heifer management and participation certificate with goals.

THE JOINING DATE

HEIFER MANAGEMENT CALENDER WHEEL

Once the 'Green Date' is determined, then just point the 'Green Date' arrow of the heifer management wheel and the rest falls into place.

NB: If other strategies are used to determine the start of joining, then simply ignore the 'Green Date' and synchronise the joining period (red section of wheel) with the required dates. Alternatively, select when you wish calving to start and point 'the start of calving' arrow (blue) at the desired date.



'Start of joining' - a once only decision.
Remains constant in almost all seasons.
Managing the breeder herd revolves around the start of joining.

CRITICAL MATING WEIGHT

The Critical Mating Weight (CMW) is defined as the weight at which 84% of maiden heifers will conceive within a 42 days/6 weeks (two full reproductve cycles). It is derived by

Girl Power Goals

"Upsun Downs Station"

In the beginning - Year 2021:-

- Bulls in: → Day ___ Month ___
- Length of Joining period: ___ Weeks
- Conception Rate in maidens: ___ %
- Weaning Rate in Heifers: ___ %
- Reconciliation Rates: ___ %

Possible Strategies Considered to achieve Critical Mating Weight:-
(Circle which ever applies to your enterprise)

- Post weaning Supplementation Yes or No
- Wet Season P Supplementation Yes or No
- Worm Control Yes or No
- Adjust Stocking rates/forage budget Yes or No
- Spike Feeding (last third pregnancy) Yes or No
- Other: _____

- All replacement heifers pregnant in 6 week joining period AND 95% wean a calf
- 80% reconceive within 3 months of calving

In 2024
Did we hit the target?

AIM: To improve reproductive performance of the breeder herd by targeting young breeder productivity - identifying Critical Mating Weight and the best time to join.

(For PDS Members Only)

4. Photo Gallery

Workshops and Field Days



“Blackfella Beef” workshop at Crocodile Station Laura, NQ



10 local Aramac producers signing up for the ‘Girl Power’ PDS.