

2013-14 FutureBeef Priority Area #5

BREEDER MANAGEMENT

Background:

The National Beef Research, Development and Extension Strategy was developed in 2009 in a collaborative effort by representatives from the Australian beef industry, state government agencies, academic institutions and research organisations. The intent is to improve research, development and extension capability, capitalising on the collective critical mass around specialised areas. This focussed RD&E investment is expected to improve efficiencies by reducing the more traditional, fragmented RD&E approach. The national beef strategy emphasises the importance of industry partnerships and co-investment to support strategic research, the delivery of regional development and extension tailored to local needs.

In March 2013, the North Australia Beef Research Council (NABRC) conducted a series of workshops across Queensland to identify RD&E priorities. NABRC is a collaborative forum for industry, funding bodies and RD&E providers to lead research, innovation and technology adoption to benefit the northern beef industry. These RD&E priorities were published in a *NABRC Priorities Prospectus* and can be accessed through the NABRC website. www.nabrc.org.au

Six themes or broad areas of work were identified as being the most important for planning of RD&E priorities:

1. **Reproduction**
2. Grazing land management
3. Nutrition and growth
4. Human capacity and enabling change
5. Animal welfare
6. Information technology; and Precision livestock management

Linkages:

Reproduction is a major driver of beef enterprise profitability in northern Australia. Under the 'Reproduction' theme there are three sub-themes:

- 1.1 *Rapid dissemination of superior genetics*
- 1.2 *Reducing losses from pregnancy test to weaning*
- 1.3 *Develop producer's pathway to efficiency*

FutureBeef Program for Northern Australia

In May 2013, key industry funder Meat and Livestock Australia and state agency extension services (DAFF Qld, NTDPIF and DAFWA) launched a collaborative extension program designed to focus extension effort and investment into key priorities outlined in the National Beef RD&E Strategy and NABRC's RD&E priorities in the following five areas:

- Priority 1 – Weaner management
- Priority 2 – Phosphorous supplementation
- Priority 3 – Whole of business management
- Priority 4 – Grazing land management
- Priority 5 – Breeder management**

In addition, while other project collaborations and investment from natural resource management groups and catchment groups focus on NRM outcomes, these generally can only be achieved by a whole-of-business enterprise approach. There will also be linkages from these priority areas to the

voluntary Grazing Best Management Practice project that is currently being developed and trialled in Queensland. For more information on the above, visit the FutureBeef website www.futurebeef.com.au – a collaborative website by the FutureBeef program partners.

Background – Breeder management:

Reproduction is probably the single most important factor affecting the economics and profitability of beef cattle breeding operations in northern Australia. For bulls, reproduction is all about the capacity and ability to sire a large number of viable offspring in each mating year. For cows, reproduction is all about the capacity to conceive and rear a calf to weaning each year following puberty. The cow that produces a live normal calf within 365-day calving intervals and rears that calf to weaning is superior to the cow that has longer inter-calving intervals or fails to wean the calf.

Reproduction forms the basis of livestock improvement as it allows the transfer of genetic material from one generation to the next and can greatly influence genetic gain. Independent of growth potential, reproductive function influences the age of the calf and thereby the total amount (kg) of beef turned off at any point in time.

Many factors influence and can impact on reproductive performance. Improved management of reproduction can increase economic returns to cattle producers. In severe environments where nutrition is a major stress factor, improvements of 5–10% in weaning rates are possible through improving nutrition and management. This then provides additional opportunities for implementation of genetic selection strategies in breeding programs to improve profitability. Furthermore, reproductive function can be improved by focusing selection on the economically important criteria and traits related to fertility.

Reproductive performance is influenced by a number of independent traits. Measures for the cow include:

- weight and age at first oestrous cycle
- the intercalving interval
- lactation status at subsequent pregnancy diagnosis.

Measures for the breeder herd include:

- conception rates determined by pregnancy diagnosis (PD)
- branding and/or weaning rates
- kilograms of calf weaned per 100 kg of cow mated.

The reproductive performance measures set out in the table below can be calculated using the formulae provided.

Performance measure	Calculation
Pregnancy percentage	= $\frac{\text{Pregnant females}}{\text{Females joined}} \times 100$
Calving percentage	= $\frac{\text{Calves born within a 12 month period}}{\text{Females joined in previous 12 month period}} \times 100$
Weaning percentage	= $\frac{\text{Calves weaned}}{\text{Females joined in previous 12 month period}} \times 100$
Branding percentage	= $\frac{\text{Calves branded}}{\text{Females joined in previous 12 month period}} \times 100$
Weight of calves weaned per cows joined	= $\frac{\text{Total weight of all calves at weaning}}{\text{Number of females joined in previous twelve months}} \times 100$
Kilograms of calves per 100 kg of cows joined	= $\frac{\text{Kilograms of calves weaned}}{100 \text{ of females joined in previous 12 month period}} \times 100$

Limitations to the above measures include:

- fertility cannot be assessed directly for bulls

- pregnancy status for cows requires skills in pregnancy diagnosis, which should be coupled with an assessment of lactation status
- branding and weaning rates (in isolation) do not provide indications of when or where reproductive losses may be occurring
- unless birth dates are known and a restricted joining period used, a slight 'creep' in inter-calving interval can often be overlooked
- it is important to consider that these rates must be calculated for a standard or specific period of time (e.g. 12 months) to allow accurate analysis and comparison. This is difficult in a herd where controlled mating is not carried out, as distinctions between calving periods become blurred.

Benefits of calculating reproductive rates:

Calculating a number of reproductive rates can help to identify areas of loss. A combination of pregnancy diagnosis, lactation status, branding rates and weaning rates will help to determine stages and possible causes of low herd fertility and assist in the following:

- identifying the importance of age, weight, body condition and lactation status impacts on herd fertility
- identifying how management, nutrition and breeding practices can be modified to optimise fertility
- making an assessment of whether disease status of both cows and bulls may be interfering with herd fertility.

Key messages for breeder management

Improving re-conception rates in breeders can significantly improve herd profitability. General principles that can be applied to the management of breeders include:

- Body condition at mating has the greatest effect on fertility.
- Conservative stocking and good pasture in breeder paddocks are the cheapest ways to achieve good body condition. Supplements may be cost effective.
- The breeder needs to have a body condition score (BCS) of 3.5 (on BCS scale of 1–5) or higher at calving to maximise the chance of getting pregnant again while rearing her calf.
- Mate more heifers than are needed for replacements using young bulls evaluated for breeding soundness, 'calving ease' and 'low birth weight'.
- Select replacement breeders from those that get pregnant early in the joining period - and on temperament.
- Ideally, breeders should be mated for only three cycles (63 days). On extensive properties, pregnancy diagnosis can be used to identify breeders that conceived early in the mating period.
- The best type of breeder will be that suited to the environment and target market.
- Genetic improvement is faster through crossbreeding than through selection.
- Bull selection will have a much greater impact on herd improvement than selecting heifers or cows.
- Wean calves early, down to 100kg (3 months), or even earlier if breeder survival is at risk.

Additional info for heifers:

- Heifers should be segregated from the breeder herd, grazed on the best paddocks and may need supplements over the post-weaning dry season to reach critical mating weight.
- The majority of heifers should be at or above the critical mating weight (CMW) at the start of joining. The CMW for *Bos indicus* heifers is 320–340kg.
- *Bos indicus* heifers tend to reach puberty at heavier weights and at a later age than *Bos taurus* heifers.
- If heifers are selected before joining, this should be based on growth over the postweaning year, and not on weight at weaning, which largely depends on age.

- Yearling mating will give good results only if heifers are heavy enough (on good country) and are of early-maturing breed types.
- Calf losses in first-calf heifers are often high (>20%) and mostly occur around the time of birth.
- Muster and wean first-calf heifers before the main breeder herd.
- Maiden heifers are a good group to use if an artificial insemination program is planned.
- Vaccinate all heifers against botulism and against any other diseases that could have significant economic impact.

Topics contained in *Heifer management in northern beef herds*

1. Why improve heifer fertility?
2. The problem – re-conception and calf losses
3. Body condition and feeding
4. Heifer selection
5. Heifer puberty and joining
6. Calving and calf losses
7. Weaning
8. Diseases
9. AI in maiden heifers Weaner training
10. Longer term benefits
11. Economic impacts

Topics contained in *Managing the breeder herd: Practical steps to breeding livestock in northern Australia*

1. Reproduction
2. Managing the breeding herd
3. Breeding and selection for improved beef production

Keys times for breeder management:

Timeframes will be addressed in the Communication Planner.

FutureBeef activities:

	Maintaining broad industry awareness	Building knowledge, skills and confidence	Supporting adoption and practice change
DAFF	<ul style="list-style-type: none"> - Breeder management articles in department beef industry eBulletins (all print newsletters will transition to online versions in 2013) - <i>Northern Muster</i> - <i>CQ Beef</i> - <i>BeefTalk</i> - Links to publication posted on FB website and promoted with local articles through 'news' section; Twitter and FB facebook site. - FB website can feature local stories with breeder management focus 	<ul style="list-style-type: none"> - Breeder management (post Beef CRC) to feature in Beef Up forums in 2013; relevant project and producer demonstration site field days. - Key messages to feature in Grazing BMP - Key messages to be considered in 'Nutrition' Extension Review project workshop meetings in Feb 2013 	<p>Breeding EDGENetwork training workshops delivered predominately through private consultants and DAFF extension officers</p>

DAFWA	-	-	-
NTDPIF	-	-	-
MLA	-	-	-

FutureBeef activity timeline:

Date	Who	Activity
Jan 2013		•
Feb 2013		•
Mar 2013	MLA MLA	<ul style="list-style-type: none"> • Feedback and website article '<i>Cash Cow targets reproduction efficiency</i>' • Website article '<i>Improve heifer fertility to increase profits</i>' • Website producer case study '<i>Paul Smith, NT - Improving young breeder performance</i>'
Apr 2013	MLA	<ul style="list-style-type: none"> • Feedback article '<i>Girl power: improving young breeder performance</i>'
May 2013	MLA MLA MLA MLA	<ul style="list-style-type: none"> • Feedback article '<i>Feeding for fertility</i>' • Feedback and website article '<i>Condition scoring helps cash flow from cows</i>' • Website article '<i>Breed and body condition impact on cow fertility</i>' • Website producer case study '<i>Helen Springs, NT - Feeding for fertility</i>'
Jun 2013	MLA MLA	<ul style="list-style-type: none"> • Feedback article '<i>Effectively managing out-of-season calvers</i>' • Feedback article '<i>Segregating breeders: a profitable strategy</i>' • Feedback article '<i>Gains to come from better mortality recording</i>' • Website producer case study '<i>Dan Lynch, Qld - Segregating breeders</i>'
Jul 2013		
Aug 2013		
Sep 2013		
Oct 2013		
Nov 2013		
Dec 2013		

Agency Experts:

- MLA - Geoff Niethé
- DAFF – Desiree Jackson, Mick Sullivan, Alan Laing, Dave Smith
- NTDPIF -
- DAFWA -

Resources:

All resources available on FutureBeef DVD except those marked with asterisk.

MLA	<ul style="list-style-type: none"> - Heifer management in northern beef herds (2013)* - NBP.344 Industry initiatives to improve young breeder performance in the NT Final Report (2011)
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	<ul style="list-style-type: none"> - Breeding Brahmans for fertility (Frontier Autumn 2011) - For the record – using herd data to target breeder productivity (Frontier Summer 2010/11) - NBP.345 Industry initiatives to improve young breeder performance in the Pilbara and Kimberley of WA Final Report (2010) - Breeder losses killing profits fertility (Frontier Winter 2010) - The economic benefits of feeding phosphorus productivity (Frontier Summer 2009/10) - Segregate cows for greater flexibility (Frontier Autumn 2009) - NAP3.119 Lake Nash Breeder Herd Efficiency Project Final Report (2007) - AHW.181 Evaluation of the economic cost-benefit of spaying associated with female turnoff options for Nth Australia Final Report (2007) - B.NBP.0372 Northern Australian Beef Fertility project, Wean-a-calf Final Report Final Report (2007) - Breeder herd management during the drought (Frontier Summer 2007) - Pestivirus – a serious threat to productivity? (Frontier Summer 2007) - Management can limit pestivirus threat (Frontier Summer 2007) - Feeding fertility (Frontier Winter 2007) - Insist on foetal aging for maximum benefits (Frontier Autumn 2007) - Managing the breeder herd: Practical steps to breeding livestock in northern Australia Final Report (2006) - NBP.301 Links between the genetics of beef quality & components of herd profitability Final Report (2006) - Smarter supplementation – keys to success (Frontier Winter 2006) - Calving improvements of 15% at Flora Valley Station (Frontier Winter 2006) - Manage breeding cows to improve weaning rates (Frontier Spring 2006) - Single shot vibriosis vaccination for maiden heifers (Frontier Spring 2006) - Phosphorus-deficient cattle can prosper in the wet (Frontier Spring 2006) - Persisting with supplementation in the wet (Frontier Spring 2006) - NAP3.304 Effectiveness of Water Medication to Supplement Breeder Cattle In NT Spinifex Country PDS Final Report (2001) - NBP.201 Breeder Herd Management Survey (EDGE) Final Report (2001) - PIRD.01.NT01 Breeding Herd Efficiency - Barkly Tablelands, NT (2001) - CS.148 Effect of P-status on phosphorus absorption and excretion rates and reproductive function in pregnant and lactating beef heifers Final Report - DAQ.065 Nutritional and Managerial Strategies to Increase Annual Liveweight Gain and Improve Product Quality Final Report - DAQ.098 Improving cost effectiveness of supplementation systems for breeder herds in northern Australia Final Report (1998)
DAFF	-
NTDPIF	-
DAFWA	-

Tools

Weaner management case studies:

Understanding and improving heifer fertility in the Northern Territory also led by Tim Schatz and research results obtained in Beef CRCII project NBP.301 *Links between the genetics of beef quality and components of herd profitability in northern Australia.*