

2013-14 FutureBeef Priority Area #2

PHOSPHORUS SUPPLEMENTATION TO IMPROVE BREEDER PERFORMANCE IN NORTHERN AUSTRALIA

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 2012, 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:

Under the 'Nutrition and growth theme' is a sub-theme:

3.3 Improved supplementation

Goal: Increased profitability of northern beef enterprises through improved supplementation practices

The increasing cost of supplements, difficulty in delivery, and uncertainty over the net benefits are inhibiting current practice. Confidence in the recommended practices needs to be established and should include: developing new supplements; improving existing supplement strategies for growing and breeding cattle; and developing better delivery methods.

FutureBeef Program for Northern Australia

In May 2012, key industry funder Meat and Livestock Australia and state agency extension services (DAFF Qld, NTDFIF 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 – P supplementation:

Growth rates of >40kgs and increases in weaning rates by 10-15% are widely accepted where herds are supplemented with phosphorus in acutely deficient areas. Current adoption rates are very low even with a benefit/cost ratio of phosphorus supplementation in acutely deficient areas in excess of 3.5:1. If 5 million of the estimated 16 million head of cattle in northern Australia are located in the acutely deficient and marginal phosphorus regions, then the annual phosphorus requirements would be around 5,200 tonnes (equivalent to 24,700 tonnes of Kynofos). Based on a 2009 survey, approximately 1,500 to 2,000 tonne of Australian feed phosphate is used per annum.

Low adoption rates are due to the following:

- Poor producer knowledge of the phosphorus status of their paddocks and cattle
- Perception that phosphorus is not a serious constraint during the wet season when cattle are already growing.
- Lack of knowledge of the economics of phosphorus supplementation, and confidence that the animal responses to phosphorus supplementation would be economically worthwhile. Key concerns include the amounts of phosphorus required, animal growth and reproduction responses in specific situations, the input costs and the delays before the production benefits can be captured. This is often exacerbated by lack of adequate herd records,
- The practical difficulties in implementing phosphorus supplementation during the wet season (e.g. access, achieving satisfactory supplement intakes, labour).

Other key issues include:

- Understanding required intakes for different groups of cattle
- Recording lick intakes/cost effectiveness
- Understanding ways to regulate supplement intakes
- Target feeding in marginal country e.g. heifers
- Many properties feed P in dry season supplements hoping this will negate the need to feed wet season P.

Key messages:

1. P deficiency results in poor performance in all the factors that make beef production efficient and profitable.
2. Feeding P supplements is a part of general property and herd management.
3. Feed P supplement to all classes of stock where soil P levels are 5mg/kg or less ('deficient'); soil levels of 6–8 mg/kg are considered marginal.
4. Feed P supplement to young breeders in 'marginal' areas with soil P of 6–8 mg/kg. The economic benefit of feeding mature cows diminishes when soil phosphorus exceeds 8 mg/kg.
5. There are no simple diagnostic tests for the P status of grazing cattle.
6. Results of analyses of blood or dung should be interpreted by specialist.
7. The ratio of faecal P to dry matter digestibility in the diet is currently the most reliable indicator.
8. Animals need P all the time but deficient animals respond best to supplement when their diet has adequate protein and energy.
9. Feed high levels of P supplement during the wet season and the late dry season, and lower levels during the dry.

10. Cattle grazing native pasture with good content of stylo may respond to P supplement during the early dry season.

Topics contained in *Feeding phosphorus to northern beef cattle*

1. Why feed phosphorus?
2. Who should feed phosphorus?
3. What phosphorus to feed
4. When should P be fed?
5. How much to feed
6. How to feed phosphorus
7. Plants and P fertiliser
8. Economic responses to phosphorus supplementation
9. Case studies

Keys times for phosphorus supplementation:

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 QLD	<ul style="list-style-type: none"> • P supplementatoin 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 P book posted on FB website and promoted with local articles through 'news' section; Twitter and FB facebook site. • FB website can feature local stories with p supplementation focus 	<ul style="list-style-type: none"> • North/North West Qld FutureBeef Team to coordinate producer study tours of Brunchilly trial as results come to hand • Conduct NIRS/wet chemistry P tests on 2-3 marginal P properties in north/north west Qld to firstly build Team confidence in the analysis; and secondly to help lift adoption rates of P feeding - Weaner mgt/nutrition to feature in Beef Up forums?; 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 	<ul style="list-style-type: none"> • Heifer response to P on marginal and acutely deficient country. PDS project currently being development by N/NW Qld Team • P Supplementation is a key theme of the \$avannaPlan on-property program run in N/NW Qld. Feasibility, affordability and practical delivery systems explored and costed on 10 breeding enterprises/year.

DAFWA	<ul style="list-style-type: none"> Annual phosphorus articles in the November Pastoral Memo – (sent out as 'Stop Press in 2011). 	<ul style="list-style-type: none"> Develop PDS proposal focussed on P supplementation in the Pilbara – proposal submitted March 2013 	<ul style="list-style-type: none"> Animal performance and cost benefit to be recorded and promoted from Pilbara PDS
NTDPIF	<ul style="list-style-type: none"> Annual P articles in Rural Reviews P case study article Brunchilly P project update articles in Rural Reviews 	<ul style="list-style-type: none"> Interaction with RBRCs re Brunchilly project Top End Best Practice Manual Stock Courses for stockcamps in Katherine region NT Pastoral Industry Survey Reports 	<ul style="list-style-type: none"> Brunchilly P project One-on-one P advice
MLA	<ul style="list-style-type: none"> Annual P articles in the pre-wet season edition of Feedback 	-	-

Agency Experts:

- MLA - Geoff Niethé
- DAFF QLD - Joe Rolfe and Bernie English
- NTDPIF -
- DAFWA –

Current Projects

1. Dennis Poppi – Brunchilly work looking at wet and dry season P+ and P-.
2. Rob Dixon – Preliminary Proposal “Improving prediction of phosphorus intakes of cattle grazing tropical pastures”
3. “Heifer response to phosphorus in marginal & acutely deficient areas” – project under development by North/North West QLD FutureBeef Team

Resources:

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

MLA	<ul style="list-style-type: none"> - Pasture planning from the ground up (Frontier Summer 2010-11) - Stylos – lifting pasture quality (Frontier Winter 2009) - B.NBP.0343 The manipulation of nutrition in pregnancy to increase weaning rates Final Report (2008) - B.PRS.0604 Tableland Production Feeding Group PIRD (2006) - Beef cattle nutrition - An introduction to the essentials (2006) - PIRD.95.Q04 Phosphorus supplements boost fertility and weaning weight (2006) - Water Medication - A guide for beef producers (2005) - NAP3.313 Collation of basic biological data on beef cattle production in North Australia Final Report (2001) - PIRD.01.NT01 Breeding Herd Efficiency - Barkly Tablelands, NT (2001) - NAP Occasional Publication No 5 - 1998 Review of Reproduction & Genetics Projects (1998) - NAP.001 A review of the effectiveness of water medication to supplement
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	grazing livestock Final Report (1996)
DAFF QLD	-
NTDPIF	-
DAFWA	-

Feeding P case studies:

Case studies highlighted in *Feeding phosphorus to northern beef cattle*

- Werrington Station, Georgetown QLD
- Desert Uplands, Jericho QLD
- Tara Station, Cloncurry QLD
- Watson River, Cape York QLD
- Victoria River District, NT
- Napier Downs, Kimberley WA
- Yardoogarra, Broome, WA

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