\$ensible \$upplementation

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#beefextension



Department of Agriculture and Fisheries

Outline

Today

- Practical cattle nutrition
- Limiting nutrients
- Legumes
- Pasture intake

8 September

- Herd management and nutrition
- 15 September
- Choosing and managing supplements





Online resources



https://futurebeef.com.au



Queensland Rural and Industry Development Authority

www.qrida.qld.gov.au



The Long Paddock

https://www.longpaddock.qld.gov.au/



https://farmhub.org.au/





https://www.daf.qld.gov.au/busin ess-priorities/agriculture/disasterrecovery/drought/assistanceprograms



Handy resources







FutureBeef website - Phosphorus

	Search FutureBeef					Q		
Future Beef	Home	About	Knowledge centre	News	Events	Intranet		

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this section	Phosphorus supplementation of cattle in northern Australia
nowledge centre rticles locument library pols and services	Phosphorous deficiency is a major problem for grazing cattle in much of northern Australia because of the low soll phosphorus levels in many solls. While phosphorus (P) is important in all bodily processes, the major impact of P dehicrery in cattle is a significant reduction in appetite. This results in lower pusture intake and consequently lower energy and protein intake.
rojects idustry newsletters	The reduction in nutrilent intake affects the breeder's ability to maintain body condition, resulting in lower wearing rates and increased mortality. Mik production is also reduced leading to lower wearing weights. In growing cattle, the lower nutrient intake produces lower growth rates. All of these impacts have serious consequences for production and profitability.
	Other symptoms of P deficiency include bone chewing (increases the risk of botulism), chewing of other objects (rocks, sticks, wire, etc.), stiff gait, preg leg and bone breakages.
	Watch these webinars for more information on P in breeders and growing cattle:
	Managing and using body phosphorus reserves in breeders Growth of stears in assesses to phosphorus in the dist

· Quantifying the benefit of phosphorus supplementation - Kidman Springs research results

How to diagnose P deficiency

It is important to know if a specific mob or paddock is P deficient and if cattle will respond to P supplementation. There are a variety of ways to assess whether P deficiency is a problem.

- 1. Observation symptoms of P deficiency in cattle are described above.
- 2. Soil and pasture tests soil and land type mapping and information can give an indication of the potential for a P deficiency. See the Land types of Queensland page for more information. Soil and pasture tests can determine the P concentration in the soil and plants, however they are of limited value because most grazing paddocks contain a mixture of soils and land types. The selective grazing of cattle means that simply testing the available plants is not representative of the diet consumed.
- 3. Blood the 'P-screen' test is currently the most reliable method of assessing the P status of a mob of cattle. This test cannot be used on breeders, therefore samples from growing cattle (not lactating or pregnant) running in the breeder paddock are used to assess the breeder mob. Testing is undertaken at the end of the wet season while growing cattle are still gaining weight and not on P supplements

https://futurebeef.com.au/knowledgecentre/phosphorus-supplementation-of-cattle-innorthern-australia/

Managing P intake

It is important to know the P supplement requirements of the classes of cattle at different times of the year on the property's land types. More information on cattle P supplement requirements can be found in the "Phosphorus management of beef cattle in northern Australia, PDF 2.2 MBI" handbook.

Feeding P in the wet season can be challenging. To achieve target intakes, time has to be invested in identifying the most suitable P source and supplement composition and training animals to eat supplements.

Good supplement intake records are critical to ensure target P intakes are achieved and for managing the cost of supplementation. Download our Lick Intake calculator (Excel spreadsheet, 200 KB).

Economics

Economic analyses and producer case studies demonstrate that P supplementation in deficient country is a very cost effective strategy for beef businesses. More information on the latest P economics and the benefits modelled for beef businesses in central Queensland can be found in an article written by Dr Maree Bowen (DAF Principal Research Scientist) and Fred Chudleigh (DAF Principal Economist), "Improving beef business performance with phosphorus supplementation".

A research project at the Victoria River Research Station (Kidman Springs), NT, has found a return on investment of over 300% over the period of 2017-2018 due to increased reconception rates in the supplemented helfers and heavier weapers produced by those females. Read more about the "Effect of phosphorus supplementation on Brahman females at Kidman Springs" project.

Help with managing P

Our FutureBeef staff are here to help! Contact your local extension officer to talk about your Phosphorus management plan (Word document, 200 KB), or watch this short clip demonstrating how DAF staff and resources have helped other northern beef producers develop a cost effective strategic P supplementation program using P blood testing and property land type mapping.







Upcoming free workshops

Central Queensland

- Mon 20th September Gin Gin
- Tues 21st September Miriam Vale
- Wed 22nd September Gracemere
- Tues 26th October Biloela
- Wed 27th October Taroom
- Fri 29th October Alpha

Southern Queensland

- Tues 23rd November Gympie
- Wed 24th November Proston
- Thurs 25th November Biggenden







Beef cattle nutrition 101







Vitamins and Minerals

Macro nutrients

Need grams per day

- Phosphorus
- Calcium
- Magnesium
- Sodium
- Sulphur
- Potassium
- Chlorine

Micro nutrients

Need <u>milligrams</u> per day

- Copper
- Cobalt
- Selenium
- Iron
- lodine
- Manganese
 - Zinc

Vitamins

- Environment
- Pasture
- Rumen

Except Phosphorus, deficiencies in vitamins and minerals are uncommon and only occur in very specific circumstances







EARLY DRY SEASON





EARLY DRY SEASON





LATE DRY SEASON





LATE DRY SEASON





WET SEASON on Phosphorus deficient country





WET SEASON on Phosphorus deficient country





Energy

- Energy intake drives daily liveweight gain (kg/d)
- Forage with a high dry matter digestibility has a double effect in increasing energy intake
 - greater energy per kg dry matter of feed consumed, and
 - the cattle can physically consume more kg DM/day





Energy

- Pasture intake depends on:
 - liveweight
 - status of animal
 - quality of pasture
- On tropical pastures daily intake generally 1.5-2.4% of body weight for most of the year
- Legumes provide **energy** and **protein**







Protein

- Protein feeds microbes in the rumen
- As the dry season progresses
 - Less protein available for rumen microbes
 - Digestion slows
 - Feed intake is reduced
- Urea and sulphate of ammonia supply ammonia to rumen microbes
 - Increases microbial protein production
 - Feed intake increases 10-30%







Sulphur

- Microorganisms in the rumen use sulphur to synthesis protein
- Sulphur becomes more of an issue the more mulga is in the diet
- When urea is fed, sulphur has to be added for effective use of the N







Phosphorus deficient country

Categories for soil P concentration

Acutely deficient	2-3 ppm
Deficient	4-5 ppm
Marginal	6-8 ppm
Adequate	>8 ppm

Colwell P – bicarbonate extractable P ppm = mg/kg



P deficiency - cows





Reduced appetite and grass intake = reduced body condition

- Some obvious signs of severe deficiency
- Deficiency causes long term effects P is mobilised from the bones during lactation
- Reduced conception & weaning rates
- Reduced milk production → reduced calf growth rates and lower weaner weights
- Increased mortality
- Lower cull cow weights



P deficiency – growing animals

Reduced appetite and grass intake = reduced body condition



Low growth rates



P depletion & repletion

Research in steers shows:

- When P in the diet becomes deficient, the effects of depletion can be seen as early as 6 weeks
- When P is supplemented and the diet becomes adequate, repletion happens in a matter of days





P depletion & repletion

 Post weaning, we assume the same rates of repletion for cows as steers

BUT

- Cows need to replete & store much more P, as they have mobilised so much during lactation
- Cows can replete P even when losing weight in the dry season







Benefits of P supplementation

On deficient and acutely deficient country:

- Feed intake increased by 10-60%
- Increased liveweight gain of 20 100kg per year depending on pasture and legume quality
- Decreased breeder mortality by 3-5%
- Increased weaning rates by 6-15%
- Increased weaner weights by 15kg







What quality are different forage sources?

Forage	DMD	СР	Р	S
Maintenance	50%	5%		
Grass	45 – 60%	4 – 12%	Deficient on low P soils	Adequate
Herbage & legumes	50 – 70%	15 – 30%	Adequate	Adequate
Mulga	45%	10 – 14% but only 30-40% digestible	Deficient	Deficient



Nature's supplement: LEGUMES

- Source of energy and protein
- Produce more beef kg/ha/yr
 - Increased stocking rate
 - Increased daily liveweight gain
 - Increased grazing period

Very profitable But, management is key!







Diet quality provided by pasture:

CP = 4.77% DMD = 47%

450kg cow eating 1.5% of her bodyweight



Diet quality provided by pasture:					
CP = 4.77% DMD = 4 450kg cow eating 1.5% c	7% of her bodyweight	CP g	ME MJ	Dry matter intake kg	Can she physically eat it?
	Pasture only	333	44	7	







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	Pasture + urea	400 + 150	53	8.4	







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	Requirements	570	60	9.5	
Dry cow - last trimester		1	I	I	I







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	Pasture + urea	400 + 150	53	8.4	 ✓
	Requirements	570	60	9.5	X
Dry cow - last trimester	Pasture only deficit Pasture + urea deficit	237 20	16	Manag body co	ed with ondition



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Lactating cow with calf up to 4 months	Requirements	911	80	12.7	





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		δ		time of we	aning and
	Pasture only	333	44	pasture a	vailability
	Pasture + urea	400 + 150	53	8.4	\checkmark
	Requirements	570	60	95	X
Dry cow - last trimester	Pasture only deficit	237	16	2-3 kg per day of molasses, copra meal or sorghum	
	Pasture + urea deficit	20	7		
Lactating cow with calf up to 4 months	Requirements	911	80	12.7	X
	Pasture only deficit	578	36	Manag	ed with
	Pasture + urea deficit	361	27	\$\$\$\$\$\$ when body condition runs out	



Summary

- Energy > protein > Phosphorus > other vitamins & minerals
- Legumes are natures supplement
- Pasture intake is critical forage budgeting can help – StockTake App
- Managing body condition in breeders is key – more next week
- Supplementation should help pasture intake, not substitute pasture





Extra support

- FutureBeef website
- DAF extension officer, phone: 13 25 23
- Workshops in CQ and SQ FutureBeef event calendar
- Webinars:
 - 8 September Herd management and nutrition
 - 15 September Choosing and managing supplements



