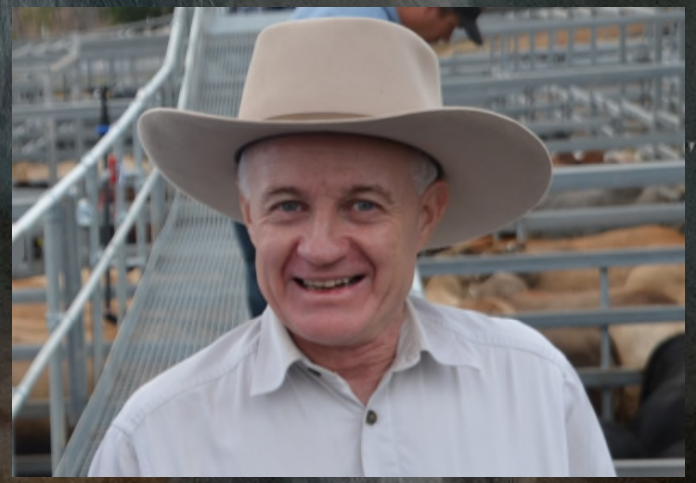
$ENSIBLE $UPPLEMENTATION



Choosing and managing supplements

@QldAgriculture
@futurebeef
#eatqld
#beefextension

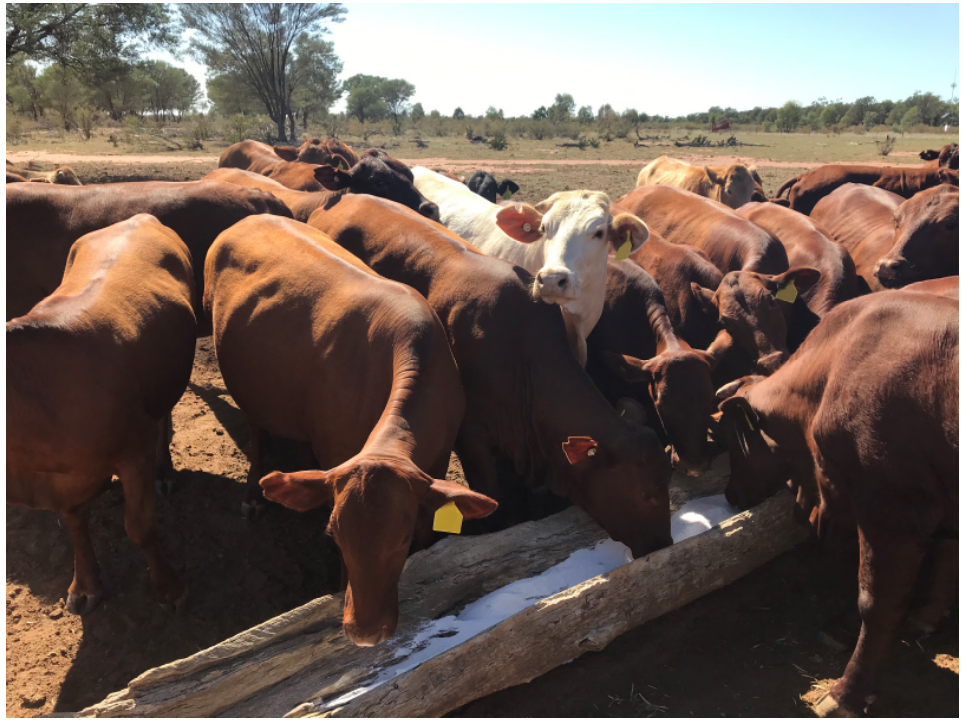
Webinar Series Outline

1 September – Cattle nutrition principles

8 September – Herd management & nutrition

Today – Choosing and managing supplements

- Supplement types and their use
- Reading supplement labels
- Nutritional requirements and targets
- Assessing and choosing supplements



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

Future Beef

Supplement types

Non protein nitrogen (NPN) supplements

- Urea and GranAm
- Supply nitrogen to the rumen microbes
- Increased microbial protein = increased protein intake
- Nitrogen % x 6.25 = Equivalent crude protein %

Urea - 46% nitrogen x 6.25 = 287% Equivalent crude protein

Urea % x 2.87 = Equivalent crude protein %

10% Urea x 2.87 = 28.7% Equivalent crude protein

Supplement types

Non protein nitrogen (NPN) supplements

GranAm - 20.2% nitrogen x 6.25 = 126% Equivalent crude protein

GranAm % x 1.26 = Equivalent crude protein %

8% GranAm x 1.26 = 10% Equivalent crude protein

Supplement types

Protein and energy supplements

Protein meals supply protein and energy

Product	Crude protein (%)	Metabolisable energy (MJ ME/kg)
Canola meal	35.0	9.0
Soybean meal	47.0	12.0
Whole cottonseed	21.0	13.0
Sorghum	9.6	10.4

Supplement types

Protein meals

- Most of the protein is broken down in the rumen to produce microbial protein (Rumen degradable protein RDP)
- Some protein passes through rumen and is digested in the intestine (Undegraded protein UDP)
- UDP is only important for early weaners and high growth animals

Supplement types

Energy supplements

Supply energy and small amounts of protein

Product	Crude protein (%)	Metabolisable energy (MJ ME/kg)
Sorghum	9.6	10.4
Wheat	12.3	12.0
Molasses	4.2	8.7
Whole cottonseed	21.0	13.0

Reading labels

Total crude protein	86%	Fluorine (maximum)	0.1%
Crude protein	Nil	Sulphur	1.4%
Equivalent crude protein	86%	Magnesium	3.5%
Urea	30%	Copper	300 mg/kg
Crude fat	0%	Cobalt	30 mg/kg
Crude fibre	0%	Iodine	30 mg/kg
Salt	30%	Zinc	500 mg/kg
Calcium	7%	Selenium	2.5 mg/kg
Phosphorus (minimum)	3.6%		

Total protein

Protein from natural/true protein sources

Protein from urea & GranAm

<u>Note</u>

No metabolisable energy (ME)

Metabolisable energy	4.0 MJ ME/kg

Check units used in labels

Total crude protein	65%	Magnesium	3.5%
Crude protein	22%	Copper	250 mg/kg
Equivalent crude protein	43%	Cobalt	30 mg/kg
Urea	15%	Iodine	30 mg/kg
Metabolisable energy	3.5 MJ/kg	Zinc	500 mg/kg
Salt	20%	Selenium	2.5 mg/kg
Calcium	4%	Vitamin A	45000 IU/kg
Phosphorus (minimum)	1500 mg/kg	Vitamin D	4500 IU/kg
Sulphur	2.0%	Vitamin E	145 mg/kg

Labels have a mix of units

- **%s**
- **g/kg**
- **MJ/kg**
- **mg/kg**
- **IU/kg**

1500 mg P/kg is

- **1.5 g/kg**
- **0.15%**

Check units used in labels

Total crude protein	65%	Magnesium	3.5%
Crude protein	22%	Copper	250 mg/kg
Equivalent crude protein	43%	Cobalt	30 mg/kg
Urea	15%	Iodine	30 mg/kg
Metabolisable energy	3.5 MJ/kg	Zinc	500 mg/kg
Salt	20%	Selenium	2.5 mg/kg
Calcium	4%	Vitamin A	45000 IU/kg
Phosphorus (minimum)	1500 mg/kg	Vitamin D	4500 IU/kg
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Labels have a mix of units

- **%s**
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1500 mg P/kg is

- **1.5 g/kg**
- **0.15%**

Intake must be considered with analysis

Protein

400 g/day of product with 40% protein supplies 160 g protein/day

1,000 g/day of product with 16% protein supplies 160 g protein/day

Phosphorus

67 g/day of product with 15% phosphorus supplies 10 g phosphorus/day

200 g/day of product with 5% phosphorus supplies 10 g phosphorus/day

Energy

2 kg/day of product with 12 MJ ME/kg supplies 24 MJ ME/day

4.8 kg/day of product with 5 MJ ME/kg supplies 24 MJ ME/day

Liquid supplements

Critical to know:

- **Specific gravity (kg/L)**
- **Is analysis on Dry Matter or As Fed basis**

Liquid supplements

Specific gravity (kg/L)

- Needed to convert volume fed (L) to weight fed (kg) for nutrient intake calculations

Water	1.00 kg/L
Molasses	1.35 kg/L
M8U	1.46 kg/L
Dunder	1.10 kg/L
Liquid supplement	1.30 kg/L

Liquid supplements

Analysis on Dry Matter versus As Fed basis

	Dry matter %	Metabolisable energy (ME)	
		Dry matter basis	As fed basis
Molasses (1.35 kg/L)	76%	11.0 MJ ME/kg	8.7 MJ ME/kg
Dunder (1.1 kg/L)	28.7%	10.4 MJ ME/kg	3.0 MJ ME/kg

1 kg Molasses is 740 ml and supplies 8.7 MJ ME

1 kg Dunder is 909 ml and supplies 3.0 MJ ME

Liquid supplements

TYPICAL ANALYSIS[2]

Ingredients	SuplaFlo® 10NP		
	Units	Dry matter	As fed
Dry matter	%	100	28.7
Protein	%	11.2	3.2
Fat	%	2.0	0.6
Ash	%	26.9	7.7
ME[3]	MJ/kg	10.4	3.0
Calcium	g/kg	20	5.6
Phosphorus (P)	g/kg	1.2	0.4
Magnesium (Mg)	g/kg	12.6	3.6
Sulphur (S)	g/kg	13	3.7
Potassium (K)	g/kg	86	25
Sodium (Na)	g/kg	3.8	1.1
Chloride (Cl)	g/kg	59	17
Cobalt (Co)	mg/kg	2.0	0.6
Copper (Cu)	mg/kg	5.0	1.5
Iodine (I)	mg/kg	2.0	0.6
Iron (Fe)	mg/kg	177	51
Manganese (Mn)	mg/kg	119	34
Selenium (Se)	mg/kg	0.2	0.1
Zinc (Zn)	mg/kg	18	5

Analysis on both Dry matter and As fed basis

Liquid supplements

Analysis As Fed	Molafos (15 NQ)
Min. Dry Matter	68%
Energy ME (Dry Matter)	10Mj/kg DM
Min. Total Crude Protein	15%
Min. Crude Protein	3%
Min. Equiv Crude Protein	12%
Max Urea	2%
Min. Calcium (Ca)	0.6%
Min. Phosphorus(P)	0.8%

ME is expressed on Dry Matter basis

Other nutrients on As Fed basis

ME on As Fed basis is 6.8 MJ ME/kg

For the same ME as 1 kg molasses (8.7 MJ) have to consume 1.2 kg Molafos 15 NQ

Liquid supplements

Analysis as fed

Dry matter	60%
Total crude protein	18%
Crude protein	4%
Equivalent crude protein	14%
Urea	5%
Metabolisable energy (Dry matter)	10 MJ/kg DM
Calcium	0.8%
Phosphorus	1.0%

Most nutrients on As Fed basis

Metabolisable energy on Dry matter basis

ME on As Fed basis is 6.0 MJ ME/kg

For the same ME as 1 kg molasses (8.7 MJ) have to consume 1.45 kg of product

Nutrition requirements and targets

- First requirement is for cattle to be able to consume potential pasture intake
- With paddock supplementation, cannot supply total protein and energy requirements because of cost and logistics

Dry season protein supplementation

Growing cattle	75-90 g crude protein/day
Breeders	150-170 g crude protein/day

Nutrition requirements and targets

Dry season energy supplementation

Growing cattle	**8 - 15 MJ metabolisable energy/day**
Breeders	**16 - 20 MJ metabolisable energy/day**

Nutrition requirements and targets

Weaners under 160 kg

Require a palatable high energy and true protein supplement

Weaner meals	**700-1,000 g/day**
Protein meals	**500-700 g/day**
Fortified molasses	**1,000 g/day**

Supplying 6-12 MJ ME/day

Supplement selection

- Identify nutrients and target intakes required e.g. protein, phosphorus, energy
- Assess supplements on basis of cost of supplying nutrients required
- Cost per unit of protein, phosphorus or energy
- Palatability
- Consider practicalities and infrastructure

Which protein supplement?

- Compare supplements on cost per unit of protein
- FEEDCALC & RationCalc tools

Intakes and costs to supply 150 g protein/day

Supplement	Cost ($/t)	Protein (%)	Urea (%)	Intake (g/hd/day)	Cost ($/hd/mth)
30% urea block	1,280	86	30	174	6.70
Roller drum mix	180	21.6	6.4	694	3.75
10% urea lick	900	57	10	263	7.10
Liquid product	250	15	3.3	1,000	7.50
30% urea lick	1,000	99	30	152	4.56

Which protein supplement?

- Higher urea products are more economical
- Will it supply enough phosphorus?
- Roller drums and dunder are often good value in near coastal areas
- Commercial liquid supplements offer convenience but intake control can be a problem under very dry conditions

- Most protein supplements supply little or no energy
  e.g. 2-5 MJ ME/day → Wet cow news 80-90 MJ/day

Lick composition

- GranAm supplies sulphur and protein and limits intake
- Salt can be an attractant or limiter depending on country and water
- Protein meal e.g. 10-30% can be used as an attractant
- Aim to feed as little attractant as possible to reduce costs
- Phosphorus component of dry season licks is based on lick intake and desired P intake. Usually 10-20% MDCP, DCP or MCP on deficient country.

Energy Supplements

- Energy can only be provided by high intakes of molasses, whole cotton seed, protein meals or grain
- Most commercial liquid supplements are low in energy i.e. 2-6 MJ ME/kg v Molasses 8.7 MJ ME/kg (As fed)

Which energy supplement?

- Compare supplements on cost of supplying target energy intake
- Is analysis “As fed” or “Dry matter” basis?
- Know the density (kg/L) of liquid supplements

Intakes and costs to supply 17 MJ ME/day

Supplement	Cost ($/t)	ME (MJ/kg)	Intake (kg/hd/day)	Cost ($/hd/mth)
Liquid product	250	3.8	4.7	35.25
M8U	280	8.1	2.1	17.64
Whole cottonseed	500	13.0	1.3	31.68

Managing supplements

- Experiment with supplement composition to find out what works best
- Good intake records enable nutrient intakes (protein, ME & P) and costs to be monitored
- Urea and phosphorus supplements work by increasing feed intake therefore grazing pressure increases 10-30%
- With energy supplements, severe grazing pressure can be applied

Supplementation v Substitution

- Cattle are grazers, do not replace grass with purchased feed
- Danger signs
  - Regular long periods of energy feeding
  - Regular hay feeding

Rising feeder prices push grainfed trading budget loss to record levels

by Jon Condon, 08 November 2018

Summary

- Understand the composition of supplements
- Identify what your cattle and target supplement intakes
- Compare supplements on the basis of supplying target nutrient intakes e.g. protein, phosphorus
- Targeted supplementation to address deficiencies not replacing grass with purchased feed

Extra support

- FutureBeef website
- DAF extension officer, phone: 13 25 23
- Workshops in CQ and SQ – FutureBeef event calendar