Queensland **the Smart State**

Northern muster

Information for rural business in north Queensland

Producing quality food and fibre for a healthy bottom line

in this edition

Issue 19 September 2008

editorial

Welcome to this 2008 edition of the *Northern muster*. There is a range of seasonal conditions facing us. Some have had good recent rain while others are in tough times. One thing is in common – supplement prices have escalated enormously.

This affects operating costs and profit. This issue covers aspects of management and supplement strategies that are even more important than they were before the price rises.

This issue also looks at Climate outlook, Market report, Project updates, Dalrymple diary, supplement strategies and more.

Cattle prices are currently very good for meatworks cattle. There have been some good store sales as well. The bull selling season has kicked off and there have been some good sales (high clearance and average price).

MSA is now a reality in north and central Queensland. There are producer group MSA activities. Contact your local DPI&F if you want to know more.

Enjoy the newsletter. Phone DPI&F on 13 25 23 for advice and contacting DPI&F staff. Please fill out the Feedback sheet and send it in.

Thank you to our advertisers and support teams.

Alan Laing
Editor

Queensland Government
Department of Primary Industries and Fisheries

Antibiotic residue threat in calves prompts warning to local cattle owners

Biosecurity Queensland has called on all cattle owners, whether they own one head of cattle or 1000, to make sure calves sold for slaughter do not contain antibiotic residues.

The call follows recent moves to ramp up testing for chemical residues in bobby calves at abattoirs throughout Queensland.

Giving antibiotics to calves may increase risks of chemical residues, and local producers need to be aware of their legal obligations.

Any calves receiving antibiotics, either directly or indirectly, must be identified and withheld from sale for slaughter for the withholding period (the legal period between treatment and slaughter or collection of milk).

Even if the calves are being sold to be reared, the purchaser must be notified of the treatments given, the date of that treatment, and its withholding period.

These legal requirements are in place to make sure our food is safe. They're also there to ensure Queensland maintains access to export markets around the world – all of which check chemical residue levels in beef and meat products.

Milk from lactating cows undergoing antibiotic treatment which is then fed to calves may also cause unacceptable antibiotic residue levels.

Antibiotic treatment administered to cows during pregnancy or lactation, or treatment of calves for scours or pneumonia, for example, may cause unacceptable levels of residual antibiotic in calves if the withholding period is not observed.

It's really important that all antibiotics are used in accordance with label directions and the prescribing veterinarian's directions. Always check with your local vet before starting any treatment. Sometimes, antibiotics might not be the best treatment.

If you are selling calves you need to demonstrate adherence to withholding periods for any treatments by recording information on a Bobby Calf NVD/ Waybill prior to transportation.

Bobby Calf NVDs are available on the Meat and Livestock Australia website www.mla.com.au.

General information about the use of waybills and NVDs is available on the DPI&F website www.dpi.qld.gov.au or by calling 13 25 23.

If you know of anyone who would like to receive the *Northern muster* drop us a note at:

Department of Primary Industries and Fisheries
PO Box 15
Ayr Qld 4807
Telephone: 07 4720 5100
Facsimile: 07 4720 5198

Email : Tanya.Firth@dpi.qld.gov.au
Tonia.Grundy@dpi.qld.gov.au
Alan.Laing@dpi.qld.gov.au

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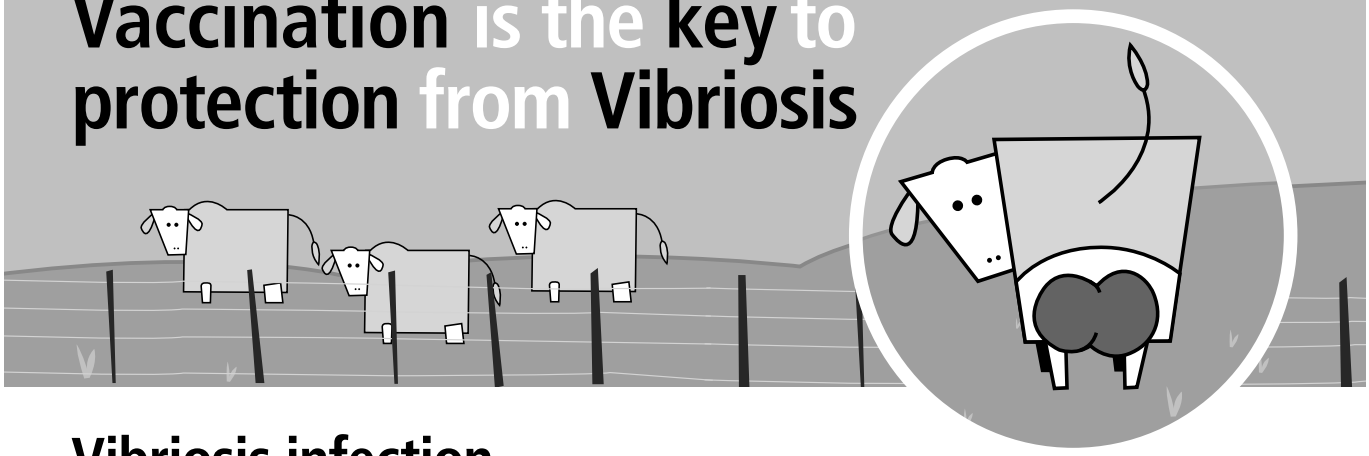
Vaccination is the key to protection from Vibriosis



Vibriosis infection

- Spread by bulls during breeding (a sexually transmitted disease)
- Impacts the female's reproductive tract
  - Causes reduced pregnancy rates and calving percentages
  - Can cause a shift in conception patterns causing late calves especially in heifers
  - Can cause heifer infertility

Start Protection before conception

One shot of Vibrovax® provides two years protection for heifers

The key principles of Vibrovax vaccination for northern beef herds

- **Vaccinate all bulls annually**
- **One 5mL vaccination pre-joining in heifers 18 months or older will protect for 2 years**

Start protection before conception

Vaccination with Vibrovax will protect your herd's reproductive potential

For more information about protecting the health of your herd talk to your Pfizer Professional Sales Representative.
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Neutral ENSO conditions

SOI remains near zero.

The SOI has been consistently near zero over the past few months, after remaining positive for several months over last summer and autumn. The monthly average of the SOI for July was plus 2.3. The SOI looks set to remain near zero for August.

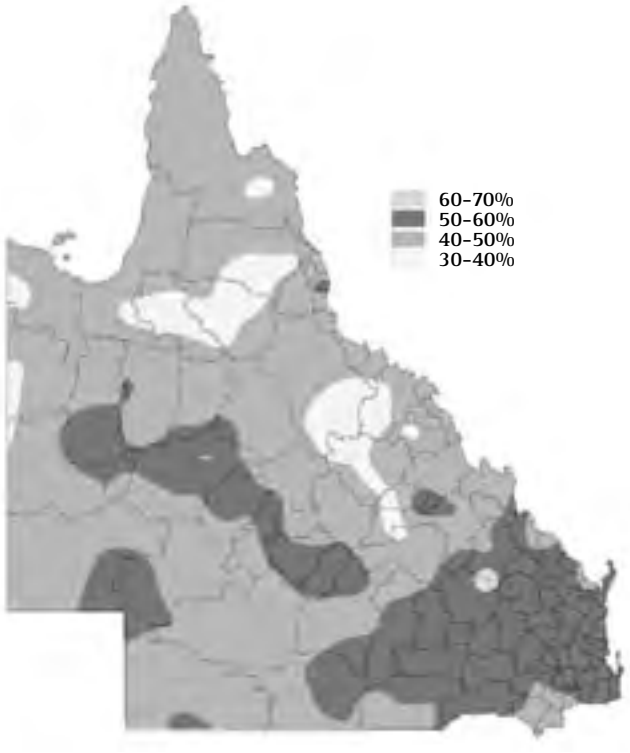
A neutral SOI phase during August and historical rainfall data indicates a 40 to 60% chance, or almost even odds, of exceeding median rainfall. However, much of this forecast still falls in the dry season, so drought-breaking rains during winter and spring are unusual.

Above average rainfall in July was followed by very dry conditions across Queensland in August.

According to the Bureau of Meteorology we can look forward to warmer days and nights over the next few months. There is a 65 to 80% chance of exceeding median maximum daytime temperatures. The exception is northern and eastern Cape York, which should be closer to normal daytime temperatures.

Overnight minimum temperatures are expected to be above normal August to October, especially in the south. However, day and night temperatures have been cooler than normal in the forecast period.

Probability of exceeding median rainfall
for September/November based on consistantly near zero phase during July/August



It remains to be seen over the next few months if temperatures climb above normal, or if this is one of the few years with this sea surface temperature pattern that cooler than normal temperatures are experienced. For more information go to the temperature outlook at http://www.bom.gov.au/climate.

If you live in area that does experience frost then the Bureau of Meteorology also has information about daily frost potential, simply go to the Bureau's website and search for 'frost' or go straight to http://www.bom.gov.au/jsp/watl/weather/frost.jsp

The Madden-Julian Oscillation (MJO) affects Australian rainfall differently in winter and spring to summer, but does still influence our rain. In northern Queensland, in spring, the MJO is associated with dry conditions during Phases 1 and 2, and wetter conditions during Phase 6.

The MJO is a band of low air pressure originating off the east coast of central Africa travelling eastward across the Indian Ocean and northern Australia roughly every 30 to 60 days.

The chance of specific rainfall amounts, based on a near zero SOI Phase during August and historical rainfall records, for a number of regional locations are shown in the table. For similar information about your area a copy of Australian Rainman can be purchased from the Department of Primary Industries and Fisheries (Phone 13 25 23).

Location	Median Sept–Nov	Chance of		
		60 mm	100 mm	140 mm
Ingham	134 mm	74%	51%	31%
Atherton	102 mm	73%	37%	23%
	Median	10 mm	30 mm	50 mm
Mareeba	48 mm	88%	56%	44%
	Median	20 mm	40 mm	60 mm
Charters Towers	63 mm	78%	61%	44%
	Median	10 mm	30 mm	50 mm
Mt Isa	43 mm	89%	71%	43%

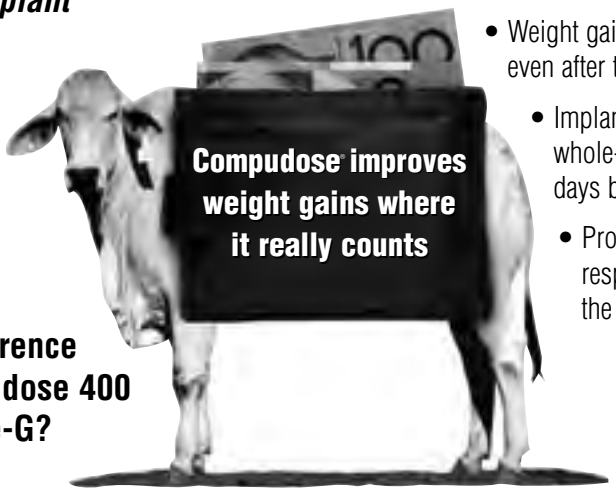
(Source Rainman Streamflow)

Daily updates of the SOI are available at 07 4688 1439. You can also receive a text message with the latest SOI values sent to your mobile phone. To subscribe to this free service or for any other climate information contact:

Lexie Donald
Queensland Climate Change Centre of Excellence on (07) 4688 1588 or at Alexis.Donald@climatechange.qld.gov.au

Implanting for profit

Compudose 400 is the proven way of maximising growth rates in steers and spayed heifers, regardless of the season. It is the only implant independently proven to have a functional life of 400 days.



Compudose 400 at a glance

- Superior long-term liveweight gain advantage
- Functional life of at least 400 days
- Works year round – implant when it suits you
- Weight gain benefits are maintained, even after the pay-out period expires
- Implant at branding as part of a whole-of-life strategy, or 400 days before anticipated turn-off
- Provides an economic response, regardless of the season

What's the difference between Compudose 400 and Compudose-G?

Compudose 400 is a long-acting implant whose liveweight gain advantages are maintained even after the pay-out period expires. It is the only implant which maximises growth rates in beef cattle for 400 days, making it the best choice when sustained growth is required. It is ideally implanted at branding as part of a whole-of-life program.

Compudose-G (which has the same active ingredients as revalor†-G) is a short-acting implant which has a functional life of less than 100 days. While it delivers superior short-term liveweight gain advantages, these benefits can be lost if cattle are not re-implanted. As such, Compudose-G should be implanted 100 days before anticipated turn-off, or ideally, as the terminal implant as part of a whole-of-life strategy.

The implant specialists

Elanco has a complete range of long, medium and short-acting implants suitable for maximising growth rates in grassfed cattle. No matter what your target market, the strategic use of Compudose implants can maximise the profitability of your beef operation by helping your cattle achieve market specifications sooner.

ELANCO*
Compudose®*

For more information, please contact Elanco on 1800 226 324

*Elanco®, Compudose® and the diagonal colour bar are trademarks of Eli Lilly and Company. ®Compudose is a trademark for Elanco's brand of oestradiol. †Trademark name WORDSMITH28125

dalrymplediary

Wrapping up the SPIRAL project (Strategic Partnerships Incentives for Revitalising Active Landcare) in the Burdekin Rangelands
It has been a busy few months for the SPIRAL project with a range of activities occurring in recent months. While the bulk of the on-ground works in the region have since been undertaken and completed, the recent focus has been aimed at the capacity building and training objectives of the project. July 30 2008 marks the end of the very successfully SPIRAL project and it is hoped that the momentum of the SPIRAL project can be carried onto future works in the region.

SPIRAL GPS & computer mapping courses a success – Over two days, in conjunction with AgForward, landholders from around the area came together to attend GPS training days held at *Cardigan Station* and the QCWA Hall at Mingela. During the training, property owners and managers were given a thorough but practical demonstration of how a GPS unit could be used to help in property mapping and planning. From marking fence lines and watering points right through to calculation of paddock areas, measuring distances and recording headings, all was covered in the one day training.

Following this GPS training, a series of one-day AgForward computer mapping workshops were held for landholders to learn how to use computer mapping software. Using SPOT5 Satellite Imagery provided through Burdekin Dry Tropics NRM, landholders were able to use a combination of GPS-created points and lines as well as those created from within the software to quickly and simply create property maps detailing fences, waters, paddock areas and distances. It is hoped that from these maps, landholders will be able to make better estimates of where changes or improvements to infrastructure and management of stock numbers and paddock spelling are needed.

Good Land Management Awards help mark 20 years of Dalrymple Landcare – The SPIRAL project awarded 4 Good Land Management Awards in June this year. The Awards were designed to recognise the efforts of landholders who have made significant effort towards improving land condition, raising awareness and generally improving management of their properties. This years winners were as follows:

- Michael and Lynda Bethel – *Leahton Park* Rural Blockholder Award
- David and Dianne Hood – *Kirkton* Landholder Innovation Award
- McCullough Family – *Bruslee* Woody Weed Control Award
- Ravenswood Landcare Group – Landcare Group Activity Award

Congratulations to this years winners in the awards, their case studies as well as those from previous years can be viewed online at http://www.landcare.placestories.com

The awards were presented at the 20 Years of Landcare Anniversary Dinner held at the Charters Towers RSL on 13 June. The event was well attended with over 100 landholders turning out on the night to hear from a range of guest speakers about the history of the DLC and its achievements. Also present on the evening were previous DLC Co-ordinators Tania Dahl and Marie Vitelli who reflected on their time with the committee and the landholders in the region.

I would like to take this opportunity to once again congratulate the 2008 SPIRAL Good Land Management winners. Further, I would also like to acknowledge the 20 Years of Landcare Anniversary Dinner sponsors: Burdekin Dry Tropics NRM, Southedge Seeds Pty Ltd, Landmark, Dow Agrosciences and the National Landcare Programme.

Clarke River and East Burdekin project update
The transition from the SPIRAL project to the CREB project has taken place, and John Nicholas will soon be focusing on finalising on-ground works for the CREB project. In addition to this, the CREB project through the National Action Plan for Salinity and Water Quality and Burdekin Dry Tropics NRM will be holding an information field day later in the year. Early indications are that issues surrounding carbon emissions and trading will be a focus of the event which is planned for the Clarke River area. Landholders with suggestions as to what would make for an interesting information day are encouraged to contact John Nicholas at the Charters Towers DPI&F.

New project for the DLC under Caring For Our Country
The DLC was successful in its recent application to the Australian Governments Caring For Our Country – 2008-09 Landcare Sustainable Practices program. The project Piloting Adoption of Grazing Best Management Practices for Improving Water Quality in the Burdekin Rangelands will look at recently developed best practices guidelines developed to help reduce sediment loss from grazing areas in the Upper Burdekin Catchment. Although a 3 year project, with a research focus, it is aimed to ultimately provide practical input to the Grazing Best Practice guidelines for the region. More news on this project as it is developed.

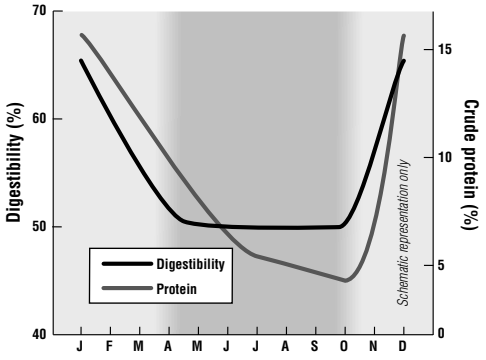
John Nicholas
Project Officer – SPIRAL Dalrymple Landcare Committee Inc.
PO Box 976 Charters Towers QLD 4820
Ph:07 4761 5170 john.nicholas@dpi.qld.gov.au

The essential ingredient

Overcoming the "nutrient gap"

Tropical pastures can sustain high growth rates during the wet season. But after a relatively short growing period, their nutritional value declines rapidly. Protein and energy levels quickly fall beneath minimum requirements, leading to dramatic liveweight loss in cattle.

Protein and digestibility of tropical pastures



Pastures become more fibrous as they mature, further reducing digestibility and voluntary feed intake. In many cases, cattle become physically full before they can consume sufficient levels of nutrients. These deficiencies can have a significant impact on the growth rates, health, fertility and overall performance of your cattle.

Supplementation via loose licks and molasses aims to bridge the "nutrient gap" between what the animal needs and what the pasture actually supplies. This "nutrient gap" is most evident during the dry season.

An effective supplementation program keeps your cattle moving forward through the dry season, thereby improving your ability to achieve demanding market specifications for grassfed and live export markets.

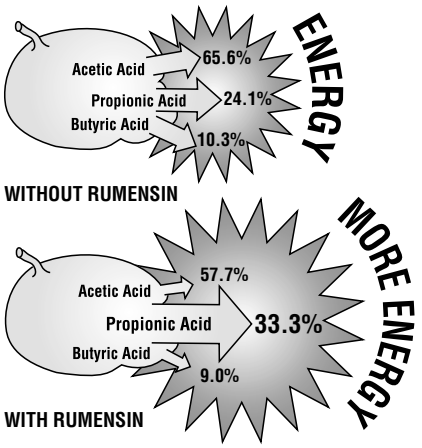
More energy from every mouthful

Rumensin® is the essential ingredient in all feed supplements. No matter what type of feed is provided or at what time of the year, Rumensin helps cattle to digest their food more efficiently.

Put simply, this means more energy in the feed is made available to the animal from every mouthful consumed, thereby improving feed conversion efficiency (i.e. liveweight gain relative to feed intake) regardless of the pasture quality or the level of supplementary feeding.

Besides improving feed efficiency, Rumensin is the proven way of improving growth rates and reproductive performance in grassfed cattle, as well as controlling coccidiosis.[2] If your lick or molasses doesn't contain Rumensin, then you're not getting the most out of your investment in feed supplementation.

Effect of Rumensin on volatile fatty acid production (molar percentage)[1]



For further information, contact your feed manufacturer or Elanco on 1800 226 324

ELANCO*
Rumensin®*

[1]BF2703. [2]Rumensin is registered for improved feed efficiency and as an aid in the control of bloat in feedlot cattle; for improved feed efficiency, weight gain and reproductive performance in heifers; and as an aid in the prevention of coccidiosis caused by *Eimeria zuernii* and *E. bovis*. *Elanco®, Rumensin® and the diagonal colour bar are trademarks of Eli Lilly and Company. Rumensin® is a trademark for Elanco's brand of monensin sodium. WORDSMITH28051

How do you make decisions about managing your property?

Decision making by landholders and how it can inform better policies is being explored by postgraduate student Ally Lankester, who is working with landholders in north Queensland as part of a joint project with James Cook University and CSIRO.

Ally will be contacting beef producers in the Burdekin River catchment and the Northern Gulf over the next few months seeking participation in a survey focussing on what is involved when you decide whether or not to adopt natural resource management practices.

Ally is particularly interested in the motivations and learning involved in the decision making process and the influence of the following factors:

- your perceptions of environmental, industry and personal changes
- who you trust and why
- your different roles in life
- the meanings the grazing life and your property has for you.

Why participate?

Beef production and natural resource management in the rangelands of north Queensland is increasingly challenging. Therefore, providing external agencies with an improved understanding of your decision making process will help in the design of policies that better address producer's needs and natural resource management issues. Future policies will be better able to fulfil the long term goals of producers and improve information and learning support for producers to make practice change easier.

Your opinions and input to the survey are very valuable.

You could win a $500 gift voucher!

By participating in the survey you will go in the draw to win a $500 gift voucher from Stockland Plaza that can be used in either Townsville or Cairns.

For more information contact

Ally Lankester
4753 8611 or email: Ally.Lankester@csiro.au

Botulism on the block

We have a small acreage on Hervey Range west of Townsville on which we grow out up to 20 head of cattle. Usually we have steers, though currently it's a group of calving cows.

Recently I went to feed some molasses which I do regularly and two of the cows were missing. One was just away from the yard and was decidedly lethargic but walked to the yard showing no usual interest in the molasses.

The second missing cow was subsequently found dead. The live cow only showed symptoms in the morning and died that night. A third cow was sick the following morning and had died by nightfall. Death was too quick for lantana poisoning or three-day.

It was obvious after some phone calls that the problem was botulism. Fortunately, even though it was a long weekend, I was able to get hold of some vaccine and vaccinated everything, cows and all nine calves, immediately.

We have had cattle on the block for eight years and had never had any problems before. Other people on the range have had cattle for much longer than that and also had no botulism that they could remember.

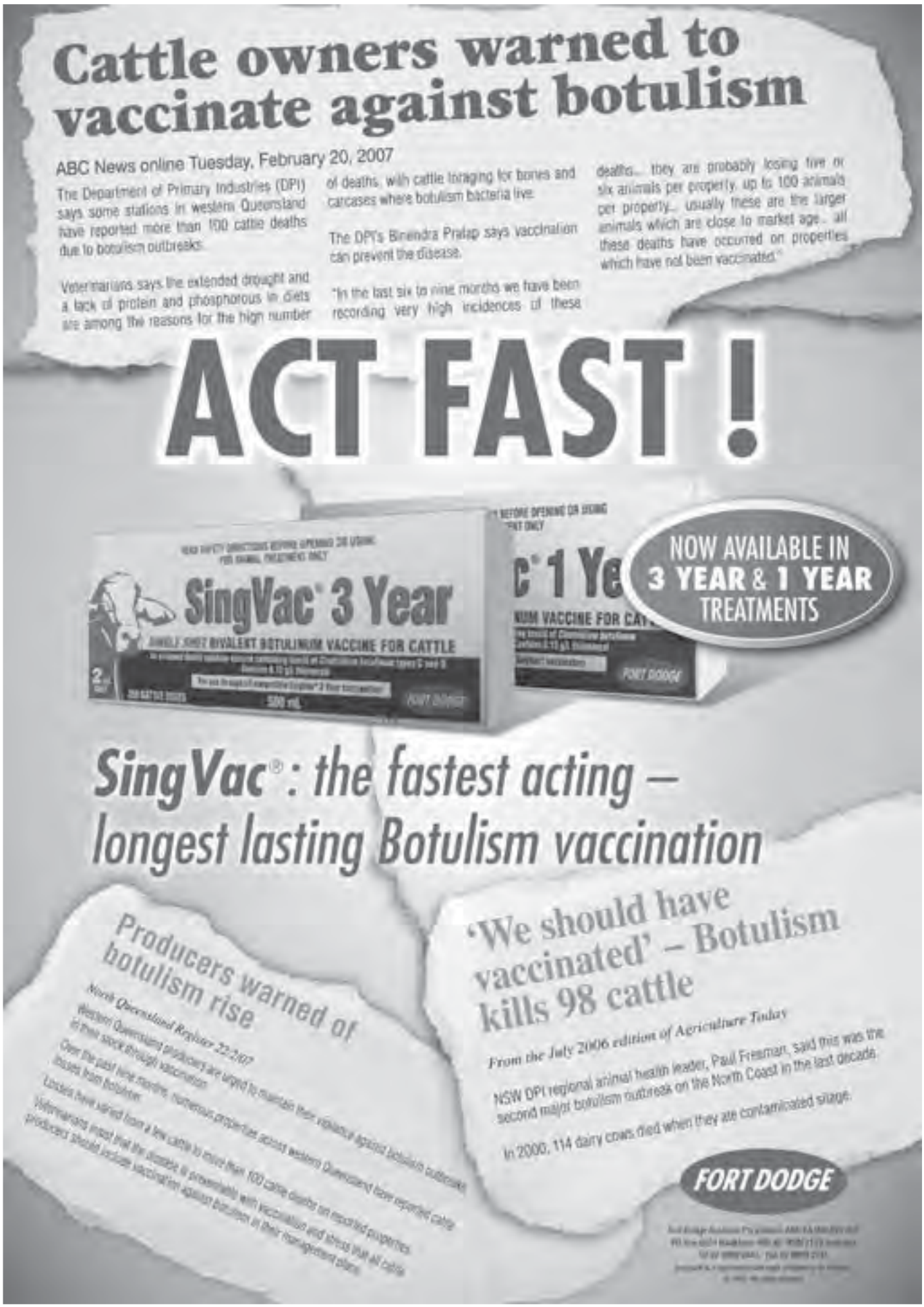
It appears it can be triggered by a number of things. Examples are bones from dead animals, water with rotting vegetation in it, mouldy feed or perhaps just by dry weather following good earlier rain. Botulism can lay dormant for many years. Since our experience, there have been a number of reports of botulism deaths up on the range and down in the coastal country.

I would strongly advise anyone with cattle to vaccinate against botulism as a routine. The vaccine is a very cheap insurance as losses can be quite significant. If you buy cattle, check to establish their vaccination status and vaccinate if not already done.

It is worth checking with your cattle vet or the DPI&F for options on vaccines as there are a number of different types with different application requirements and protection periods.

The bad news for us is the loss of three good cows. The good news is that we have lost no more cows or, thankfully, calves.

Graham McGregor
Frogmoor, Hervey Range


Cattle owners warned to vaccinate against botulism
ABC News online Tuesday, February 20, 2007
The Department of Primary Industries (DPI) says some stations in western Queensland have reported more than 100 cattle deaths due to botulism outbreaks.
Veterinarians says the extended drought and a lack of protein and phosphorous in diets are among the reasons for the high number of deaths, with cattle foraging for bones and carcases where botulism bacteria live.
The DPI's Birendra Pratap says vaccination can prevent the disease.
"In the last six to nine months we have been recording very high incidences of these deaths... they are probably losing five or six animals per property, up to 100 animals per property... usually these are the larger animals which are close to market age... all these deaths have occurred on properties which have not been vaccinated."
ACT FAST !
SingVac® 3 Year
BIVALENT BOTULINUM VACCINE FOR CATTLE
NOW AVAILABLE IN 3 YEAR & 1 YEAR TREATMENTS
SingVac®: the fastest acting – longest lasting Botulism vaccination
Producers warned of botulism rise
'We should have vaccinated' – Botulism kills 98 cattle
From the July 2006 edition of Agriculture Today
NSW DPI regional animal health leader, Paul Freeman, said this was the second major botulism outbreak on the North Coast in the last decade.
In 2000, 114 dairy cows died when they ate contaminated silage.
FORT DODGE

To V or not to V ?

Most of us run for cover when we suspect an insurance salesman is knocking at the door. Their tales of doom and gloom and what will happen to us one day eventually is akin to being told that we are going to die and are doomed for penury unless we have 'adequate cover'. The price of premiums particularly in these times of record compensation pay-outs is enough to make us choke on the spot. But when trouble hits, there is great comfort in having had made the decision to insure.

Likewise with vaccination of animals against the ever-increasing number of diseases that can be covered by modern vaccines. 'When will it all stop', 'what bloody next!' is the usual cry, 'My animals look like pin cushions now'. It is often easy to forget to vaccinate or 'let it go for this year' when a disease is not presently a problem in the herd or in the district at large.

Because a disease does not show up in an unvaccinated herd or a pet animal (Parvo), it does not mean that the disease is not present on the property or in the environment. Once when investigating a disease problem, a grazier asked me the eternal question 'When do you stop vaccinating for diseases?'

My answer was 'What risks are you prepared to take with your investment?' (Grazing is no different to punting on racehorses – the risk is the same - just the pain is slower and more subtle).

Once a disease has been diagnosed on a property, then it can be assumed that it is there for evermore. And once a disease outbreak occurs, a vaccination programme will not be fully effective for up to six weeks during which the disease can still remain rampant.

There is often a tendency to delay vaccination until 'something is going about'. Unfortunately, many of the diseases we are concerned with today do not 'go about'. They are enzootic (that is, they are here to stay) in the district or on particular properties and cannot be eradicated. In simple terms, this means that the disease lies dormant in the soil until exposed to the open environment and comes in contact with the grazing beast; or if harboured and carried by insects can spread rapidly when the insect population explodes with suitable weather.

Blackleg has caused numerous deaths on many properties. The causative organism *Clostridium chauvoei* is a spore forming organism and lives for years in the soil. It can be brought to the surface by ploughing, stick-raking or from rain and water erosion. In severe dry conditions, the soil can pulverise to loose dust and the organism exposed simply by animals walking on the ground or by wind disturbance. Blackleg does not 'go around'. Once on a property, it is there for a lifetime to surface again under favourable conditions. Pulpy kidney disease from the same family as blackleg is something that is rarely seen in our grazing conditions but in feedlots or in crop feeding can be a major problem.

The same thing is true for botulism. In low phosphorus country or when protein levels of the pasture fall, bone chewing and carrion-eating in search of phosphorus and/or protein can expose the grazing animal to the disease. Someone said that 'vaccinating for botulism can cure 25 diseases'. This is an off beat quote meaning many unexplained deaths put down to snake bite or plant poisoning could be due to undiagnosed botulism. One client told me that after vaccinating the entire herd for botulism, the annual death rate fell from what was an acceptable 2% down to 0.1%.

Three Day Sickness (Bovine Ephemeral Fever or BEF) - the bovine version of 'colds and flu'- can cause havoc in our herds. It is often heard commented that 'it is just a bit of Three Day'. However, like the human 'cold and flu', the cost of Three Day Sickness to the industry due to loss of production, abortions, and lingering side effects is nearly beyond measure. Not to mention the soul destroying deaths of fat bullocks.

Like the common cold and flu, have we become blasé about the impact of BEF and have we just learned to live with it and accept the losses? That is until deaths occur on a devastating scale.

There are two approaches to vaccination (herd health) strategies.

1. *Proactive* – 'closing the stable door before the horse bolts even if it has no immediate intention of doing so, but the possibility and probability is still there.' Vaccinations are carried out on the assumption that the disease will occur. This is insurance. This takes into account the saying 'A failure to plan can be a plan for failure'.

2. *Reactive* – the 'if it is not broken, then why fix it' attitude does not take into consideration the vulnerability of the naïve animal or herd – a animal or herd that has not had any previous exposure to

a disease and has no immunity (e.g. EI in horses, Pestivirus in cattle, clean cattle into ticky country) or that a disease may be already present in a dormant state waiting for the right conditions to explode.

Logistical costs In a proactive programme, vaccinations are carried out during other handling procedures such as weaning or processing when cattle are being brought in. There are no added special mustering costs. No further associated worries. Here it must be noted, that to shortcut the manufacturer's protocols is pure risk taking. It is not just a case of covering their backside by the manufacturer or the professional giving the advice. These protocols include keeping the vaccine cool, out of sunlight etc.

With a reactive programme, special mustering and handling expenses are incurred both in time and money in addition to the costs of the losses that have already occurred. During a disease outbreak, it may not be possible to muster either due to the disease itself (e.g. Three Day) or inclement weather. The bruising from a 5in1 vaccination can itself be the focus for a blackleg case. This situation brings to mind another great quote that I put before myself every day 'A failure to plan on your part does not constitute an emergency on mine'. As a consulting professional, it is equally devastating for me to stand by in some of these situations feeling bloody helpless with nothing to offer other than a misguided joke or two.

But what about the cost? 'Every joy has a price'

Here a line should be drawn between a production cost and a production expense -

Take a 500 steer herd and vaccinate for all relevant diseases. (Prices are approx. only for the exercise)

Botulism	$925	Longrange – once only
Tick Fever – 3 germ	$1750	Once as weaners
Five in One	$300	two shots 4 – 6 weeks apart
Three Day Sickness	$3500	2 shots 2 – 4 weeks apart
Total	$6675	or approx. $13.35 per head

This equates to 11 x 350 kg stores at $1.60/kg or 7 X 575 kg fats at $3.00/kg DW. (Some losses in a Three Day episode alone have exceeded these figures).

Subclinical loss – The profit killer

But what is often not taken into account are the money-sapping subclinical losses or the failure of the affected animals to come back to full production potential. Subclinical loss (better known in the Australian idiom as 'white anting') – means that a disease or condition is active but the animal appears normal until time for slaughter or some other measurement is applied. We find that the guts has been chewed out of the production profit. Slow or poor-doers, slow finishers, low slaughter weights; and in the breeding herds, reduced milk production for feeder calves, low pregnancy rates, increased PD – weaning losses.

To demonstrate exactly what sub-clinical losses can mean, these are some figures from an Anaplasmosis (Tick Fever) outbreak in a group of 274 unvaccinated Brahman steers in a feedlot situation. This case also highlights the need for accurate recording of production figures so losses can be measured in $ terms and corrective action taken where possible.

What was the cost of this outbreak?

- Four deaths $4300
- Additional feed for 9 and wasted on deaths $1123
- Vet fees $1200
- Average daily wt gain 13% and 33% down on expected and less reached 340 kg carcass wt $24045
- Total $30 669
- Plus the intangible cost of lost time for the feedlot operator in supervising cases

ALL FOR THE WANT OF A MERE $3.25 PER HEAD AS WEANERS! 274 head - $890.50

Prevention cost is cheap – treatment and loss expenses are not

The property of origin was also feeding cattle at the same time; experiencing an episode of what they thought was Bovine Ephemeral Fever. One death occurred; but becoming aware that Anaplasmosis was present, a further 26 animals were treated. Subsequently, at slaughter, this mob was penalized heavily for D – Butt Profiles, indicating the severe impact the disease had on the on-feed performance and carcass quality.

The owner in case had been quoted in the past as saying 'What the eyes don't see, the heart doesn't feel'. Here the owner's heart was enlightened very sorely and quickly through a gaping hole in his pocket.

Conclusion

To paraphrase Shakespeare from Hamlet 'To V or not to V, that is the question'. The answer is quite simple, 'vaccinate, vaccinate, vaccinate' or as O'Leary the Irish bard wrote 'to be sure, to be sure, to be sure!'

Dr Alan Guilfoyle
Veterinary Surgeon, Clermont

Post-weaning diarrhoea

Post-weaning diarrhoea (PWD) is a very common condition in weaned calves in north Australia. It is mainly caused by two coccidia that are normal intestinal inhabitants, *Eimeria bovis* and *Eimeria zeurnii* which cattle contract within a day of birth from herd mates.

Under normal circumstances, coccidia cause no significant problems in cattle as they develop immunity and keep populations suppressed. If the immune system in the gut of a calf is compromised, the parasite can rapidly reproduce and cause substantial damage to the lining of the intestines. This is expressed as bloody or black diarrhoea. Usually it takes about 4 weeks from the time of immune suppression to clinical disease.

This disease causes considerable losses both from deaths and lost production.

The parasite usually damages its own environment to the extent that it no longer has a suitable environment in which it can successfully reproduce. This causes a rapid decline in intestinal populations and regression of the disease; i.e. the disease is typically self-limiting. This effect is usually potentiated by a recovery of immune competence following removal of whatever caused immune system impairment initially. Often, by this time there have been deaths and/or permanent effects turning animals into poor doers.

Stress can compromise immunocompetence of the whole animal. To exemplify its effect on PWD, experimentally, a single injection of steroid stress hormone can precipitate coccidiosis in weaners.

The immune system functioning in the intestinal lining requires a constant flow of digesta. Interruption to feed supply for as little as one day can compromise the gut's immune system and precipitate coccidiosis in weaned calves.

A young calf experiencing PWD may be a long way from the disease limiting itself as described above. If not given drugs to control the parasite, the calf may continue to suffer chronic intestinal damage from coccidia. If left untreated, scarring of the intestine can occur, which may affect long-term growth. These animals become poor doers for whole of life.

Recommended methods of managing this disease include:

- Prevention is far better than having to treat or cure affected animals
- Ensure calves have access to nutritious palatable feedstuffs to satisfy voluntary feed intake from the point of weaning.
- In calves that may be at risk of stress or coccidiosis, include monensin (active ingredient of an Elanco product, Rumensin™) in a supplement (e.g. licks, meals or fortified molasses) to achieve intakes of approximately 25 mg/day.
- In calves that suffer severe and or chronic PWD, treat individually with Scourban™, a product which includes a coccidostat, an antibiotic and anti-diarrhoeal powders. Put in a management group by themselves and feed extra well with high quality supplements, for example, 1 to 2 kg per day of MUP (molasses, urea, protein meal).

Molasses-based supplements for weaners were tabled in *Northern muster*, Issue 17, December 2007.

Alan Laing
Extension Officer (Beef)
DPI&F Ayr Research Station Ph (07) 4720 5100

Exciting study opportunities with Rangelands Australia

Postgraduate courses in rangeland management in Charters Towers

These University of Queensland courses are run over 5 days. Students will be required to undertake pre-reading before the workshop, attend the workshop and complete a final assignment after the workshop.

Two courses are offered in workshop mode in Semester 2 2008:

1. MGTS7976 Building Effective Stakeholder Engagements
   Date: 25-29 August 08
   Venue: DPI&F Conference Centre, Charters Towers
2. ANIM7017 Animal Nutrition and Behaviour
   Date: 8-12 September 08
   Venue: DPI&F Conference Centre Charters Towers
   Other venues and dates will be considered subject to minimum numbers.

For further information please contact one of our rangelands champions:

Ian Beale	(07) 46231840
Mike Chuk	0427 427 695
Richard Golden	(07) 4623 5228
Joe Rolfe	0427 378 412

Or: Elizabeth Wallis, Rangelands Australia:
mob.0419781549; e.wallis@uq.edu.au
http://www.rangelands-australia.com.au/

Research to Reality - Beef extension innovation for the Burdekin Catchment

Three beef producer teams from the Collinsville, Belyando and Northern Speargrass (Greenvale) regions are about to complete a two-year beef extension project which has taken a 'whole of business' approach to assessing beef enterprise profitability.

The project 'Research to Reality' has used extensive enterprise analysis to assist producers in identifying practical solutions to key financial, production and sustainability issues. Project funding came from the Burdekin Dry Tropics Natural Resource Management, the Department of Primary Industries and Fisheries (DPI&F) and the Beef Cooperative Research Centre.

These solutions have culminated in producer-led research projects tackling a range of issues including property development, land rehabilitation, animal nutrition, succession planning and weed control.

Producers have considered these issues within a broader process of continuous improvement and innovation.

This involved producer teams working through a six-step process of issue analysis, setting targets, identifying actions, taking action, evaluating and creating new opportunities.

DPI&F project leader Brigid Nelson said the most critical step has been the issues analysis where we used benchmarking tools to assess each enterprise's economic performance.

This information was an important first step in assisting producers to get an accurate picture of the key strengths and weaknesses within their enterprise.

The project also utilised DPI&F's Breedcow Dynama program to understand the impact of suggested improvements on herd structure and profitability. Another important tool was the use of a beef-focusing framework that clearly illustrated the relationship between key sustainability issues such as land condition and its wider impact on animal nutrition, live weight growth, reproduction rates and overall profitability.

Producer teams have been encouraged to share and compare their results. Significant learnings have come from producers questioning each other over their results and understanding the impact of different management practices on profitability.

The project team is now busy writing up project's results which will include detailed cost benefit analysis and practical case studies of what has been achieved. Field days and the development of producer research sites are also scheduled to share the project success with other producers in the Burdekin catchment.

The Research to Reality beef project is a key DPI&F commitment under the Queensland and Australian Government's Reef Plan to improve the quality of water entering the Great Barrier Reef Lagoon.

Brigid Nelson
DPI&F Charters Towers Ph (07) 4761 5158

Flying robots can help improve farm management

Biosecurity is just one of the many potential uses for 'flying farm robots'.

Tests are being carried out in the United States to use uninhabited aerial vehicles (UAV) to collect spore samples for early detection of possible diseases, a potential benefit to biosecurity.

The Department of Primary Industries and Fisheries is working with the Australian Research Centre for Aerospace Automation at Queensland University of Technology and CSIRO to develop these flying robots.

In a recent presentation in Cairns, DPI&F agricultural engineer Troy Jensen gave many examples of how farmers could use UAVs to improve the management of their properties.

UAVs fitted with low-cost imaging systems, including digital cameras, are able to fly over crops and provide images that would help farmers understand their crops better and make decisions accordingly.

For example, the camera could:

- pick up weed infestations
- identify spatial distributions of plants
- differentiate between species of cereal crops
- detect disease in cereal crops
- investigate the effects of irrigation
- investigate the state of water points
- quantify hail and flood damage.

When you look at things from above, you can get a much better perspective of what is happening on the ground.

In another example, Troy explained that after floods, farmers have to physically check the integrity of their fences. With a UAV imaging system, farmers would save time if any possible damage could be pinpointed before they head out to mend fence lines.

Banana growers are interested in UAV use to locate feral banana plants in suburban areas because these have the potential to harbour diseases such as bunchy top.

Other possible applications could include cattle mustering, bushfires and searching for people lost in the bush.

Biosecurity agencies could find UAVs especially useful in the early detection of possible disease threats by collecting spores in the air.

The Australian Research Centre for Aerospace Automation, QUT, CSIRO and DPI&F are developing the technology to hopefully become more available to more producers in the future.

Market report

Large areas of eastern Queensland have received useful rain in late July with many districts getting falls over 50 mm.

The cattle market has responded with useful increases in prices.

Again western Queensland districts missed out on the rain and large cattle consignments have continued to pour out of the north west to abattoirs, saleyards and live export. North Queensland saleyards and direct to abattoir consignment prices so far this year have been very ordinary and hopefully the run into Christmas will see improvement. The lack of processor competition in the deep north and our distance away from the large populations and the domestic market does not help the situation.

The Australian dollar has come back from over 95 cents in mid July to below 90c in early August which should help our cattle price. Since our last report, demand for beef from Korea, Japan and the USA has been a little weaker but this has been balanced by good demand from other markets like Russia.

Live export

The live export trade has been very active out of north Queensland this year and our spies tell us that the next shipment due out of Townsville in September will have slightly better money for the right type of cattle.

The 14,000 head shipped out of Townsville in July had an average value of $571.

Darwin was again our leading live export port during 2007.

Darwin	292,000	Wyndham	42,000
Fremantle	116,000	Port Headland	22,000
Broome	93,000	Brisbane	20,000
Townsville	51,000	Geraldton	19,000
Portland	48,000	Karumba	15,000

Live exports by state 2007:

Northern Territory	45%
Western Australia	36%
Queensland	12%
Victoria	6%

Domestic market

JBS Friboi has continued its processor purchasing in Australia with the acquisition of the Tasman group that includes three abattoirs in Victoria and three in Tasmania. These works process approximately two million sheep and 600,000 veal and cattle annually.

Wheels are turning within our industry to eventually have a registered pasture fed beef product available for domestic and export markets. Similar products are on the world market scene now from South America and the USA. Australia is being left behind considering our potential for producing quality pasture product coupled with our world leading MSA technology to ensure eating quality.

ABARE predicts a 1% decline in Australian beef and veal production in 2008-09 with around 8.7 million head going to slaughter producing 2.1 million tonne of beef. The tightening of supply is expected because of herd re-building.

Australian feedlot numbers have increased in the June quarter to 685,000 head (Queensland 358,000 head) because of cheaper feeder cattle prices and a good summer sorghum harvest putting downward pressure on grain prices.

Korea

A lot has happened in the Korean beef market over the last few months.

The new government in power announced that it was allowing nearly all USA boneless and bone-in beef to begin coming into the country (April). This triggered violent protests in Seoul, with huge crowds demonstrating about the beef safety issue. The Korean president sacked several leading staff members, and was forced to delay the resumption of imports of USA beef under the new relaxed quarantine restrictions.

At this point, US packers are being asked only to import beef of animals under 30 month of age. The whole saga highlights the fear their consumers have of BSE in yankee beef and the food safety issue. Glen Feist, our MLA man in Korea, states that all beef sales have suffered because of the drama. Most wholesalers have stayed loyal to Australian product and are making this known in the market place. To add to the confusion, a large case of mislabelled beef has been uncovered in Seoul.

Korea is about to introduce 'Country of Origin' labelling laws for all beef products sold in butcher shops and supermarkets.

Despite all these happenings, bone-in beef from the USA which has been banned for 5 years is likely to be sold in Korea this week. The 1.3 tonne of product has cleared all quarantine inspections.

USA

The US grinder beef market has been running at record prices with tight import supplies and the US recession lifting demand for mince and burgers. The USA is a great nation of beef eaters and they produce and consume more beef than any other country.

Top world beef producers (million tonne)		Top beef consumption nations (million tonne)	
USA	12	USA	12.8
Brazil	9	EU	8.3
EU	8	China	7.4
China	7.8	Brazil	6.9
Argentina	3	Australia	1.1
India	2.8		
Australia	2.2		
Mexico	2.1		
Russia	1.9		
Canada	1.85		

Our imports into the US are down 20% on last year. Russian importers have been out-bidding buyers from the US and Japan, especially for the cheaper manufacturing and forequarter cuts.

South America

There is no doubt that Brazil, Argentina and Uruguay will continue to be important beef export nations using their low cost-price advantage to obtain a share of the global beef market.

Brazil and Argentina continue to battle foot and mouth disease and the resulting export restrictions.

At present, the Argentine government is restricting export sales to ensure adequate supplies and low beef prices at home. Less than 10% of their production is being exported at present.

Uruguay has approximately 12 million head of cattle, mainly of Hereford genetics with most turnoff coming from grasslands. 80% of production is exported with no artificial growth promotants. It has a compulsory cattle ID traceability system.

Brazil's feedlot sector has grown over the last few years with aprox. 4M head of the 40M slaughtered annually coming from feedlots. The main ration component being silage from corn or sorghum.

Some notes comparing Australia and Brazil's beef industry

	Australia	Brazil
Population	20 M	190 M
Cattle herd	28 M	180 M
Total beef production	2.2 M tonne	9 M tonne
Per capita beef consumption	35.5 kg	36.9 kg
Beef export (% of production)	67%	23%
Top 5 export markets by volume (2007)	Japan 40% USA 31% Korea 16% Taiwan 3% Indonesia 2.9%	Russia 26% EU 14% Egypt 14% Iran 4% Algeria 4%

Bernie English
DPI&F, Kairi

Greg Brown
Meadowbank Station, Mt Garnet

Wambiana: the $ report

Many *Muster* readers would be aware of the large scale DPI&F grazing trial hosted since December 1997 by the Lyons family at *Wambiana* (60 km SW of Charters Towers). This co-funded MLA trial investigates the long-term impacts of different grazing strategies on profitability and resource sustainability. In an earlier *Muster* (Issue 9) we reported on the importance of sustainability for profitability. This link was emphasized in a subsequent *Muster* report (Issue 12) on results of matching cattle numbers with yearly variations in rainfall and pasture supply.

In this issue we present findings on one of the major drivers of practice change....the economic bottom line.

The philosophy behind the trial is that sustainable grazing practices do exist but there is a lack of associated economic data to give managers the confidence for adoption. Our results collected over 11 years and calculated from the actual value of beef produced minus feeding and interest costs, clearly demonstrates the advantage to moderate stocking over constant heavy stocking and high pasture utilization. In fact, if these steer-based results are applied to an average sized Charters Towers district property of 20,000 ha, over 11 years it translates to an estimated advantage of over $1.5 million.

This is possibly a conservative estimate as one major demonstration was that moderate stocking gave many more marketing options. Although the moderate stocking steers were of a marketable condition sooner than those from the heavy strategy, we were restricted by the trial procedure to sending all the steers to the meat works at the same time each year. The opportunity to sell earlier and increase the total numbers turned over or even to spell these paddocks, would probably further enhance total productivity.

Another important point was that all paddocks started in 1997 in good pasture condition, meaning that the heavy stocking strategy was initially being subsided by previous years of good management. Combined with a series of above average rainfall years this meant that the heavy stocking strategy probably performed better than in normal circumstances.

The economic advantage to moderate stocking comes from avoiding the costs of molasses and urea feeding in drought years, as well as reducing the interest costs on livestock capital. Moderate stocking steers also attracted premiums at slaughter over the heavily stocked steers due to their improved condition and weight for age.

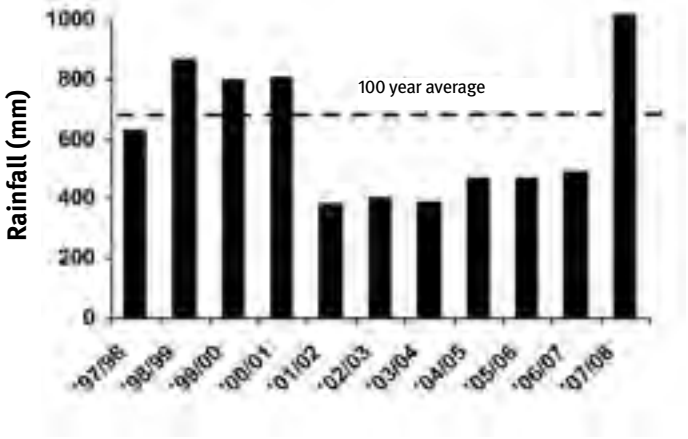
Over the course of the trial, pasture condition declined in the heavy stocking paddocks to the extent that their carrying capacity is now reduced by 30%. In fact, for the past few years it has not been possible to run many more than currently run in the moderate stocking paddocks. Despite reducing numbers, the annual live weight gain per head is still 30 kg less than the moderate paddocks due to the changed pasture composition.

Under what circumstances and for how long this difference remains is likely to be part of the next phase of the Wambiana Grazing Trial beginning in 2009.

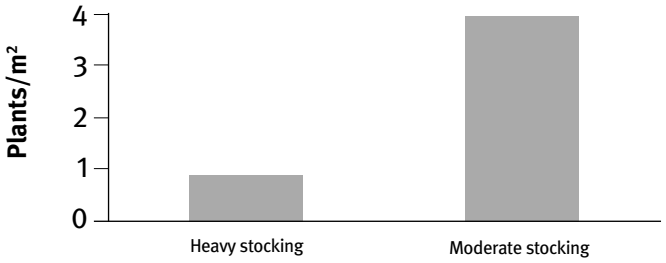
A full report is available on the MLA website.

John Bushell and Peter O'Reagain
DPI&F Charters Towers Ph (07) 4761 5151

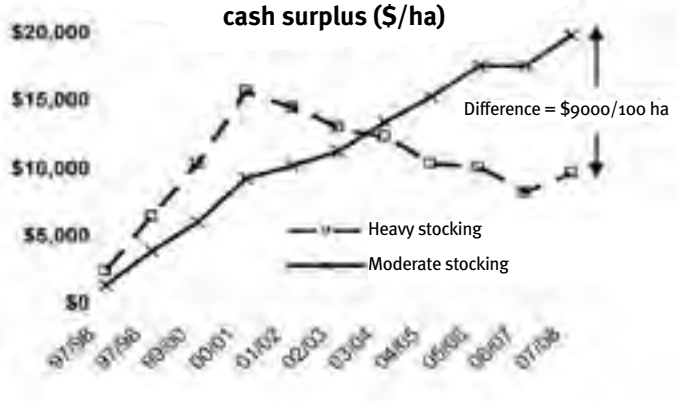
Wambianan trail rainfall: 1997 – 2008



Productive perennjial grass density after 10 years



Wambianan grazing trail accumulated cash surplus ($/ha)



COLUMBA CATHOLIC COLLEGE

DATE CLAIMER!

Sunday 12th October
3:00 pm

Columba Catholic College
invites you to the Official Opening of their newly established
VETERINARY CENTRE

- Live animal demonstrations
- Entertainment provided by our College Students
- Chance to view our College facilities, in particular our VET Centre including Bull table, Stables, A.I Training facility, Horse Veterinary crush, plus an interactive conference/classroom centre.

FOR MORE INFORMATION CONTACT THE COLLEGE OFFICE.
TO RSVP — PLEASE EMAIL vet.centre@columba.qld.edu.au

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LIGHT TO THE WORLD
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Phone (07) 4787 1744
Fax (07) 4787 4986
Email office@columba.qld.edu.au

www.columba.qld.edu.au

ASPIRE AND ACHIEVE AT COLUMBA!

BDTNRM working with local farmers and graziers to improve water quality in the Burdekin Region

In late 2002 Burdekin Dry Tropics NRM engaged the Australian Centre for Tropical Freshwater Research (ACTFR), based at James Cook University in Townsville, to undertake a community-assisted water quality monitoring program throughout the Burdekin Dry Tropics region.

The aim of the program was to investigate suspended sediment and nutrient concentrations in waterways throughout the Burdekin Dry Tropics region during wet season rainfall events. This information will help identify the major sediment hotspots in the region.

Wet season rain events provide approximately 80% of the annual discharge from the Burdekin River into the Great Barrier Reef lagoon. Due to the irregular nature of wet season flood sampling, we developed a network of landholder volunteers to help with sampling.

The 2006/2007 wet season saw 30 volunteers monitoring 54 sites in the greater Burdekin catchment. Samples have been successfully collected from the major sub-catchments in the Burdekin region (Belyando, Suttor, Bowen, Upper Burdekin and Cape catchments).

Results indicate that the following Burdekin rivers contribute the greatest amount of transported suspended sediment to the Great Barrier Reef lagoon:

- Little Bowen River (Bowen sub-catchment)
- Clarke River (upper Burdekin sub-catchment)
- Dry River (upper Burdekin sub-catchment)
- Bogie River (Bogie sub-catchment).

Elevated concentrations of dissolved inorganic nitrogen and herbicides associated with sugar farming have been found in Barratta Creek and Haughton River.

Since initiating the monitoring program, the question has been raised as to how much sediment is trapped by the Burdekin Falls Dam. Further research will help to better guide management actions aimed at reducing sediment loads entering the Great Barrier Reef lagoon.

Over the last two wet seasons we also conducted a herbicide monitoring program in the Lower Burdekin. Diuron, Atrazine, Ametryn and a range of other pesticides were detected in the water ways of this coastal region.

The herbicide Tebuthiuron was detected in four of the major Burdekin sub-catchments (Belyando, Suttor,

Thank you for your help monitoring water quality in the Burdekin Catchment

Over 30 volunteers brave floodwaters each wet season since 2002 to collect water samples to help improve the quality of water leaving the Burdekin River Catchment.

The Burdekin Community Water Quality Monitoring Project targets wet season rainfall flow events, which comprise approximately 80% of the annual discharge from the Burdekin River. The volunteer network collects samples from subcatchment waterways at different stages during the flood events. These samples are analysed and the results help identify "hotspots" in the catchment, where sediment and nutrient runoff is greatest.

Thanks to the voluntary help of many farmers and graziers throughout the Burdekin River Catchment, we can now begin to see patterns and address the major issues affecting water quality in our region.

Australian Government

Queensland Government

BURDEKIN DRY TROPICS NRM

JCU

Cape and Bowen Rivers) and the Burdekin River flood plume, which is of particular concern due to the length of its half life (persistence) of approximately one year. Tebuthiuron is commonly used to destroy woody weeds.

In large flood events sediments, nutrients and pesticides are flushed into the GBR lagoon, forming 'plumes'. These plumes commonly travel north to Magnetic Island and, in very large events, can reach as far north as Cairns or Cooktown.

The water quality monitoring data provide a valuable baseline to examine trends in sediment and nutrient delivery from the Burdekin river system over time. All of these data are currently being used in the development of the Burdekin Water Quality Improvement Plan.

The Water Quality Improvement Plan aims to deliver significant, targeted reductions in the discharge of nutrients, sediments and herbicides from the Burdekin river catchment as one of the strategies for implementing Reef Water Quality Protection Plan, otherwise known as Reef Plan.

Canegrowers, graziers and horticulturalists are aware of the issues and are actively working to reduce runoff from their properties by working with BDTNRM and other management agencies to develop and implement Best Management Practices on their properties.

Around 60 canegrowers are monitoring water leaving their properties in a new BDTNRM project. The WQ PIXEL Project is aimed at providing support for growers in the Lower Burdekin to monitor key surface and groundwater quality parameters. The results from the monitoring will allow growers to relate on-farm management practices to the quality of the water they are applying to their crops and running off their paddocks. This project is managed by the Burdekin Bowen Integrated Floodplain Management Advisory Committee (BBIFMAC) and funded by BDTNRM.

For more information visit the BDTNRM website www.bdtnrm.org.au or call BDTNRM at (07) 4724-3544.

Technology a useful tool for NQ grazing enterprises

Most successful grazing enterprises keep a close eye on the accounts to make sure there is sufficient cash flow, workers are paid and debtors minimised.

Many would regard it as a necessary evil of every business.

The same strategic approach to land management is what can separate the successful grazing enterprises from those struggling season to season.

Until recently, the tools for decision-making have been limited to a grazier's intuition and memory of pasture condition transposed onto a static map or satellite image. What has been missing is the link between management actions and geographical information that tracks condition changes through variable climatic sequences.

Years of scientific research by the Department of Primary Industries and Fisheries, the Department of Natural Resources and Water, CSIRO, universities and other experts is delivering a more complete understanding of soil types, grazing impacts, ground cover and water flows.

Through this work, technology has delivered land managers some pretty useful tools to gather information to make better business decisions about improving land condition, and this information is now more widely available through land monitoring projects funded by the Burdekin Dry Tropics NRM and the Fitzroy Basin Association.

Satellites give us photographs of the same land for more than 30 years, providing a history of how the land reacts to the seasons and the impacts of grazing and weed spread. This unique perspective also can give land managers an opportunity to assess climate change impacts.

Smart graziers are realising how gathering this information can help them achieve greater efficiencies in their production systems. For example, destocking at the right time during prolonged dry spells will allow a speedier recovery in land condition and return to profitability once the drought breaks. Many are accessing training programs such as the Grazing Land Management Education package offered through a partnership between Meat and Livestock Australia and DPI&F, or taking advantage of DPI&F's extension services for access to this information.

DPI&F is indeed enhancing its services to meet the need to package complex monitoring information into formats that demonstrate their business value to land managers, which will help them make decisions that improve productivity while maintaining or improving condition.

For more information contact the DPI&F on 13 25 23.

Bob Karfs
Senior Grazing Land Scientist
Department of Primary Industries and Fisheries

Grader grass floret ... grazing while plants are young is an option

Far right: Grader grass infestations ... New control measures are being developed in the DPI&F research work

Grader grass study sheds light on severity of infestations

A study taken by Department of Primary Industries and Fisheries weed experts is giving land managers an insight into the destructive potential of grader grass.

Grader grass (*Themeda quadrivalvis*) is an invasive exotic high biomass annual grass that is increasing its distribution in northern Australia.

A native of India, it grows well in the higher rainfall areas of the savannahs and coastal regions of northern Australia although it has been recorded as far south as Sydney and in areas receiving as little as 400 mm annually.

A sign of the level of concern that exists within the community about the grass is the funding sources of the recent study – Burdekin Dry Tropics Natural Resource Management, Northern Gulf Resource Management Group and Southern Gulf Catchments have all provided money towards the research and the collaboration with Queensland Parks and Wildlife, graziers and the Department of Natural Resources and Water Fire Management Unit. Some local governments have even declared grader grass within their boundaries.

Researcher Dr Wayne Vogler, who is based at DPI&F's Biosecurity Queensland Tropical Weeds Research Centre in Charters Towers, said if grader grass was left unchecked, it could dominate large areas of northern Australia's savannah grasslands.

Given an opportunity it can quickly out-compete native vegetation, and studies show that it can re-establish after bushfire events by rapid seedling establishment following early wet season rainfall.

This means that grader grass infestations can significantly impact the profitability of grazing enterprises by reducing the productive capacity of pastures, as well as severely degrade conservation areas by forming dense monocultures.

Of equal concern is that the biomass present in grader grass can increase fire intensity and hazard – which makes its presence more of a threat to stock, equipment and infrastructure, and also makes bushfires a lot more costly to bring under control.

The majority of the on-property testing that has been undertaken over the past two years has been conducted in the Mount Garnet and Mount Surprise area.

Researchers have also explored the viability of various herbicide and cutting control measures as well as its nutritional value compared to native and introduced pasture grasses.

These initial tests will form the basis of the recommended control measures that will be released to land managers and local government. While the research continues, as a first line of defence against weed invasion, land managers should manage their pastures to maintain good ground cover which will suppress grader grass establishment. Limiting the potential for seed spread by ensuring vehicles and machinery are cleaned down before moving from infested to uninfested areas will also go a long way to reducing the longer term impact of this grass. Small infestations should be cleaned up before they get out of hand.

Where grader grass is well established across large areas, grazing while the plants are young, palatable and relatively high in protein offer graziers a way of obtaining some productivity from this undesirable grass. However large scale control with herbicides is problematic due to cost, accessibility and limited herbicides registered for such application.

Landholders wanting more information about the research can contact DPI&F on 13 25 23 or their local government office.

Bellyache can be a headache for northern graziers

Queensland scientists are making significant inroads to developing control practices for the prolific bellyache bush that is rapidly spreading across Australia's northern rangelands.

Bellyache bush is one of the most toxic and vigorous weeds growing in the dry tropics of northern Australia – mostly north of the tropic of Capricorn in Queensland, the Northern Territory and Western Australia.

It is ranked high on the nation's weed priority list and thrives in the seasonally wet/dry climate of the north.

Bellyache bush is responsible for infesting productive grazing land, killing livestock and reducing biodiversity and has potential to spread across Australia's entire tropical savannahs.

To develop effective control options for the weed, the Department of Primary Industries and Fisheries' (DPI&F) Tropical Weeds Research Centre has been studying its ecology and management for the past six years.

These researchers have found an integrated management approach is necessary to control weed areas, which can spread up to 75% over three years – even with below average rainfall.

Economic impacts

Bellyache bush is toxic to animals and has killed cattle, horses and goats in Queensland.

DPI&F weed scientist Dr Faiz Bebawi said cattle tended to eat the bush in drought years and resulting in direct stock losses for pastoralists.

Since the weed aggressively spreads into impenetrable clusters that wipe out native grasses, it also means significant loss of productive grazing land, and increases in mustering costs because the multi-stemmed, sticky-leaf nature of the bush means horses have difficulty getting through it.

Management

Graziers in susceptible areas who don't have bellyache bush on their properties should maintain a vigilant watch for any plants, especially along creek lines or flood-prone areas. Any plants found should be removed quickly.

Bellyache bush is a vigorous plant that sets seed within 55 days under ideal conditions, meaning it has to be wiped out in this period to prevent seed going into the seed bank. For small patches of the weed, hand pulling or spot spraying with selective herbicides were recommended.

Bellyache bush can infest large areas of grazing land

Researchers had found integrated control measures using fire, machinery and herbicides over a 4-6 year period were effective in controlling big, established infestations of bellyache bush.

If you only carry out one of these control measures in a single year, it actually aggravates the problem. But researchers have found that four years of integrated control methods will significantly deplete its seed bank.

Bellyache bush is very sensitive to fire and burning is most effective if pastures are spelt beforehand to ensure a good fuel load.

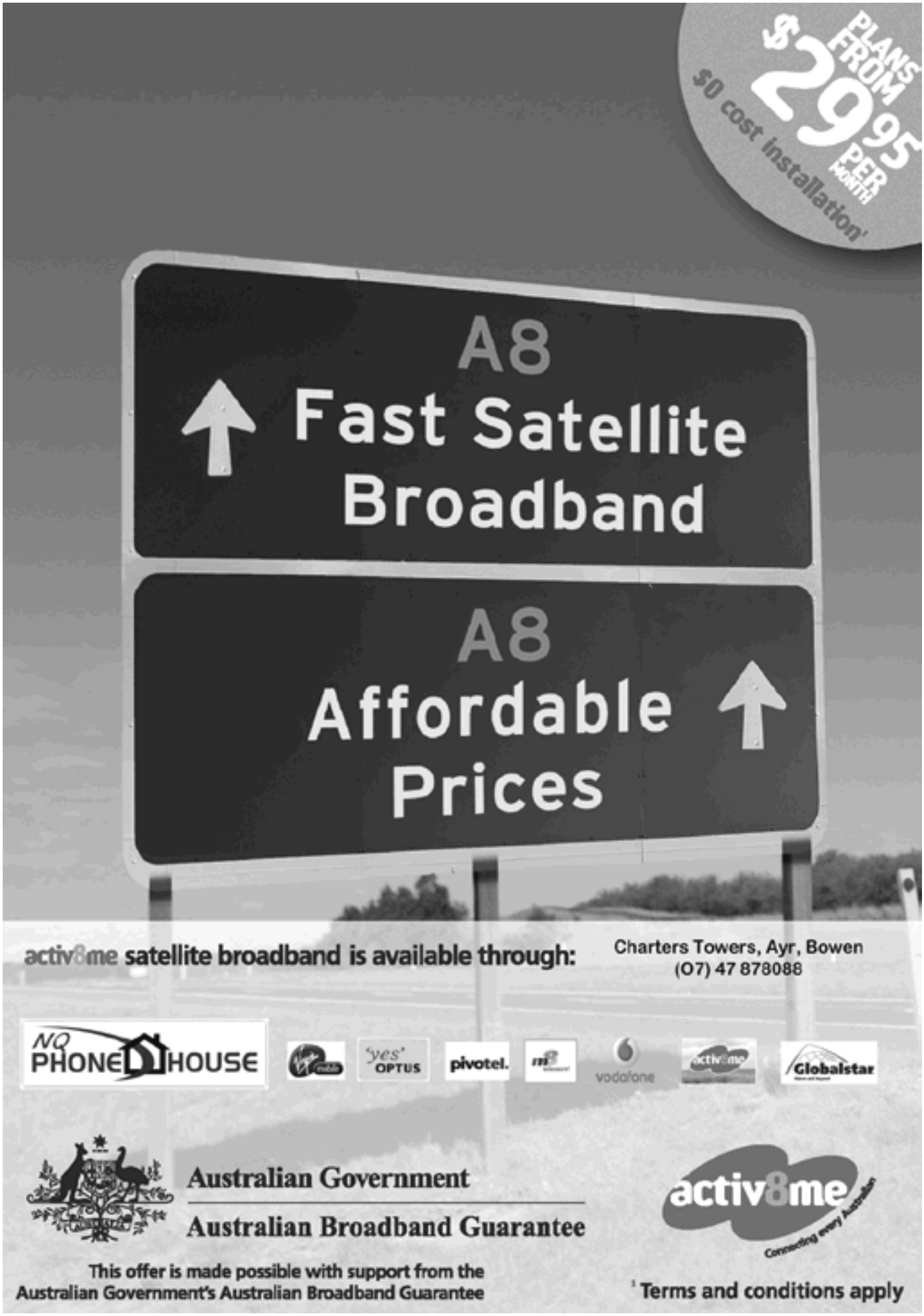
Slashing as close to ground level as possible, using heavy duty slashers or mulchers has also been successful in suitable areas. This is best done when the plant is actively growing – during or soon after the wet season.

There are two selective herbicides currently registered for bellyache bush – commonly sold as Brush Off® or Starane® or related generic brands – and they do not affect surrounding grass. Landholders appear to get mixed results with these herbicides at times, but generally if one doesn't work well in their situation the other will. It is extremely important to wet the plants well and to make sure that a wetting agent is used.

Research into biological control of bellyache bush has not yet found any successful agents, but this work is continuing with additional funding from Meat and Livestock Australia. One agent is currently in quarantine at the DPI&F's Alan Fletcher Research Station in Brisbane undergoing host testing.

Graziers are having success with establishment of healthy pasture to out-compete bellyache bush. For example, there are areas in the tropics where buffel grass has replaced bellyache bush when conservatively grazed to enable it to maintain its competitiveness.

For further information about this research, contact Dr Faiz Bebawi or Dr Shane Campbell at the DPI&F Tropical Weeds Research Centre in Charters Towers on (07) 4761 5704. This article was originally published in Meat and Livestock Australia's Frontier Magazine.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North Queensland beef supply chain gearing up for consumer demand

North Queensland-produced pasture fed beef is well positioned to gain a market edge as the price of grain rises – but this is just one of the drivers that has the region well placed to meet increasing market demand.

The Department of Primary Industries and Fisheries has been working with the pasture-fed beef industry to explore niche markets as part of its Value in Beef set of projects.

As DPI&F Value in Beef's Felicity Hamlyn-Hill explained, the aim is to encourage north Queensland graziers to produce high quality, pasture fed beef, preferably MSA, that is desirable to consumers in Australia and overseas.

The real push in the Value in Beef project has been to gear up our entire supply chain to maximise the market advantage that a great product delivers.

This project is not only working in the paddock, where our science can assist maximising breeding and nutrition technologies, but also along the supply chain, in processing and marketing.

The ambitions of the project received a boost this year, when one of North Queensland's largest processors, Swift & Co in Townsville, adopted MSA grading.

This means that producers who achieve MSA grading receive a premium price – opening up opportunities for greater gross margin returns.

The grading has prompted renewed interest from producers in the MSA grading system, and the Value in Beef team are now working with producer groups to enhance on-property systems to achieve MSA targets.

The DPI&F Value in Beef team consists of scientists, economists, extension officers and trade and market officers, all working toward the same cause – to ensure consumer demand for north Queensland produced, pasture fed beef.

Elton Calcott (Clay Hole, Dalrymple) looking into a microscope at semen from one of his bulls. Looking on is VIB team member Karl McKellar. Bull testing is undertaken as part of VIB activities.

DPI&F senior economist Bill Holmes crunches the numbers with Dalrymple producer David Black

The team is: Ron Wheeler, Felicity Hamlyn-Hill, Bernie English, Ian Gray, Bill Holmes, Roger Kaus, Karl McKellar, Alan Laing, Rebecca Matthews, Marnie McCullough, Vic O'Keefe, Joe Rolfe and Kev Shaw.

Graziers have been more than willing to become involved in the various workshops and groups that have been formed as part of the project.

There is not one, simple answer when it comes to achieving an MSA grading, but rather a range of on-property inputs from grazing land management, nutrition, herd breeding and genetics, and animal handling.

Mareeba-based Value in Beef team member Kev Shaw said: 'The key to the success of Value in Beef is rapid feedback throughout the supply chain from the plate back to the paddock, so producers can implement changes to their management and production systems.'

As an example of this, the Dalrymple Value in Beef group has partnered with Meat and Livestock Australia in a National Livestock Identification Scheme (NLIS) three year project. DPI&F's Karl McKellar is working with VIB producers to establish demonstration sites, to show how NLIS data can be used to effectively record the lifetime performance of animals within a herd.

Ayr-based Value In Beef member, Alan Laing, is working closely with bull breeders in using Breedplan to reduce age of turnoff and improve carcass performance. Other producers are watching this approach very closely.

Working up the supply chain, smaller processors have also become involved in Value in Beef, taking advantage of training and technique workshops. Bernie English, DPI&F Kairi, has played an integral part in this process.

The more processors we have involved that turn out a high-quality, high-value product, the more we can meet consumer demand.

DPI&F trade officers Roger Kaus and Vic O'Keefe had been working with their counterparts in Hong Kong, Southern

China and Vietnam to secure a niche market for the beef. They have been concentrating on marketing the product to small-to-medium restaurant chains in these areas.

There are a number of factors that lead us to be optimistic, including the increasing affluence of these areas, as well as the westernisation of meals – where once beef was largely consumed as part of stews or soups, diners are now looking for plated steaks.

These consumers also had a desire to eat foods that were 'healthy' and from reputable sources. Once again, this profile fits really well with the type of products North Queensland beef producers can supply.

If you would like more information on the Value in Beef project, please contact a member of the DPI&F team on 13 25 23.

Value in Beef – a snapshot of projects underway

Behind the farm gate:

- NLIS Producer Demonstration Sites (PDS's) are being established on properties in the Charters Towers district. An MLA-funded project to demonstrate how NLIS technology can be used to record herd performance information which can be integrated into business decision-making
- Extension officers are working closely with producers who are supplying MSA cattle, in MLA funded MSA projects and DPI&F funded Beeftrak projects. Feedback and property performance data is used in decisions to improve compliance rates.
- DPI&F economists and extension officers are working with producer groups to undertake economic analyses and herd modelling to evaluate current systems and opportunities for improvement that include nutrition, breeding and genetics, grazing land management and selling/marketing strategies.
- Profitable practice change is then being supported with access to training workshops and technical expertise covering topics such as MSA, NLIS systems, breeding and genetics, nutrition and grazing land management.
- Linking producer groups with the Beef CRC's Beef Profit Partnerships project, which give producers access to the latest beef CRC research and its expertise.
- Supporting the activities of the Flinders Beef Challenge, a steer growout trial and competition led by a producer group in the Hughenden district.

Boosting profits at the processors:

- Supporting MSA grading at Townsville's Swift & Co processing facilities. This ensures increased gross margins to processors and to producers who can achieve the MSA grading percentages. The Value in Beef team is working on increasing producers' understanding of MSA Grading, and what they can do to turn-off animals that can achieve these gradings at the processors.
- Value in Beef team members are working with smaller processors to improve their efficiency and encourage achievement of MSA grading capability, as well as increase turnover of trims and lower price product.
- Temperature and pH workshops are being conducted with smaller processors and butchers (retail and wholesale). Other training and skills development include boning and handling.

NQ meat on the menu:

- DPI&F trade and export officers are working to find niche markets in China, Vietnam and Hong Kong for MSA pasture fed beef.
- DPI&F's global footprints project is linking producers and processors with distributors and exporters from across the world.
- DPI&F will take a delegation of NQ producers & processors to meet with potential customers at Beef 2009
- Butchers and chefs are being encouraged to become involved in Value in Beef, as a direct link with consumers.

Seasonal mating – 2008 is a good time to start

(or fine tune existing system)

The key objective of seasonal mating is to reduce the period of dry season lactation. This will preserve body condition and improve herd fertility. Other benefits of seasonal mating include:

- Reduced supplement costs due to few or no dry season lactations.
- Easier and more targeted weaner management, particularly with shorter mating periods.
- Foetal aging benefits are maximised, lazy breeders identified and sales decisions should increase breeder gross margins.
- Reproductive disease control and bull testing is more efficient.

Seasonal mating as part of a good integrated management system will achieve:

- More calves! Cow condition, and hence fertility, is improved by both reducing the period of lactation and avoiding dry season lactations.
- More calves weaned at the 1st weaning round.
- Fewer weaning rounds, therefore lower mustering costs.

These benefits are more than worth the extra effort of pulling out bulls and creating a separate paddock for them. Even where seasonal mating will be more difficult to implement, the cost of supplementing lactating breeders all year round may force many owners to rethink their situation. Segregating, and seasonal mating, first and second calf heifers is a suggested starting point. If bulls can't be controlled seasonal mating can still be achieved by foetal aging and removing 'late calvers'.

When should the mating period begin?

Beware the simple answer. There are a number of factors to consider:

- **Breeder nutritional requirements.** In the most common systems the objective is to synchronize high nutritional needs of breeders during lactation with good quality feed. Pregnancy lasts for 9.3 months (+ or - 2 weeks). For your situation work backwards 9.3 months for commencement of mating.
- **Getting the bulls out.** If there is a risk of not being able to get bulls out (e.g. in February), then the mating period may need to start earlier.
- **Nutritional management prior to calving.** If mating allows calving and lactation late in the dry season, there will be a greater need for nutritional support. This includes pasture management, stocking rate control and energy supplements, such as fortified molasses. To improve conceptions following calving aim for store condition (3/5 score) at time of calving. This can be assisted by 'spike feeding' at least 6 weeks before calving. This strategy works best when applied to maiden pregnant heifers.
- **Age of calves at the first weaning round.** Age at weaning is a compromise between having a shorter lactation period and weaning a bigger calf. For example if the first weaning round can't be undertaken until May and calving begins in late October (bulls out late January) then the earliest (oldest) calves will be seven months old at the first weaning.
- **Facilities and systems for managing small weaners.** The calving period in relation to when the first weaning round can be conducted, will determine the proportion of small weaners that need to be managed. Seasonal mating will require weaning of some calves as early as 3-4 months to help preserve cow condition and reduce lactational anoestrus. The poorer the nutritional conditions the more important this will be.
- **The harshness of the environment.** In harsher environments, especially where molasses is cost prohibitive, it is best to start the calving season when adequate good quality feed is available. If calving commences too early, under poor nutritional conditions, it may take cows many months to recover ovarian function and start cycling.
- **Marketing policies.** Marketing empty cows earlier in the year to take advantage of better prices and generate cash flow may be a consideration. Remember a minimum nine week mating is needed to give cows a 95% chance of conception, if they are all empty at the start of mating, and a further two months to detect pregnancies in the later cycling group.

What length of time should the mating period be?

When first commencing seasonal mating a seven month mating period is recommended for breeders. This will result in two months when breeders are 'lactation free'. Start by removing the bulls at the last weaning round this year. A calving spread over 5 months can still be achieved through foetal aging at the last round and removing empty cows (early pregnant cows will not be detected).

Bulls in late January @ 2.5%

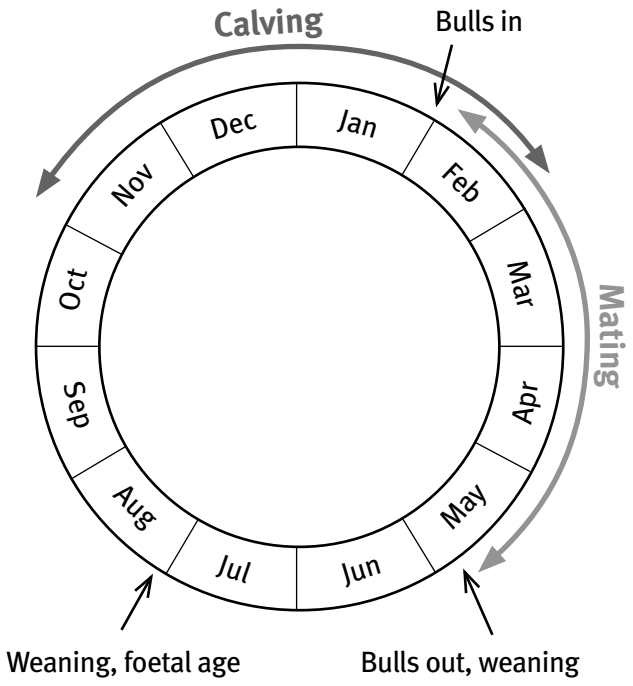
Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
	← Mating →										
	← Calving →									Calving→	
			Wean				Wean				
							Foetal age				
							Vibrio bulls				
Wet season Phos									Molasses		Phos

Over time, a shorter mating period can be achieved with good breeder nutritional management, targeted disease control, improved bull management and selection. Bull performance becomes even more critical and attention to bull selection for fertility is crucial, particularly if using low bull percentages.

A shorter (3-4 month) mating period is recommended for maiden heifers to prevent dry season lactations.

When should foetal aging occur?

There is so much variation between systems, production targets and marketing policies, and environments. This makes it difficult to state when foetal aging should occur without knowing the particular system. To detect all pregnancies, foetal aging should be conducted no earlier than two months after the bulls come out. If the bulls come out at the last round then foetal aging should be conducted then. Dry cows can be tested at the first round to identify sale opportunities.



Putting a plan together

Taking all the considerations into account, develop your plan by drawing it. Label the 12 months of the year either on a circle, graph or table. Identify when mating, calving, and foetal aging will occur. See examples.

Once the basic plan is in place other management practices, such as supplementation and bull disease management, can be added.

For more information on improving herd fertility, and improving genetic composition of your herd, a Breeding EDGE workshop is recommended.

Felicity Hamlyn-Hill
DPI&F, Charters Towers Ph (07) 4761 5157

High supplement prices – What are your options?

The large increases in supplement prices this year have come as a shock for everyone. High urea, Gran-am and Phosphorus prices are having most impact, but protein meal prices have also increased. This has resulted in everyone questioning their supplement feeding practices and recipes.

So what can we do? First it is important to keep in mind the principle behind what we are trying to achieve: optimal cattle production with cost effective inputs. For breeder herds, the focus should primarily be

- management to reduce or eliminate the number of dry season lactations, and
- targeted but effective and balanced supplementation for reduced time periods.

When to start feeding urea

The fundamentals of urea supplementation haven't changed for 30 years. For example if there is still green in the pasture, generally there won't be a response to urea. This will be the case ii some locations that had July rain. This can be finetuned by utilizing NIRS dung sampling which will provide an estimate of dietary protein %. A rough rule of thumb is that supplementation should commence if dietary protein is less than 5%, however lactating breeders with higher dietary requirements may well need supplementing earlier. To further fine tune your decision work out the Dry Matter Digestibility: Crude Protein ratio from the NIRS result. If the DMD:CP ratio is less than 10:1 (e.g. 8:1) there is not much chance of a response to urea supplements. The best chance of a response is when the DMD:CP ratio is greater than 10:1.

For those locations that have had a poor wet season remember that the response to urea supplement depends on the cattle being able to increase intakes of available dry feed - so the cattle need a reasonable body of dry standing feed.

Modifying dry loose licks

Principle: cost effective and balanced supplements for optimal performance.

Urea

Rumen Degradable Nitrogen or RDN is what cattle are most deficient in during the dry season, that is, it is the first limiting nutrient.

- Urea is still the cheapest form of RDN. Reducing urea percentages is not the answer, nor is replacing urea with other sources of protein which cost more per unit RDN.
- Reducing urea percentages will increase palatability, increase intake levels, and cost more in the long run. If using low levels of urea in dry licks (<25%) consider increasing levels to 30% to reduce intakes.

Gran-am

Gram-am and elemental sulphur are sulphur sources added to dry licks to provide optimal N:S ratios (around 10:1) under which rumen organisms best 'proliferate'. These organisms provide 70% of the animal's protein requirements.

- High levels of Gran-am should not be used to reduce intakes.
- Use Gran-am over elemental sulphur for increased bitterness. Do not use both.
- High sulphur levels may reduce intakes of the total pasture diet (also common with excess levels of some other minerals), may exacerbate a copper deficiency on certain landtypes and likely to cause other problems. (See December 2007 *Northern muster).*

Protein meals

Protein meals make licks more palatable, provide limited amounts of protein and energy, plus absorb small amounts of moisture.

- Reducing the percentage, or even eliminating, most protein meal in the lick will reduce palatability and therefore reduce intakes.
- If wanting to keep some protein meal in dry licks and reduce palatability at the same time replace a significant portion of salt with palm kernal extract (PKE).

Modifying molasses based supplements

If normal practice is to feed M8U, an option for reducing intakes is to increase the level of urea in the mixture. This means increasing the concentration of urea in the mix i.e. from 8% to 12%, or even 16% urea. The reduction in intake of urea will be greater than the increase in proportion of urea in the mix. The following table shows intake results from trial work undertaken by Rob Dixon at Swans Lagoon. This work demonstrated that increased urea levels decreased intakes, when fed to 12-16 month old heifers (about 200 kg liveweight) in April/May.

Supplement	Intake (kg/day)	% of M8U intake	Intake -grams of urea	Cost per day (assuming molasses $120/t, urea $1100/tonne)
M8U *	1.15	100%	85	$0.22
M12U**	0.75	65%	80	$0.17
M16U***	0.35	30%	48	$0.09

*M8U – 100kg molasses plus 8 kg urea
**M12U – 100kg molasses plus 12 kg urea
***M16U – 100kg molasses plus 16 kg urea

Please Note! While M12U and M16U have been safely fed in some commercial situations, **it must be understood that these may mean a greater risk of urea toxicity.**

Work from Swans Lagoon also indicates that urea is a more effective agent than acid (e.g. phosphoric acid) for reducing voluntary intakes of molasses.

Some businesses this year have chosen to feed out M3U + protein meal instead of M8U. While it is slightly cheaper on per tonne basis, intakes can be at least double that of M8U. To counteract increased intakes it can be fed out less often, as urea toxicity is less likely to be a problem. The aim being to put out no more tonnage than you would have if feeding M8U. This is a cheaper alternative. It is especially effective when the requirement is both supplementary protein and energy.

It should be remembered that the mix should contain enough protein to not only balance the molasses (3% urea), but to also balance the protein shortfall in the pasture portion of the diet. Also remember that even with the increases in the cost of urea, it is still the cheapest source of N for the rumen bugs.

Breeder management systems

Principle: A management system designed to reduce or eliminate dry season lactations, and hence reduce the degree of dry season supplementation.

1. *Seasonal mate (or if already seasonal mating consider tightening the mating period).* This reduces the need to feed lactating cows during the dry season. NIRS results show dry season protein shortfalls often exceed 250 to 300 grams for lactating breeders. A daily intake of 200 grams of a 30% urea lick only provides 172 grams of protein. Nutritional shortfalls will lead to failure to re-conceive and poor condition cows.
2. Seasonal mating must be coupled with *effective weaning strategies*. Remember it is cheaper to feed a cow and calf separately than together.
3. *Foetal age breeders to eliminate empties and late calves*. This will reduce the number of non-performing breeders in the herd, reduce the grazing pressure, and reduce the number of breeders to be fed supplements.

The industry can no longer afford to supplementary feed lactating breeders all dry season. 'Late calvers' and dry empty cows have the lowest Internal Rate of Return (IRR) or future gross margin of any breeder. The diet quality of those better performing animals retained in the herd, can then be monitored through NIRS dung sampling. Supplementation can commence when the diet quality indicates that a response to urea will occur.

Is segregation an option to target supplement?
There are examples of large extensive properties that successfully segregate breeding cattle so that lactating cows are separated from dry cows for supplementation purposes. This strategy is worth some consideration for the purposes of cutting supplement costs. Cattle that are already used to being moved between paddocks will adapt and be less likely to 'want to go home'.

Effective weaning strategies

Weaning instantly reduces a breeder's nutritional requirements. A 400 kg lactating mature cow with a calf up 4 months old may require 75MJ of Metabolisable Energy (ME) a day, and 800-850 grams of protein, to maintain body weight. By comparison a 400 kg dry cow in last third of pregnancy may need 59 MJ ME and 500-530 grams of protein.

Cost-effective supplementation strategies are maximised with a whole of management approach. This not only includes pasture management, stocking rate control, breeder management, and selling polices, but also genetic improvement as well.

Felicity Hamlyn-Hill
DPI&F, Charters Towers
Ph (07) 4761 5157

Wet season phosphorus is the answer

Get organised now

The price of our wet season phosphorus supplements have increased dramatically and are in very short supply this year. Therefore, you need to start planning your phosphorus feeding program now. Not feeding wet season phosphorus on deficient country (because you have green grass) and then spending money on dry season licks is false economy.

The wet season is the time you can use phosphorus supplements to increase the number of calves on the ground and boost weight gains. Just tossing out a few tonne of wet season phosphorus can be a real waste of money. Producers need to know approximately how much their cattle need to eat per day, and monitor their intakes - so if the lick is not being eaten, it can be changed. Feeding wet season phosphorus and removing the calf as soon as possible after the wet will also minimise the need (and cost) for dry season supplementation. On the other hand it is difficult to fine tune and reduce supplementation costs (wet and dry season) where herds calve all year round, as is the case with many northern breeding operations.

Do your homework on what wet season lick suits your property. Intakes can vary enormously between paddocks and even water sources (bore or dam) can influence lick consumption. Take the opportunity to monitor intakes this wet season and you will be able to use this information to adjust your feeding program the following season. Monitoring and recording intakes will enable you to keep a close eye of supplement costs per head. Many areas in north Queensland have access problems during the wet season, so first, establish which lick gives a satisfactory intake, then provide enough supplement for the breeders for 3-4 months. This will require lick sheds and large troughs. If you are using loose lick you need lick sheds. Several producers are also trialling the use of half tonne bags as a wet season feeding option. Wastage can be an issue but some producers are getting good intakes and less wastage by adding 5% concrete to the mix.

Why feed phosphorus

Some soil types in north Queensland provide adequate levels of phosphorus but a large proportion are phosphorus deficient. Cattle get phosphorus from pasture – pasture species source phosphorus from the soil. Therefore cattle will be deficient on low phosphorus soils. Even with the recent price increases, phosphorus supplements in the wet season are still the most cost-effective supplement strategy available to northern beef producers on deficient country. Phosphorus is needed to covert feed into energy and is critical for skeletal growth, developing foetus' and milk production. It has been proven over many years that inadequate phosphorus reduces growth and branding rates and increases breeder deaths. Animals receiving adequate amounts of phosphorus per day eat more grass so weight gain and milk production increases (see trial results below).

Effect from phosphorus supplements – data from experimental work across northern Australia

Soil phosphorus	2 ppm (acute)	4 ppm (deficient)	8 ppm (marginal)
Liveweight gain/year no supplement (kg)	22	101	156
Liveweight gain/year plus supplement (kg)	94	154	171
Liveweight advantage (kg)	72	53	15

Soil phosphorus	2 ppm (acute)	8 ppm (marginal)
Branding rates - no phosphorus supplement to breeders	50	65
Branding rates - breeders with phosphorus supplement	65	70

Look for the next edition of the *Northern muster* for information on calculating costs and target intakes required for different classes of cattle. Please call us if you need a hand to start planning your wet season program.

Rebecca Matthews, Joe Rolfe and Bernie English
FNQ Beef Team, Kairi
Phone (07) 4091 9400

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NQ Breeder Loose Mix

A balanced supplement suitable for use in the peak of the dry season

Analysis:

Min. Crude Protein	7.40%
Min. Crude Fibre	2.48%
Maximum Salt	31.00%
Urea Equivalent	31.15%
Min. Phosphorus	1.32%
Min. Calcium	2.84%
Min. Sulphur	3.36%
Vitamins A, D & E	
Essential Trace Minerals	

Daily Intake: 80 to 155 grams

M8U+R+P Molasses Blend

High energy liquid supplement for All Seasons

Analysis:

Min. Total Protein	27.84%
Urea Equivalent	8.26%
Min. Phosphorus	0.31%
Min. Sulphur	0.66%

Daily Intake: 1 to 2kg/head/day

CHARTERS TOWERS OFFICE
Lot 6 Flinders Highway
Charters Towers Qld 4820
Ph: (07) 4787 7007
Fax: (07) 4787 7008

Contact: Craig Cook 0428 646 916
Scott Adams 0408 880 593
Goscelyn Smith 0408 773 157
Belinda McMillan 0428 970 081
Adam Brahim 0429 723 865

MT GARNET OFFICE
Lot 1 Battle Creek
Mt Garnet Qld 4872
Ph: (07) 4097 0081
Fax: (07) 4097 0082

Contact: Steve Flett 0429 970 081