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Department of **Employment, Economic Development and Innovation**

CQ BEEF

Better Economic and Environmental Futures

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Planning for weaning and pregnancy testing

Mick Sullivan
DEEDI, Rockhampton

After a very long dry season in 2009, most of Central Queensland is experiencing a good summer. Managing herds in 2009 was made particularly difficult by very low feed quality and high supplement costs.

While things are currently looking good, it is important to be proactive to help herds recover and ensure future productivity. Decisions over the next few months will have a significant, impact on herd productivity over the next two to three years.

With the growing season ending it is a good time to plan for the year ahead. Significant new pasture growth cannot be expected until the seasonal break in October–December.

Risks that may have to be managed are;

- Big wet season resulting in a large body of poor quality feed. While there may be plenty of feed the low quality affects breeder body condition and weight gains in dry cattle.
- Early end to the wet season and a late spring break. If this occurs many pastures may be only partly recovered, forage availability will be below average and feed quality will decline early. Lactating cows will have difficulty improving body condition and the weight gains of growing cattle will be reduced.

Weaning to manage breeder body condition

Weaning is the most important tool for managing breeder body condition and its timing is critical.

When the season is good, it is tempting to leave calves on their mothers a bit longer but delays in weaning can have a major impact on cow body condition, and as a consequence conception rates at the next joining (table 1).

The critical target is to have cows in body condition score 3 or better (1–5 scale) at calving.

As the nutrition available from pastures is often not sufficient to maintain cattle condition from early in the dry season, weaning to conserve cow body condition is most effective if done before cows lose too much condition i.e. March–May. Early dry season weaning, will save 10–15 kg cow liveweight per month, this is equivalent to about 1.0 body condition score in three months.

In 2009, late weaned herds and those with out-of-season calves experienced greater difficulties managing the drought, had more cows at risk and higher supplement costs.

Timing weaning and adjusting the weaning age in response to seasonal conditions is equally critical for controlled and continuously mated herds. If cow body condition is not maintained in controlled mated herds very poor re-conception rates occur. In a continuously mated herd the impact can be partially concealed because the cows have more time to conceive. However the impact on profitability of cows calving later and producing smaller weaners is just as significant.

In control mated herds with a three to four month calving period, typically only one weaning is required. Some producers with control mated herds (and particularly if they have longer calving periods) undertake two weanings say March and May–June. This ensures that cows which have been wet

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Editorial

We have had a wonderful time visiting CQ *BEEF* members of the Middlemount, Rolleston and Billaboo groups to compete herd modelling and options analysis using *Breedcow Dynama* software. The photos in the margin on the cover pages were taken during these property visits. See if you can pick your place out. To those who hosted us — Thankyou very much for your hospitality during these visits, we were very well fed and looked after. CQ *BEEF* Economist Rebecca Gowen, has summarised some of the common themes from our Breedcow visits.

Following Rebecca's article we have a contribution from Bill Holmes, inventor of the *Breedcow Dynama* software. Bill's article describes some of his learning's and experiences from using the software in North Queensland. Bill's article is well worth a read.

Project Leader Mick Sullivan has contributed a timely article on pregnancy testing and weaning. The article is specially written and considers what recent season conditions will mean for pregnancy testing and weaning plans.

Another timely subject 'Pasture Budgeting' has been covered by Gina Mace from the Fitzroy Basin Association (FBA). Our staff profile features a new face at FBA Prue Becker who will be assisting with CQ *BEEF* groups from the Biloela office.

In this edition Beef Extension Officer David Hickey, has written the *Producer profile* which features Lachie and Trudy Mace from the Broadsound CQ *BEEF* group.

I hope you enjoy reading our seventh edition of the CQ *BEEF* newsletter. I welcome your feedback.

Byrony Daniels, CQ*BEEF editor*

Table 1. End of dry season cow body condition scores and subsequent pregnancy rates

Cow body condition at the end of the dry season		Likely pregnancy rate as lactating cows in the following growing season*
Body condition score (1-5 scale)	Description	
1	Poor	Up to 25%
2	Backward	50%
3	Moderate	70%
4	Good	85%
5	Fat	95%

* Assumes good nutritional conditions during mating. For young cows and poor nutritional conditions rates are likely to be lower

the longest are weaned as soon as possible and it minimises the number of weaners requiring special treatment i.e. less than 160 kg. However, if the season is poor and/or cows are struggling to recover body condition the best strategy is to wean all cows early and manage the weaners appropriately.

In continuously mated herds, two rounds of weaning are desirable to minimize the number of cows that are lactating for extended periods and particularly over the dry season. The first weaning round at the end of the wet season enables cows that have lactated over the wet to recover body condition and a large proportion will conceive after this weaning. Weaning earlier (March–April v May–June) and weaning down to a younger age (3 months v 6 months) has been a critical component of improving reproductive rates in many herds.

The second weaning round in mid dry season reduces the number of cows lactating when feed quality is lowest. By reducing the loss of breeder condition, dry season deaths and losses from heavy rain at the seasonal break are markedly reduced. By preserving breeder body condition the second round weaning ensures cows can re-conceive quickly following the seasonal break. Many producers find it advantageous to wean down to a younger age on the second round and particularly under poor seasonal conditions.

Weaners may require special management

Whether herds are control mated or year round mated there can be significant numbers of lighter weaners which will require special management and particularly if weaning is brought forward to manage breeder body condition. Data from *Brian Pastures* shown in table 2 highlights this.

Table 2. Brian Pastures *CRC 2005 weaner weights*

Calving period	Sep – Nov 2004
Weaning date	27 April 2005
Average weaning age (days)	204
Calf age range at weaning (mths)	4.7 – 7.9
Average weaning weight (kg)	173
Weight range (kg)	% of weaners
100-159	32
160-199	53
>199	15

Accurate foetal age data can be used to help plan weaning management and supplementation (table 3).

Table 3. Estimated 2005 calving data for Swans Lagoon *CRC Brahman cows*

Pregnancy test date	1 June 04
Gestation length (days)	290
Estimated breeder mortality (%)	1
Estimated foetal and calf losses (%)	6
Mean birth weight (kg)	31
Mean calf growth rate (kg/hd/day)	0.8

Estimated cow numbers

	No	%
Wet cows	240	94
Dry cows (lost calf)	15	6
Total cows	**255**	**100**

Estimated cow and calf numbers, losses, calving dates and calf ages at 30 May 2005							
Pregnancy status (months)	No of cows	Surviving breeders	Calving	Calf numbers	Age of calves (days)	(months)	Mean calf weight (kg)
2	5	5	17 Jan 05	5	133	4.4	137
2.5	21	21	2 Jan 05	20	148	4.9	149
3	36	36	18 Dec 04	34	163	5.4	161
3.5	97	96	3 Dec 04	90	178	5.9	173
4	69	68	18 Nov 04	64	193	6.4	185
4.5	30	30	3 Nov 04	28	208	6.9	197
Total	**258**	**255**		**240**			**175**

Pregnancy testing for better planning

While pregnancy testing is extensively utilized there is considerable opportunity in many herds to make better use of it. Accurate foetal ageing is the key. Knowing how many animals got pregnant and when, enables a better assessment of the reproductive performance of the herd. If cows calve in low body condition they take longer to commence cycling and this leads to a drawn out conception pattern. Fertility diseases such as vibriosis can also be a cause with cows aborting then re-conceiving.

Accurate foetal age data also enables better planning over the next 12 months. Table 3 is an example of how this data can be used to assess;

- When calving will occur
- When weaning should occur
- How big weaners will be and consequently supplement requirements.

Foetal ageing improves the efficiency of culling decisions. Removing late conceivers improves overall weaner weights and enables selection of more fertile animals i.e. those that conceive the quickest. With a tighter calving pattern, breeders can be better managed and supplements used more effectively.

Foetal ageing is also very useful when changing a herd from year round to controlled mating. Animals which will not calve in the desired period can be identified and a decision made on whether to retain them. If there are sufficient cows in the desired calving period then those outside of it can be culled. Where more cows need to be retained those with most advanced pregnancies can be retained.

If potential culls are identified with paint brands according to stage of pregnancy, they can be held in a holding paddock and reassessed after returning the main mob to the paddock. This allows culls to be selected on the overall herd and seasonal situation.

Table 4 shows a simple paint brand system for identifying cows at pregnancy testing. While this system can cover all stages of pregnancy in most cases only the empties and potential culls need to be identified.

Table 4. Paint brands for pregnancy testing

Paint brand	Pregnancy status (months)	Code for pregnancy status
O	0	E
T	1.5	P1
⊣	2.0	P2
⊥	3.0	P3
⊢	4.0	P4
V	5.0	P5
<	6.0	P6
∧	7.0	P7
>	8.0	P8
N	9.0	P9

Data recording

NLIS has greatly improved the efficiency with which individual animal data can be collected and used. However, in many herds individual identification is not required for effective management. There are a range of quick paper based recording systems which can be used crush side to collect data for herd management such as pregnancy status, lactation status, body condition and weight. If you would like information on these systems and the recording sheets please contact the CQ *BEEF* team.

Key points

Many herds will take time to recover from the 2009 dry season and proactive management of grazing and the herd is important

Weaning is the most critical tool for managing breeder body condition

Accurate foetal ageing at pregnancy testing provides valuable data for assessing reproductive performance and forward planning

Foetal ageing can be used to improve culling strategies

Simple systems are available to record data that can improve herd management.

Mick Sullivan
DEEDI, Rockhampton

Rebecca Gowen
DEEDI, Rockhampton

Modelling in the mud – Breedcow at its best

During the last two months, Byrony, Peggy, Mick, Gina and I have survived flooded roads, sandflies and sweltering humidity to conduct a mammoth 20 Breedcow/Dynama modelling visits. For our efforts we've been rewarded with scones, home-made corn beef and some fantastic insights into a range of beef businesses across central Queensland. In return I hope we've provided some useful guidance for decision-making whether it's a new direction or just confidence in what you've been doing. Across the diversity of businesses we've visited some common themes have emerged which I will discuss here. Most of it is not rocket-science, it's often just a slightly different way of tackling issues which makes a big difference.

Breeder herd efficiency

Improving reproduction rates and overall breeding herd efficiency was a key focus for many enterprises. At several places we discussed how accurate pregnancy diagnosis, controlled mating and rigorous culling for performance could go a long way to improving turnover quickly, by tightening calving windows and identifying less productive cows for sale.

In one enterprise, which produces Feeder steers the current weaning rate (weaners/total cows mated) was 74%, if this could be increased to 82%, the gross margin per Adult Equivalent (AE) after interest would increase from $150 to $163. The gross margin for the overall herd increased by $10,000. These increases are a result of increased sales and a lower herd capital cost because money is not tied up in unproductive cows.

Increasing turnover has been identified as the priority issue by most producers. More intensive breeder management and a tighter calving time will produce heavier weaners and reduce the range in weaner ages and weights. This will allow a greater percentage of steers to be turned off earlier (70% @ 18 months rather than 60%), and further increase the gross margin to $166/AE. With fewer steers being carried into the next year, there are opportunities to increase cattle numbers or alternatively reduce overall grazing pressure.

Towrie *in the Arcadia Valley*

The benefits to a bullock producing enterprise of selling more animals at the target weight and age is shown in table 1. This example shows the impact of being able to turn-off a greater proportion of bullocks at the target weight before they reach 36 months of age i.e. reducing the tail on the mob.

Critical factors in turning off more animals at a younger age is getting calves born at the right time, a compact calving period and the growth rate from weaning to turnoff. Obviously seasonal conditions will have a significant impact on growth rate, however the magnitude of the difference in returns suggests that there may be room to spend money on measures such as supplementary feeding and still record an increase in gross margin.

Importance of weight and weight gain data

An important component of the modelling work has been documenting the profitability of the breeding and growing/finishing components of the herd and the relative profitability of the different stages of the growing/finishing enterprise e.g. weaners to 18 months, 18 to 30 months, 30 months to turnoff. This enables a sound assessment of turnoff options.

Strategically collected weight data is critical for assessing the current value and future earning potential of animals. For example, the gross margin from carrying No 8 bullocks, which cannot be finished in 2010 into 2011 is often less than that which can be achieved by trading cattle.

Good weight data enables an assessment of what animals are currently worth and weight gain data enables their future earning potential to be assessed. A practical example is, would it be more profitable to sell the tail of the No 8s this year as Feeder steers or carry them into 2011?

One CQ *BEEF* group member has a very effective way to view animal performance. Unless every animal is earning at least $150/year you may as well replace it with an agisted animal.

Marketing options

Another issue which emerged was the cost of marketing cattle. For producers with small numbers the difficulties and costs of selling direct to meatworks or store buyers may negate the lower direct selling costs. However, several businesses said they would investigate cooperating with neighbours to send a bigger consignment together and reduce the overall

Table 1. Herd structure and gross margins for bullock producing herds with different percentages being sold by 36 months

	% Bullocks sold <36 months		
Breeder herd	**60%**	**75%**	**90%**
Total adult equivalents	2500	2500	2500
Total cattle carried	2139	2103	2066
Weaner heifers retained	184	185	187
Total breeders mated	935	945	955
Total calves weaned	767	775	783
Weaners/total cows mated	82%	82%	82%
Gross margin (GM) for herd	$462,675	$472,708	$482,950
GM after imputed interest	$332,083	$346,767	$361,758
GM per adult equivalent	$185.07	$189.08	$193.18
GM/AE after interest	$132.83	$138.71	$144.70

per head selling cost. An example of the costs involved is shown in table 2.

This case study considers the options for selling cull cows from the Emerald district during late February 2010 and is based on prices quoted at that time. Freight costs are based on prices quoted by producers in the Emerald area. In this case the additional freight cost of a meatworks sale is compensated by the higher prices and lower selling costs.

Table 2. Sale weights, selling costs, freight costs and prices for cows sold at Emerald saleyards and direct to Rockhampton meatworks

	Emerald saleyards	Rocky meat-works
Sale weight live (kg)	520	520
Dressing %	NA	51
Sale weight dressed (kg)	NA	265
Sale price live ($/kg)	1.34	NA
Sale price dressed ($/kg)	NA	2.70
Price ($/hd)	**697**	**716**
Selling costs		
Commission (%)	3.75	0
Commission ($/hd)	26.13	0
Yard fees ($/hd)	14.50	0
MLA levy ($/hd)	5.00	5.00
Total selling costs	**45.63**	**5.00**
Freight costs		
No. per deck	24	24
Distance (km)	50	325
Freight cost – Single deck ($/hd)	11.46	47.40
Freight cost – Double deck ($/hd)	8.33	28.44
Prices net freight and selling costs		
Single deck load ($/hd)	640	664
Double deck load ($/hd)	643	683

Cattle trading

Cattle trading either regular or opportunistic is a component of many central Queensland beef businesses and evaluating it has been an important part of the herd modelling work. In many situations it has the potential to produce higher gross margins than breeding and finishing enterprises and consequently many producers see it as making better use of expensive finishing country and have reduced their breeder numbers. Other producers undertake it opportunistically to utilise feed when seasons are good and or to take advantage of low store cattle prices.

The *Breedcow and Dynama* software package has two programs for evaluating trading options. Bullocks is designed for dry cattle while *Cowtrade* is designed for cows and calves or pregnant cows. Table 3 provides details on some steer and heifer trading scenarios examined.

The work with the CQ *BEEF* businesses has documented the recognised potential excellent returns from trading cows and calves. In one example, the gross margin/AE/year after interest for a $750 cow and calf unit was $298 compared to $237 for Feeder steers and $192 for Jap Ox. The potential higher returns have to be balanced against the greater management input required and the risks of introducing diseases such as Pestivirus.

An important part of evaluating trading opportunities is looking at the impact of different purchase and sale prices and growth rates on the gross margin. The programs produce sensitivity tables which make it easy to see the effects of a range of purchase and sale prices. It is also relatively easy to evaluate the impact of growth rates. Undertaking these analyses has provided producers with a clearer picture of the prices and growth rates which will produce appropriate returns.

Mick Sullivan and Justin MacDonnell brave mud to complete Breedcow modelling, Clematis Creek, Arcadia Valley

Other analyses

Whilst many of the options we considered across the groups were similar, if you are interesting in looking at a specific scenario, especially those with varying feeding costs please let us know and we are happy to work with you. Also, I have not reported here any of the long term cash flow and herd modelling projections we did with *Dynama* as these are very specific to individual properties. If you are in need of a long term projection or would like to consider the long term impacts of major changes e.g. property development let us know and we will organise to undertake this.

The *Breedcow Dynama* software suite was developed by Townsville based economist Bill Holmes. The software is available to purchase from the new DEEDI website - http://www.dpi.qld.gov.au/16_6886.htm. There are two packages available, the full suite for $495 or just the trading options programs (*Bullocks* and *Cowtrade*) for $99.00.

Table 3. Returns from a range of steer and heifer trading scenarios

	Grass finished Jap Ox	Feeder steers	Grass finished trade heifers	Feeder heifers
Purchase weight (kg)	270	270	250	250
Landed purchase price ($/kg)	2.04	2.04	1.82	1.82
Landed purchase price ($/hd)	551	551	455	455
Sale weight live (kg)	600	450	530	320
Dressing %	53	NA	51	NA
Sale weight dressed (kg)	318	NA	270	NA
Sale price live net ($/kg)	NA	1.65	NA	1.62
Sale price dressed net ($/kg)	2.72	NA	2.61	NA
Sale price net ($/hd)	865	742	705	518
AE rating (AE = 455 kg)	1.44	0.65	1.10	0.20
Days on forage	550	300	467	117
Average daily gain (kg/hd/day)	0.6	0.6	0.6	0.6
Mortality %	1	1	1	1
Variable cost ($/kg)	10.00	5.00	6.00	6.00
Gross margin/beast ($)	296	179	237	52
Gross margin ($/AE/yr)	205	276	217	260
GM after interest ($/AE/yr)[1]	**131**	**194**	**149**	**182**
Return on investment (%/yr)	27.7	33.8	32.0	33.4

[1]. Interest rate on herd capital of 10%

Observations on beef business performance

W.E.(Bill) Holmes DEEDI, Townsville

The following is a set of observations arising from my involvement first in surveying grazing enterprise profitability in western Queensland in the 1980s, and subsequently in performing options analysis on a whole lot more places in north Queensland.

Maximising herd profit

The Bcowplus program (part of the Breedcow and Dynama package) can be used to model herd performance. The purpose is to represent the current herd structure, turnoff and gross margin. This enables assessment of current performance. Adult equivalent (AE) ratings are used so that options compared utilise the same stocking rate (total AEs).

The next step is to look at age of male turnoff. This is done firstly as a simple comparison of the whole herd with different male turnoff ages ranging from weaners to bullocks. Now we also do 'profit centre' modelling. In this approach we treat the herd as two enterprises – breeding and growing out. The breeding enterprise 'sells' weaner steers to the growing/fattening enterprise. The sale or transfer value is based on market prices.

This modelling has shown almost universally that in NQ the profit centre of the herd is the steers. Another way of looking at this is to say that the market price for weaner steers falls short of what they are really worth to the breeder as stores for his own growing and fattening operation.

The 'opportunity cost' (true value) of these weaner steers can be calculated by one of the menu functions in Bcowplus. The profit target is whatever can be made with the best choice of male turnoff age. A trial and error calculation (automated by a menu function) then finds the weaner steer price that will just reach that profit target.

Another approach to dealing with the inequality between breeding and growing gross margins (GM) is to improve breeder performance. Various husbandry options for improving breeder performance can be budgeted in Bcowplus, but in most instances they only lessen the problem, not remove it.

Some improvement in breeder GM may also be possible by fine tuning female sales choices. The most obvious choice is between culling a large % of the heifers and keeping the cows to an advanced age, versus culling fewer heifers and selling cows younger. The economics of this choice depend less than we might suppose on relative breeding performance, and usually come down to a straight comparison of prices for two year old heifers versus mature cows. Heifer sale age (weaners, yearlings or two year olds) can also be important.

Despite the gains that can be made by better female sales choices, the really big gains still come from getting the male turnoff age right.

Integrating breeding and fattening

A variation, or perhaps a complication, of the turnoff age issue is the vertically integrated operation combining a breeding property with a fattening property. If it is a bad thing to sell weaner steers when you have only a breeding property, how can it be a good thing to transfer out weaners when you have your own fattening country?

For the integrated operation, the task is to come up with a steer transfer strategy that maximises profit for the combined operation. Should they go as weaners, allowing the breeding property to increase breeder numbers and weaner turnoff, or should they go older? This decision is affected also by the relative size of the two properties.

The most obvious way to analyse the integrated operation is to model the whole operation as a unit to compare transfer strategies. There are some (soluble) issues with keeping track of total AEs on each place when modelling the two as a unit, but it can also be quite messy when the carrying capacities of the fattening and breeding properties are mismatched.

The breeding property is modelled as if it was the only property, best age of turnoff determined, and breakeven prices calculated for all plausible steer turnoff ages. This 'locks in' the profitability of the breeding property on the assumption that all steer transfers are made at the breakeven prices.

Using these breakeven prices as the transfer prices we then test the profitability of various steer ages going on to the fattening property. This is done in the Bullocks program (another part of Breedcow and Dynama).

For instance we can calculate the GM/AE from transferring weaner steers to turn off Jap Ox. Alternately we can try transferring yearling steers to turn off Jap Ox, or transfer weaners but sell them sooner as feedlot steers. Just for completeness we can also consider some options with purchased steers. The task then is to select an age group, or even a portfolio, that will maximise profit on the fattening property,

bearing in mind that steer output from the breeding property will vary with transfer age (sending weaners will allow the more cows to be carried and more steers produced). Turnoff numbers at each age are calculated very easily by Bcowplus.

Since the profit of the breeding property was already held at the maximum by using breakeven transfer values, finding the profit maximising combination of steers for the fattening property ensures that the overall profitability is maximised.

Analyses so far indicate that a combination of a rough breeding block with prime fattening country will almost certainly be most profitable if the weaner steers are transferred to the good country as young as possible.

The 'store trap'

When comparing herd structures for the same herd with a range of male turnoff ages, the obvious difference is that younger male turnoff means more breeders and more calves for the same total adult equivalents. Less obvious is that the herd valuation is lowest for weaner turnoff and highest for bullock turnoff. This is due mostly to the difference in value of cows and heifers relative to steers, especially the older steers.

Producers may argue that this is irrelevant since they already own the cattle. The relevance can be demonstrated by looking at what happens over time when a change to age of turnoff is implemented.

If the change is to a younger turnoff (as in the shift from bullocks to live export), breeder numbers are increased as male age groups are sold down. There is a flush of cash over the transition as normal turnoff bullocks are sold, and some or all of the next age group as well, depending on the availability of females to take up the carrying capacity. The income sacrifice from reduced female sales is more than covered by the extra male sales. Whilst this is usually seen by producers as income, it would be more correct to see it as a capital withdrawal.

Conversely, changing from a yearling steer turnoff to something older requires holding back on the yearling sales and finding some cows or heifers to sell instead. The result is less money, and the same again for maybe another year or two. Making the change to a more profitable herd thus requires the accumulation of more capital. If the producer cannot afford this sacrifice, then the change is impossible.

The 'store trap' refers to the situation where the producer knows an older male turnoff would be more profitable, but cannot achieve it because the income sacrifice required to get there is out of the question.

The store trap can strike new owners trying to establish, or existing owners who have made 'temporary' changes to younger turnoff, or owners coming out of drought.

Supplementation

Supplements used in north Queensland are typically urea to get through the dry season and phosphorus in the wet (and in the dry for breeders).

Some budgeting work I did for an MLA phosphorus workshop in 2009 showed that P supplementation of phosphorus deficient cattle was still very much worthwhile, despite the higher prices of the lick components.

This modelling was based on assumptions of higher weaning rates, reduced breeder mortalities, and superior growth in all classes, but especially steers.

An important observation from the modelling was that the changes in animal weights and herd structure (more total cattle for the same number of breeders) greatly increase the number of adult equivalents resulting from a fixed number of breeders. Put another way, **if supplementation was to be done without increasing total AEs, breeder numbers had to be reduced by approximately 30%.** The assertion that P supplementation is still profitable included allowance for this 30% reduction.

This calculation is based only on weight changes and herd structure changes. Nutritionists at the workshop pointed out that the reason supplementation works is that it helps animals eat more, i.e. a 400 kg animal with supplement eats more than a 400 kg animal without supplement. This means that I have underestimated the increase in total AE with supplementation, and that the 30% breeder reduction is an underestimate.

These calculations suggest that overstocking is an insidious and perhaps inevitable consequence of successful supplementation.

The calculations also underline the value of thinking of herd size in terms of feed consumption (total adult equivalents) rather than the number of breeders.

Economics of stocking rates

If you think you know how stocking rate affects growth, reproduction, survival and supplement costs, it is possible in Bcowplus to model the herd at two different stocking rates, expressed as different herd sizes, for example 3000 or 4000 AE.

We expect that, at the higher stocking rate,

branding rates will be reduced, deaths increased, growth will be slower, price per kg might be lower on account of increased age at target weight, and supplement costs higher. Importantly, capital requirements for livestock will increase in proportion to herd size while the increase in production (if any) will be less than proportionate to the increase in numbers.

By comparing the total GM at the two herd sizes we can see what the budgeted difference is. To deal with the extra capital requirement of heavier stocking either compare GM after interest on livestock capital, or set the extra GM (assuming it is extra) against the extra herd capital required.

The short term outcomes of stocking rate decisions are however not the whole story, since excessive stocking rate will lead to a progressive decline in pasture productivity, and thus of the level of future GM that is possible from the country.

Loss of future GM from land condition decline can be valued and capitalised, and will represent production loss to the landowner (current or future). Whether this loss is reflected in the price that a naïve buyer would pay for the land is irrelevant in an industry context, since whoever owns the land will pay the production cost.

The other issue in stocking rate is that of production risk – heavier stocking increases drought risk and reduces the management options available to the producer going into a drought. The long term financial impact of a single management coup or disaster has already been noted under 'Accounting, budgeting and benchmarking'.

Landholders look at natural solutions

Landholders that let nature take control could improve the hydrology of their property, prevent soil erosion and improve soil fertility according to natural sequence farming guru Peter Andrews.

A group of farmers in central Queensland are hoping to benefit from this different way of thinking about land management by bringing Mr Andrews' to the region as part of a new project that will include a series of activities such as field days, workshops and webinars.

The Central Queensland Natural Sequence Farming Group secured $20,000 under the Community Action Grants component of the Australian Government's Caring for our Country to raise awareness of natural sequence farming.

For more information on joining the group or upcoming events, people should contact Dan Carney on 49757319, or e-mail dan_j_carney@yahoo.com.au.

The region's leading natural resource management group Fitzroy Basin Association Inc (FBA) sponsored the group's funding application in recognition of strong community demand.

'We know landholders want to explore the potential of different alternative practices, including NSF, and we believe it is important to facilitate information-sharing,' FBA chief executive officer Suzie Christensen said.

'We encourage landholders to remember that some landscape changes on their properties may require approval, and they should contact the Department of Environment and Resource Management if they have any questions,' she said.

Ms Christensen said the project was one of six in central Queensland to received funding under the Community Action Grants.

Workshops give community a voice on water values

More than 10 one-day workshops were held across the Fitzroy Basin in February and March to capture local knowledge of catchments and views on how they should be managed to protect water quality.

The workshops were run by the region's leading natural resource management group and partner in the CQ BEEF project, Fitzroy Basin Association Inc (FBA).

FBA Healthy Waterways Manager Nathan Johnston said the feedback was being used to develop a Fitzroy Environmental Values and Water Quality Objectives report.

'FBA has been funded under the Queensland Government's Q2 Coasts and Country program to develop environmental values for the Fitzroy Basin region in consultation with the community,' Mr Johnston said.

'The workshops have helped build up our knowledge of how people use and value waterways, which will help ensure we are better placed to protect them into the future.'

More information about the report's development can be obtained by contacting FBA Healthy Waterways Officer Jackie Dupavillon on 4999 2823.

Accelerated adoption of leucaena

Stuart Buck DEEDI, Biloela

The Department of Employment, Economic Development and Innovation has funded a new project titled 'Accelerated Adoption of Leucaena' which will capitalise on many years of research and extension to help producers successfully establish and manage leucaena pastures to increase the profitability of individual enterprise and the beef industry as a whole.

Responsible adoption and management of leucaena has been promoted for many years by Queensland primary industries as well as The Leucaena Network, University of Queensland and AgForce. The 'Accelerated Adoption of Leucaena' project will collaborate with producer groups to undertake on-farm research, development and extension in a group learning environment. It will build upon and expand the network of people involved in leucaena by providing technical and mentoring support to producers who wish to plant leucaena. A number of on-farm field days will be held across the state for producers to learn more about leucaena establishment, management and production. On-farm activities that have already started include:

- Comparison of establishing leucaena either after full grass removal or strip preparation
- Assessment of leucaena pastures on cattle performance and soil and waterway health compared to grass-only pastures
- Leucaena response to pre-plant ripping
- Row spacing and configuration impacts on cattle performance.

Studies into economics and cattle performance of irrigated leucaena will be conducted in the future.

The project will work with producer groups associated with the CQ Sustainable Farming Systems and CQ *BEEF* projects. Other interested producer groups are invited to become involved. For more information about the 'Accelerated Adoption of Leucaena' project, contact Stuart Buck at Biloela on 07 4992 9187 or email stuart.buck@deedi.qld.gov.au.

Leucaena is a perennial tropical legume that can be highly productive for over 30 years. Leucaena foliage is highly palatable to most grazing animals and has a high nutritive value for ruminants. Leucaena provides high weight gain, commonly 250–300 kg/head/year (0.7–0.85 kg/head/day), which enables earlier turnoff and better marketability of cattle. Soil health and ground cover are also improved due to nitrogen fixation and extraction of soil water deep into the subsoil. For best results leucaena should be planted into deep, fertile, well-drained soils. A weed-free area of at least two metres either side of the establishing plants needs to be maintained. Leucaena can be slow to establish, particularly if weeds are not controlled and where soil phosphorus levels are below 25 mg/kg.

Leucaena contains mimosine, a non-protein amino acid that is acutely toxic to animals and causes excessive salivation, poor appetite and low liveweight gains, especially when the diet contains more than 30% leucaena. Producers should inoculate 10% of the herd with the 'leucaena rumen bug' when introducing cattle onto leucaena for the first time. The rumen bug can be obtained from the DEEDI at *Brian Pastures*, Gayndah.

It is important that graziers work to protect the long term sustainability of the leucaena industry in Australia by implementing the Code of Practice developed by The Leucaena Network' and industry leaders. The key message is **do not let leucaena set any seed**, as leucaena can only become a weed if it is allowed to seed. Leucaena is best managed by controlled grazing, where cattle are rotated in short, intensive periods followed by rest. In areas where leucaena is subject to grazing, seedlings that do establish will die either from grazing or grass competition. Leucaena should ONLY be sown where cattle can access the plants, as there is weed potential in ungrazed situations due to long seed dormancy. Weedy patches of leucaena especially in coastal areas are a different sub species to the cultivated types utilised by the grazing industry today. The first of the improved grazing varieties were not available until the mid 1960s, long after the weedy subspecies was naturalised over 90 years ago.

Strengths

- Very high nutritive quality for ruminant livestock.
- Highly productive on suitable soils, high weight gains are possible.
- Tolerant of prolonged dry periods and remains productive for over 30 years.

Limitations

- Poorly adapted to shallow, infertile soils.
- Poor growth at low temperatures and is susceptible to frosting.
- Relatively weak in seedling stage and slow to establish.

Budgeting for pasture to last the dry – a supply and demand balancing act

Gina Mace, Fitzroy Basin Association

In livestock industries we are generally well aware of how much money is required to operate our business from year to year. The costs necessary to run the operation are carefully considered and the necessary amount of money is allocated. This process of allocating money is known as budgeting.

However we often overlook the need to budget for our most precious resource – our pasture.

With the recent good rain across the most part of central Queensland, and the end of the wet season fast approaching, it's important to look at how much pasture has grown, and how much useful feed we have to take us through to the next wet season.

Pasture budgeting is a very practical technique for balancing forage demand with supply over a defined time frame, such as between the end of the growing season to the end of the dry season.

The dry season pasture budget begins with accurately estimating how much forage has grown and working out how likely it will be to rain over the following months. The reality is that in central Queensland you generally can't expect a break in the season until November, so your feed needs to last from the end of the growing season, around April, until November. Therefore approximately 200 days of feed is needed per beast grazing.

It is then necessary to account for how much of this total forage is actually useful and palatable to the stock. You will fall short of feed before the next wet season if your stocking rates are matched to a pasture that is made up of a mixture of annuals or unpalatable species (figure 1).

Figure 1

There are more animals than feed causing the system to overbalance over time. Demand is higher than supply.

From this total forage you need also consider that some will be trampled or fall onto the ground before the animal has a chance to eat it, plus you will want some ground cover after the dry season to protect the soil from erosion caused by the first storms.

This has now given you the amount of total usable forage (figure 2).

Figure 2

Budgeting for how much actual usable forage you have around April, will enable you to forward plan stock numbers and off load stock early at opportunistic times of the year when cattle prices are good, such as in May. Feed budgeting can also work in the reverse, for example, after an above average growing season like we are currently in, you can use feed budgeting to determine weather you can carry more cattle, whilst still achieving a desired residual amount of pasture at the end of the dry season for ground cover. However increasing stock numbers over the short term to take advantage of the extra feed will depend on how your pastures have recovered from last years very dry season. You should only use this option if you are certain your pastures have responded to the recent rains to their optimum productivity, otherwise you will be costing yourself money in the long term through reduced pasture growth next wet season.

Monitoring and further budgeting is necessary throughout the dry season to account for changes in pasture quality and ensure the stocking rate continues to balance with the amount of useful forage remaining. You must also account for increased daily intake by stock if they are being fed a supplement.

Other variables to consider when budgeting include the distance between permanent watering points as pasture utilisation drops to only 60% when cattle have to walk between 2–3 km to water. Also the different land types within each paddock and the relative productivity of each need to be considered.

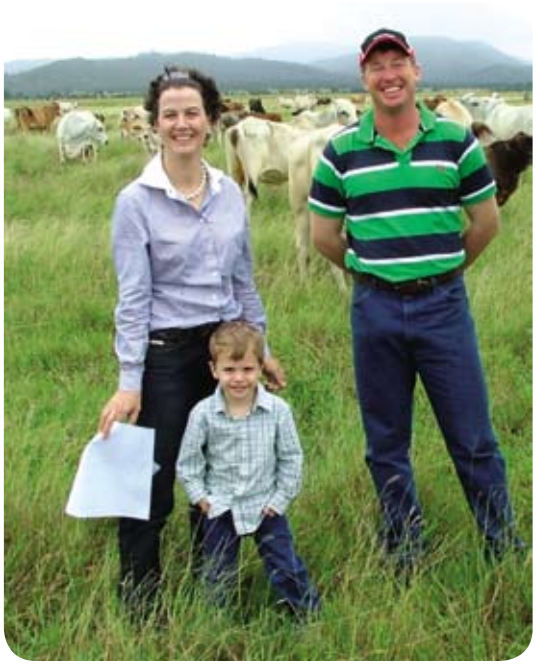
The Fitzroy Basin Association currently offers technical support and subsidies for water and fencing developments such as increased watering points and landtype fencing of 25–50% designed to improve land management. For further information call:

Gina Mace, FBA Emerald
ph 4987 7904 mob 0429 992 810
or Joe O'Reagain, FBA Biloela
ph 4992 5417 mob 0427 572 200

Producer profile

Lachlan and Trudy Mace

Broadsound CQ *BEEF* group



Lachie and Trudy Mace's 10 442 ha property, *Toorilla*, is located on the eastern side of the Herbert River inlet, approximately 120 km north of Rockhampton on the Stanage Bay Road.

Just over half of *Toorilla* (5634 ha) is marine plains, covered with parra grass, water and salt couch on alluvial loam with clay sub-soil. Of the remaining 5176 ha, 3676 ha is coastal forest (ironbark, tea tree, blue gum) on sandy soils (red and grey) and 1500 ha of salt pan with scattered salt couch.

Lachie and Trudy run a EU breeding and finishing operation and a feeder trading operation.

- Finished steers are sold direct to the meatworks.
- Cull cows are fattened and are sold direct to the meatworks.
- Cull heifers are grouped with purchased trade heifers and are backgrounded and sold to the feeder market. An agent is used to purchase and sell trade animals.

Ironically, given their location and an average rainfall of approximately 950 mm, in late 2007, the year after Lachie and Trudy took up the operation, *Toorilla* nearly ran out of water. Trading stock were sold and some of the breeding stock were moved to a couple of paddocks the Mace's were able to lease, close by. To reduce the risk of this ever happening again, the existing main dam was enlarged to 70 000 cubic meters and a depth of 14 m at the wall. Water from the dam is now reticulated around most of the property using a large solar array and electric pump setup.

During the last few years around 17 km of new fence has been erected to divide existing paddocks so that now there are two paddocks for each mob of cattle. Lachie and Trudy now have more control in spelling country, the benefits of this is better pasture composition, reduced parasites and ease of management.

Lachie and Trudy implement a controlled mating programme, putting the bulls in the first week of December, and take them out after 4 months.

This will have the first calves on the ground around about September, with late calves falling early January. The first branding generally occurs in early January with a follow up branding in March.

Breeders are pregnancy tested early June coinciding with weaning. Empty cows are culled and transported to a leased block for fattening and are generally turned off direct to meatworks in late January the following year.

Calves are weaned and handled for about 4 weeks and supplemented during this time.

Steers are grown and fattened on the marine plain. During the dry season weight gains of up to 1 kg per day are achieved on the plains. The tops of the steers are sold direct to meatworks, generally around mid May, with the majority going to the 'works' mid July and the tail late in October.

In previous years Lachie and Trudy have run their weaner heifers on forest country and provided them with a protein supplement for the first dry season to ensure they are up to weight. They would then transfer them to the 'plain', six months before mating through to calving out. This would regularly lead to a twenty percent loss, from pregnancy testing to branding. This year though, instead of running the heifers on the marine plains through to calving they transferred the pregnant heifers back to the forest country for their last trimester of pregnancy then shifted them back to the 'plain' as they were about to calve out. This has resulted in a halving of the loss from the previous years.

Lachie and Trudy find that being involved in the Broadsound CQ *BEEF* group has been valuable in terms of seeing and sharing other producers enterprises and experiences and say that it has been a useful and worthwhile tool for them, in moving their business forward.

Staff profile

Prue Becker
Grazing Land Management Support Officer (FBA)

CHILDHOOD: Born and raised on my family owned and operated sheep and cattle property south west of Blackall. I was home schooled through to grade 7 at Longreach School of the Air and then went on to boarding school in Toowoomba.

CAREER: Studied Bachelor of Agricultural Science (Rural Technology) at the University of Queensland's Gatton campus. After graduating, I pursued a career in the beef industry, focusing on animal nutrition and lot feeding. I gained employment with family operations; Woods Grain in Goondiwindi and Coggan Partnership 'Enarra Feedlot' Meandarra. I married and moved to CQ last year and whilst involved in our family beef and grain enterprise I contracted to outside consultancy firms. I am currently involved in, the MLA 'Cash Cow' program and I commenced work with the Fitzroy Basin Association in January this year.

INTERESTS: Friends and family, sports (fitness and health), water skiing

BRAG SHEET: Member of the team that won Reserve Champion at the Brisbane Exhibition in the prime steer competition in 2007. School awards, I was school house and swimming house caption and overall sports champion.

HOLIDAYS: I wish!!!

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