FutureBeef

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CQ BEEF

Information for rural business in Central Queensland

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Welcome to *CQ Beef* 34

Welcome to the winter issue of the *CQ Beef* feature for 2018.

Hi everyone

CQUniversity had a big presence at Beef Australia 2018 through the Belmont Station property tour. They have some exciting news in the launch of the Central Queensland Centre of Excellence—a new research partnership. Read all about it in this issue.

Talking about research—do yourself a favour and get stuck into Stacey Haucke's article on the *Repronomics*™ project, an exciting genetics project run on our research stations.

Also in this issue, some sound heifer management advice from none other than Dr Geoffry Fordyce—a great read as we look towards the breeding season.

We've also included an article from last year's winter issue on dry season feeding as we know that's a pertinent topic at this time for many, unfortunately.

We've got a great article this issue outlining how Department of Agriculture and Fisheries staff can assist graziers. Please give it a read and contact one of our staff members below if you'd like more information.

Our Central Queensland beef extension team includes:

Mick Sullivan, Rockhampton, 4843 2623
Matt Brown, Rockhampton, 4843 2611
Kylie Hopkins, Rockhampton, 4843 2615
Carly Johnstone, Biloela, 4808 6887
Eloise Moir, Biloela, 4808 6878
Byrony Daniels, Emerald, 4991 0867
Alice Bambling, Emerald, 4991 0837
Jim Fletcher, Mackay, 4967 0731

We hope you get something from this issue. Please get in touch if you have any ideas about how we could improve CQ Beef for your benefit.

Byrony Daniels
Beef extension (FutureBeef)
Department of Agriculture and Fisheries
Emerald

Repronomics™ update…enabling genetic improvement in tropically adapted beef cattle

The decisions you make when you introduce new genetics into a beef cattle herd have long-lasting effects. Your ability to accurately select genetics that will improve your herd's economically important traits is essential to increasing productivity and profitability.

Repronomics™ is a five-year project supported by Meat and Livestock Australia (MLA) in northern Australia that aims to improve the ability of bull breeders to produce genetically superior bulls and bull buyers to more accurately select bulls specific to their breeding objectives.

Dr David Johnston from the Animal Genetics and Breeding Unit at the University of New England, Armidale, leads the *Repronomics*™ project. This collaborative project uses cattle and resources across the Department of Agriculture and Fisheries (Queensland) research stations at Brian Pastures, Gayndah, and Spyglass, Charters Towers, as well as the Northern Territory Department of Primary Industries Douglas Daly Research Station.

The project measures female reproductive performance traits of specifically-bred cattle to provide a broad genetic sample of the three most populous tropically-adapted breeds in northern Australia—Brahmans, Droughtmasters and Santa Gertrudis. Artificial breeding programs have been used to put highly influential sires (that have been used in industry herds in recent years) over a large number of breeders. Upcoming sires that have potential as future influential bulls have also been used.

Real-time ultrasound scanning of the animals' reproductive systems provides data on hard-to-measure female reproduction traits such as heifer age at puberty and lactation anoestrous interval. Other measurements include birth weight, growth and ultrasound carcase traits.

The steer progeny are purchased by the Australian Brahman Breeders Association, the Droughtmaster Stud Breeders Society of Australia and a consortium of Santa Gertrudis breeders. These animals have been backgrounded, finished, processed and measured for carcase and meat quality traits including intramuscular fat and shear force.

All project animals and a large number of industry sires in the three breeds have had

DNA extracted and high-density genotyping undertaken to enable their performance data to be added to their genomic profiles. This combination of actual performance information and the genetic makeup reinforces the ability to get an estimate of an offspring's genetic breeding value earlier in life before the animal has any performance data of its own and enables a more accurate description of their genetic merit for a raft of traits prior to selection.

To date, the project has produced more than 5000 progeny from approximately 300 industry sires. The data from these animals has identified a critical mass of precision phenotypes that can help bull breeders and buyers to better understand the genetic component influencing an animal's productivity and performance.

Ultimately, breeders and buyers are able to make more accurately informed breeding and buying decisions.

The information generated by *Repronomics*™ is being delivered to the beef cattle industry through BREEDPLAN estimated breeding values (EBVs) and is helping to underpin the new genomic analysis known as 'single-step' which will help development of across-breed EBVs.

Stacey Haucke
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Introducing the CQ beef extension team

The Central Queensland beef extension team is comprised of beef cattle extension officers, pasture agronomists, nutritionists, spatial scientists and economists with staff located in the Rockhampton, Emerald, Biloela and Mackay Department of Agriculture and Fisheries (DAF) offices.

Stuart Buck, Byrony Daniels and Eloise Moir (left to right).

Collectively, the team has more than 150 years of experience in the Queensland grazing industry, with expertise in cattle production and genetics, grazing management and beef business performance. Staff work with producers in the greater Fitzroy River Basin area and the southern end of the Burdekin catchment. They also actively contribute to state-wide beef industry research and extension projects, often partnering with natural resource management groups, research institutions and agribusiness. As well as using their own strong technical knowledge and practical industry experience, the CQ beef extension team is able to access the resources and skills of the Queensland-wide DAF beef team.

Personalised support and sound advice

Beef extension staff are available to provide advice and one-on-one support to beef businesses across all aspects of land, livestock and business management. DAF staff are committed to providing a free and trustworthy source of best practice information for the grazing industry. With access to the latest research findings, there is no better place to go for reliable information for your beef enterprise.

Janet Nimmo with Carly Johnstone of the Biloela team.

Jim Fletcher from Mackay.

Kylie Hopkins and grazier Louis Moore.

Strength in numbers

Group workshops and field days are an integral part of beef extension in the Fitzroy region. These events facilitate networking within the grazing community and peer-learning from fellow graziers. Many training and extension activities are held across the Fitzroy region every year and cover a wide range of topics, including:

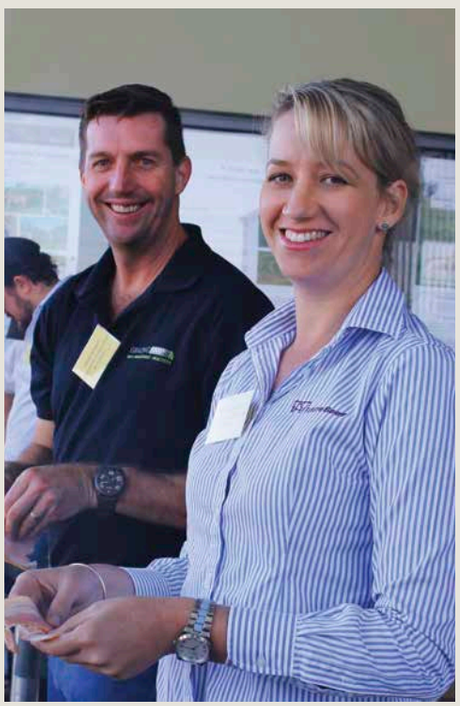
- beef business analysis
- breeder herd management
- genetics
- grazing land management
- forage budgeting
- National Livestock Identification System database training
- nutrition and supplementation
- sown pasture establishment and management
- workplace health and safety.

Grazing BMP program

The Grazing Best Management Practice (Grazing BMP) program has been delivered in the Fitzroy region since 2009 and has engaged more than 780 grazing businesses managing more than 4.9 million hectares of country.

A workshop group checking out soil and grass in the paddock.

Mick Sullivan.



Matt Brown and Byrony Daniels.

Grazing BMP, funded by the Queensland Department of Environment and Science, is a partnership between DAF, the Fitzroy Basin Association (FBA) and AgForce. The program is a free and voluntary online tool designed to help landholders improve the economic, environmental and social sustainability of their grazing enterprise. The program enables producers to self-assess their management practices and identify opportunities to improve business performance.

In the Fitzroy, the Grazing BMP program is delivered in a two-day accelerated workshop format. Over two days, DAF and FBA staff present best practice information and encourage group discussion. These workshops are very interactive and attendees are encouraged to learn from group discussion. Graziers are able to reassess their modules every year to refresh their action plans and maintain their knowledge of industry standards. Reassessment workshops are held over one day and feature guest presenters and topics that aim to further the knowledge base and improve practices of those attending.

Contact your local DAF extension officer.
See page one editorial for contact details.

Heifer mating—the importance of tailoring solutions to fit Australia's diverse conditions

Heifer management recipes can be problematic as they should always be tailored to the individual business. For example, it is quite common for those in temperate climates to mate heifers 4-6 weeks earlier than their cow herd—a practice that could have risks in the dry tropics of northern Australia.

Most of the north experiences long, severe dry seasons that end in storms arriving anytime over a five-month period. The wet season peaks usually in January-February. The dry season is a high-risk period. Exposing heifers, the most vulnerable class of stock, to an extra four–six weeks of extreme nutritional stress when they need the opposite is madness. If you're not lucky enough to catch an early storm or you don't happen to have a rare corner of 'safe' nutrition, your business will incur considerable costs recovering the situation.

An average of seven per cent of all females in the northern forest region die annually—we do not need to exacerbate the problem.

Young female cattle with their growing skeletons have specific challenges to deal with. In northern systems, skeletal growth continues until approximately 4.5 years of age. To maintain the same body condition, females need to gain approximately 50 kg between 1.5 and 2.5 years and 35 kg between 2.5 and 3.5 years of age for their skeletal growth. That equates to an entire body condition score.

My advice for dry tropics systems is to build the start of mating for maidens around the same time as for cows. I also advise not extending mating beyond three months if possible. In dry tropical systems, the main objective with timing of mating is to minimise dry season lactation; concentration of calving is a secondary outcome if it can be achieved.

The main reason for short seasonal mating of heifers is to keep subsequent input costs under control, i.e. use management to reduce feed need and supplement only to value-add good management.

Another reason is to minimise dystocia and reduce the costs of controlling and treating this problem. Dystocia is common in all breeds of two-year-old calving females in all regions of northern Australia. Low nutrition in the first half of pregnancy and high nutrition in the second half appear to be primary risk factors, and, if combined, heifer mortality can exceed ten per cent as calving is mostly unsupervised.

Dr Geoffry Fordyce, Queensland Alliance for Agriculture and Food Innovation
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Centre of Excellence drives new research for Central Queensland producers.

Central Queensland livestock producers are in the box seat to benefit from a new research partnership specialising in digital technologies to boost herd management, genetic performance and financial literacy.

The Central Queensland Livestock Centre of Excellence is a newly formed research partnership between CQUniversity Australia, AgForce Queensland, the Queensland Department of Agriculture and Fisheries (DAF) and the Queensland Agricultural Training Colleges (QATC).

The centre is unique in its ability to bring together the industry's first integrated group of beef research sites in Central Queensland, encompassing the cattle production chain from stud, breeder and finisher operations and headquartered in the beef capital of Rockhampton.

Trials are conducted at CQUniversity's world-class laboratories and at four research stations located at AgForce's Belmont' (Rockhampton) and QATC's Berrigurra (Emerald), Narayen (Mundubbera), and Rosebank (Longreach). These will link with research, development and extension activity at the AgForce-owned and DAF-managed Brian Pastures facility near Gayndah, and the DAF-owned Spyglass facility near Charters Towers.

The key to its success will be putting producers first in developing research projects and testing ideas to make sure they deliver benefits in real world operating environments.

The stations will act as research hubs for developing proofs-of-concept before technologies are deployed to private 'spoke' properties which act as remote demonstration sites for cattle communities to test systems in their own environments.

Close to 150 producers attended the launch of the centre of excellence during the Belmont Station property tour at Beef Australia 2018. The Belmont Station property tour also showcased projects already underway including development of automated livestock monitoring systems to gather phenotypic performance data for integration into BREEDPLAN. This project aims to overcome the barrier of the time and labour costs for producers to participate in objective genetic selection programs.

Central Queensland is home to more than three million cattle, three major processing plants, and Australia's 'beef capital'—Rockhampton. As such an important region to the national industry, a centre of excellence is needed to drive locally focused research, development and extension activities that can drive productivity gains for producers now and into the future.

Each partner brings unique skills to service the industry, but by working together, capacity is greater than the sum of the parts. By collaborating, the group creates the critical mass needed to work with producers to drive innovation.

More than 150 producers were on hand at AgForce's Belmont Station when the Central Queensland Livestock Centre of Excellence was launched during Beef Australia 2018.

Grazing essentials: Loading ramps, fences, watering points… . and the Futurebeef website

OBE Organic sustainability adviser Chris Cosgrove is just one of the thousands in the Australian grazing industry who use the FutureBeef website as a go-to tool for information.

The FutureBeef website, futurebeef.com.au, provides essential information that graziers can apply to boost the performance of their enterprises—creating more jobs and more opportunities for regional and rural economies.

'The grazing industry needs to continue to improve its productivity and to meet the expectations of stakeholders at the same time,' Chris said.

'The FutureBeef website contains a range of best practice information to do this—from environmental information for grazing land management, to animal welfare, to the people and business aspects of running a successful grazing business.'

'We use it to help research best practice, to plan the training workshops we deliver to graziers, and in the future we want to circulate more information to OBE Organic's producer network by sharing links and fact sheets on OBE's social media platforms' he said.

Since its inception in 2012, the FutureBeef website has provided Australia's grazing industry with a link to the latest scientific discoveries and research and beef business information. Users can also subscribe to a free monthly eBulletin.

There is also a calendar of events so graziers can take advantage of field days, workshops and other activities that are occurring in their production area.

FutureBeef is a partnership between the Queensland, Northern Territory and Western Australian governments and MLA.

Dry Season Feeding—what should you know to make better decisions?

First up, if you are going to supplement make sure you have enough pasture to carry your cattle through to when the seasonal break can be expected.

Dry season protein supplements work by enabling cattle to eat more grass (up to 30 per cent more) so the extra pasture consumption needs to be considered. It's rarely economical to feed hay. If you don't have pasture in the paddock you need to offload cattle.

Effective supplementation depends on identifying what deficiencies are present and providing enough of the required nutrients. An assessment of diet quality is valuable for determining what nutrients are required and what supplementation can achieve. Faecal Near Infrared Spectrometry testing (faecal NIRS) can be used to assess the protein content and digestibility of the diet. Analysis of pastures is of limited value in the extensive grazing situation because of the ability of cattle to select a higher quality diet from the pasture on offer.

Dry season deficiency problems

The biggest dry season deficiency problems are protein and energy with protein becoming limiting first. On phosphorus deficient country, lactating and heavily pregnant breeders will benefit from adding phosphorus in a dry season supplement. Dry cattle have much lower phosphorus requirements if they are growing slowly or at maintenance and phosphorus is usually not a problem in the dry season. Other mineral deficiencies are possible but are very uncommon.

Your feed merchant should supply to you the ingredients and their percentages in the mix. If they don't…shop elsewhere! Many supplements have low levels of protein and energy and may not supply what cattle require or high intakes are needed to supply the required nutrients. If you are not aware of what is in the supplements it is hard to assess its usefulness.

Knowing supplement intakes is critical for determining whether the supplementation program is meeting animal requirements for particular nutrients. Record how much is going out to particular paddocks then divide it by how many cattle are in the paddock and how many days it lasts to determine the daily intake per animal. You can then calculate how much protein and energy the cattle are receiving from the supplement. DAF staff have access to the FeedCalc spreadsheets, a great tool for comparing the efficiency and economics of supplements but we do need intake information to make useful comparisons.

There is a rumour in the industry that licks with high urea content can affect fertility. This is not true because cattle grazing low quality dry season pastures and being fed a urea lick have far lower protein intakes than dairy or beef cattle on improved pastures.

We are aiming to give a breeder 150 grams of protein a day and a dry animal 75 grams. A 30% urea lick (with total protein content of 103%) will supply 150 grams of protein at a lick intake of 145 grams per day. A 10% urea lick (with total protein content of 48%) will supply 150 grams of protein with a lick intake of 313 grams per day and will likely be the more expensive option.

Options to slow or increase intake

Which leads us to the question 'what are the options to slow or increase intake'? In many situations high intakes are due to the supplement having a low urea content and significant amounts of palatable ingredients such as protein meal, grain or molasses. Increasing the urea content and reducing the amount of palatable ingredients will reduce supplement intake. If lick intakes are too low the addition of protein meal will usually increase intake. Salt can either be an attractant or a deterrent depending on the land type and the water type. Please seek advice if you are having difficulty optimising intake.

Roller drums can be an effective means of supplying a dry season protein supplement if the appropriate mixing and delivery infrastructure is available to reduce the workload associated with mixing and delivery.

When cattle require energy supplementation high energy products such as molasses, whole cotton seed or grain are required. Most dry licks, roller mixes and commercial liquid supplements have low energy contents—0-5 megajoule (MJ) of metabolisable energy (ME) per kg of dry matter. By contrast molasses contains 8.7 MJ of ME per kg of dry matter and whole cottonseed 13.1 MJ of ME per kg of dry matter. The recommended M8U (molasses 8 percent urea) intake of 2 kg per day provides 18 MJ of ME. A 450 kg lactating cow requires 80 MJ of ME per day, this means that on low quality dry season pasture when energy intake may be only 45 MJ of ME a day, the cow has a ME deficiency of 35 MJ. Consequently, even with 2 kg of M8U per day the animal will still have an energy deficiency of 17 MJ of ME per day. This is why body reserves are so critical for breeders.

The best way to manage supplementation costs is to limit supplement by keeping breeders in a condition where they can afford to lose some weight when there is deficiencies in the pasture. Weaning for breeder body condition is key here, as is joining, so calves are dropping when there is the best quality pasture. If you would like a hand calculating your key joining dates, please contact local beef extension officer.

Organic protein supplements

Organic copra meals and soyabean meals are probably the best choices in terms of organic protein supplements. The problem with these meals is that they are very palatable. Intake could be limited by the choice of feeder used to fed the meals. While the range of organic energy supplements is limited, organic phosphorous is available (bat waste products).

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Using genetic tools to improve carcase traits

Estimated Breeding Values (EBVs) can be used to identify sires that will improve carcase traits of sale cattle and the ability to meet market specifications. EBVs are available to improve rib and rump fat depth, marbling, retail beef yield and eye muscle area. Cattle growth and temperament must also be considered.

EBVs are estimates of the genetic merit of an animal for particular traits and are calculated on the animal's, and its relatives', performance data and linked traits. Each EBV is given an accuracy percentage; the higher the accuracy the less likely the EBV will change as more data becomes available. Even with low accuracy, EBVs are a useful guide when selecting animals.

Carcase traits

Retail Beef Yield EBVs estimate the genetic differences of animals in boned-out meat from a 400 kg carcase. Animals with higher Retail Beef Yield EBVs will produce progeny with higher retail beef yields.

Rib and Rump Fat EBVs can be used to increase fat coverage at the 12/13th rib site and P8 rump site respectively. Marbling can be positively influenced by selecting bulls with higher Intramuscular Fat EBVs. While higher fat levels are favourable for eating quality, it needs to be noted that higher rib and rump fat measurements are normally correlated with decreased retail beef yield. Selecting for eye muscle area using the Eye Muscle Area EBV should improve retail beef yield. Genetic correlations between carcase traits for the Angus breed are shown in Figure 1.

Carcase Weight EBVs estimate genetic differences in hot standard carcase weights at 650 days and can be used to increase carcase weights.

Cattle growth

Cattle growth is also a critical consideration to ensure cattle meet target weights in the desired timeframe. Growth EBVs (200, 400 and 600 Day Weight) can be used to improve growth rates and growth patterns of cattle. Animals that reach target weights quickly with the desired carcase characteristics are generally more profitable. Better growth rates should also result in improved Meat Standards Australia (MSA) compliance through lower ossification scores.

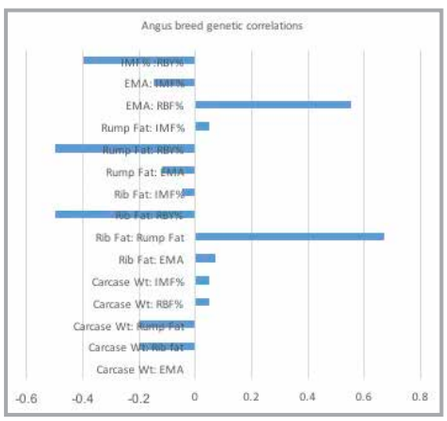

Figure 1: Genetic correlations in the Angus breed.

Temperament

Temperament is important for meat quality, MSA compliance and animal handling on-farm, during transport and at the abattoir. Some breeds have EBVs to address temperament; some use flight time and others docility.

Using EBVs in selection

To effectively use EBVs current herd performance (fertility, growth and carcase) has to be understood. This enables opportunities for improvement to be identified and breeding objectives developed. Balance in selection is also critical to avoid the problems that arise from a narrow selection focus.

Selections indexes are useful because they:

- provide an overall score of an animal's genetic value for a specific production system/market
- are calculated using EBVs and are based on traits and weighting important for the production system/market
- are breed specific and designed to suit the production systems and markets the breed is used for
- assist with balanced selection as they consider progeny sold and females retained for breeding
- are expressed in a dollar figure and indicate the net profit per cow mated over the bull's lifetime.

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