GENETICS
SPECIAL FEATURE

FEEDBACK

MLA – FOSTERING PROSPERITY

JULY/AUGUST 2019

mla
MEAT & LIVESTOCK AUSTRALIA

FEEDBACK

MLA fosters the long-term prosperity of the Australian red meat and livestock industry by delivering world-class research, development and marketing outcomes.

Cover (page 24): *Queensland beef producers Melinee and Rob Leather at home with their horses.* Image: Jessica Howard.

Have your say!

We'd love to hear from you

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A NOTE FROM THE MD...

My first few months with MLA have cemented my view there's significant extra value to be created in this industry if we can find better ways to work together through the supply chain. There are, of course, challenges in doing that, but the gains to be made make those challenges worth tackling.

The opportunity to set the foundations for this industry to move forward in a far more aligned manner has never been greater than with the current processes underway for revitalising the Red Meat Industry Memorandum of Understanding (MoU), the *Meat Industry Strategic Plan* (MISP 2030) and MLA's own Strategic Plan. The MoU review has demonstrated there is appetite for change. MLA supports reform that is in the best interests of red meat producers. Our industry must have the capacity to respond in an agile and proactive way to the current and future challenges and opportunities.

Regardless of what structure emerges, MLA's role in driving innovation, research and development and marketing campaigns – all adding up to prosperity for producers – remains the same. Against that background, let me introduce the July/August edition of *Feedback*, which reports back on the highlights of what's being achieved across those areas.

Despite the proven significant link between genetics and the commercial profitability of the Australian livestock industry, there remains a big opportunity to increase the uptake of genetic technologies in Australia. The launch of MLA's new genetics website hub – genetics.mla.com.au – provides a one-stop-shop of tools and resources, aimed at demystifying genetics. This edition contains a 16-page special genetics feature, providing a look at why doing just that is a worthwhile decision. Packed with case studies from around the country and across all enterprise types, this special feature delivers know-how from those at the coalface of capturing value from selecting good genetics.

Recent months have seen the commercial launch of a number of significant products – the results of years of R&D. Included is a biological herbicide for managing parkinsonia (page 10) and a psyllid-resistant variety of leucaena (page 16).

Meanwhile, big strides are being made in the snacking market and *Feedback* delves into some classic examples, from page 40, of how entrepreneurial minds have partnered with MLA to dig deep on consumer trends and deliver a red meat product that hits the mark.

I'm keen to hear your experiences with MLA and any feedback on the work we're doing and have planned. Feel free to contact me or catch up at one of the events I'll be attending in the next few months.

Jason Strong
MLA Managing Director
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Keeping up with Jason

Meet MLA's MD at upcoming industry events, including:

2 August: PGA Convention, Perth, WA

19 August: Northern Beef Research Update Conference, Brisbane, QLD

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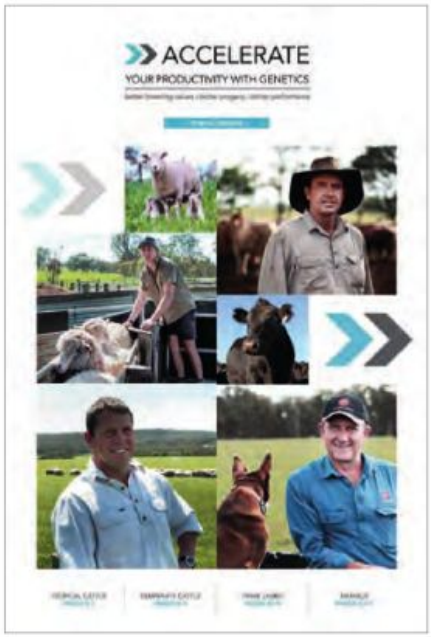

Focus on cattle stress levels

When beef supply chains are managed well, cattle stress levels remain low-to-moderate from the time of induction at a feedlot in the grainfed production system to slaughter, and can be lower at slaughter than at time of induction.

That's according to results of a recently released study designed to provide a better understanding of physiological indicators of stress in cattle during handling and in new environments.

Supported by MLA Donor Company (MDC) in collaboration with Australian Meat Processor Corporation (AMPC), Harvey Beef and Murdoch University, the research assessed stress levels at different time points from feedlot induction through to slaughter, as well as the impact of temperament on stress and carcase quality.

MDC Business Development Manager, Josh Whelan, said the research assessed and quantified data relating to the impacts of handling and temperament on cattle production and performance.

"Identifying specific times at which cattle are stressed will allow for targeted management of these animals to proactively reduce that stress," Josh said. ■

Download the report at mla.com.au/cattle-stress-report.

Business as usual following Red Meat MoU White Paper release

Following the release of the Red Meat Memorandum of Understanding (MoU) White Paper, Managing Director Jason Strong said it's business as usual for MLA.

The White Paper release, which included a number of recommendations for the future structure of Australia's red meat industry, represents the latest step in the review of the Red Meat MoU and is the culmination of 12 months' work.

While it marks the end of the review process, the wide-ranging recommendations will now undergo a period of careful consideration by industry and Government, with any progression of reform requiring the support of all nine signatories to the MoU, which includes MLA.

Jason said the next steps for MLA would involve working closely with Government and industry partners to review and assess the recommendations.

"To be clear, MLA supports reform that is in the best interests of red meat producers, however we believe careful consideration of the recommendations will be the key to ensuring that occurs," Jason said.

"Together with industry agreement, any variation to the current structure will also require significant legislative change.

"All this will take time so for now it's business as usual for MLA. We'll be getting on with the task of delivering our extensive range of programs, which will see over $270 million invested on behalf of livestock levy payers, processors and live exporters during the next 12 months. This investment includes levies, matched research funding from the Federal Government and external commercial investment."

The review process

The MoU review was instigated in recognition that no significant changes within the red meat industry had occurred since the MoU was established 20 years ago and that it was important to ensure relevant systems and structures are in place to be successful in the future.

MLA has been actively engaged in the consultation process, and has consistently advocated for a revitalised red meat industry that is fit to meet both the challenges and opportunities today and in the future.

"Given its age, there's consensus across the industry that the current MoU is outdated. It's therefore important that industry structures are reviewed to ensure they help position the industry to succeed in a dynamic and challenging operating environment," Jason said.

"The changing operating environment has been a key focus for MLA – in particular how to continue to drive global demand for red meat, build on-farm productivity and deliver value throughout the supply chain."

The recommendations

- The White Paper recommendations include the establishment of three new unified industry bodies.
- Red Meat Australia, with an independent chair and a board drawn from the peak industry councils and up to three new independent skills-based representatives, would be the single voice of the industry and the conduit for levies collected, as well as be responsible for industry public policy and marketing.
- Red meat Research and Development Corporations and Service Providers – MLA, LiveCorp and Australian Meat Processing Corporation (AMPC) – would be merged into one single research body. Existing integrity and quality systems would also be merged into a new Industry Standards body. ■

rmac.com.au/mou

Get connected

A new report outlining the ways producers can implement connectivity on-farm is helping to unlock the benefits of new digital technologies.

MLA joined forces with professional service company KPMG and agrifood innovation leaders Aatlis to produce the *Agri 4.0 Connectivity at our Fingertips* report, released in June. It highlights the $20.3 billion uplift in gross value produce estimated to be available via digital agriculture, and addresses the sense among producers that they're at a disadvantage due to an inability to achieve on-farm connectivity.

Setting up digital infrastructure on-farm

Sean Starling, MLA's General Manager of Research, Development, Innovation and MDC, said producers were looking to concepts such as Internet of Things and the sensor-heavy Factory 4.0, which has been widely publicised and is gathering steam globally across many industries.

"It all requires data to be connected. In a city environment with easy access to 4G and NBN, that's not a problem," he said.

"But if you're on a farm with no NBN, you have to put your own communication infrastructure in to allow sensors to talk to each other.

"If you're looking to make your farm digital – if you buy a soil sensor or a weather station – one consideration needs to be how you get the data from the sensors back to your computer or phone. That is, how you make it useable."

The report outlines different types of data communication protocols, including LPWAN, Sigfox, digital UHF and satellite. It informs producers about the different protocols that exist and discusses the positives and negatives of each. Case studies are used to demonstrate how some producers are engaging with this technology, what they've learnt and what works on their farms.

Connecting the entire supply chain

Sean said MLA pursues the concept of connectivity and a digitally-enabled supply chain for many reasons.

"Consumers are demanding more information about how and where the product is produced," he said.

"Non-consumers are also seeking evidence it's being produced in an ethical and sustainable way – they want information ranging from environmental use to animal welfare and energy consumption.

"Further down the supply chain, building these technologies into a farm has massive potential. It's real-time information, accessed more frequently than would otherwise be possible. Put simply, it can enhance the quality of business decisions exponentially."

Meanwhile, MLA is also working with Food Agility CRC to build an online resource where producers can find out what ag-tech solutions are available. ■

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mla.com.au/agri4.0

Check out MLA's video on the Carwoola Smart Farm Initiative, which showcases what's currently available to producers in the connectivity solutions space, at mla.com.au/carwoolaconnect

Find out if it's fit to load

An updated guide to help producers, agents, buyers and transporters decide if an animal is fit to be loaded for transport by road or rail was released by MLA in July.

The 2019 edition of the national guide, *Is the animal fit to load?*, includes new content to ensure best practice animal welfare when preparing, loading and delivering cattle, sheep and goats.

MLA General Manager – Producer Consultation and Adoption, Michael Crowley, said the release was timely in recognition of ongoing dry conditions across many livestock production regions, and reflected industry's commitment to animal welfare practices.

"The guide has been developed to help livestock operators meet the Australian Animal Welfare Standards and Guidelines for the Land Transport of Livestock, and decide whether an animal is fit to be loaded for transport and for the entire journey by road or rail, to any destination within Australia."

The guide includes:

- New information about loading densities for livestock, managing effluent, and the chain of responsibility for all involved
- Checklists to help assess whether an animal is fit to load
- The roles and responsibilities of consignors and transporters, to identify who is the 'person in charge' of animals at different stages of the journey. ■

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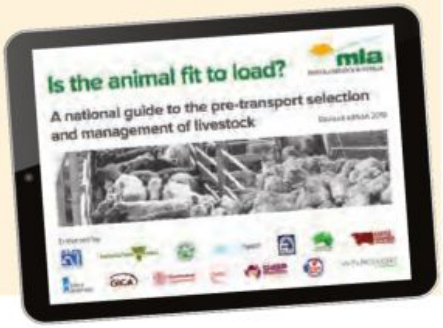
To download the guide or to order a hard copy, visit the MLA website: mla.com.au/isitfittoload



New lamb definition: what's changed?

The definition of lamb has changed in Australia

The previous definition of lamb was: 'A female, castrate or entire male that has 0 permanent incisor teeth'.

From 1 July 2019, the new definition is an ovine animal that:

a. is under 12 months of age; or

b. does not have any permanent incisor teeth in wear.

This means a lamb is able to cut one or both of its permanent central incisor teeth, as long as they are not in wear.

Why did the change occur?

The previous definition gave producers no warning light about when a lamb stops being a lamb – the moment a permanent incisor erupts, the lamb was downgraded to hogget. Rather, the new definition gives producers greater certainty and a definitive signal to make moves to market their lambs. Producers will have generally less than a month from the time of eruption to when permanent incisors are in wear. The new definition is also consistent with New Zealand's definition – Australia's biggest lamb competitor in export markets. The change serves to even the playing field between the two countries.

Who initiated the change?

The change to the definition was first announced by Sheep Producers Australia in March 2018, following extensive consultation with producers and other industry stakeholders.

The change has been endorsed by the Australian Meat Industry Language and Standards Committee. Current members of the committee include the Australian Government Department of Agriculture, Australian Meat Industry Council, Sheep Producers Australia, Cattle Council of Australia, Australian Lot Feeders' Association, and the Retail Council of Australia.

How do I apply the change?

The process for checking whether lambs comply with the new definition is via a visual inspection – the same process used to verify lambs against the previous definition.

A permanent incisor is considered 'in wear' if:

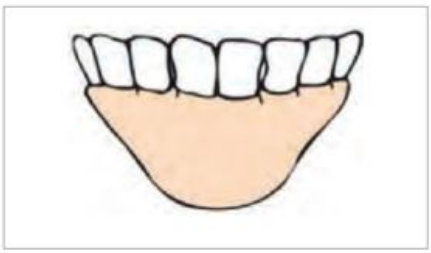
- it touches the upper pad when the sheep's mouth is closed
- it is above the height of the lamb's milk teeth either side of the permanent incisors. ■

For more information and resources, including a video explaining what the change means and how to apply it, visit: sheepproducers.com.au/lamb-definition

No permanent incisors

✔ previous definition

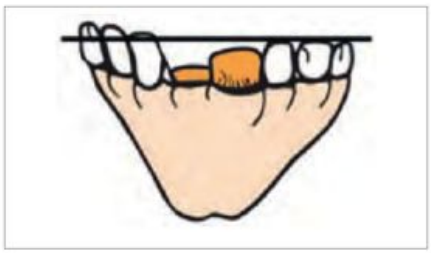
✔ new definition



Permanent incisor not in wear

✘ previous definition

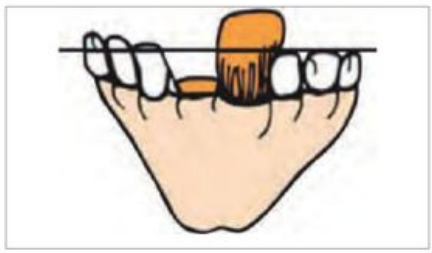
✔ new definition



Permanent incisor in wear

✘ previous definition

✘ new definition



Meet the new crop of livestock consultants

The second class of interns to complete MLA's Livestock Consulting Internship program officially graduated from the program in June, with 10 interns completing two-year internships with participating livestock consulting businesses throughout Australia.

Consultants of the future

The Livestock Consulting Internship program is a partnership between MLA Donor Company (MDC) and participating consulting firms, managed by Meridian Agriculture.

The capability building program is designed to ensure the continuation of new livestock consultants for the private sector to support producer decision making, deliver industry extension programs and provide skilled one-on-one advice.

The 2019 graduates included:

- Georgia Reid, AgPro Management, WA
- Jackson Adams, University of Adelaide, SA
- Bec Clapperton, RCS, Queensland
- Michael Wellington, Bush Agribusiness, Queensland
- Hilary Beech, Holmes Sackett, NSW
- Georgia McCarthy, Macquarie Franklin, Tasmania
- Will Clark-Dickson, Moses & Sons, NSW
- Tara Graetz, Rural Directions, SA
- James Macfarlane, Southern Dirt, WA
- Jess Brogden, Southern Farming Systems, Victoria.

The Livestock Consulting Internship program was established to help address the decline in extension services offered by public agencies by supporting private consulting businesses overcome the substantial financial costs and time required to upskill graduates and, as a result, boost the number of new entrants to the livestock consultancy field.

As part of the program, interns are required to undertake professional hours and major industry research projects, to give them a real-world understanding of the implementation of research and development.

Overall, 469 red meat producers were engaged by the interns over the past two years.

Industry project topics included addressing barriers to producers benchmarking their businesses, comparing the difference between long and short acting worm control in sheep flocks, and the impact of body condition score and genetics in northern beef herds.

MLA has committed to support round three of the program. ■

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Ben Reeve
Meridian Agriculture
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Back row: Will Clark-Dickson, Jackson Adams, Georgia Reid, Michael Wellington, Georgia McCarthy, Bec Clapperton, and front row: Tara Graetz, Jess Brogden, Hilary Beech, James Macfarlane.

World first for beef boning

Australia's red meat industry is set to benefit from the establishment of the world's first beef boning automation R&D room, as the industry looks to reduce processing costs and increase boning room yield efficiency.

MLA Donor Company (MDC) will invest up to $32.4 million over five years to enable MLA, beef processor, Teys Australia, and solution providers to develop beef boning automation technology.

The program won't utilise any producer or processor levies, with Teys Australia co-funding the beef boning automation R&D room at its facility in Rockhampton, Queensland, with matching R&D contributions to come from the Federal Government.

MLA Managing Director Jason Strong said with Australia reportedly having one of the world's most expensive processing sectors, automating beef boning would reduce per head operating costs for the benefit of the entire Australian industry.

"Maximising the value of carcases through accurate cutting along with the increase in productivity through continuous flow in the boning room is vital to the sustainability of the Australian red meat industry," Jason said.

"Beyond movement in livestock prices, the single biggest impact on processing efficiency is the accurate segmentation and deboning of carcases into the highest primal value possible. It's where the most significant improvements in processing industry efficiency can be made.

"Beef boning automation has been estimated to deliver at least a $30 per head benefit, with an estimated 40% of this benefit to return to producers.

"The developments will also provide a platform for other value adding outcomes, such as increasing producer feedback through DEXA and CT installations.

"We're seeing the benefits of lamb boning automation in Australian processing plants, with carcase values increasing by more than $6/head. More than 40% of large processing throughput now uses the technology, and pending installations will raise this to 71% of throughput."

Teys Chief Value Chain Officer, Tom Maguire, said "Beef processing is one of Australia's largest manufacturing industries employing thousands of Australians in rural and regional communities and this type of investment will help us secure its future for the long-term.

"Automation of critical beef cutting lines has the potential to greatly improve consistency and quality of product offered to customers whilst improving the working conditions in our plants," Tom said. ■

Sean Starling
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How MLA's investing levies

Each year, MLA releases its Annual Investment Plan (AIP) to inform levy payers, peak industry councils, the Australian Government and the wider industry about MLA's planned work program for the next 12 months.

The 2019–20 AIP was released in June and outlines the programs, sub-programs, product groups, key performance indicators and budgets that will guide MLA's activities throughout the year. Successful delivery of this plan will act as a stepping stone towards achieving MLA's *Strategic Plan 2016–2020*.

Budget summary

In 2019–20, MLA plans to invest $279.2 million in research, development and marketing activities across six pillars and 16 program areas. Projected 2019–20 investment by funding source is:

- Australian Government: $79.6 million
- Grassfed cattle levies: $65.3 million
- External funding: $52.2 million
- Sheep levies: $46.6 million
- Australian Meat Processor Corporation: $17.4 million
- Grainfed cattle levies: $15.3 million
- LiveCorp: $1.7 million
- Goat levies: $1.1 million. ■

To read the full Annual Investment Plan, which also includes a high-level SWOT analysis of the drivers affecting MLA's operating environment, visit: mla.com.au/aip

ON FARM

RESEARCH IN ACTION

FEEDBASE

Direct hit on parkinsonia

t's safer, cheaper and more environmentally friendly – the new tool to fight the noxious woody weed, parkinsonia, is being heralded as a major step forward in boosting feedbase management.

Now available to landholders, Di-Bak Parkinsonia is a biological herbicide containing naturally occurring fungal pathogens. These are delivered in capsules injected directly into the trees, enabling targeted application and limiting adverse impacts on the surrounding environment.

The product, which has Australian Pesticides and Veterinary Medicines Authority approval, introduces pathogens that induce dieback disease, which stresses and can kill the plant.

Dense thickets of parkinsonia occupy vast areas of northern Australia, negatively impacting pastoral industry production by limiting pasture growth, restricting stock access to pasture and water points, and increasing mustering difficulty and cost.

More than a decade ago, producer observations indicated evidence of naturally occurring dieback in parkinsonia, which raised the possibility of using native soil pathogens to help contain the weed.

Di-Bak Parkinsonia is now available after years of collaborative research and trials by the University of Queensland, BioHerbicides Australia (BHA), cattle producers, government departments and natural resource management groups.

Following initial producer observations and small plot trials, MLA supported larger producer trials.

MLA Program Manager Sustainable Feedbase Resources, Cameron Allan, said the product was a positive addition to existing methods of managing parkinsonia.

"Di-Bak Parkinsonia provides another tool for producers to implement into their weed management programs and tackle their specific parkinsonia problems," Cameron said.

During its development, it was observed that Di-Bak works best in dense thickets, with the disease establishing and spreading in the thicket after inoculation of several plants. Spot spraying isolated or large plants with chemicals to rapidly reduce seed production is another key management technique.

"As with any weed control program, it's important that producers are clear about their objectives in taking action. For instance, they need to identify whether they want to keep clean country clean, or reduce existing larger weed infestations," Cameron said.

BioHerbicides Australia's CEO Peter Riikonen and MLA's Cameron Allan with the new product Di-Bak Parkinsonia. BHA's Dr Ken Goulter, University of Queensland's Professor Vic Galea and MLA's Amanda McAlpine test out the equipment at back.

Research indicates the performance of Di-Bak Parkinsonia is influenced by local conditions, with treatment more effective in hotter environments.

"As with all biological control approaches, results are not instant and can take months before the disease takes hold and kills the plant," Cameron said.

"As part of a well-considered, consistent weed management program, Di-Bak Parkinsonia will be a useful tool for landholders."

Di-Bak Parkinsonia is commercially available to producers through BioHerbicides Australia. ■

Cameron Allan
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bioherbicides.com.au

Over the fence

In this series, *Feedback* follows a group of producers from across Australia as they manage their operations over the course of a year and respond to the challenges that arise. This is the final instalment in the 2018–19 series.

SNAPSHOT:

Jock Hughes,
Longford, Tasmania

Area:
800ha

Enterprise:
Breeding seedstock Angus and Coopworth ewes, finishing lambs, cropping poppies, peas and grass seed

SEASONAL CHALLENGES:

Autumn was pretty good at home. The new block that we'd purchased was dry, but we've now had rain everywhere.

WHAT'S ON MY PLATE:

Pregnant ewes are out on native grass runs and we'll supplement them with grain in the four weeks prior to lambing to avoid pregnancy toxaemia. The cows have been rotating around the dryland perennial pastures that had residual cover in the spring. There was a spring flush that we didn't manage to fully utilise, so we've been getting it cleaned up to allow the grass to grow with the autumn break. The heifers start calving in July and cows in August, so we'll be weighing and tagging calves at birth.

We began rotating the calves around the irrigated ryegrass pastures in April, using electric fencing to subdivide the paddocks and extend the grazing rotation, and we'll continue doing that over winter.

PROGRESS AGAINST LONG-TERM GOALS:

We've started using a lot more nitrogen in autumn and we used even more this year to grow as much feed as we could. Previously we used it as required for the mouths we had, but now I'm more inclined to grow as much feed as we can and stock it accordingly. ■

ACTIVITIES OVER THE NEXT TWO MONTHS:

- weighing and tagging calves
- calving and lambing
- preparing spring cropping paddocks.

Jock Hughes
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SNAPSHOT:

Will, Simone and Mandy Onus,
Adjungbilly, NSW

Area:
2,630ha plus 4,850ha of state forest lease, and 1,619ha agistment at Condobolin, NSW

Enterprise:
Feeder steers and wool production

ACTIVITIES OVER THE NEXT TWO MONTHS:

- getting ewes scanned and sorted up ready to lamb, which may include condition scoring and getting ready for supplementary feeding prior to lambing
- feeding the paddocks – fertilising with urea and trying to grow as much grass as we can on whatever little rainfall we may have
- lambing in August and focusing on pasture and the returns from feeding stock.

SEASONAL CHALLENGES:

Things are marginally better than where we were at this time last year, but we haven't made a lot of progress. We haven't had the rain we'd like.

WHAT'S ON MY PLATE:

We'll preg scan the ewes and get them in good condition for lambing. Based on Lifetime Ewe Management principles, they need to be at condition score 3 to lamb successfully. If there's not enough grass to achieve that, we need to supplementary feed. We're quite sensitive to that after some mistakes we made last year.

Having the animals on either a neutral or rising plane of nutrition at the right time is imperative, because we learned that the cost of having the animals lose weight and then have to regain it is considerably more than just maintaining condition. I think last year there was a reluctance on my part to accept the full economic reality of feeding at that scale. This is something we've improved on over the past 12 months and we're feeding much better now.

We've also invested in constructing confinement areas for sheep and cattle and focused on our ability to feed, because I don't think it's the last time we'll go through this. I also think there are opportunities around as much as there are challenges. Having the confinement areas gives us the capacity to buy stock in for production feeding when the opportunities arise.

PROGRESS AGAINST LONG-TERM GOALS:

Cattle numbers are still where they were – we haven't downscaled in terms of the breeding herd – and sheep numbers are up at the moment, but that's not a permanent situation. Our cattle conception rate was around 75%, down from 92–95%. Their body condition relative to joining time meant there was a small window for conception. This has caused some issues for this year's production – there aren't as many calves around – but there may be some demand for pregnancy-tested empty finished cows later in the year. There are always opportunities – we just have to try to turn the difficult situations to our advantage.

In the past 12 months I've come to understand the value in concentrating on the bottom end of our production stock (lambs, steers and heifers). If we can take the lighter cattle up to 250kg from 150kg, the economics look good because they don't eat a lot and there's a good trade differential. Last year our heifers and steers that were 150kg in May had only put on 120kg by January–February and then we found they were unsaleable. The EYCI was the lowest it had been since 2014. We'd set our sights on sending fat stock to market but they weren't fat enough. We didn't execute our plan well – it was just so hard to get it right. However, people tried a lot of different things last year and it rarely worked for anyone. One lucky aspect of being a young farmer is that we're a lot more open and transparent. We can learn from what others are doing. ■

Will Onus
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SNAPSHOT:

Lynda and Darcy O'Brien,
Basalt, Queensland

Area:
21,000ha

Enterprise:
Breeding, backgrounding and agistment

ACTIVITIES OVER THE NEXT TWO MONTHS:

- preg testing our breeder herd and making strategic decisions based on the results
- taking pasture samples to direct supplementation decision making with advice from a nutritionist
- continuing soil testing – there are three different testing sites over the property to monitor changes in soil quality as a result of improvements to pasture and changes in management practices in those areas.

SEASONAL CHALLENGES:

Things are going well. Despite receiving well over our average rainfall during the monsoon event earlier in the year, we were fortunate to have sustained a comparatively small number of livestock losses.

The feed budget has been completed. Traditionally we don't expect rain from now until the end of the year, so that's why our feed budgeting is so important. We were carrying quite a large herd last year, within capacity, and we still have some surplus grass coming into the non-growing season. As a result, we're looking at using that grass for some agistment cattle. We'll budget right through to our green date (25 December) and for another six weeks after that, in case of a late season.

Generally speaking, this year is going to be about making sure our business continues to maximise profit drivers and contain costs. The challenging area is obviously the market situation – the market for cattle in the north is not strong because of the drought in many parts of Australia. It's taken some time for exporters to begin taking cattle out of this area of Queensland.

WHAT'S ON OUR PLATE:

We weaned during April–May to maintain good body condition on the cows and help foster good rebreeding rates. During June and July we're focusing on grass management. The weaners will be the first mob to graze the new leucaena paddock. We participated in an MLA Donor Company Innovation Fast-Track project that allowed us to develop 300ha of leucaena and mixed legumes, integrated with our existing pastures. This is the largest project of its kind in the area. There's been an explosion of diversity in this paddock.

PROGRESS AGAINST LONG-TERM GOALS:

Continuing to recruit and nurture the right quality staff is imperative. In terms of continuing to monitor profit drivers, we've seen an upward trajectory in calving rates purely from better nutrition and management, driven by rotating the breeders, improved pasture quality, strategic supplementation and early use of water supplementation to provide adequate urea. We want to continue tightening our breeder herd by focusing on nutrition and on our strategy with empty cattle, which will change depending on the market when we preg test, and we may carry more dry cattle. ■

Lynda O'Brien
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REPRODUCTIVE EFFICIENCY

To join or not to join?

Increasing the number of ewes mated to lamb at 12–14 months can be an effective way to build replacement ewe numbers, increase lamb supply and boost farm profitability – particularly with maternal breeds in high-rainfall areas.

An MLA-funded research project, led by Dr Andrew Thompson from Murdoch University, used economic modelling to guide the decision-making process behind whether or not to join maternal or Merino ewes at seven to nine months of age.

"Joining ewe lambs is not for everyone," Andrew said.

"You need to have the right sheep, be operating in the right environment with the right season, and be doing everything else right before you consider this option."

Andrew said producers should first consider whether there are other production issues that are likely to have a higher pay-off, including improving pasture production and utilisation, or improving reproduction from mature or hogget ewes.

The project drew on prior MLA and Murdoch University-funded research into joining ewe lambs. It was made possible with the contribution of significant data sets from Cashmore Oaklea Performance Maternals (see story opposite) in south-west Victoria and Moojepin Multi-Purpose Merinos in WA's Great Southern region.

Ewe lamb focus

Andrew said the earlier work quantified the effects of sire genetics on ewe lamb reproductive performance. It showed reproductive rate increased by about 4% per extra kilo of live weight at joining (when below 45kg).

"The earlier research found that improving the nutrition of ewe lambs during joining also increased reproductive rate," he said.

"It also quantified the impacts of live weight and age-at-joining on the survival of the ewe lamb dam and her progeny, carryover effects on the ewe's performance when joined at 19 months, and the productivity of her progeny.

"While there are still some knowledge gaps, we know a lot more than we did and this is what allowed us to model the cost-effectiveness of joining ewe lambs."

The results are in

The economic analysis was carried out for Merino and maternal ewe lambs in three different regions, and for autumn and spring-lambing flocks.

Results included the following:

- Mating maternal ewe lambs was profitable in all regions and times of lambing examined.
- Joining maternal ewe lambs was more profitable than joining Merino ewe lambs.
- Profits from joining ewe lambs were greater in environments with a longer growing season, regardless of ewe breed.
- Joining maternal ewe lambs was not sufficiently profitable to be a priority in wheatbelt regions with low rainfall.
- It was more profitable to join ewe lambs at eight months of age, rather than seven months.
- The economic optimum was for live weight at joining to be around 75% of mature weight (42–45kg) and, for all scenarios, feeding to gain more weight during joining itself was more profitable.

New decision-support tool

Andrew said a decision-support tool has been developed to help producers and consultants determine how mating ewe lambs should be evaluated alongside other production alternatives.

"The tool also determines the optimal management system for an enterprise mating ewe lambs, together with the impacts on profitability of sub-optimal management," he said.

"It's in the prototype stage now and we're aiming to have it in limited use by the end of the year."

Supporting extension and adoption

In preparing the project's final report, Andrew and economic analyst John Young summarised their major findings into draft key messages for improving the reproductive performance of ewe lambs.

These will be refined based on testing of the tool, then shared via existing extension and adoption programs and materials, including MLA Tips & Tools, Bred Well Fed Well and Profitable Grazing Systems. ■

Dr Andrew Thompson
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The full report can be downloaded at: mla.com.au/yearlinglambs

Balancing opportunity and risk

The opportunity to boost on-farm returns by joining ewe lambs needs to be balanced against the risk of eroding capital value if the young ewes aren't managed correctly, according to Victorian seedstock producer John Keiller.

John (pictured) is co-principal of Cashmore Oaklea Performance Maternals and has been joining ewe lambs since 1995.

"We've refined our practice so we're now joining at about seven-and-a-half months, but aiming to get it down to seven months," John said.

"That will allow the ewe lambs to lamb at 12 months, providing the most efficient consumption of our spring pasture."

John said the economic benefits of joining ewe lambs were clear for his enterprise in the high-rainfall region of south-western Victoria, but choosing this path is not a decision to be taken lightly.

"We join up to 2,500 ewe lambs which gives us about 1,600 extra lambs annually," he said.

"With an average weaning weight of 28kg, at a value of $3/kg live weight, that equates to $84/head. That's $135,000, or $112.50/ha, gross across the sheep-grazed area.

"So, yes, ewe lambs are an amazing opportunity, but I wouldn't consider joining them unless I had everything else right first.

"The potential survival of embryos of ewe lambs is 70% versus adult ewes at 85%, so the priority should always be given to your adult ewes – they're your most efficient producers.

"Manage adults perfectly and only then, if you have surplus energy on the farm, consider mating ewe lambs. It's not a given."

Firm targets key to success

John said ewe lambs need to be carefully managed, to ensure they have sufficient time to hit adult weight targets needed to achieve a successful second joining at 19 months of age. Some of his management strategies include the following:

- ensure ewe lambs are 7–7.5 months of age at joining
- ensure ewe lambs weigh a minimum of 37kg at start of the 50-day joining
- provide nutrition that allows weight gain of 100–150g/day throughout joining
- use rams with good Australian Sheep Breeding Values for number of lambs weaned (i.e. early puberty), low birth weight and positive lambing ease
- use experienced rams at a higher percentage than for adult ewes, i.e. 2% rather than 1.3% for mature ewes
- set date-based (rather than lamb weight-based) weaning targets to give dams sufficient time to recover.

Risky business

"Joining ewe lambs is all about opportunity versus risk," John said.

"If you allow insufficient time for post-weaning recovery of weight and condition score, the risk is that a large number of high-value breeding animals will pregnancy-test empty and be sold as empty 22-month-olds at a low value as mutton.

"All these capital-value animals that you spent development money on will give you one lamb and then that's it – they're out of the system. You will only undertake that poor management process once." ■

SNAPSHOT:

John Keiller, Cashmore Park (co-principal Cashmore Oaklea Performance Maternals), Cashmore, south-west Victoria

Area:
1,350ha

Enterprise:
Prime lambs and seedstock

Livestock:
9,000 Maternal Composite ewes, 1,000 Cashmore Nudie ewes

Pasture:
Perennial ryegrass, white clover and sub-clover

Soil:
Sandy loam

Rainfall:
830mm

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Redlands a game changer for northern beef

The opportunity to open up large areas for leucaena-based grazing systems in the north's high rainfall zones is now here, with the commercial release of a psyllid-resistant variety.

After almost 15 years in the making, Redlands leucaena was launched in May at 'Pinnarendi Station', Mount Surprise, Queensland – the site of a large-scale trial comparing the new variety to the conventional Wondergraze variety.

Cattle grazing Redlands at Pinnarendi have demonstrated an average daily gain of 0.69kg – no different to those grazing the psyllid-susceptible Wondergraze. That live weight gain is double what would be expected from animals grazing native pasture only, in the same environment. Redlands has proven both palatable and free from attack by psyllids.

Bred by researchers at the University of Queensland and developed with funding from MLA, Redlands was described as a game changer by MLA Managing Director Jason Strong, who performed the official launch.

Of the $7 million invested in leucaena research and development across 26 projects to date, using both MLA Donor Company funds and levies, almost 12% has been dedicated to the development and assessment of psyllid-resistant leucaena.

"Adoption of leucaena will increase carrying capacities in north and coastal Queensland, reduce age at turn-off, extend feedbase quality further into the dry season and enable producers to target premium slaughter markets," Jason said.

"It'll also lift the potential for better rangeland management by reducing stocking rate pressure on native pastures and contribute to targets for a carbon neutral beef industry by 2030. Leucaena has already been shown to reduce methane emissions intensity by up to 20% in research conducted by the National Livestock Methane Project, managed by MLA, from 2010–15."

Redlands seed is now available from two exclusive growers and suppliers: Peter Larsen of Leucseeds, Banana, Queensland and Bruce Mayne, Calliope, Queensland.

For producers like Peter and Lorna Langtree, 'Wyvuri', Bramston Beach, who attended the launch, Redlands' potential is enormous.

The Langtrees run 600 Droughtmaster breeders on black sand and peat swamp country with low-protein pastures, turning off weaners that are sent west for fattening.

"We'd like to bring our herd back to 400 head and fatten the weaners at home to retain profit, but we need better feed to do that," Peter said.

"Leucaena hasn't been an option to date due to psyllids. If I can get my weaners from 250kg to 350kg at home, that's feedlot entry weight. The availability of Redlands now is very exciting for us."

Pathway to earlier turn-off

Brett and Theresa Blennerhassett, 'Goshen Station', Mount Garnet, run 1,500 Brahman–Santa Gertrudis breeders, turning off live export steers at 350–380kg and heifers at 300–350kg on native pastures, namely black spear and kangaroo grass.

They planted 240ha of leucaena 10 years ago which was largely destroyed by psyllids, so they've been keenly watching the development of a psyllid-resistant variety.

As part of the MLA Producer Innovation Fast-Track program with The Leucaena Network, Brett and Theresa planted 70ha of Redlands using a precision Norseman leucaena planter early last year. Overall establishment success was 70% and cattle were put in early in May for initial grazing.

"We believe Redlands is the pathway to turning off our steers and heifers 6–12 months earlier. It's all about weight-for-age in northern beef," Brett said.

Double value

Northern Queensland breeders Tom and Christine Saunders have recorded close to double the weight gains in weaners on leucaena compared to native pastures.

The couple run 1,000 Droughtmaster–Brahman breeders on 'Whitewater Station', Mount Surprise, which is predominantly black spear and Indian couch. They planted 40ha of Wondergraze in 2016 on well-draining, high-phosphorous and low-sulphur

Queensland beef producers Tom Saunders (left) and Brett Blennerhassett (right) talk leucaena with MLA Managing Director Jason Strong.

red basalt soil. Good planting conditions and follow-up rain meant there was an establishment success rate of 75%.

Grazing began in the 2017 dry season with a high stocking rate. Early results are showing weaners on leucaena had an average daily gain of 0.48kg/day an improvement on weaners grazing native pastures only, which typically remained at maintenance (i.e. not losing or gaining weight).

Weaners put on leucaena at 220kg came out after 300 days at 400kg, which amounted to close to double the property's typical weight gains, Tom said.

Stocking rates on leucaena were 1:3, compared to 1:6 on native grasses. The leucaena on Whitewater was planted in timbered country in rows 10m apart, with the diet of cattle estimated to be 30% leucaena.

"We did get some psyllid affect, where we lost production in parts for up to two months," Tom said.

"So we'll try some Redlands to see what advantage that will bring."

Management the key

Good management will be key to the success of leucaena in northern grazing systems, according to The Leucaena Network. Executive officer Bron Christensen (pictured left) said leucaena should only be planted if the intention is to manage it, including taking on the responsibility of controlling leucaena that establishes outside the planted area on your property. ■

Here are Bron's top tips for managing leucaena:

- Leucaena shouldn't be planted in areas where rivers, creeks and flood channels can disperse seed pods or seed.
- Keep leucaena at least 20m away from external fence lines and maintain a buffer strip of strong grass pasture between leucaena plantings and creeks or boundary fences.
- Fully fence leucaena paddocks and graze or cut leucaena to keep it within the reach of animals.
- Minimise seed set and chemically manage any 'escapees' with Access®.

Nigel Tomkins
E: ntomkins@mla.com.au

Producers looking to purchase Redlands seed should contact:

Bruce Mayne
E: brucemayne@outlook.com

Peter Larsen
E: leucseeds@outlook.com

The full Code of Practice is available at leucaena.net

GENETICS

Genetics to 'meat' the future

Working out what future customers will want, and then how to produce it while being profitable on-farm, provides producers with both an opportunity and a challenge.

Leading Breeder conference presenter Jamie Heinrich, from Ella Matta White Suffolk and Poll Merino stud, at home on Kangaroo Island, SA.

But the use of good genetics could make the road ahead smoother, according to SA seedstock producer Jamie Heinrich, who spoke at the Sheep Genetics annual Leading Breeder conference in March.

The event marked the 30th anniversary of sheep genetic evaluation in Australia.

Jamie said the time had come when the sheep industry needed to have a product and a production system the general public would accept.

"The vegan protests going on recently have really brought that point to the fore," he said.

Jamie and his parents, Andrew and Tracie, operate the Ella Matta White Suffolk and Poll Merino stud at Parndana, on Kangaroo Island, SA.

Ella Matta was Australia's first registered White Suffolk stud – founded by Jamie's grandfather in 1979 – and the family has been using the LAMBPLAN and MERINOSELECT analyses since the late 1990s.

Jamie's conference presentation focused on how to bring together the dual business drivers of consumer trends and on-farm production.

"In terms of consumer trends, these vary from market to market," he said.

"In the US and Australia, for example, we're seeing increasing animal welfare concerns, the rise of 'fake meat', and a focus on 'sustainable' production and associated terms such as pasture-raised, free range, cruelty-free, and so on. We also have more health-conscious consumers and fewer people cooking.

"In Asia and the Middle East, the consumer priorities are a little different, with a major focus on food safety."

Technology the key

Jamie says technology offers the potential to overcome many challenges.

"Electronic ID, auto-drafting equipment, farm management software, remote sensing, soil mapping and virtual fencing are just some of the technologies that can improve our animal management, and therefore animal welfare," he said.

"We can also use our breeding tools, including Australian Sheep Breeding Values, to help phase out mulesing and improve lamb survival, while also improving production traits.

"In terms of overcoming food safety concerns, we need to protect our traceability and integrity systems and investigate new opportunities, such as blockchain technology." ■

Jamie Heinrich
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Turn to the middle of the magazine to see *Feedback's* Genetics special feature.

Leading breeders descend on Dubbo

A record 170 delegates attended the 2019 Leading Breeder conference in Dubbo, NSW earlier this year.

Themed 'Breeding sheep for a future environment', the conference attracted breeders and genetics service providers from six Australian states and New Zealand.

The biennial conference is hosted by Sheep Genetics, the sheep industry's national genetic information and evaluation service, delivered as LAMBPLAN and MERINOSELECT.

SNAPSHOT: **Jamie Heinrich,** Parndana, Kangaroo Island, SA

Area: 880ha

Enterprise: White Suffolk, Poll Merino and Maternal Composite seedstock business, plus self-replacing commercial Poll Merino flock

Livestock: 1,300 stud ewes across all three breeds, plus 6,000 commercial Poll Merinos, with surplus commercial ewes mated to White Suffolk rams

Pasture: Kikuyu, sub-clover and ryegrass

Soil: Sandy loam

Rainfall: 620mm

Breeding for reproduction

When breeding for reproductive traits, accurately recording all performance data – good and bad – is paramount, says ram breeder Lynton Arney.

Lynton (pictured) and his wife Claire run Inverbrackie Border Leicester Stud at Strathalbyn, SA.

Speaking at the recent Leading Breeder conference, Lynton told delegates why accurate data recording was so important to his business, and outlined his selection process.

"When you're talking about reproduction, which is lowly heritable, the further we deviate from an accurate record, the less heritable these traits become," Lynton said.

"It's important to enter all the stuff that happens. That means recording the ewe that weaned 45kg twins, and also the ewe that weaned a 35kg single lamb.

"If you don't submit this data [to the LAMBPLAN evaluation] you're seriously limiting the results you'll have to work with."

Lynton said he maintains the integrity of management groups that have the same opportunity to feed, thus eliminating the impact of environmental conditions and ensuring any differences in performance are genetic.

Avoiding bias

Lynton selects sheep using two procedures: one in the office, without looking at the sheep, and one in the yards, without looking at the data.

"We always have a stick of raddle in our hands," he said.

"If we see something in the yards that doesn't look right, we mark it out. If we then look at the data for that animal and it's amazing, it doesn't matter. We stick to the decision to mark it out."

New opportunities

Lynton said he was looking forward to using new LAMBPLAN Research Breeding Values (RBVs), which were released for maternal breeds in May.

"The new RBVs for conception, litter size and ewe-rearing ability used to be combined under the Australian Sheep Breeding Value (ASBV) of number of lambs weaned (NLW)," Lynton said.

"Breaking NLW down into its components will allow us to select for each of the individual components of reproduction.

"In particular, it'll allow us to balance litter size, which is where most of the industry wants to be. This will help improve lamb survival, which is both a huge cost and a welfare issue."

Genetics education

Lynton believes the industry's biggest future gains could come from more focus on educating commercial producers about the value of genetic evaluation and how to use the LAMBPLAN and MERINOSELECT databases.

"There's been a lot of industry investment in genetics, and seedstock producers who have taken the research on board now have animals on the ground to help the industry go forward," he said.

"But there's still a huge number of animals being sold – sometimes for extremely high prices – with average or below-average performance data, based on commercial producers not understanding how to use the information."

Turn to the middle of the magazine to see *Feedback's* Genetics special feature. ■

SNAPSHOT:

Lynton Arney,
Strathalbyn, SA

Area:
1,500ha

Enterprise:
Border Leicester stud

Livestock:
950 ewes

Pasture:
Annual pastures

Soil:
Duplex (sand over dispersive clay)

Rainfall:
390mm

Lynton and Claire Arney
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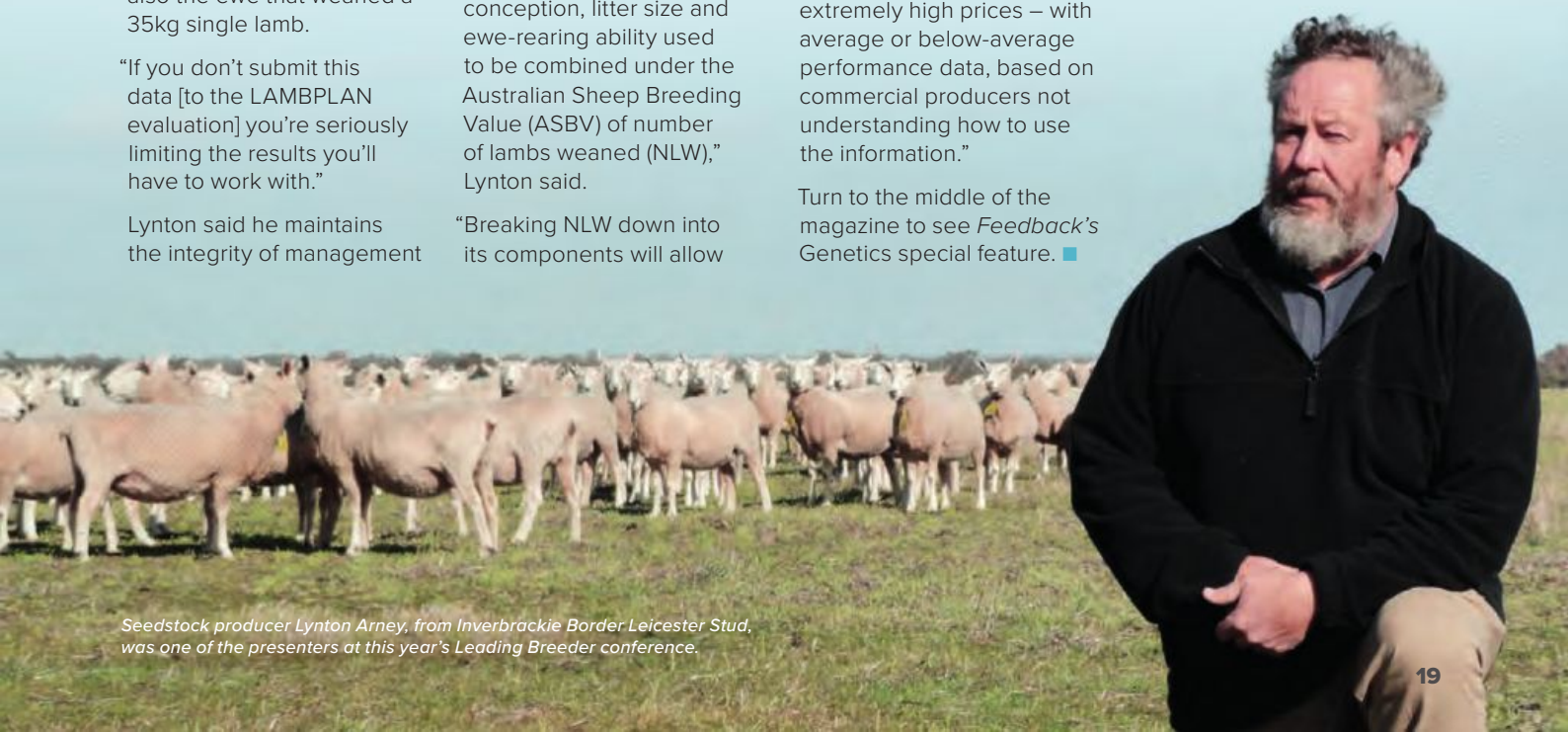

Seedstock producer Lynton Arney, from Inverbrackie Border Leicester Stud, was one of the presenters at this year's Leading Breeder conference.

CARBON NEUTRAL

Carbon-neutral pathways

Dunkeld Pastoral Company has shared its strategies for moving to carbon neutrality in a new MLA video in an example of supporting the industry goal of a carbon neutral Australian red meat industry by 2030.

Dunkeld Group General Manager Glenn White (pictured) explains how using carbon emission reduction strategies in the past five years has worked in unison with growing production – from the same land base.

"It won't be long before a carbon-neutral product will command a premium and we want to be ready to take advantage of that market and be at the forefront," he said.

"It's about taking the land you have and utilising it to the best potential in a way that is sustainable."

Dunkeld has taken its red meat and wool production from 440 tonnes in 2012 to 800 tonnes in 2018.

In the video, Glenn explains the four pathways utilised to reduce emissions:

1. Genetics

"We're using a composite sire and breeding for early finishing, high-end marbling, weight gains and fertility," Glenn said.

"In our area, you lamb down in June and July when it's quite cold and wet. Survivability is a big thing. If a lamb is born with 2mm of fat on its back instead of zero, it has a much better chance."

2. Vegetation and land management

Approximately 20% of the land area was set aside for conservation and biodiversity. Much of this is contained in 30–50m corridors. Paddocks of up to 120ha were cut into smaller paddocks of 10–15ha surrounded by shelterbelts.

"By doing that we've been able to lamb down small mobs of 120–150 ewes, so we're getting higher lambing percentages," Glenn said.

"Clover is king for us. As soon as pasture gets to a certain height we take it down, allowing new fresh growth to come through. Stock do better on that.

"By planting tree shelterbelts we've been able to reduce the overall chill factor by 4–5^{0}C, and that can be the difference between lambs surviving or not."

3. Lot feeding

Lambs are reaching market compliance faster by being moved into a feedlot, allowing the paddocks to be rested ready for pregnant and lambing ewes.

4. Productivity

With a smaller land base for livestock production, every hectare must perform. Using a combination of genetics, livestock management and a highly productive feedbase, this is being achieved.

Towards 2030

On the back of its plan for the red meat industry to be carbon neutral by 2030, known as CN30, MLA is currently working with producers to provide examples of current carbon balances and to determine which approaches to adopt to close the carbon balance to neutral.

Dozens of producer case studies will be conducted Australia-wide over the next 12 months and will provide the best pathways for the industry to be carbon neutral by 2030 or earlier. ■

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View Dunkeld's CN30 video on MLA's YouTube channel: meatandlivestock

SNAPSHOT: **Dunkeld Pastoral Company,** Dunkeld, Victoria

Area:	Enterprise:	Livestock:	Pasture:	Soil:	Rainfall:
9,000ha	Sheep and cattle	26,000 Merino ewes, 800 breeding cows	Phalaris, clover-based	Sandy loams, self-mulching basalts	700mm

MARKET INFORMATION

Drought bites further into sheep flock

Australia's sheep flock fell to 65.8 million head in June, down 6.8% year-on-year and the largest year-on-year decline since 2008, according to MLA's 2019 Sheep Industry Projections.

The contraction is being driven by ongoing drought in all key sheep production regions and heightened sheep slaughter, with many producers now running significantly reduced flocks.

MLA's Market Intelligence Manager, Scott Tolmie, said the combination of generally low lambing rates and a poor weather outlook for winter is expected to disrupt lamb supply in the coming months.

"Throughout 2019, rainfall has been insufficient in all key sheep production regions, compounding the effects of an extended two-year period of rainfall deficiencies," Scott said.

"On the whole, NSW remains the worst affected with 99% of the state still drought-declared and many producers relying solely on supplementary feeding programs to maintain flocks.

"Elsewhere, very few regions across South Australia, Western Australia and Victoria have been immune to the poor conditions. Forming a crucial component of Australian sheepmeat production, the absence of winter rain in these states may lead to a disruption in spring lamb supply, similar to what was experienced in 2018.

"The dry conditions have led to sheep slaughter remaining elevated so far in 2019. However, there has been an easing trend through autumn and a slow-down is expected in the second half of the year as producers look to maintain their core breeding flocks.

"Overall forecast annual lamb slaughter remains unchanged from the January projections, at 21.2 million head, down 7% on 2018, while annual sheep slaughter has been revised slightly upwards and is now expected to fall 11% year-on-year, to 8.5 million head.

"Lamb production is expected to be 477,000 tonnes carcase weight (cwt), down 7% year-on-year, and mutton production is now forecast to be 12% lower than 2018, at 199,000 tonnes cwt."

Focusing on demand, Scott said the outlook remains positive for the industry.

"Despite the drought, both lamb and mutton prices have reached record highs in the last 12 months," Scott said.

"This has been underpinned by strong demand for Australia's sheepmeat exports, which continue to push new highs, bolstered by a declining Australian dollar and limited competition.

"The growth in demand, particularly from China and the United States, has translated into strong domestic farm-gate prices, with the national mutton indicator breaking through 600c/kg cwt in May for the first time and lamb prices quickly closing in on the record highs of August 2018.

Key points

- National sheep flock to fall further
- Fewer expected lambs to limit winter and spring supply
- Export demand from China and the US underpins robust saleyard prices

"The national saleyard trade lamb indicator opened the year at 657c/kg and has since advanced to 888c/kg, 40% above year-ago levels."

Scott said the forecast drop in sheepmeat production in 2019 should keep lamb and mutton prices historically high throughout the year, with an additional upside possible if improved seasonal conditions spark restocker activity.

"Sheepmeat exports have grown across most markets during the first four months of 2019 with Australian lamb exports to China increasing 22% year-on-year, to 21,000 tonnes shipped weight (swt) while mutton shipments surged 99%, to 22,000 tonnes swt," Scott said.

"Despite an elevated start to the year, exports are forecast to contract throughout the remainder of the year as supply tightens.

"Lamb exports are forecast to finish the year 6% below 2018 levels, at 254,000 tonnes swt, and mutton to contract 9%, to 160,000 tonnes swt." ■

mla.com.au/prices-markets/trends-analysis

Producers leading the wa

Tips and tools to be FMD ready

- Understand your risk of exposure to disease, such as location (proximity to other farms or transport routes).
- Always be vigilant, regularly inspect animals and don't turn a blind eye to anything suspicious – early reporting could prevent disease spreading.
- If you suspect an animal is showing symptoms of a notifiable disease, it must be reported to a local vet, a Department of Primary Industries vet or to the Emergency Animal Disease Watch Hotline on 1800 675 888.
- Connect with your relevant FMD Ready pilot group to participate in events and training. For more information visit: research.csiro.au/fmd
- Implement on-farm biosecurity, supported by recording tools such as NLIS, to enhance animal health and livestock traceability. Check out farmbiosecurity.com.au for farm biosecurity plans.

While Australia is foot-and-mouth disease (FMD) free, responding to and recovering from an outbreak could cost $50 billion over 10 years. Producers are now taking the lead to enhance emergency disease surveillance, preparedness and response.

The FMD Ready Project, led by CSIRO and co-funded by MLA, brings together researchers and the FMD-susceptible industries of beef, dairy cattle, sheep, goats and pigs, to improve preparedness.

More than 1,000 producers have contributed to the project by participating in a survey, interviews and joining groups to demonstrate the value of producer-led partnerships to improve livestock surveillance.

There are four integrated sub-projects that use FMD as a model to look at how Australia could prevent, control and manage an emergency animal disease outbreak, and return to trade as soon as possible.

The sub-projects are:

1. **Rapid diagnostics and vaccination strategy preparedness:** Developing better tests and identifying the most effective vaccines, enabling rapid diagnosis and containment of disease outbreaks.
2. **Producer-led surveillance:** Enhancing trust and relationships between producers, transporters, stock agents, veterinarians and other stakeholders, and improving early reporting of unusual diseases, detection, and effective and rapid response.
3. **Outbreak decision support tools:** Identifying strategies and developing guidelines for FMD response, post-outbreak surveillance and management to support proof-of-freedom and a faster return to trade.
4. **Disease transmission path analysis:** Understanding how climatic factors such as wind affect the spread of FMD virus between properties and utilising genetic fingerprinting to trace its movement.

CSIRO senior scientist and veterinarian Dr Yiheyis Maru, who leads the 'producer-led surveillance' sub-project, said the rural community plays an integral role in helping Australia maintain 'free-from' status for many serious animal diseases.

"We need to be ready to prevent, detect, and rapidly and effectively respond to the introduction of exotic or emergency animal diseases and spread of significant endemic diseases to protect the livestock industries and Australia's trade status," he said.

The producer survey revealed factors which need to be overcome to strengthen general animal health surveillance, including:

- producer concern about what might happen if they report signs of anything unusual, such as property quarantine, financial cost and social stigma
- uncertainty about what to look for, and what will happen when reporting unusual diseases
- limited existing relationships with veterinarians and uncertainty about how to report

y on biosecurity

- intergenerational differences between approaches to biosecurity and reporting
- low concern about emergency animal diseases and less priority given to biosecurity and surveillance practices among some farmers and farming types, which could result in vulnerability to disease incursion.

"The sub-project takes a ground-up approach, to create partnerships that Yiheyis said.

"For example, the survey feedback identifies areas where stronger relationships and trust are needed to encourage producers to report anything unusual on-farm.

"The project also encourages collaboration between industries dealing with FMD-susceptible species, as an outbreak in one livestock industry would impact all."

Five partnership pilot groups involving producer and other animal health stakeholders have been established to enhance trust and partnership and to develop and trial innovative solutions:

- dairy cattle, Victoria
- beef cattle, Queensland
- sheep, WA
- pork, Tasmania
- goats, SA.

Each group is working on local solutions to improve surveillance and biosecurity, as well as identifying challenges and opportunities at state level and nationally.

For example, the beef pilot group held a workshop in March to improve producers' skills in detecting signs and symptoms of significant endemic and emergency animal diseases.

"The workshop aimed to improve the capacity of beef producers to provide timely and meaningful information to veterinarians to assist with their disease investigations," Yiheyis said.

"It shows our trade partners we're proactively taking steps to improve surveillance and reporting, not just relying on our past freedom status as assurance we are FMD-free."

Other activities include:

- creating awareness campaigns to reinforce the need to report early
- identifying and engaging 'high-risk' groups in surveillance and biosecurity training
- exploring digital technologies that might assist with animal health surveillance
- developing emergency animal diseases-ready resources and tools for producers
- working together to enhance relationships among producers and other stakeholders, which are essential to report anything unusual early and to mount a rapid and effective response in case of an outbreak.

Information and lessons from these groups are shared with industry and government stakeholders, and recommendations will be made on how to expand this producer-led approach to surveillance. ■

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Foot-and-Mouth Disease Ready Project: research.csiro.au/fmd

Subscribe to the FMD stakeholder updates: research.csiro.au/fmd/subscribe-to-the-fmd-ready-stakeholder-update/

CSIRO senior scientist and veterinarian Dr Yiheyis Maru leads the producer-led surveillance sub-project as part of the FMD Ready Project. Image: CSIRO

RESEARCH IN REVIEW

PROJECT NAME
The Foot-and-Mouth Disease Ready Project

RESEARCH ORGANISATIONS
CSIRO, Charles Sturt University through the Graham Centre for Agricultural Innovation, Bureau of Meteorology and the Australian Department of Agriculture, supported by Animal Health Australia

FUNDING ORGANISATIONS
This project is supported by MLA through funding from the Australian Government Department of Agriculture as part of its Rural R&D for Profit program, and by producer levies from Australian FMD-susceptible livestock industries (cattle, sheep, goats and pigs) and Charles Sturt University, leveraging significant in-kind support from the research partners.

GOAL
To strengthen preparedness for an emergency animal disease outbreak and facilitate an earlier return to trade for Australia following control of such a disease, using FMD as a model.

BUDGET
$10.5 million

DURATION

July 2016 – June 2020

KEY FINDINGS TO DATE

- Vaccine strains in Australia's FMD vaccine bank will provide sufficient protection against strains circulating internationally.
- Better understanding of the challenges and opportunities for improving animal health surveillance in Australia, as well as creation of local partnerships involving all relevant stakeholders to achieve improved surveillance.
- Contribution by the jurisdictions in developing realistic outbreak scenarios and provision of information on essential response costs to update the Australian Animal Disease Spread Model.
- Determination of circumstances (temperature and humidity-dependent) in which FMD is spread by wind.

Biosecurity begins at home

Melinee and Rob Leather use biosecurity as a tool to protect their own business, as well as contribute to the integrity of the whole industry.

The Leathers' (pictured) measured approach to preventing disease, managing pest and weed threats, and practising animal welfare was recognised earlier this year when Melinee was awarded the Farm Biosecurity Producer of the Year as part of the Australian Biosecurity Awards.

"Our markets demand biosecurity – without it, nothing else really matters. Biosecurity affects the health of our livestock, our environment, even our people, and it's everyone's responsibility," Melinee said.

With their son Adam and his wife Chloe, Rob and Melinee run a 4,000-head Brahman-based herd to produce animals suitable for EU and organic markets, and Teys' Grasslands beef program.

Cattle are bred at 'Four Mile', North Burnett and finished at 'Barfield Station' near Banana. Barfield is also home to a small organic breeding operation.

Operating strict biosecurity measures is paramount to ensure movement of cattle between properties does not introduce pests or weeds, and to maintain their organic accreditation at Barfield.

This commitment to avoiding the spread of pests underscores the importance of the mindset that biosecurity begins at home – it's not solely concerned with safeguarding against the incursion of exotic diseases.

"It's essential to never underestimate the importance of biosecurity," Melinee said.

"We've consistently made it an everyday part of our business and have never had problems with diseases, pests or weeds being introduced onto our properties."

The Leathers' biosecurity strategies include:

- **Quarantine:** all incoming cattle spend a minimum 21 days in a quarantine paddock before entering the main grazing paddocks. This also helps cattle settle and adjust to the new environment, water and feed.
- **Surveillance:** cattle are checked daily during the quarantine period for any health issues.
- **Buying cattle:** purchased cattle must have animal health statements and up-to-date vaccinations, and bulls must also be backed by soundness tests.
- **Visitors:** visitor movement is limited. Visitors can bring vehicles as far as the house; only farm vehicles are allowed to move around the rest of the property.
- **Vehicle hygiene:** visiting vehicles, including contractors, must be cleaned and washed down before entry to the property. The Leathers also wash down their own vehicles when moving between properties.
- **Signage:** biosecurity signs on gates provide contact numbers for visitors to call before entering.

Biosecurity plans and animal health procedures (including using pain relief for husbandry practices) form part of staff induction and training, along with other workplace health and safety processes.

Melinee said establishing effective property biosecurity plans doesn't have to be time consuming.

She also uses Animal Health Australia's farm biosecurity plan template and relies on the FarmBiosecurity app to keep records.

Melinee said that, as well as making sense from farm biosecurity and animal health perspectives, their stringent policies support annual auditing to maintain Grazing Best Management Practice, EU, organic, Teys' Grasslands program and LPA accreditations. ■

LESSONS LEARNED

- Quarantine livestock coming onto your property.
- Request animal health statements when buying cattle.
- Surveillance is critical; take regular photos and notes to monitor paddocks.
- Consistency is vital to maintain good biosecurity.

SNAPSHOT:

Melinee and Rob Leather, Banana and North Burnett, Queensland

Area:
14,000ha across two properties

Enterprise:
Beef breeding and finishing

Livestock:
3,500–4,000 cattle (Brahman-based herd crossed with Limousin/Senepol/Belmont Red and Brangus)

Pasture:
Buffel grass, leucaena, native bluegrass, flinders, Rhodes grass and stylos

Soil:
Variable; includes undulating sandy loam, ironbark and blue-gum flats, black soil to softwood scrub

Rainfall:
1,000mm at North Burnett, 650mm at Banana

Melinee Leather
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Animal Health Australia Farm Biosecurity Plan: animalhealthaustralia.com.au and search 'Farm Biosecurity Plan'.

LPA On-Farm Biosecurity Plan Template: mla.com.au/integritytools resources

FarmBiosecurity app: farmbiosecurity.com.au/farmbiosecurity-app

Herd health 'more than a marketing tool'

Ann-Marie and Matt Collins run a tight ship at 'Kenmere Charolais', striving for industry best practice when it comes to biosecurity and animal health on their two NSW properties.

The Collinses are proud of the health rating of their cattle, with both herds maintaining Johne's Beef Assurance Score (J BAS) 7 status and negative pestivirus status.

Their animal health practices include:

- All cattle receive a 7-in-1 vaccine, as well as a Multimin injection and a drench.
- Females are given a pestivirus vaccination to continue best practice within the herd.
- All young bulls and heifers are tested for pestivirus.
- Bulls are sold with a guarantee they're J BAS 7, pestivirus-negative, semen tested and checked by the stud's vet for structural soundness.

Traceability

The Collinses keep detailed records for traceability. All stud and commercial cattle are tagged and recorded at birth, and all treatments and vaccinations are recorded on a herd health program using NLIS tag numbers.

Kenmere stud cattle have Estimated Breeding Values (EBVs) and are registered with the Charolais Society of Australia. They comply with the breed's code of conduct, which has provisions for herd health and husbandry.

A healthy herd is also important to meet commercial production targets.

The Collinses use their own bulls in their commercial operation to produce early-finishing calves – in a good season, they expect calves to reach 400kg by 10–11 months old.

Keeping the farm clean

To ensure they're protecting their herds and farms from pest, weed and disease incursions, all vehicles entering and leaving the properties must pass over a purpose-built wheel wash.

Ann-Marie and Matt are also creating buffer zones along any fence lines with neighbours and all boundary fences are electrified to deter cattle from going too close.

Biosecurity measures include:

1. Mandatory recording of all animals' histories while in their ownership.
2. Recording all on-farm movements of people, vehicles and equipment.
3. Delivering bulls to clients, only using a transport company (that complies with their vehicle hygiene requirements) to reduce the number of trucks entering the property.
4. New genetics are only purchased from herds that carry the same health status, and new cattle are retested as a precaution.
5. Any introduced cattle are quarantined for 21 days before joining other cattle.
6. All paddock treatments are recorded, imported feed is controlled and they only buy hay backed by feed quality tests.

Ann-Marie Collins, with Kenmere Charolais heifers.

7. Routine monitoring and management for weed and pest control, including weekly monitoring of fence lines. ■

LESSONS LEARNED

- Don't relax farm biosecurity, even in drought years.
- Ensure all staff are onboard with biosecurity policies.
- Work with veterinarians to establish and maintain animal health processes.
- Keep records for traceability and to demonstrate biosecurity and animal health practices.

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View a video of the Collinses' wheel-washer at: kenmerecharolais.com.au

SNAPSHOT: **Matt and Ann-Marie Collins,** Holbrook and Cookardinia, NSW

Area: 800ha

Enterprise: Stud and commercial Charolais cattle

Livestock: 300 stud breeders and 250 commercial breeders

Pasture: Permanent pasture including phalaris and lucerne; perennial pastures with annual ryegrass and clover; cereals

Soil: Alluvial creek loams and heavier loam and clay loam

Rainfall: 700mm

Feedbase future-proofing

"It's like putting pasture plants in a time machine and taking them to climate conditions predicted for the future," Professor Sally Power says of the Pastures and Climate Extremes (PACE) project she leads.

"We're looking at what the climate is likely to be later this century, which in southern and eastern Australia is generally warmer, with higher CO_2 concentrations, more heat waves and reduced spring and winter rainfall, and seeing how that affects pasture growth."

Keeping up the pace

Based at the University of Western Sydney's Hawkesbury Campus, the PACE project is funded by MLA Donor Company and Dairy Australia. It started at the end of 2016 with the construction of six large polytunnels to enable climate control. Infrared heat lamps are used to increase air temperature and rainfall is added in line with current and future rainfall scenarios.

The first phase of the project will run for three years.

Hot and dry

Not all experimental plots are being exposed to heat stress, but all are being 'droughted', with watering applied at a rate that reflects a 60% reduction in winter and spring rainfall. This is roughly equivalent to the climate experienced in many parts of NSW in 2018, so the scenario is entirely realistic and will provide useful, real-world information.

Research plots have been planted with a range of widely grown pasture grasses and legumes to enable testing of their response to drought and heat stress.

"By measuring a suite of physiological, morphological and biochemical traits, we hope to provide new insight into the mechanisms that determine sensitivity and resilience in climate extremes. This will help us identify traits that enable plants to cope with the more extreme conditions that are predicted to occur, more often and for longer," Sally said.

"Those characteristics will in turn help us identify other species and cultivars with those traits, so ultimately producers can choose ones more likely to perform well in future, more extreme climates."

Early indications

"Our two main climate treatments – warming (+3°C) and [winter/spring] drought – were initiated in 2018 and we're now seeing some interesting treatment effects," Sally said.

Early observations included:

- fescue productivity in late spring was particularly reduced in drought conditions, with an 80% decrease compared to control plots recorded in November 2018
- biserrula was the most strongly affected legume in spring 2018, with a 50% reduction in productivity in drought plots compared to a decrease of 33% for lucerne
- tropical C4 grasses maintained higher yields in drought conditions than their temperate counterparts, although yield reductions of up to 50% were still observed at the end of spring.

Recovery after drought is an important aspect of a species' resilience, so will be carefully monitored by the researchers.

"Big species differences in mortality at the end of the drought (e.g. 80% dead fescue, compared to 0% dead kangaroo grass) will undoubtedly influence recovery trajectories, and this is one of the things we are looking at during autumn," Sally said.

"We need to know how our treatments affect pasture persistence, how much of a legacy winter and spring drought has for summer growth, and what plant and microbial traits are associated with faster and/or more complete sward recovery, both in terms of productivity and nutrition."

Glasshouse trials

Along with the polytunnel trial plots, glasshouse experiments are being used to assess specific aspects of climate resilience.

"Importantly, glasshouse experiments will also allow us to evaluate the impact of elevated CO_2 concentrations (a key component of future climate predictions) on species' performance, and interactions between plants and their symbiotic microbes," Sally said.

"Our preliminary findings confirm that grasses grown with legumes are much more productive than grasses grown on their own and, in particular, that they benefit from elevated CO_2 when grown in combination with legumes, but not when grown alone."

The researchers believe this grass biomass increase was caused by the grasses accessing additional nitrogen fixed by the legume, which grew more in the presence of elevated CO_2, even though the grasses themselves did not appear to benefit directly from increased CO_2.

This increase in legume 'facilitation' of grass growth is an interesting mechanism that may contribute to enhanced performance of mixed pastures in future increased concentrations of atmospheric CO_2. ■

Professor Sally Power
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Above: Each polytunnel used for the PACE project houses sub-plots planted with fescue – either individual species or mixtures – to enable researchers to assess pasture performance under a predicted future climate scenario.

BUSINESS MANAGEMENT

Linking up data for success

SA producer Jane Kellock says it pays to monitor individual animal performance and keep a finger on the pulse of market and consumer needs.


Jane Kellock, Farrell Flat, SA

Jane's livestock consistently achieve 98% Meat Standards Australia (MSA) compliance and she credits MLA's Livestock Data Link (LDL) information-sharing platform for making it possible.

Launched in May 2015, LDL is an online portal that enables the flow of carcase information between certain processors and producers. The information allows producers to review individual carcase performance and assess it against market compliance specifications.

"Every time we send a mob of lambs, we always seem to get the information back on LDL quicker than we get it through our agents," Jane said.

"I can go in and see if we've had any carcases condemned and whether it's cost us anything. We can also find out the reasons why."

Jane consigns up to 5,000 head to MSA annually and believes LDL provides critical information every business should know.

"For me, the feedback is fantastic as it shows where we're meeting our targets for our meat and fat condition scores," Jane said.

"LDL can tell us exactly what it's costing us by not meeting those targets."

LDL also supports Jane to make informed management decisions by creating customised grids that map carcase performance against individual market specifications.

"I have a look at the grid to see if it's worth us keeping animals in a feedlot to get some more weight on them, or quit them a bit earlier," she said.

Animal health remains the most important aspect of the business and, through LDL, Jane is able to view all animal health conditions in consignments through data collected via the MLA-supported National Sheep Health Monitoring Project.

"If you've got sheep that have got grass seeds in them, then there's a cost associated with that," she said.

Processor perspective

Jane has supplied processor JBS Southern Bordertown for around three years. JBS Southern Bordertown was an early adopter of LDL in its wider farm assurance program. The on-farm quality assurance program guarantees the supply chain, from producer to processor, meets expected standards for food safety, animal welfare, quality assurance and traceability.

JBS Farm Assurance Supply Chain Manager Mark Inglis said LDL helps share a large amount of data with producers in a meaningful and beneficial way.

"We process around 60,000 lambs a week between two plants, Bordertown and Brooklyn, so we have huge amounts of data," Mark said.

"LDL allows us to get that data back to producers in a form they can actually understand and work with." ■

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Watch a video of Jane sharing her experience with LDL: mla.com.au/LDLKellock

SNAPSHOT: **Greg and Jane Kellock,** Farrell Flat, SA

Area: 2,500ha

Enterprise: Cropping, self-replacing Merino flock, lamb feedlot and cattle

Livestock: 4,500 Merinos, 2,000 crossbred lambs and 40 cattle

Pasture: Improved pastures and lucerne flats

Soil: Red loamy clay

Rainfall: 450mm

GENOMICS

Corriedales seek superior taste traits

University of Adelaide honours student Hannah Gordon and Professor Wayne Pitchford (seated) collecting data with seedstock producers Legh Jenkin, Brenton Lush, Peter Blackwood and John Manchester.

Corriedale ram breeders are one step closer to being able to use genomic tools to select for superior eating quality traits.

The Corriedale Eating Quality Genomics project, funded by MLA Donor Company (MDC) and the University of Adelaide, is the brainchild of a group of like-minded Corriedale seedstock producers from Tasmania, NSW, Victoria and SA.

The breeders formed the Performance Corriedale Group in 2006 (see story on page 29), with a shared focus on selecting for performance using LAMBPLAN and working together to promote their breed.

The group currently has eight members and works closely with Sheep Genetics staff to optimise their breeding programs.

Backing up 'good eating' claim

Group founding member Peter Blackwood said the genomics project grew out of a desire to quantify anecdotal accounts of the superior eating quality of Corriedales.

"As a group, we've always said Corriedale meat ate well and we've seen lambs do well in taste-test competitions," Peter said.

"But, as Corriedales are one of the minor breeds, we weren't going to get enough research through the MLA Resource Flock to allow us to benchmark our sires against the other breeds, or quantify our eating quality claims.

"At one of our group meetings we said 'how can we do this?' In six months we had a progeny trial up and running."

Dataset building

The progeny-testing trial is being led by Professor of Animal Breeding and Genetics, Wayne Pitchford, from the University of Adelaide.

The aim of the trial is to test the progeny of 45 Corriedale rams and 900 Corriedale ewes over three years, resulting in DNA testing of 900 lambs (genotyping) with their physical traits recorded (phenotyping).

"There have been minimal numbers of Corriedales included in industry-supported reference population flocks to date, with the eating quality traits of only 218 progeny measured so far," Wayne said.

"We aim to have about 2,000 records for a breed included in the multi-breed data set to be confident of the genomic predictions for that breed, so clearly the Corriedales had insufficient records for the genomic tests to be of value.

"In this project, we're aiming to add data from an extra 900 Corriedales – it won't quite take us to 2,000 but it will get us halfway towards it.

"We're also using purebred Corriedale progeny which will give us more information about genetic variation within the Corriedale breed."

Results so far

Progeny were slaughtered in April 2018 and 2019 and, according to Wayne, early results appear to back breeders' claims about eating quality.

"The carcases were highly regarded by the processor," Wayne said.

"They hung up well, displayed adequate muscle and none were over-fat.

"In terms of intramuscular fat (IMF) and shear force of the 2018 lambs, IMF was up to 10%, which was fantastic, and the majority of shear force results were in a range that was highly acceptable to a consumer."

Meat samples taken from the progeny processed in 2019 will be tested for IMF and shear force in the next few months.

A lesson in collaboration

Wayne said he was impressed by the cooperative culture of the Performance Corriedale Group.

"People are sharing semen between studs so there's good genetic linkage, which makes their data more valuable, and there's been tremendous support in supplying sires for the trial" he said.

Producers leading the way

The group's cooperative and proactive attitude had also contributed to MDC's support of the project, according to Caris Jones, MLA Project Manager – Genetics.

"This is one of the first projects we've seen in which producers are directly involved in creating their own reference population for eating quality traits," Caris said. ■

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Backing instinct with science

Victoria Archer chairs the Performance Corriedale Group and advocates for using genetic evaluation to drive on-farm productivity and profitability.

Victoria is the fourth Archer to hold the reins at the 102-year-old Quamby Plains Corriedale Stud, taking over from her father Richard in 2013.

Richard began recording the performance of the Quamby Plains flock and submitting data to LAMBPLAN in 2006, when he co-founded the Performance Corriedale Group.

Feedback spoke to Victoria about the group's eating quality genomics project.

What are you hoping the research will deliver for the Corriedale breed?

Our group believes one of the strengths of the Corriedale is the eating quality, but this is anecdotal, so we're hoping the trial will back up our belief. There's also been a concern that selecting for more growth or other maternal traits could cause us to lose our eating quality, so ensuring we keep that trait is another aim.

What about for your own flock?

We want to be known for producing an article the consumer wants – that is, Corriedale lambs and commercial ewes producing terminal lambs that are known for their eating quality.

Tell us about your flock's particular genetic challenges and what direction you would like to take your enterprise in.

Corriedales need to continue to lift productivity, which we're achieving. As a group, we've made great productivity gains in lambing percentage, growth, muscle and fat. However, we also need to balance the traits we're selecting for, which will be helped by the new LAMPBLAN index, Maternal Wool Production Plus (MWP+). MWP+ has a focus on improving wool quality and quantity while simultaneously improving reproduction and carcase traits.

Are there benefits to having genetics and science to back up your on-farm decisions and direction?

Since becoming involved within the Performance Corriedale Group, and recording data and using LAMBPLAN, we've seen significant gains in our flock, resulting in higher profitability.

We're operating a commercially viable sheep enterprise, producing both meat and wool on a consistent basis. We've seen great improvement in the ratio of number of lambs to ewes joined, and we've been able to turn off lambs more quickly, either directly off mum or off the crop.

We're achieving higher weaning weights and carcase weights and are meeting our target market specifications, which is supermarket supply lambs at 22–24kg.

We're conscious of the shape of our lambs, which we measure by scanning for muscle and fat, which helps in selection. ■

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Victoria Archer and her father Richard, from Quamby Plains Corriedale Stud at Hagley, Tasmania. Victoria chairs the Corriedale Performance Group, which Richard co-founded in 2006.
Photo: 'Tasmanian Country'

SNAPSHOT: **Victoria Archer,** Quamby Plains Corriedale Stud, Hagley, Tasmania

Area: 1,200ha

Enterprise: Corriedale stud, self-replacing commercial Corriedale flock, prime lambs, Poll Hereford stud, commercial Poll Hereford herd, cropping

Livestock: 450 stud ewes, 3,200 commercial ewes, 940 ewe weaners, 200 stud cows, 170 commercial cows

Pasture: Perennial ryegrass mix with white and red clover and sub-clover

Soil: Sandy loam

Rainfall: 680mm

FEEDBASE

The facts on flushing

Providing ewes with nutritional supplementation prior to joining – known as flushing – can improve lambing percentages through an increase in ovulation rate. While research has shown this to be the case, how it plays out on farm using typical grazing management and available feed is less well known.

MLA worked with Agriculture Victoria to establish 32 Producer Demonstration Sites to investigate the impact of short and long-term flushing with green feed or lupins, compared to ewes grazing dry pasture.

Trials were conducted between 2013 and 2017 on farms in Victoria, NSW and SA. More than 22,000 crossbred, composite and Merino ewes were included in the study and were joined between late December and March for autumn/winter lambing.

Gervaise Gaunt, Agriculture Victoria, said an important component of the project was that it used whatever green feed (lucerne, rape, millet or green pasture) was available on farm. The benefits were clear at most sites.

"Short-term flushing with green feed provides a strong likelihood of achieving impressive reproductive benefits compared to ewes grazing dry pasture," Gervaise said.

"We found increases of up to 33 additional lambs scanned per 100 ewes joined, but more generally in the range of 10–30 additional lambs scanned per 100 ewes joined.

"The ewes only needed to be on green feed (minimum of 350kg/DM/ha) for a week before joining, and a week into joining, for the benefits to show up.

"The largest influence on increasing reproductive efficiency from short or long-term flushing on green fed was through having more ewes producing twin foetuses.

"Overall, there were more pregnant ewes at some sites, but this was less of an influence on reproductive efficiency."

While a short flush (two weeks total) was found to be adequate to increase reproductive rates, Gervaise said conception and reproductive rates were not negatively affected when ewes grazed lucerne for the entire joining period (long flush).

"Further work would be needed to determine when grazing lucerne throughout joining is a feasible and economic option," she said.

"However, grazing lucerne should be avoided if fungal disease is present or if the lucerne is stressed by aphid attack, as it can produce a chemical called coumestan (a type of phytoestrogen) that can have an impact on ewe fertility."

Gervaise said the reproductive response to increased nutrition from green feed appeared to be independent of live weight at joining.

"It appears to be similarly independent of condition score," she said.

"The opportunity cost of flushing ewes on green feed versus finishing lambs or growing out weaners is a factor that needs to be considered before joining. For example, if there's a lower available feedbase due to seasonal conditions, then it could be more profitable to flush ewes than finish lambs."

Lupins were also shown to be effective for flushing ewes and increasing reproduction rates, but lupins can be difficult to obtain in some areas and tend to be less cost effective compared to available green feed. ■

Short-term flushing of ewes using any green feed can significantly increase reproductive rates by increasing the number of twins born.
Photo: Gervaise Gaunt

RESEARCH IN REVIEW

PROJECT NAME
Participatory research evaluating and demonstrating the impact of green feed (particularly lucerne) on sheep conception

RESEARCH ORGANISATIONS
Agriculture Victoria, MLA

FUNDING ORGANISATIONS
Agriculture Victoria, MLA

GOAL
To demonstrate and validate scientific research investigating the impact of short and long-term flushing with green feed (including lucerne) using grazing management 'typical' to that farm

DURATION
2013–2017

Gervaise Gaunt
Agriculture Victoria
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E: gervaise.gaunt@ecodev.vic.gov.au

mla.com.au/greenflush

agriculture.vic.gov.au and search 'diseases of lucerne'

A quick flush pays off

To his surprise, lamb producer Andrew Hunter (pictured) found that a short flush on green feed was enough to increase reproductive rates in his maternal composite ewes.

"The two-week flush was just as effective as the six-week flush," Andrew said.

"That's a good way of conserving the lucerne for other stock.

"Using these principles, we're gradually picking up our fertility through tighter management. It means we don't throw money around willy-nilly. We know the things that are going to deliver benefits to us. If we can drive fertility by management, that's a good thing."

Andrew's property in the south-east Riverina was one of 32 Producer Demonstration Sites in a project run by MLA and Agriculture Victoria that investigated the practicalities of short and long-term flushing (see story opposite). He said he definitely learnt some useful lessons during the project.

"It was surprising how little green feed needed to be in the paddock to make a difference to the ewes," Andrew said.

"We ran the ewes through a lucerne paddock that had already been eaten over by the lambs. A bit of leaf and stalk was all that was left but the flushing effect seemed to work even on that."

The broad results from the project showed that available feed of 350kg/DM/ha minimum for seven days before joining and seven days into joining was enough to provide a reproductive benefit.

Andrew said knowing the benefits of a short-term flush provides him with greater options in his enterprise, given that he generally runs a fairly high stocking rate. Short-term flushing will be a useful strategic tool, especially in years when green feed is in short supply. Due to the drought, he's sent ewes off on agistment, which will restrict his ability to flush them this year.

"We manage the ewes as individuals rather than on mob averages," he said.

"We simply split off lighter animals after condition scoring."

The heavier ewes (condition score 3.2 and above) will not be flushed at all, because they'll perform well regardless of flushing.

"Then I'll use a short flush to increase performance of the tail end of the ewes," Andrew said.

"That'll enable me to prioritise the good green feed for finishing lambs, giving better overall returns across the farm. If green feed was really scarce, I'd use lupins to flush the lighter ewes.

"During the trials, we set ourselves up so the paddocks with the green feed were available. It takes a bit of organising, but it's worth it. The fact that two weeks' flushing is as effective as six weeks makes it easier to manage.

"The real profit driver in our enterprise is fertility." ■

SNAPSHOT:

Andrew and Jane Hunter,
Yerong Creek, NSW

Area:
1,200ha

Enterprise:
Prime lamb and cropping (10–15%)

Livestock:
Maternal composites (4,500 ewes joined)

Pasture:
Lucerne on better country, some phalaris, balance is sub-clover with annual grasses, some native grasses

Soil:
Red-brown loams, varying to granite

Rainfall:
575mm long-term average

Andrew Hunter
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LESSONS LEARNED

- Flushing on green feed before and into joining can increase reproductive rates.
- A two-week flush is as effective as a six-week flush.
- Feed on offer of 350kg/DM/ha is enough to provide a benefit.

A goat pasture paradise

Establishing resilient pastures to support their Boer goat business is a key priority for Barossa Valley producers Owen and Tracy Bonython.

An MLA-funded Producer Demonstration Sites (PDS) couldn't have come at a better time, as it gave them a first-hand look at grazing management strategies to suit their 30ha farm at Ebenezer, where they run 100 breeding does.

As part of the trial, run by Barossa Improved Grazing Group (BIGG), Tracy (pictured) and Owen worked one-on-one with Rehn Freebairn from PDS-supported Pasture Genetics to develop a customised pasture mix.

They were seeking a pasture to fill the summer feed gap and help meet turn-off targets of 40–50kg for weaners, which are sold direct to Barossa Valley and Adelaide restaurants.

"Our goal is to turn off animals all year-round, so it's extremely important to have quality feed consistently available to our animals," Tracy said.

"We're still quite new with our goat business so we haven't got a large amount of information on pasture management, so the PDS was the start of improving our grazing options for our goats."

Tracy and Owen planted a pasture mix that included GTL 60 Lucerne, summer-active perennial grasses Australis phalaris, Convoy cocksfoot and Valley Diploid perennial ryegrass. It also included a small percentage of Balance chicory which Tracy had heard was a favourite of goats. Although summer active, these varieties also respond in winter and spring.

The pasture was sown on 28 May 2018 on 2.8ha at a rate of 25kg/ha.

Despite the dry winter and spring (with just 203mm of rain in the growing season) it had more than 3,000kg of dry matter per hectare (kg/DM/ha) at the end of September.

Tracy used temporary electric fencing to divide the paddock into two smaller areas. She baled 1.1ha for hay, producing 1.5 tonnes of hay.

This high-quality hay provided an extra 15 days' supplementary feed for 75 weaner goats through the summer.

Six days after baling, the pasture had 2,400kg/DM/ha. It contained a lot of chicory which was short enough to be missed by the mower at cutting.

The remaining 1.7ha was split into two with temporary electric fencing and strategically grazed.

Goats were slowly introduced onto the pasture with several half-days of grazing, then 75 head grazed 0.7ha at a stocking pressure of 107 DSE/ha for 11 days.

This high stocking pressure ensured the goats grazed evenly and quickly, resulting in less overgrazing of the establishing pasture. They utilised 2,475kg/DM/ha, with a residual of 1,000kg/DM/ha.

The second section was grazed for 12 days, then the pasture was rested to allow the perennial grasses, lucerne and chicory to recover and set seed prior to further grazing.

"Considering the low rainfall received in 2018, we were pleased with the initial growth we saw and the length of time that the animals were able to graze for," Tracy said.

"We're grateful that we've been able to work with BIGG on this pasture site and plan to continue trialling different pasture options to find the best options for our goat herd. We definitely saw the goats favour the chicory in the mix and so we would like to explore this further." ■

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bonchevon.com.au

The BIGG story

The Barossa Improved Grazing Group (BIGG) is a network of five producer groups in the Barossa and eastern Mount Lofty Ranges regions of SA which aims to deliver greater productivity and better natural resource management outcomes for its 300 members.

BIGG technical facilitator Georgie Keynes said the group developed three major sites at Koonunga, Keyneton and Mt Pleasant–Eden Valley. Different pasture varieties and blends were sown and measured at each of the sites from 2016 to 2018 to determine how they could be used to fill seasonal feed gaps.

Twelve minor sites were developed on local farms in 2017 and 2018 to test the successful pasture blends sown on the major sites.

Pasture strategies across the PDS sites included:

- extending the growing season with a mix of early and late varieties
- establishing lucerne to provide year-round feed opportunities
- increasing production by combining ryegrass with forage cereals
- using native pastures at critical times of the production calendar (such as lambing)
- using stored soil moisture to grow summer forage crops
- running high stocking rates
- producing silage in a rotational grazing system.

BUSINESS MANAGEMENT

Agents for change

Peter Gordon, Project Manager (left) and Cameron Wilson, Livestock Manager QLD, at the Northern Territory Cattlemen's Association Conference in Darwin.
Photo: Fossil Photos

Producers often turn to agents when they need help with decision-making. The Elders Innovation Project, funded by MLA Donor Company, is helping to boost the benefits of these agent/producer relationships and break down barriers to adoption of northern beef R&D.

Project Manager Peter Gordon, Elders Australia, said the project was based on building strong relationships with producers through education and involvement.

"Elders saw the need for change in the way producers and agents operate together," Peter said.

"I envisage this project would continue to operate beyond the three years.

"In that time, we'll have built up learning and tools, and the skills to help develop and retain people within the livestock business."

Ted Parish, MLA Adoption Manager – Northern Beef, said the project focuses on building the capability and capacity of Elders livestock staff to provide high-quality technical advice to their northern clients, based on MLA research findings.

"The project uses the Elders network to increase uptake of MLA research and development outcomes. This will ultimately increase the profitability, productivity and sustainability of the red meat industry," Ted said.

The Elders Innovation Project is initially focused on existing R&D that's not widely adopted.

Ted said this included research on the benefits of:

- using leucaena to increase live weight gain and fill the winter feed gap
- phosphorous supplementation
- using Estimated Breeding Values (EBVs) to achieve breeding objectives.

Case studies featuring producers who've implemented these research findings are being developed. Check out a couple of the early case studies on the following pages. ■

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RESEARCH IN REVIEW

PROJECT NAME
Elders Innovation Project

RESEARCH ORGANISATIONS
Elders and MLA Donor Company (MDC)

FUNDING ORGANISATIONS
Elders and MDC

GOAL
Innovation capability building and greater adoption of MLA research

DURATION
May 2018 – March 2021

KEY FINDINGS TO DATE
Through consultation with the Elders branch network, supported by MLA and key account managers, several livestock enterprises have been identified to develop case studies and innovation concept needs for their local regions and individual businesses.

INFRASTRUCTURE

The fine art of fencing

Good fencing and well-managed watering points enable Brent and Teresa Gadsby to effectively control stock movement using rotational grazing practices.

The Elders Innovation Project (see previous story) will use Brent and Teresa's experience to demonstrate the benefits of rotational grazing and good water management in the northern cattle industry.

Don't exclude good fences

Brent said building an exclusion fence around the perimeter of the home property in 2011 shifted their pasture management onto the right track. He describes the fence as being a typical exclusion fence, with 16 horizontal wires and 15cm between uprights, 1.6m tall with a barb on top and a skirt at the bottom. The second property now also has an exclusion fence around it.

About 32km of the Gadsbys' boundary forms part of the Morven cluster fence, which encloses almost 400,000ha.

Brent said before the exclusion fencing was erected, "every time we got a shower of rain, the roos would just mob us".

"That would effectively put us into drought conditions 6–8 months before we otherwise would have been," he said.

"The feed would just run out. Now, after every shower of rain, we get a response in the grass.

"We try to look after the grass, to keep a bit of cover at all times.

"We work on rotating stock through the paddocks over the year. That way each paddock gets a good rest in between. We generally don't mix the stock – they run as separate mobs.

"The cattle go into a paddock first when the grass is longer. The sheep follow. The goats are mainly kept in the rougher paddocks because they like to browse. They like the mulga and the ironwood. We move them on before they eat it out too much."

Water's domino effect

Aside from the strong perimeter fence, the Gadsbys have invested in watering points that enable them to control stock access.

"All our dams are fenced off," Brent said.

"We have three sub-artesian bores with solar pumps all connected to paddock troughs with poly pipe. When we shift the stock from those paddocks, we empty the trough and turn the water off."

Brent said this attention to reducing watering points available at any one time has been instrumental in controlling feral animal and kangaroo numbers.

"Sorting out the water cleaned up the feral pigs," he said.

"They don't go where there isn't any water. It's also helped with controlling other feral animals and roos. It means

Brent and Teresa Gadsby have turned goats from feral pest to lucrative business asset by using rotational grazing and good water source management.
Photo: Ashlee Gadsby

when we take the stock out of a paddock, there's nothing grazing it, so the grass and shrubs have a chance to recover."

No pressure

When feed is scarce, Brent and Teresa destock their property to control grazing pressure.

"We had one decent shower at the end of summer but haven't had much rain other than that for months, so we're selling stock off now," Brent said.

The first stock to be sold are the cattle – steers go first, then any dry heifers – followed by the Dorpers. The Gadsbys' intention is to reduce numbers by selling the animals while they're in good condition.

The goats began as a feral problem but by controlling numbers, managing their grazing and introducing good genetics by introducing Boer billies, they've become a lucrative part of the enterprise. The goats are sold direct to meat processors at nearby Charleville, mainly for export. Brent said they have to turn them off quickly to prevent numbers building up too much.

"At present, the goats are the most valuable animal we have – they get up to $7.10 a kilo – and they're very fast breeders," he said. ■

Brent Gadsby
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LESSONS LEARNED

- Exclusion fencing enabled control of animal numbers.
- Removing water supplies from unstocked paddocks dramatically reduced feral and kangaroo numbers.
- Destocking before feed runs out enabled stock to be sold at higher prices while reducing pressure on pasture.

SNAPSHOT:

Brent and Teresa Gadsby,
Morven, Queensland

Area:
Two properties – 7,700ha + 5,500ha

Enterprise:
Cattle, sheep and goats

Livestock:
450 Brangus breeding cows,
800 Dorper ewes, 2,800 nannies

Pasture:
Buffel grass and native grasses, mulga

Soil:
Red loam

Rainfall:
500mm

Feed that keeps on giving

Steve Williams said there's no such thing as a magic pudding in agriculture, but leucaena is as close to it as he's ever seen.

The Williamses' leucaena has been featured in MLA-sponsored field days, but now their experience will be made available to other producers through the Elders Innovation Project, which is co-funded by Elders and MLA Donor Company (see story on page 33).

One focus of the project is to provide information and extension about research and development that hasn't been widely adopted, such as leucaena, using Elders agents and MLA.

Know your type

The Williamses buy in steers at 300kg and sell them to feedlots at 450kg. Steve seeks a 'type' of cattle, rather than a particular breed, and ends up with a lot of black cattle, although they're invariably not pure Angus.

Using leucaena, they can fatten cattle at a rate of 1kg/day for about 35 weeks of the year.

Capitalise on cattle behaviour

The farm has eight 40ha leucaena paddocks, set up in 'cells' of two or three around a central watering point connected to the cattle yards by a laneway system.

"We don't have any water in the leucaena paddocks," Steve said.

"The cattle come out to water."

Steve capitalises on this behaviour when he wants to move the cattle on to a new paddock; he simply shuts the gate in the grazed paddock and opens the gate to the new paddock.

Similarly, if he wants to bring the cattle in to the yards, he waits until they come out of the leucaena paddocks to water.

Steve ran a cow-and-calf pastoral enterprise in western Queensland before moving to the Darling Downs 15 years ago.

"In a good season, 100 steers will eat out a 40ha leucaena paddock in about 20–30 days," he said.

"By the time they're through the third one, they can go back into the first paddock, which has had about two months' rest.

"It helps that we have no debt."

Doing it right the first time

It cost the Williamses about $500/ha to establish leucaena. Steve recommended planting at 40 seeds/m with a double disc plough.

The leucaena is planted in double rows at 1m spacings and a 6m wide inter-row. The inter-row pasture of bambatsi panic, Rhodes grass and the native creeping bluegrass is an important component of the feedbase.

"If I was starting from scratch now, I'd put 10m between the rows to give more inter-row pasture," Steve said.

"With the 6m inter-row, I run out of grass but I don't ever run out of leucaena.

"Leucaena will get frosted, so you need a winter forage crop of some kind to maintain this weight gain.

"In a dry time leucaena comes into its own. In a good season you can fatten cattle on any pasture. By lowering your stocking rate you will still have weight gains of 1kg/day. You therefore have more control when it's dry and the pressure's on." ■

Leucaena plays a crucial role in Stephen and Christine Williams' cattle backgrounding enterprise.

SNAPSHOT:

Stephen and Christine Williams, Dalby, Queensland

Area:
753ha

Enterprise:
Cattle backgrounding (buy steers in at 300kg – sell at 450kg)

Livestock:
Turn off: 600–800 head/year

Pasture:
320ha leucaena and 160ha forage oats

Soil:
Predominantly Darling Downs black soil; varies from clay to sandy

Rainfall:
640mm

Stephen Williams
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LESSONS LEARNED

- Steers can gain 1kg/day for 35 weeks of the year on leucaena.
- Establishing leucaena takes time and effort.
- Ensure good inter-row pasture is established and maintained.
- It's important to manage leucaena's vigorous growth to get the most out of the plant.

SUPPLY CHAIN

DELIVERING VALUE

TECHNOLOGY

Linking carcase measurement and biosecurity

Adaptations to medical and aviation scanning technology to advance objective carcase measurement are now also helping to detect biosecurity risks.

In a project looking at X-ray technologies to identify meat, fruit, vegetable and soil biosecurity risks, MLA is working alongside aviation security screening leaders Rapiscan® Systems to develop a border operations evaluation program with the Australian and New Zealand governments.

According to MLA General Manager for Research, Development, Innovation & MDC, Sean Starling, the project grew from the extensive objective measurement program aimed at building better management systems throughout the value chain.

"We've looked to medical CT scanners to evaluate or calibrate how other sensors, such as DEXA (dual-energy X-ray absorptiometry), could benefit our industry," Sean said.

"Ten years ago, we started engaging with medical CT equipment developers. Their machines weren't fit-for-purpose for our industry."

This meant they weren't large enough for a carcase to pass through and product couldn't go through at a fast enough rate.

"We wanted to evolve this gear to suit our supply chain. So, we looked around the world. The aviation security sector was also doing this work with continuous baggage CT scanning. Some machines were scanning 1,800 bags an hour. Our fastest sheep and beef plants need the equivalent of 1,400 bags an hour."

Three years ago, MLA reached out to US-based Rapiscan® Systems, whose technology centred on finding explosives in bags.

Rapiscan® showed an interest in expanding into food scanning and agreed to co-invest in a program to evolve aviation CT for the livestock industry.

The first of three systems developed is now undertaking evaluation work in Australia, with meat samples being analysed offline.

"We're hoping it'll measure lean meat yield, eating quality and animal wellbeing and health," Sean said.

MLA is now also reviewing two new co-investment submissions from Rapiscan® Systems, looking to move the scanning technology to live animals – one for beef and one for small stock. This would allow the technology to be applied on farm and in feedlots. ■

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This graphically-modified image shows how scanning technology could be used in future to objectively measure live animals.

TECHNOLOGY

ENERGY DECISIONS MADE EASY

A new online tool is making it easier for red meat producers to calculate energy costs and weigh up the benefits of renewable, proven technologies for their businesses.

The Energy Cost Saver, available at myenergy.tech, has been developed by engineering firm All Energy Pty Ltd with funding from MLA Donor Company, and aims to make producers more 'energy literate'.

MLA's Manager of Supply Chain Sustainability Innovation, Doug McNicholl, said the tool is about saving operating costs for producers, and delivering improved energy security and reduced emissions. This ties in with the red meat industry's goal to be carbon neutral by 2030.

"Beef and lamb production, lot feeding, and red meat processing, excluding the cold chain, spends an estimated $1.6 billion/year on energy," Doug said.

"Energy prices are a significant and rising cost for all operations along the supply chain – and having the time and know-how to weigh up options like solar pumping or electric farm vehicles can be a challenge.

"Using the Energy Cost Saver takes the guesswork out of these business decisions."

Assessing your options

The free-to-use tool has pre-loaded scenarios for typical operations presented as the default, so producers can enter no data at all and get a feel for the cost outlay and payback for the most viable options.

Alternatively, producers can enter data for their specific facility or farm, such as current pump kilowatt ratings and hours of pumping per day, and current power source or cost per kilowatt hour.

For farm vehicles, producers can enter kilometres travelled per day, the vehicle type and fuel price in dollars per litre to determine energy efficiencies.

Knowledge gap

All Energy Principal Engineer, Gareth Forde, said costs are more extreme in rural areas.

"One aim of the tool is for people to become more 'energy literate'. By that I mean, you probably know how many dollars you pay per litre of fuel, but how much are you paying for your power in cents per kWh?" Gareth said.

"Do you also know your additional access and demand charges for grid power or the maintenance costs for diesel generators? For feedlots and processors, do you know how many dollars you are paying per gigajoule (GJ) for boiler fuel and what the cheaper options are? The myenergy.tech website gives you a starting point for this information."

Gareth said Australian liquid fuel prices, such as petrol, diesel, LPG and LNG, are tied to global markets and have an unpredictable but increasing trend.

"Currently more than 90% of liquid fuel is imported. As soon as 2030, Australia could be effectively importing all of its petrol, diesel and LPG," he said.

"Relying on imported fuels and energy sources exposed to international markets is an inherent business continuity risk.

"The Energy Cost Saver tool provides options for de-coupling the red meat supply chain from imported and internationally traded fuels." ■

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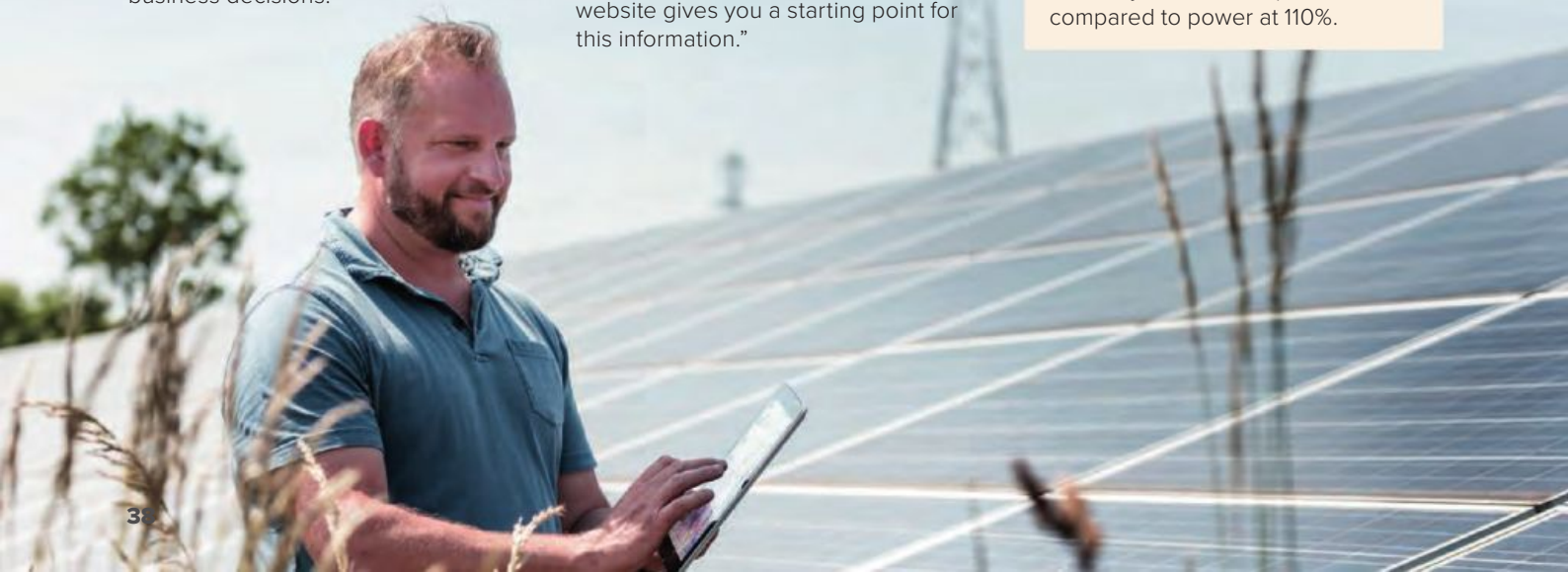
myenergy.tech

Did you know?

Australian Bureau of Statistics data shows that in the past two years, power prices are up 14.5%, with natural gas up 11.2%, against an economy-wide Consumer Price Index (CPI) increase of 3.7%. Power went up 3.9 times the rate of CPI and this is not an anomaly: over 10 years, CPI is up 23% compared to power at 110%.



CAPACITY BUILDING

ICMJ turns 30

One of the red meat industry's most successful capacity-building programs, the Australian Intercollegiate Meat Judging Association (ICMJ), celebrated 30 years in July.

The 2019 Australian ICMJ workshop and competition, held at Charles Sturt University, Wagga Wagga, NSW, was supported by MLA and the Australian Meat Processor Corporation (AMPC).

In a demonstration of its ongoing success, the event was the biggest to date, with more than 150 students from 12 Australian institutions and four international teams attending, as well as some 40 coaches.

Looking back

The program was first established in Australia after NSW Southern Tablelands beef producer, John Carter, saw the enormous contribution the program made to the US industry while on his 1983 Churchill Fellowship in meat marketing.

When he became Chairman of the NSW Meat Industry Authority, John gathered support to establish the program in Australia.

As the inaugural Australian ICMJ President, John said he was very proud of what the program had achieved.

"When I did the Churchill Fellowship and came across the ICMJ program at Greeley in the US, there were only two people in the whole of the processing sector in Australia with tertiary degrees, and our understanding of meat quality was pretty much non-existent at the time," he said.

"I find it very rewarding that we've got a lot of our graduates working in the industry now, and that there are students from each year that put their hands up to come back as coaches, run the committee and keep it going."

Model of success

The program boasts more than 2,500 alumni, including current ICMJ President and UNE Meat Science Senior Lecturer, Dr Peter McGilchrist.

Peter said what started as a one-day competition in 1990 has now grown exponentially to become a five-day event in southern Australia and a three-day event in northern Australia.

"The value of ICMJ is not just around meat science training and education – it's an opportunity to really hold the red meat industry up in lights and say to undergraduate students, 'this is a great industry to work in'," he said.

"The ICMJ program works. A 2016 survey of alumni found many were now working throughout the red meat supply chain, with just over 20% working in the processing sector alone.

"Access, insights and opportunities is what we also stand for. Australian undergraduates, sadly, can get through a whole agricultural degree and never see inside a meat processor. This program is providing students the opportunity to get a first-hand look at how technologically advanced the industry is."

Invaluable experience

MLA Managing Director Jason Strong, who has been involved in the Australian ICMJ since its second year and was a team coach for many years, said ICMJ provided invaluable experience and connections for participants.

"Of all the different things I've done over the years, from agri-politics to commercial and international roles, ICMJ, both here and in the US, has been by far the biggest contributor to the breadth of my network," Jason said.

"ICMJ is one of our most successful industry events, particularly with the connection between industry and training organisations."

Jason said the introduction of Meat Standards Australia (MSA) was a critical tipping point in ICMJ.

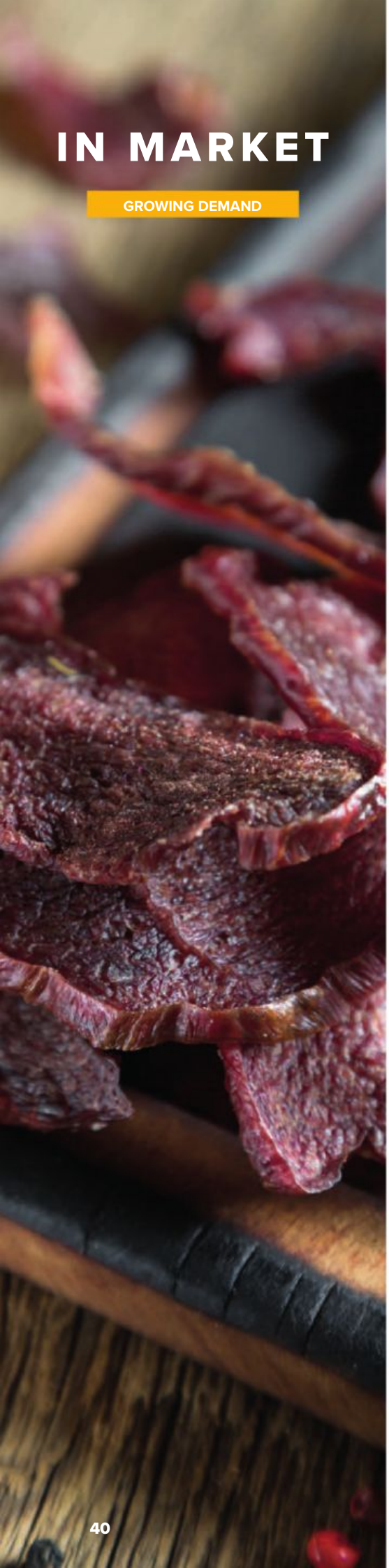
"When ICMJ first started, it was looking at how to get people in tertiary education more involved in the meat industry and then when MSA came along, that also provided a career path for meat judging students, and meat judging provided a source of potential employees for MSA as well," he said.

"There was a fundamental shift when we moved away from just having it as a competition, to having it as a training program and a competition. That was also driven by the dominance in the competition falling to a couple of individual institutions that were much better resourced and had programs with a meat component."

Furthering its reach, ICMJ expanded this year to include an inaugural Northern Conference in Rockhampton in April, sponsored by CQUniversity and Teys Australia. ■

The 2019 Australian ICMJ team which toured the US in January this year: Nikita Ellison, University of Queensland; Lauren Smith, Murdoch University; Jessie Phillips, Charles Sturt University; Jess Davis, Sydney University; and Felicity Brumpton, University of New England.

icmj.com.au



Revolutionary **snacking**

Fancy sharing a bag of meat crisps with friends, washed down by a beef collagen drink? As eating patterns change, MLA is using consumer insights and innovations to move red meat beyond the traditional 'three main meals' to tap into the on-the-go snacking revolution.

Michael Lee, MLA's Manager of High Value Food Frontiers, said snacks were no longer just an occasional treat.

"Many consumers now make snacks their primary food choice, eating on-the-go or grazing as part of their daily routines," he said.

MLA's 2Morrow's Food program uses market insights, in collaboration with global food trend experts, technology developers and nutritionists, to keep red meat a step ahead of consumer trends. With snack products covered by different tariffs and quotas than raw meat, the snacking revolution could see new export markets open up.

"Snack products using Australian red meat are uniquely positioned to leverage our 'clean, green' reputation, traceability systems and freedom from major endemic livestock diseases to address consumers' food safety and security concerns," Michael said.

"With snack products typically selling at $100–$250/kg, this category represents a great opportunity for adding value to our industry."

The definition of snacking is changing. Snacks are viewed as portable nutrition and people expect certain benefits in line with global demand for food with health and wellness attributes.

However, while the benefits of lean red meat as a natural source of protein, zinc and iron are clear, the challenge is more than just delivering bite-sized on-the-go snacks which suit busy lifestyles.

Today's consumer wants their personalised nutritional needs met. They want food options and portion sizes to match their lifestyles while managing diseases, allergies or intolerances and they want all this backed up by assurances on food safety, animal welfare and sustainability.

Michael said 'traditional' global snack manufacturers were recognising the potential of including red meat in snacks, as reflected in the purchase in recent years of US meat snack maker EPIC Provisions by General Mills and gourmet jerky brand KRAVE by chocolate company Hershey. ■

Michael Lee
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mla.com.au/2morrowsfood

Who wants a snack?

Here are some insights revealed by MLA research:

- Purchases are based on actual or perceived nutritional benefits.
- Consumers want information about their food and the stories behind it. They are willing to pay more for provenance details.
- Crunchy, natural, protein-rich alternatives are preferred over sweet, high-carbohydrate, highly processed snacks.
- Snacking extends to social occasions, outdoor activities, kids' lunch boxes and desk-based snacking (often replacing a main meal).
- The fastest-growing consumer segment is the 'active ageing' group – people aged over 60 who have a high net worth and spending power, and want to maintain physical, mental and social wellbeing.

JIM'S JERKY SINKS TEETH INTO NEW MARKETS

The man behind the brand: Jim Tanner with his daughter, Jim's Jerky CEO Emily Pullen.
Photo: Wayne Davis

Chips, lollies and chocolate – move over. A home-grown beef jerky company is staking a claim in the rise of snacking.

Queensland-based Jim's Jerky partnered with MLA Donor Company (MDC) to test the market for red meat snack foods in Japan and South-East Asia, where consumers already have an appetite for dried fish, pork and duck.

Jim's Jerky is the brainchild of Jim and Cathie Tanner, central Queensland cattle producers who became beef value-adders when they purchased a Darling Downs butcher shop in 2004.

The previous owner made biltong (a South African dried beef snack with a higher moisture content than traditional jerky) and when Jim tasted it, he had a revelation.

It was the first time he'd tried a jerky that captured the taste and quality of beef, unlike other products which he felt were over-processed.

Jim and Cathie's daughter and company Chief Executive Officer Emily Pullen recalls how important this was to her parents.

"They bred Droughtmaster cattle for 20 years and were committed to producing quality beef, so Jim saw the opportunity to continue working with red meat in a way that maintained the integrity of a great raw product," she said.

Fast forward 15 years, and Jim's Jerky has grown from producing just 12kg of beef jerky in the first month to selling jerky, biltong and beerstick (dried sausage) beyond its own retail and online outlets. The products have been sold in Woolworths in Queensland from 2017 as well as national independent grocery, liquor, convenience and fuel outlets.

"Snack foods tend to be an impulse buy, such as when you're paying for fuel and you see a packet of chips and think 'I feel like that'," Emily said.

"However, consumers are becoming more discerning and want alternatives to sugary, high-carbohydrate snacks – they want healthy, tasty products backed by quality and provenance."

This is where a premium Australian red meat product can tick the boxes, domestically and internationally.

"Australia has the world's best red meat production systems, and we aim to let the core ingredient – beef – shine. We only use quality topside and don't cheapen it with sugar and preservatives," Emily said.

Red meat is also well positioned to take advantage of the growing protein snack market and deliver on consumers' health and wellbeing requirements.

"A red meat product like beef jerky is a 'better-for-you' snack, as it contains the essential nutrients of protein, iron and zinc," Emily said.

Market opportunity

The MDC co-funded project revealed the Asian snacking market is established and consumers are familiar with meat-based snacks. Countries such as Japan are already a key market for Australian beef, and consumers recognise Aussie beef as a quality product backed by safe production systems.

These two factors combine to create an opportunity for protein snacks such as beef jerky, as well as new red meat products – something Jim's Jerky is now exploring.

"This project looked at new ways for consumers to engage with beef and reinforced that beef isn't a one-trick pony – it's a great product that can be eaten in many ways," Emily said.

MLA's Japan team also helped Jim's Jerky connect with a Japanese company to map the sensory profiles (umami, bitterness, saltiness, sourness, sweetness) of current Asian meat snacks and Jim's Jerky's concept product.

The research showed red meat must compete with all snack foods (not just other proteins), as it's increasingly common for consumers to eat by occasion, not by product. Therefore, innovative Australian red meat snacks are needed to grow the overall market share of red meat.

Emily is the 2019 Beef Industry Rising Champion of Cattle Council of Australia (CCA), a role that includes the chance to sit in on CCA's marketing, market access and trade committee. She said this opportunity builds on her experience with beef production and value-adding by giving her a better understanding of industry policy. ■

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A new waste use to get tails wagging

Powdered beef blood to sprinkle on pet food for a protein boost and snack treats for furry friends are among the innovations of a freeze-drying company which has joined forces with MLA Donor Company (MDC) to create new markets for red meat by-products.

Freeze Dry Industries, based in Queensland, is using MDC co-funding to develop the potential of freeze-drying blood, hide trim and other lower-value red meat products.

It's a process already used to turn fruit, vegetables, meat and even camel milk into ingredients for pet food, consumer food, pharmaceuticals and cosmetics.

Freeze Dry Industries Chief Executive Officer Michael Buckley said if it sounded a bit like space food, it's because it was the same technology used by NASA for their astronauts.

"The original raw material is frozen to below -30^{0}C and then slowly dried at low temperatures (45–50^{0}C) to avoid damage. The end result is a dry solid product, typically used for dried slices of fruit or powders," he said.

Freeze drying preserves the flavour and nutritional properties of the original material, but creates a product which is light weight and can be stored at ambient temperatures in airtight packaging for long periods. The process turns fresh perishables into non-perishable products and saves storage, transport and freezing costs.

"We can see some great opportunities for this technology and red meat," he said.

For example, Freeze Dry Industries trialled processing fresh blood sourced from a local abattoir, with 1,000L of blood producing 200kg of highly functional powder.

"Blood is traditionally used in low-value blood and bone products but we can significantly transform it into higher value by turning it into a 97% protein powder that could be used, for example, to deliver targeted nutrition to protein-deficient communities or into markets where there are high premiums for natural protein-enriched pet food treats," Michael said.

As part of the partnership with MDC, Freeze Dry Industries is trialling different uses for freeze-dried red meat waste and by-products. Although it's still early days, Michael said there was potential to create high-value consumer products such as health supplements.

"With support from MDC, we're identifying raw 'waste' materials and redirecting them into products which provide a return to the red meat industry and, ultimately, back to the producer," Michael said.

"By targeting waste we can turn low-value problems into solutions and create economic return for the red meat industry, as well as tackling wider issues such as energy costs and the logistics of moving large volumes of 'waste' from processing plants.

"We've received promising feedback on our freeze-dried milled collagen concepts using hide waste, which again seeks to optimise improved carcase utilisation and address the burgeoning wellness mega trend."

He said the collaboration with MDC also addressed the challenge of how to keep Australia's red meat industry internationally competitive.

"Australia is a high-cost country when it comes to processing, but we're good at innovation, technology and developing consumer products to create value," Michael said.

Freeze Dry Industries is also looking at making the technology more available, such as establishing solar hybrid freeze dry units in regional centres so raw materials can be dried before transportation, to reduce freight costs and encourage waste innovation. ■

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Freeze Dry Industries CEO Michael Buckley, in the freeze-drying vessel.
Photo: FDI

JAPAN GETS A TASTE OF DOWN UNDER

Japanese chef Hal Yamashita is replicating the flavours of the Australian barbecue in his Tokyo restaurant, as he experienced here at Sher Wagyu during an MLA chef tour in 2017.

Tokyo-based restaurateur and chef Hal Yamashita visited Australia on an MLA-hosted tour in 2017 and went to a barbecue he'll never forget. A simple Wagyu steak cooked outdoors by Nick and Vicki Sher at their property near Ballan, Victoria, made a lasting impression.

Vicki Sher remembered it was a cold day when the Japanese tour group visited. The Shers served up a striploin MS 9 (marble score nine) steak with salads around the kitchen table in front of the wood fire.

Now, Hal serves a thick-cut Australian steak cooked over a wood fire at NABADAN by Hal Yamashita, one of his six restaurants in Japan. NABADAN is a fusion restaurant based on his father's restaurant, Yamashita Harusaburo Shoten, and the Australian beef barbecue. Hal owns a seventh restaurant in Singapore.

"I've visited all around Australia as a chef and experienced the best environment, the high quality of feeding systems and the love of producers for cattle. So now I want to assist the Australian beef industry to go to the next level and be even more valued in Japan for its high quality," he said.

One trend being harnessed by Hal is the interest in flavour from leaner cuts.

"More people want the 'umami' flavours from the meat rather than from the fat, as before," he said.

"NABADAN by Hal Yamashita and Yamashita Harusaburo Shoten serve Australian roast beef cooked over fire and charcoal grilled. The roast beef is great as the customers can taste the rich umami flavours."

Australian beef has a good reputation among customers who care more about health, Hal said.

"Demand is increasing and even Japanese customers who grew up with Japanese Wagyu culture are choosing Australian beef these days," he said.

Hal said he has learned much from his visits to Australia about the safety and taste of Australian food.

"People care about where food comes from and that is fitting for my company's concept," he said. ■

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Nick and Vicki Sher
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MARKET FOCUS

TAPPING INTO JAPAN'S MEAT BOOM

Despite Japan's shrinking population and increased competition, Australia's largest beef export market has been booming over the past few years, with 2018 setting a new record.

Australian beef exports to Japan during 2017–18 jumped 10% year-on-year, totalling 307,339 tonnes swt, the highest since 2012.

Japan is in the middle of what's being referred to as a '*niku* (meat) boom'. This is driven by several factors, including increased understanding of the health benefits of eating lean red meat for all ages, especially women, children and the elderly.

The economy and consumer confidence are the strongest they've been since the early 1990s. Female participation in the workforce is increasing, there are more dual-income households, and quicker home meals or dining out are increasingly popular. Inbound tourism to Japan has almost tripled in the past five years to 28 million visitors a year.

Australia also enjoys a tariff advantage in meat exports to Japan over the largest competitor, US beef, initially from the Economic Partnership Agreement and more recently from the advent of the Comprehensive and Progressive Agreement for Trans-Pacific Partnership.

Importantly, Australian beef has a clear advantage in terms of consumer preference.

All bases covered

Australian beef can be found in all food sectors in Japan, from quick-service restaurants (McDonald's is the largest single customer in Japan) to fine-dining establishments. Most Japanese retailers, including convenience stores, carry Australian beef, and it's used in schools and a range of catering channels.

Recently, barbecue steak has become more popular and many casual and high-end steakhouses have opened.

Outdoor barbecue spaces are popping up, including a new operator called 'Real BBQ' which negotiates to take over inner-urban building rooftops in summer and turn them into private barbecue spaces available to rent for space-poor locals.

Fierce competition

Japan is also the largest export market for US beef and the US aggressively promotes its product. New Zealand, Canada, Mexico, Argentina, Uruguay and the EU are also highly active in the marketplace.

"The biggest challenge right now would be supply. Because of the drought conditions in many parts of Australia, our exports are likely to fall, and Japanese customers follow supply forecasts closely," said Andrew Cox, MLA's International Business Manager – Japan and Korea.

Provenance is important in Japan, and all Australian red meat programs are underpinned by the 'True Aussie' country-of-origin brand and positioning. Since its launch in 2014, more than half of all Japanese consumers are now able to recognise the True Aussie logo and what it stands for.

MLA also invests in consumer promotion with the message 'Aussie beef is *genki*!' – a Japanese term which roughly equates to 'full of life'.

"At grassroots we support kids to feel '*genki*' by linking with sports such as junior rugby," Andrew said.

"Most women in Japan are iron deficient, so in winter we communicate the nutritional benefits of meat, such as iron, that help people avoid issues such as chills, irritability and dry skin.

"And the largest campaign is 'Let's barbie' in the warmer months, where we encourage people to buy Aussie beef steak and enjoy it with friends and family." ■

Andrew Cox
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Going for gold with **Australian beef**

Japan is hosting two of the world's largest sporting events in the next 18 months – the Rugby World Cup and the Tokyo 2020 Olympics.

MLA is a major partner of the Australian Olympic Team and this means Australian beef will be served at all team functions.

With the 2020 Tokyo Olympics aiming to be the 'greenest games ever', food sustainability is becoming topical in Japan.

To ensure the Australian beef industry is recognised as a global leader on the issue of sustainability, MLA hosted the inaugural Aussie Beef Sustainability Forum in Chiba City in February, in conjunction with the Supermarket Trade Show.

The Forum was attended by 33 major customers from retail, trade and foodservice, including McDonald's and Japan's largest retailer, AEON, along with 21 journalists and key influencers.

"Interest in sustainability in Japan has not been as mainstream as it is in western markets, but it has certainly been increasing over the past few years, and the Tokyo Olympics has pushed the topic further up the agenda with consumers," Andrew said.

"It's an area where we've got a great story to tell and be ahead of our competitors. It also builds on Australia's reputation as a safe and trusted supplier of beef, and that we're a natural place for beef production." ■

JAPAN

Japan's population:

- 127.2m in 2018
- 125.7 projected for 2022 (due to an ageing population and a flat birth rate).

Australian beef exports to Japan:

- volume – 307,339 tonnes swt
- value – $2,117.1m (2017 and 2018)
- share of imports – 52%.

Australian sheepmeat exports to Japan:

- volume – 14,828 tonnes swt
- value – $141.9m (2017 and 2018)
- share of imports – 60%.

Japanese consumption:

Total 52.8kg per capita in 2018, excluding seafood. Beef made up 10.3kg per capita and sheepmeat .03kg per capita, with pork followed by chicken the dominant animal proteins.

Japanese households earning more than US$50,000/year:

- 15.3m in 2018
- forecast 22.6m in 2022.

Want to know more? Check out mla.com.au/market-snapshots for a more in-depth look at key markets.

INDUSTRY INSIDER

Sharing the ‘True Aussie’ story

While it was his own link to farming that initially led Jacob Baldock to a role within MLA, it’s the job’s diversity that cemented his passion for being the ‘True Aussie’ Brand Manager.

For Jacob, a normal day managing the international brand for Australian red meat could mean anything from working on a consumer marketing strategy for southern Asia or creating a website in China, to shooting a video in central Queensland or running a workshop in Singapore.

Jacob grew up on a small farm at Wattle Flat, central west NSW. Long days on motorbikes, playing in the mud, exploring the bush and helping on nearby sheep properties shaped his firm belief that “Australian producers are the lifeblood of the country and underpin the economy, and Australian way of life.”

“My mum always told me I needed to feel connected to the job I chose, and that’s why I love working at MLA – because I feel like we’re helping to make a difference to real people’s lives through creating returns back to the farm gate,” he said.

Here Jacob talks to *Feedback* about his role with MLA.

Q:

Explain your role in MLA.

The core aspects of my role are:

- ensuring the ‘True Aussie’ brand is represented consistently across all Australian red meat’s key export markets
- working with MLA’s international business managers and their teams to apply the brand strategy to ensure True Aussie resonates with local consumers and customers
- developing resources, whether that’s an image, a video, brochure, print ad or a website.

Q:

What did you do before joining the red meat industry?

Before beginning my role with MLA, I was an advertising executive. I had about 10 years’ experience as a ‘suit’ (client manager) working for agencies.

As an ad exec, I had exposure to several global and market-leading brands in categories like automotive, fast moving consumer goods, airlines, charity and not-for-profits, real estate, government and telcos. It was really diverse.

Q:

What’s your favourite red meat dish?

I’m a big fan of marbling. So for me, it’s anything tender and fatty – ideally, Wagyu Scotch fillet. If I could eat that every day for the rest of my life, I would. ■

Load up on lamb this winter

It's time to rug up, ward off the winter blues and 'Share the Lamb'. You can find plenty of comfort food inspiration at: australianlamb.com.au

Turmeric yoghurt lamb leg

Serves: 4 • **Preparation:** 15 minutes • **Cooking:** 30 minutes

1.2kg butterflied lamb leg, fat scored diagonally

2 cloves garlic, crushed

1 cup Greek yoghurt

1 tbsp ground turmeric

Juice and zest of 2 lemons

2 X 250g packets microwave basmati rice

80g baby rocket leaves

2 Lebanese cucumbers, peeled into ribbons

¼ cup currants

1 tbsp olive oil

Mint leaves, toasted flaked almonds, warm roti bread, to serve

1. Combine garlic, yoghurt, turmeric and half the lemon juice and zest in a large snap-lock bag. Season, add lamb and coat in marinade. Refrigerate for 1–2 hours then bring to room temperature.
2. Pre-heat oven to 210°C (190°C fan-forced). Place the lamb into a foil-lined roasting tin and cook for 15 mins. Reduce heat to 180°C (160°C fan-forced) and cook for a further 15–20 minutes for medium-rare. Cover loosely with foil halfway through cooking or once the marinade is lightly charred and the meat looks golden. Set lamb aside to rest for 15 minutes before slicing.
3. Prepare rice according to packet instructions. Set aside in a large bowl to cool slightly. Add rocket, cucumber and currants, drizzle with oil and remaining lemon juice and zest. Season and toss to combine.
4. Serve sliced lamb with rice salad, mint, flaked almonds and roti bread, if desired.

TIPS

1. You could also use a leg of lamb on the bone for this recipe – just increase the cooking time. Lamb rump or mini roasts would also be delicious.
2. Make a healthy salad, wrap or sandwich with any leftover lamb.
3. Use your choice of microwave rice in the salad e.g. jasmine, brown or coconut rice.

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18–20 November
Tamworth, NSW

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SPECIAL FEATURE

Welcome to this special genetics feature in *Feedback*. In the the coming months you'll see increased MLA communications on the value of red meat producers investing in breeding values.

Why?

For one, there's an inextricable link between genetics and profitability. Though not claimed to be a 'silver bullet', genetic improvement can help address the key drivers of profit, including improved market compliance, eating quality, fertility, reproduction and productivity.

Secondly, adoption of the use of breeding values in Australia could be higher. We tend to trust what we see. In the case of selecting a good sire, it's natural to go about this by visually appraising a bull or ram. But an important step is to look beyond appearance to also 'look under the hood'. This is what breeding values allows producers to do.

Breeding values can tell producers about the fertility of a sire's daughters, the carcase weights of his progeny and the likelihood of worm egg counts in his sons and daughters.

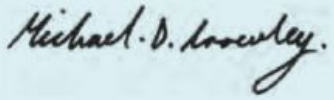
Of course, genetics on its own doesn't guarantee a good outcome. Ensuring good structural soundness and then providing good nutrition and management are essential.

This feature gives you a taste of why incorporating breeding values into your sire selection decision is worthwhile.

Here, we talk to commercial producers about why they've adopted breeding values and the benefits it's brought their business.

If this feature has whet your appetite, we have plenty more for you to discover at MLA's new genetics hub: **genetics.mla.com.au**

Keep an eye out in upcoming editions of *Feedback* for more on the benefits of using breeding values.



Michael Crowley
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Not using bre
Here's what y

If you're not aggressively accelerating the performance of your herd or flock by using better breeding values, you're fighting a losing battle.

That's the message from Dr Rob Banks, Director of the Animal Genetics and Breeding Unit at the University of New England.

"It's a message no producer can afford to ignore," Rob said.

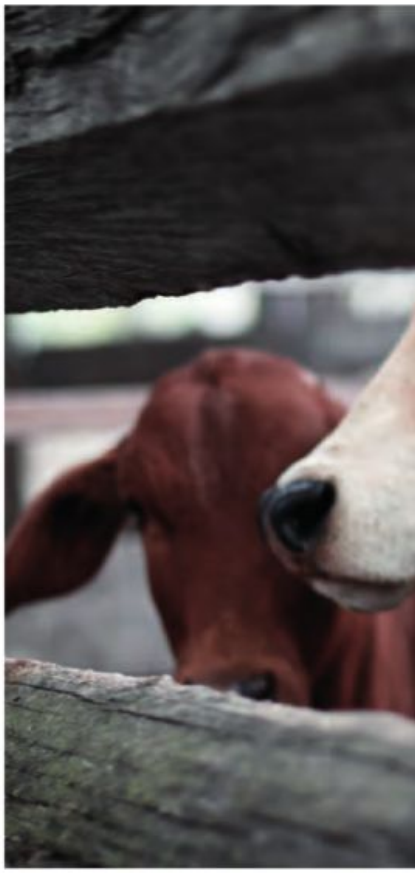
"Constant genetic improvement goes a long way to offsetting the cost–price squeeze, and complements the productivity gains available through pasture and animal management."

Many producers are tapping into the benefits of better genetics by buying bulls or rams from breeders using BREEDPLAN, LAMBPLAN or MERINOSELECT. Producers who pursue genetic progress find themselves accelerating the performance of their herds and flocks in such a way that their initial investment more than pays for itself.

"On average, the current rate of genetic progress in British breeds is just over $4 per cow joined per year," he said.

Rob said for northern Australia the rate of genetic progress for the past five years has been $1 per cow joined per year.

"The lower number in the north reflects the fact that fertility has been an important component of the index but, to date, few bull-breeding herds have had good data on it," he said.



"However, the research and industry data for fertility now becoming available underpins genomic Estimated Breeding Values, and we're seeing early signs of a lift in the rate of genetic progress. There's lots of upside potential."

But there are still some commercial producers who aren't harnessing the power of good genetic traits – even when they're widely available and identified as essential to sustained profitability.

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eding values? ou're missing

More sires backed

Many seedstock producers have embraced genetic data.

Rob said the southern beef industry has pioneered the adoption of genetic information in Australia, with more than 70% of southern bulls offered for sale backed by breeding values data.

In the north, the numbers aren't so impressive, with around 15% of sale bulls accompanied by breeding values data.

"This probably reflects the challenges of collecting accurate pedigree and date of birth in extensive northern breeding enterprises, coupled with a general perception that genetics data doesn't have as much relevance in the environmental conditions of the north," said Rob.

"That perception is wrong.

"DNA tools are helping overcome the recording challenge. Genetics data relating to fertility in the north is now becoming available, and it reveals massive genetic ranges in lifetime weaning rate and profitability in northern breeds."

Australian Sheep Breeding Values have transformed the wool and sheepmeat industries. They have given producers the power to influence traits such as eating quality, lean meat yield, reproductive rate, growth and fibre characteristics.

Rob said 70–75% of terminal meat breed sires are offered for sale with data, and around 60% of maternal meat breed sires and 35–40% of Merino sires are sold with relevant data.

"Quite a bit of artificial insemination (AI) is being used in Merinos by enterprises large enough to breed their own rams," he said.

"Producers are increasingly using semen from breeders in the MERINOSELECT program, so the impact at a flock level means about 50% of rams used across industry have some genetic information available."

Commercial uptake

While the adoption of breeding values data in the north has been challenging, its uptake by commercial livestock producers is increasing, particularly in the southern cattle and prime lamb industries.

"Many commercial producers of temperate cattle, prime lamb and Merino breeds have got on board with breeding values over the last 10–20 years," Rob said.

"They've seen the value in not just relying on visually assessing potential sires; they've also leaned on breeding values to allow them to see into the animal's genetic makeup and make more informed decisions.

"More and more producers are seeing that sires with better breeding values produce better progeny, and that means a better-performing herd or flock."

But, there is still room for improvement.

"Just because sires are increasingly sold with breeding values doesn't mean commercial producers are necessarily using that information. And those who use breeding values can always strive to find sires with better breeding values," Rob said.

"The genetic improvement journey doesn't end – it's a never-ending good story.

"The secret is to keep moving forward. Standing still means you're actually slipping behind." ■

See over for Rob's top five tips on finding the right genetics for your breeding objectives.

Dr Rob Banks
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Visit MLA's new genetics hub, a one-stop-shop full of resources, case studies and tutorial videos to get started with genetics: genetics.mla.com.au

Five tips to help you take off

Dr Rob Banks, Director of the Animal Genetics and Breeding Unit at the University of New England, shares his advice to getting started with breeding values:

1. Write down a clear breeding objective but ensure a balanced approach – a focus on one trait will have implications for other traits.
2. Your breeding objective should focus on where you want to be in five years so you can pick the genetics today that will help you get there.
3. Choose an index that suits your production system to help narrow down a large number of animals into a smaller group of potential sires.
4. Spend time on your research before a sale. Remember the sire will impact your flock or herd for the next 10–20 years.
5. Select structurally sound, fertile sires with above-average index and breeding values for traits that meet your breeding objective.

Can you pick the performer?

Just as you can't judge a book by its cover, neither can you judge a bull or ram by looks alone.

When two sires look similar (they're both from the same breed, both have the same weight and both are structurally sound), how do you tell which one will produce the most fertile daughters or progeny with the best marbling?

The truth is you can't tell by looks alone.

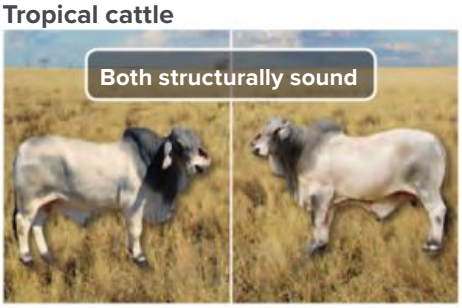
But that's why producers have access to breeding values. They allow producers to see 'under the hood' and know, with a high degree of confidence, a sire's genetics. It takes the guesswork out of picking a high-performing sire.

MLA has produced four short 'pick the performer' videos to demonstrate that looks on their own don't tell the full story. Rather, a fuller and clearer picture can be built by incorporating breeding values into ram and bull buying. ■

genetics.mla.com.au

Can you pick the performer?

Tropical cattle



Prime lamb

Temperate cattle

Merino

The basics of bull buying

Tropical Beef Technology Services' Tim Emery believes developing breeding objectives for your business is fundamental and can drive your genetic direction, productivity and profitability.

"When developing breeding objectives, it's important to have a clear understanding of how your herd is currently performing, where you want to go, what markets you're targeting and the environmental constraints at play," he said.

"Having the objectives actually written down can assist with having all those involved in the business on the same page.

"And, just because you write them down once, doesn't mean they can't change. Reviewing and refining them over time with all parties involved in the business is a key step."

Tim (pictured) recommends focusing on Estimated Breeding Values (EBVs) and understanding what they mean and how they work.

"EBVs are a free tool, they're available for anyone to use and they can assist producers make an informed, objective decision about their future genetic direction," he said.

"They shouldn't be used in isolation, but instead in conjunction with fertility, structural soundness and temperament."

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genetics.mla.com.au/tropical

To help northern beef producers fine-tune their approach to buying new genetics and the bull buying process, Tim suggests:

1. Developing breeding objectives and knowing what traits are important for your own operation.
2. Determine the selection index and individual EBVs of most relevance to you. This involves knowing exactly what you want to use the bulls for, e.g. using over heifers or cows, terminal use, producing replacement females or producing progeny for a target market.
3. Do your homework. Most of the genetics planning should take place in the office. Use the BREEDPLAN website to sort available options based on selection index and individual EBVs relevant to your business.
4. The reproductive performance of dams can be investigated, along with genetic conditions in some instances.
5. Talk at length with seedstock producers and obtain data prior to the sale – ask about their breeding objectives and joining window, seek BULLCHECK certificates and ask about their vaccination, biosecurity and feeding programs.
6. Go to the sale with a list of bulls you are confident in (based on EBVs and BULLCHECK certificates) and then spend the majority of your time assessing temperament and structure. Put a line through those that aren't suitable. ■

The genetic pay off

Imagine if someone told you they were able to lift their weaning rates by more than one-third, reduce breeder mortality to 0.5% and improve turn-off weights by 15%.

That's exactly what Russell and Donna Lethbridge have done.

And to further prove it's not just theory, the couple's Werrington Cattle Company operates in a harsh environment where any system is put to the test.

The herd operates at 20% above the district average for reproduction efficiency and its weaning rate is 25% above the industry average for northern Queensland.

The Lethbridges attribute the improved performance of their enterprise to:

- investing in sires with above-average traits for reproduction from a performance-recorded herd with similar breeding objectives
- applying selection pressure on the breeder herd for reproductive performance.

Russell (pictured) said, in their region, breeder mortality rates are typically high and reproduction rates are low. This is a result of native pasture nutrition levels below that required for animal maintenance for up to nine months each year.

The couple have proven that:

- selecting for fertility is indirectly selecting for adaptability and 'doing' ability
- removing non-performing females (for reproduction) improves entire herd performance
- weaning rates can be lifted (in their case from 45% to 72%)
- breeder mortality can be reduced to 0.5%.

Breeding objectives

Where did they start? The first step was to identify a breeding objective – they wanted an early-maturing, highly fertile Brahman herd whose progeny would comply with a broad range of markets.

Their approach was simple – select for reproduction and the rest will follow.

"I breed to produce a marketable animal – one that is fleshy and early maturing, will put muscle on bones at any time after 12 months and will lay down fat before it's three years old," Russell said.

To achieve this, Donna and Russell cull non-productive females and only buy bulls with above-average BREEDPLAN 'days to calving' values and whose dams are proven reproductive performers.

"The reliability of the mother is very important," Russell said.

"If she's had nine calves in 10 years, it's her genetics I want."

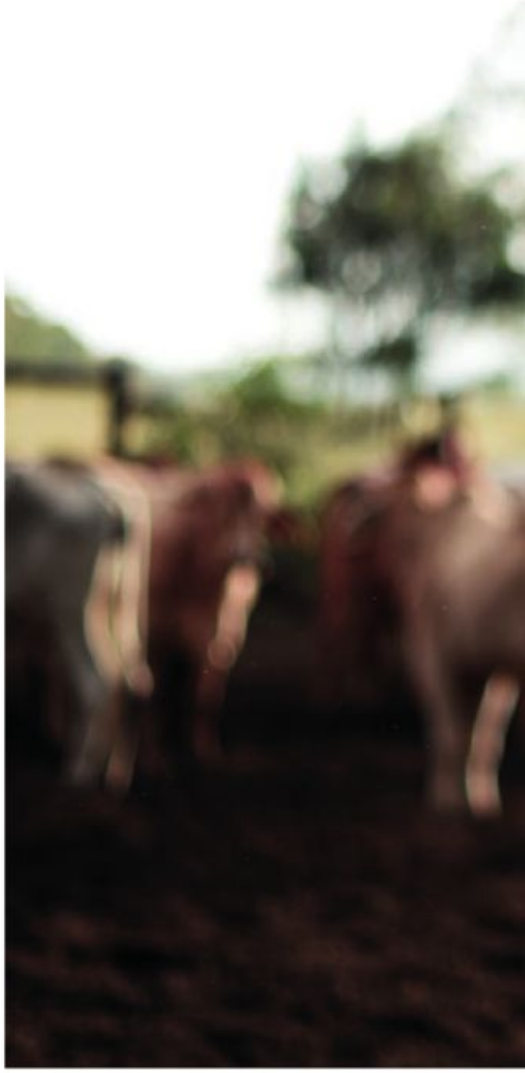
All females are pregnancy tested after a four-month controlled-mating period, and all empties become part of the cull-cow income stream.

Heifers, on the other hand, face their biggest fertility challenge first up – a 10-week joining.

However, pregnancy test results are regularly above 90%, a vast improvement on the 40–50% rate the Lethbridges accepted 25 years ago.

"Where it really pays off is with the first-calvers," Russell said.

"We know we can successfully rejoin about 75% on no rain and in



challenging conditions."

This approach means the 3,000 head breeding herd is young, with about one-third of the annual calf drop out of maiden heifers.

Recent benchmarking has shown these young heifers hold their own.

Choosing the right bulls

"When they are selecting bulls, I think people are too obsessed with growth traits and don't pay enough attention to fertility indicators such as moderate frame size, days to calving, calving ease and scrotal circumference," Russell said.

"Our most progressive move was finding a seedstock producer who had the same commercial trait objectives

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as us. Clearly, making the demands on our females was only improving us so far."

Russell does not consider growth traits directly when buying bulls, but has found that selection using breeding values and indexes has helped improve carcase weights (taking them to 220–240kg carcase weight).

He believes improved female reproduction also translates to improved adaptation to the environment, with their breeder mortality rate having fallen from 5% to 0.5% over 25 years. ■

More information

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Watch Russell tell the story of genetic progress in his herd
genetics.mla.com.au/tropical

SNAPSHOT:

Russell and Donna Lethbridge, 'Werrington', Townsville and 'Rainmore', Alpha, Queensland

Area:
Werrington 19,500ha; Rainmore 27,500ha

Enterprise:
Brahman steers for the Japanese feeder market and heifers for the domestic feeder market

Livestock:
Werrington – 3,000 adult equivalent (AE); Rainmore – 4,500 AE; up to 10,000 depending on agistment availability

Pasture:
Werrington – natives, stylos, open forest; Rainmore – buffel, stylos, natives

Soil:
Werrington – light alluvial to heavy clay, light granite; Rainmore – heavy brigalow scrub, red loamy soil, lighter eucalypt country

Rainfall:
Werrington – 700mm; Rainmore – 525mm

Selection in the south

Be clear on what drives profit in your business and match your bull selection to those profit drivers.

According to MLA's Genetics Program Manager Hamish Chandler, this should underpin how every producer uses genetic selection tools such as Estimated Breeding Values (EBVs) and indexes.

"What drives profitability in your business should be naturally linked to your breeding objective," he said.

"Traditionally, producers consider a whole range of traits and attributes when buying bulls, but we need to make sure those attributes clearly relate back to what producers want to achieve in their business.

"It's important we join the dots between what we want to improve and what traits we need when selecting replacement bulls."

Hamish said EBVs are an essential part of the selection process.

"There are things, other than the genes a bull carries, that influence what he looks like on sale day," he said.

"Breeding values are important because we can rank bulls on their genetic attributes rather than on how good a season they have had."

Hamish said in southern production systems, where good reproduction rates are generally achieved, producers should consider other profit drivers.

"If you're selling lighter-weight calves to restockers, fast early growth and moderate cow size will be considerations, whereas suppliers to feedlots and the Japanese ox market will require more emphasis on eating quality traits such as intramuscular fat," he said.

Before attending a bull sale, Hamish recommends looking at breeding values and indexes first, and then assessing bulls that fit the criteria for structure and other attributes at the sale.

"Indexes are useful for ranking bulls in terms of value in achieving a breeding objective," he said.

"If you have several candidates of similar index value, then you need to consider individual breeding values – such as birth weight, scrotal circumference and intramuscular fat – and weigh up their worth to you, as well as considering other traits not in the index such as structure and temperament." ■

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genetics.mla.com.au/temperate

It's secon

Andrew Carruthers can't remember a time when he didn't use genetic selection tools in his business.

"Dad was a seedstock producer, so appreciating the value of genetic selection, and using industry tools such as BREEDPLAN and Australian Sheep Breeding Values (ASBVs) to improve production, have always been the way we've worked," he said.

"Use of genetic selection tools combined with good management has seen us lift our flock and herd performance in terms of kilograms per hectare.

"Our breeding program is a balancing act between production goals and longevity, and we use genetic selection and visual appraisal to try and stay on what we think is the right path."

Andrew (pictured) and his wife Sarah run 2,632ha from Wollomombi to Baldersleigh in NSW and focus on breeding Angus feeder steers for Jack's Creek Feedlot, Wagyu females for Japan's live cattle market and lambs for the domestic market.

The Carruthers are focused on customer satisfaction, and genetic selection decisions are market-driven, tempered by the need for structurally sound, productive animals that have longevity.

Sheep selection

"In our composite, self-replacing sheep flock, our main concern is twinning. We want ewes that will produce twins as many times as possible, so phenotype – what the ewe *looks* like – is really important," Andrew said.

Rams are always selected on breeding values and phenotype.

"Fertility and positive fat are important," Andrew said.

"We want high-performance mothers that turn off lambs inside four months, and that have good milk and udder structure.

"It snows here and can get down to minus 15 degrees in winter so selecting rams with positive ASBVs

d nature

for fat helps our ewes to lay down fat. It's like carrying a lunch box with them during winter."

Selecting strictly for these traits for the past four years has seen the number of lambs weaned increase by more than 30%.

More recently, the focus has spread to moderating mature ewe weight.

"At 16 months old, our ewes are 75kg with 35kg twins on them, " he said.

Cattle tactics

Their approach to Angus breeding is equally measured.

"Again, the first thing I look at is phenotype; a breeder needs to look good, have a good udder and be structurally sound so that when our calves go into feedlots for 300–400 days, they're structurally sound as well," Andrew said.

A moderate parental birth weight is non-negotiable. "It's directly related to live calves," Andrew said.

"I won't buy a bull over a birth weight Estimated Breeding Value (EBV) of +5.5kg.

"Even if you join, for example, a bull with a birth weight EBV of +7kg, that heavier birth weight can still be expressed through the heifers, and that's something we want to avoid."

To ensure herd efficiency, Andrew has strict parameters on cow size.

"We want a moderate cow size; we won't go over a mature cow weight EBV of +110kg, which is sometimes hard to balance with growth rates," he said.

"Larger cows are more expensive to run.

"We keep an eye on milk; it must be above breed average, then we look at what the client wants, which is good 400 and 600-day weights and marbling for eating quality."

Andrew won't go below 2 on IMF (intramuscular fat; the EBV for marbling).

"We work closely with customers and end users. They're open in telling us what they need," he said.

"For example, the Japanese market wants a 500kg carcase with as much marbling as possible so, in terms of EBVs, that's 400 and 600 days and IMF.

"In selecting on all these traits, we've seen our end product over the past four years go up one whole AUS-MEAT score (for marbling) across the Angus program.

"In our F1 beef program, we've been able to increase and maintain weaning weights, improve our heifer conception to 92%, keep our cow conceptions over 90% and use our bulls at a ratio of 1:70." ■

More information

Andrew Carruthers
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Watch Andrew tell the story of genetic progress in his herd

genetics.mla.com.au/temperate

SNAPSHOT:

Andrew and Sarah Carruthers,
New England, NSW

Area:
2,632ha (across four properties from Wollomombi to Baldersleigh)

Enterprise:
Angus beef for domestic market, F1 Wagyu for livestock exports to Japan, Lambpro prime lambs for domestic trade

Livestock:
1,000 Angus breeders; 50 F1 Wagyu breeders; 2,000 Lambpro ewes

Pasture:
Natives and improved, ryegrass, fescues, clovers

Soil:
Fine granite, trap and basalt

Rainfall:
850–1,000mm

PRIME LAMBS

A prime lamb breeding plan

Having a clear picture of a breeding objective should be every prime lamb producer's priority before investing in new genetics.

According to MLA Sheep Genetics Senior Development Officer Peta Bradley, a breeding objective will help producers identify traits, expressed as Australian Sheep Breeding Values (ASBVs), to improve profitability and/or reduce costs of production.

"Before you turn up to a ram sale, it's really important to know your breeding objective and which traits will drive profit (e.g. weaning weight and eye muscle depth) and which traits are costs in your production system (e.g. worm egg count)," she said.

"Other important ASBVs that prime lamb producers may wish to select on or monitor when purchasing a sire may include birth weight and eating quality traits such as intramuscular fat and shear force.

"These traits give producers the ability to make more informed decisions when investing in improving genetics."

Peta said while genetic merit should be the first criteria on which rams are selected, physical appearance and structural soundness are also important elements for breeding success.

"Rams need to be structurally sound and suit your environment," she said. ■

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The 2018 Pocket Guide to ASBVs: sheepgenetics.org.au/Resources/Brochures-and-fact-sheets

genetics.mla.com.au/prime-lambs

Genetics

Victorian prime lamb producers Philip and Maz Gough have transformed their business using genetic selection tools and harnessing the benefits of hybrid vigour.

The business has evolved from running five different enterprises in the 1990s to, today, focusing on producing prime lambs for the supermarket trade and using their knowledge of genetics and best practice farm management to achieve their goals.

"Our interest in lamb started in 1995 when we began selling lambs finished on summer crops," Philip said.

"We became more interested when we realised the potential to fast-track our productivity improvement through genetic selection."

Philip set about breeding a ewe that could wean 150% of lambs annually to suit the supermarket trade (fat score 3, 18–24kg carcase weight) at 130 days of age.

To do this, some production goals were set that would improve their viability:

- maintaining hybrid vigour

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drive business growth

- lifting kilograms of lamb produced/hectare from under 300 to more than 400
- improving wool cuts from 4kg to above 5kg/head
- making as much money from as few animals as possible to achieve labour efficiencies
- producing efficient, environmentally fit animals.

From this, a crossbreeding program, based on Corriedale and Coopworth, was born that utilised the LAMBPLAN database to select high genetic merit animals on breeding values that the family could manage easily.

"We felt these breeds complemented each other but differed enough to deliver a good dose of hybrid vigour," Philip said.

Other management strategies Philip put in place to support the genetic selection decisions include:

- using LAMBPLAN data on rams to aggressively select for high fertility in maternal ewes
- selecting rams on their breed purity for hybrid vigour maximisation
- only breeding self-replacers from ewes that were conceived as a multiple and produce multiple conceptions each year
- tagging ewes which need assistance during lambing, for future culling
- pregnancy scanning to measure losses and to segregate ewes carrying singles, twins and triplets for lambing
- vaccinating for campylobacter
- reducing paddock and mob sizes.

In the past 10 years, Philip has seen his lambing percentage per ewes joined climb from 127 to 154 – the goal was an average of 150. The amount of lamb produced per hectare has also jumped, from 363 to 440kg.

Since he started selecting on ASBVs for high early growth rates, coupled with better flock management, Philip has also achieved higher lamb weaning weights. ■

SNAPSHOT:

Philip and Maz Gough,
Hotspur and Branxholme, Victoria

Area:
1,100ha

Enterprise:
Prime lambs – targeting supermarket trade 18–26kg and fat score 3

Livestock:
5,400 crossbred ewes (self-replacing flock)

Pasture:
Perennial ryegrass, sub-clover, summer forage brassica

Soil:
Hotspur (light sandy loams)
Branxholme (heavy clay loams)

Rainfall:
700–800mm

More information

sheepgenetics.org.au/LAMBPLAN

Watch Philip tell the story of genetic progress in his flock
genetics.mla.com.au/prime-lambs

MERINOS

Tools aplenty for Merinos

Merino producers have more help than ever to lift profitability of their flock, while improving animal health and welfare outcomes.

MLA Sheep Genetics Senior Development Officer Peta Bradley said Australian Sheep Breeding Values (ASBVs) allow producers to simultaneously select for key production traits such as fleece weight, carcase characteristics and number of lambs weaned, while putting pressure on breech cover and/or breech wrinkle and other health traits such as worm egg count.

"It's important that commercial ram buyers identify seedstock breeders who are recording in MERINOSELECT and selecting for traits they have identified in their breeding objective," she said.

Peta said there are industry indexes in MERINOSELECT that commercial breeders can use to make a balanced selection of animals. It is important that commercial producers use the index that best suits their production system.

"An index combines many traits and helps breeders rank animals so they can draft out the top picks. These top picks can then be researched further by looking at individual ASBVs and by visual appraisal on sale day," Peta said.

"The benefits of buying rams of higher genetic merit is multiplied at each joining in a self-replacing flock, as the daughters of rams with high genetic merit are retained and bred from in the flock, compounding the benefit over time." ■

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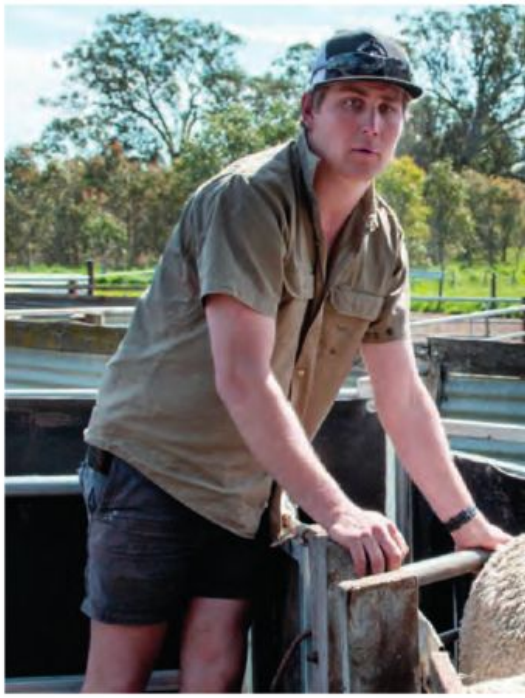

Victorian sheep and wool producer Ricky Luhrs has come a long way in eight years.

From new kid on the block in the family business to progressive producer embracing genetic technologies and best practice, Ricky's inquiring mind has driven gains in flock performance and profit.

Early on Ricky, who runs the property with his father, Russell, focused on how to cope with challenging seasons, particularly poor springs and late breaks, and how to improve lamb weaning percentages.

"Our approach has been a mixture of improved genetic selection and adopting management strategies to better utilise pasture and preserve ground cover," he said.

"Containment feeding of all our sheep during late summer–autumn each year helps preserve pasture and build a winter feed wedge for lambing.

"The challenge is early assessment of the stock we want to carry over, and having enough supplementary feed and cash flow to get through the

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ait track

containment feeding period to ensure ewes are kept in good condition from joining right through."

Genetics have also played a significant role, enabling Ricky to increase lambing percentages, lamb growth, and carcase and fleece weights.

"By selecting rams based on Australian Sheep Breeding Values (ASBVs), we've worked on getting more fat and muscle into our ewes so they have more of a fuel tank on their back for tough times which has, in turn, helped lamb survival," Ricky said.

Today, their operation is focused on improving their rate of genetic gain, particularly in traits for early growth (YWT* and PWT*), fat and muscle (PFAT* and PEMD*), fleece weight (YCFW*) and plain bodies (YSL* working with YCFW* – to prevent mulesing and working towards six-month shearing).

This, combined with improved breeder and ram management, has catapulted their operation into becoming more efficient, profitable and sustainable.

"Genetic selection is an important tool, but it is one of many on the farm," Ricky said.

"The important management strategies that help us make the most of our flock's genetic potential are early weaning, condition scoring ewes at weaning to ensure they get back up to target weights, pregnancy testing, foetal ageing, good nutritional management of twins and singles, not shearing within six weeks of joining and good ram nutrition."

Ricky first learnt about genetics and sire selection through Australian Wool Innovation's Lifetime Ewe Management and MLA's Bred Well Fed Well programs, and by attending a Best Wool Best Lamb conference.

"I really enjoyed the learning curve," he said.

"It was a great way of combining my youthful enthusiasm for wanting results with Dad's (Russell Luhrs') knowledge and passion for Merino sheep. We had the same breeding objectives so it worked well."

Ricky said interpreting ASBVs in a sale catalogue was easy, but he found it more challenging to understand the balance and heritability of traits "so you don't end up single-trait heavy."

To convince themselves that buying rams with ASBVs improved their flock, father and son set about designing their own on-farm trial.

"We bought rams from performance-recorded studs, new to us but high on our radar for traits we wanted, and measured raw data on all the progeny from the different bloodline groups," Ricky said.

"We measured early growth (marking to weaning), fleece weight at first full-fleece shearing and the percentage that joined as ewe lambs."

The new bloodlines, selected using ASBVs, outshone their traditional bloodlines in average growth rate, marking weight, weaning weight, fleece weight and lamb survival. ■

**YWT – yearling weight; PWT – post-weaning weight; PFAT – post-weaning fat depth (mm); PEMD – post-weaning eye muscle depth (mm); YCFW – yearling clean fleece weight; YSL – yearling staple length.*

SNAPSHOT:

Ricky Luhrs,
Cavendish, Victoria

Area:
1,000ha

Enterprise:
Wool and prime lamb production

Livestock:
5,500 18.5 micron Merino ewes (3,000 joined to Merinos, remainder joined to terminal sires). Joining 500–800 yearling ewes each year.

Pasture:
Ryegrass and clover

Soil:
Clay and sandy loam

Rainfall:
500–550mm

More information

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Watch Ricky tell the story of genetic progress in his flock
genetics.mla.com.au/merino

Not convinced about br
Producers respond

Before breeding values came along, producers had no choice but to pick sires purely on the basis of visual appraisal and gut instinct. The art of judging 'a good sire' was generationally passed on with an emphasis on staying true to tradition.

Today, with scientific advances in genetics and genomics, producers can 'see under the hood' and select sires that fit the bill phenotypically, but also deliver profit-driving traits such as growth, fertility and calving and lambing ease.

Here's how some of Australia's leading commercial producers respond to commonly cited statements about genetic selection.

I'm not convinced that using breeding values will ultimately deliver me a net financial return.

"The most obvious payback is being able to control important variables. For example, birth weight is directly related to live calves, 400 and 600-day growth figures are directly related to kilograms out the gate. Explain to me how that's not a payback. Those are two major production gauges without taking into account fertility and calving ease." Andrew Carruthers, beef and prime lamb producer, NSW

I've been buying rams/bulls for years. I know what a good ram/bull looks like.

"Phenotypically you might, but you don't know what's under the hood. Estimated Breeding Values (EBVs), Australian Sheep Breeding Values (ASBVs) and genomics – all this data takes out risk and variability." Andrew Carruthers, beef and prime lamb producer, NSW

"What a good ram looks like is completely different to how he breeds. For example, it's impossible to know how his daughters milk, or how the birth weights of his progeny compare to the next ram. Personally, over the years, we've made huge gains in lambing percentage to ewes joined. Without a selection program such as LAMBPLAN, that would be impossible on such a lowly heritable trait. Rams that I like are the ones that make the most money for the least amount of work, and LAMBPLAN identifies these for me." Philip Gough, prime lamb producer, Victoria

"That's good. ASBVs are just another tool in the kit. You still need to know what a good ram is on the outside but do you know how he'll perform on the inside and what (traits) he will pass on to his lambs?" Ricky Luhrs, Merino sheep producer, Victoria

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eeding values?

I don't understand breeding values and BREEDPLAN/ LAMBPLAN/MERINOSELECT. It's just complex language designed for studs and scientists.

"We're absolutely certain this selection system works and, given that we operate in a sector where often we have little control over outcomes, it's important to capitalise on the areas that we can control. My recommendation to producers that currently don't understand, and who want to get the best genetics affordable to them, is to educate themselves, find someone who is familiar with the information or follow industry guides." **Philip Gough, prime lamb producer, Victoria**

Most studs don't sell sires that have breeding values and they tell me it's just for academics who don't know cattle.

"It's my belief that seedstock producers who haven't adopted ASBVs to date have a limited time left in the industry. As with the dairy, southern beef, pig and poultry industries, the big players all come from a common standpoint of implementing and using objective measurement." **Philip Gough, prime lamb producer, Victoria**

There's no value in genetics; or it takes too long to see a return.

"Once you have introduced superior genetics they don't just disappear, the benefit compounds, like interest." **Philip Gough, prime lamb producer, Victoria**

Putting together the shopping list

Before attending a ram or bull sale, producers can follow this simple checklist:

- ☐ Identify the traits and corresponding ASBVs and EBVs that are important to your breeding objective.
- ☐ Find the breeding index that best suits this goal.
- ☐ Do your homework. This includes ranking animals on your index of choice; then, of the top animals, look at the individual ASBVs and EBVs with the percentile table to identify where animals are ranked for individual traits compared to all other rams or bulls.
- ☐ Take this shortlist to the sale and do a visual assessment on the shortlisted animals for structural and physical attributes.

MLA's genetics hub contains videos on how to shop for a high-performing sire.

Visit genetics.mla.com.au, choose your livestock type then scroll to 'How do I get started with genetics'.

Check out MLA's new genetics hub

MLA has launched a new website, genetics.mla.com.au, to help commercial cattle and sheep producers grow their understanding of how breeding values can benefit livestock businesses.

MLA's National Adoption Manager Genetics Clara Bradford said MLA identified the gap in resources for commercial producers as a limiting factor to the adoption of genetic selection tools.

"This new site offers a ground-floor introduction to the benefits of genetics, showcasing on-farm case studies of producers using breeding values in their businesses to improve productivity and profitability," she said.

"Genetics has the reputation of being complicated and difficult. This site takes the mystery out of genetics and takes producers back to basics, talking them through the value of using genetics and how to use breeding values."

The site contains four main sections: tropical cattle, temperate cattle, Merinos and prime lambs.

"Producers can quickly get their hands on the resources that are relevant to their own herds and flocks; they don't have to wade through irrelevant information," Clara said.

"The site takes producers on a step-by-step journey in understanding genetics and using genetic selection tools such as BREEDPLAN and Australian Sheep Breeding Values (ASBVs)," she said.

"Producers need less than seven minutes to learn more about improving genetic progress with one of the 10 introductory sheep and beef videos that are featured on this unique site – the first central resource of its kind for the industry."

"We're really excited about the videos. We have another series of videos to launch after this and we'll keep adding to the library as the site progresses," she said.

Some of the topics in the videos include:

- What is an ASBV or EBV (Estimated Breeding Value)?
- What is a breeding objective?
- What is an index?
- How to shop for a high-performing sire (rams and bulls)
- How to navigate BREEDPLAN and Sheep Genetics websites to search for sires.

Clara said genetics.mla.com.au also includes links to other valuable online resources such as BREEDPLAN, MERINOSELECT, LAMBPLAN, Southern Beef Technology Services, Tropical Beef Technology Services and Sheep Genetics websites.

The site also provides information on other useful resources and courses such as Breeding EDGE and Bred Well Fed Well workshops.

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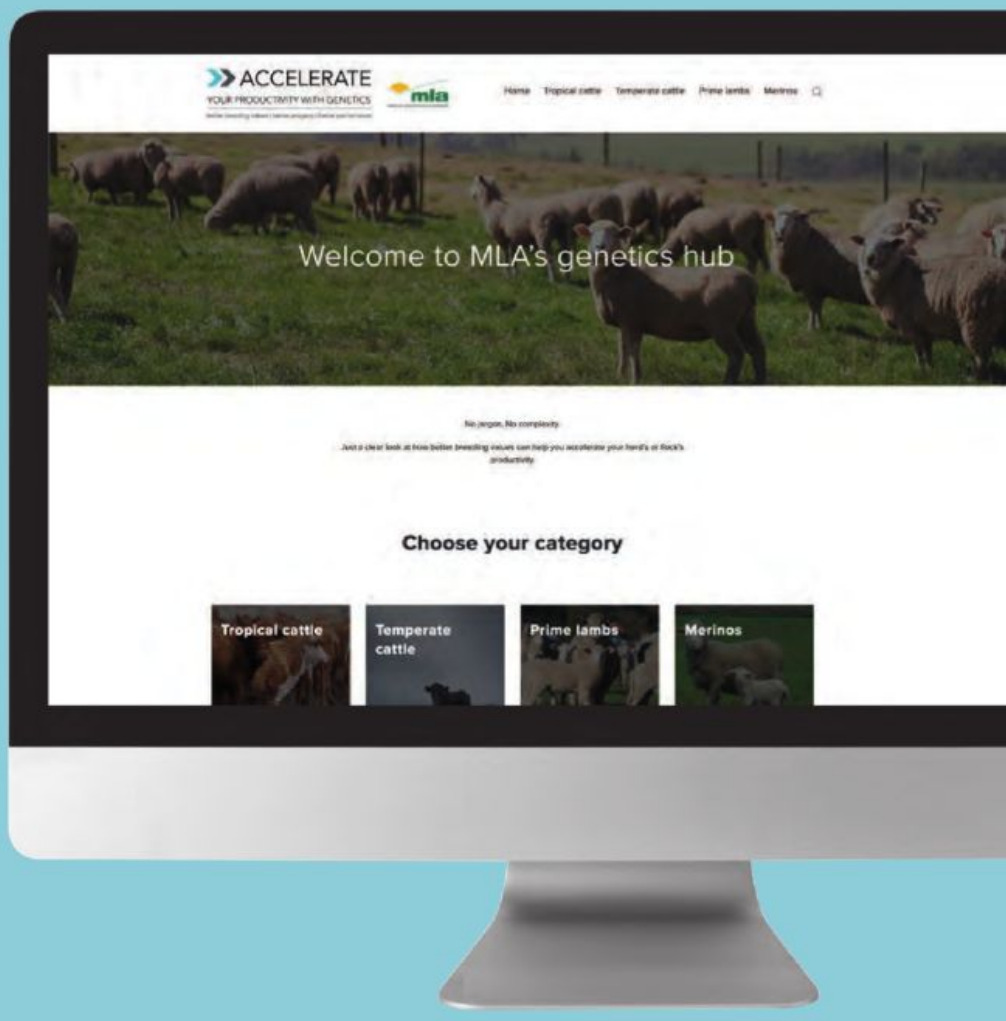

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