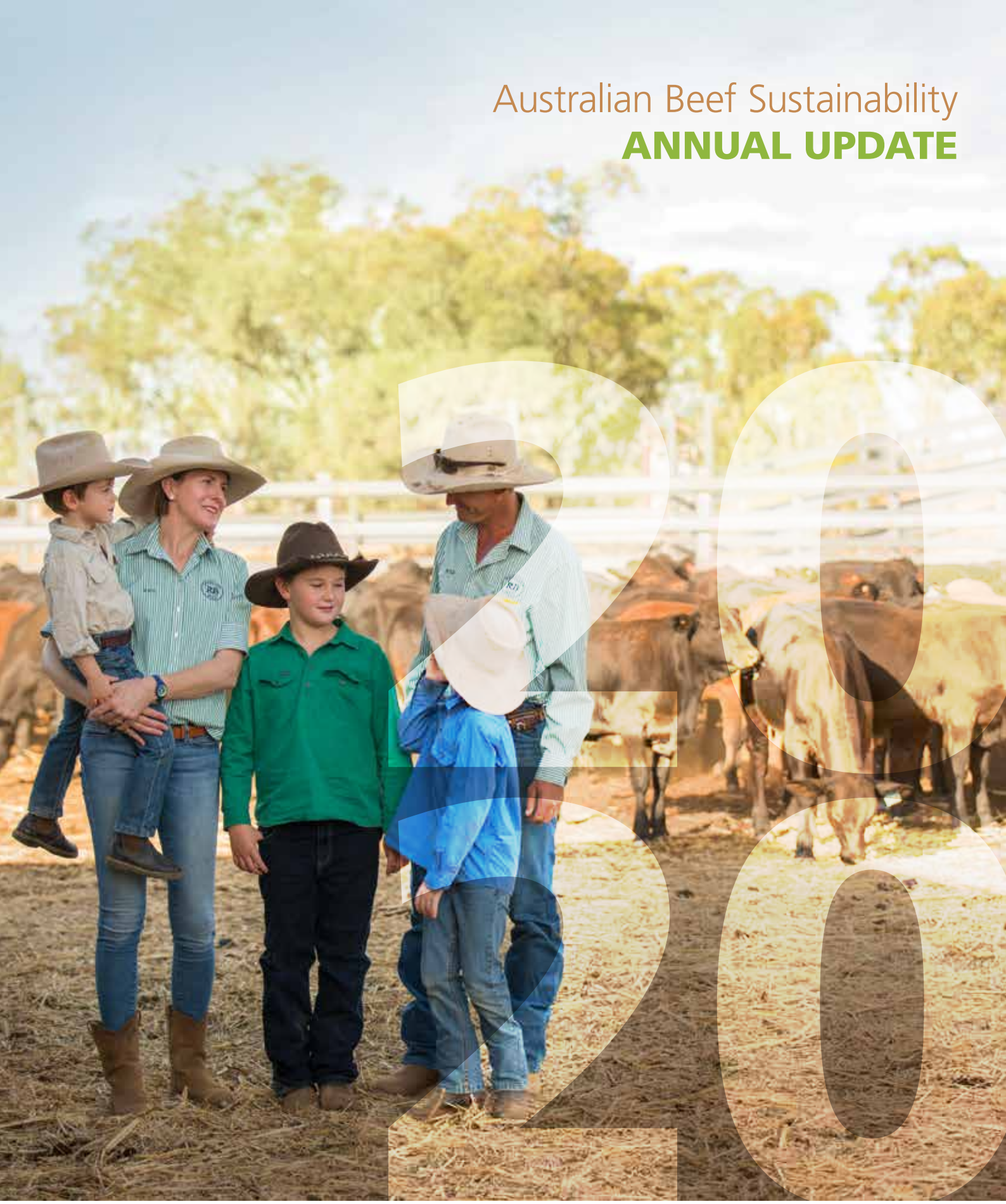
Australian Beef Sustainability

ANNUAL UPDATE



Australian Beef Sustainability Framework

RMAC

Highlights

Increased cattle properties covered by documented biosecurity plan from 25% to 90%

Reduced CO_2e emissions by 56.7% CO_2e since 2005

Achieved 99.9% compliance with Australian standards for chemical residues

Improved regular pain relief usage from 15% to 21%

Covered 59% of feedlots with an antimicrobial stewardship plan, up from 39%

Reduced the amount of water required to raise cattle from 515 L/kg to 486 L/kg in the last five years

Obtained data for 84% of Framework indicators

Challenges

Drought, floods, and extreme weather continue to impact farmers and the animals they care for in many parts of Australia

Devastating bushfires took lives, destroyed nearly 3,000 homes and led to countless stock losses

The COVID-19 pandemic endangered the lives of those across Australia and led to market volatility

Disruption to international trade due to the pandemic has affected many in the industry

The African Swine Fever outbreaks overseas and COVID-19 bring the challenge and importance of managing biosecurity across industries to the forefront

About **this report**

The Australian beef industry developed the Australian Beef Sustainability Framework (the Framework) to meet the changing expectations of customers, consumers, investors and other stakeholders. The Annual Update will provide the industry and the wider community with an understanding of how the Framework is being implemented by industry, the progress made to date, and how the industry is moving forward to creating a more sustainable sector. The Framework defines sustainable beef production and tracks performance over a series of indicators annually.

This report is the third annual update of the Framework. It contains:

- Activity underway or planned for six key priorities as selected by stakeholders.
- A situation statement and, where data permits, reports on industry performance across 23 priorities.
- Case studies of sustainable practice through the value chain.

This update follows the reporting principles of the Global Reporting Initiative (GRI), but not in accordance with the GRI Standards (the Standards). This is because the Standards were established for entities, and not for whole-of-industry reporting. Decision-making for the Framework is guided by five core principles found in Appendix 1.

Report boundary	Within scope	Out of scope
On-farm	✔	
Feedlot	✔	
Processor	✔	
Saleyard	✔	
Land transport	✔	
Live export	✔	
Domestic customers		✔
Overseas customers		✔
Consumers		✔

HOW WE DEFINE SUSTAINABILITY

Sustainability is the production of beef in a manner that is socially, environmentally and economically responsible. We do this by caring for natural resources, people and the community, ensuring the health and welfare of animals, and driving continuous improvement.

MATERIALITY

A formal materiality assessment was undertaken in 2016, based on both the AA1000 AccountAbility Assurance Standard and the Principles. The results of this materiality assessment are presented in our 2016 materiality matrix in Appendix 5. These informed the development of the Framework's 23 priorities.

The Framework's materiality assessment will be updated for the next report.

STAKEHOLDER INCLUSIVENESS

The Framework engages industry and external stakeholders through the half-yearly Consultative Committee forum. Read more on this engagement process on page 15.

The Framework's representatives attend large industry events such as Meat & Livestock Australia's (MLA) AGM, Beef Australia, ABARES Outlook, Global Food Forum, producer events and the Annual Update launch. These events are outlined on page 15.

Industry-wide subject matter experts were consulted in writing this report.

The Framework engages the public through its online consultation platform, accessible at **www.sustainableaustralianbeef.com.au**, and through Twitter and LinkedIn.

WE WELCOME YOUR FEEDBACK

Feedback on this report, and the Framework generally, can be given through **www.sustainableaustralianbeef.com.au/annual-update-2019**.

SIX KEY PRIORITIES

Six key priority areas were selected by our stakeholders in 2017:

- Animal husbandry techniques
- Profitability across value chain
- Balance of tree and grass cover
- Manage climate change risk
- Antimicrobial stewardship, and
- Health and safety of people in the industry.

This Annual Update reports on these six key priorities in detail on pages 19-51. It also provides summary information on the remaining 17 priorities on pages 52-65. While reporting is focused on these six priorities, industry activity continues across all priorities, which remain important to our stakeholders, and critical to the Framework.

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BACKGROUND AND HISTORY

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Red Meat Advisory Council Chair

Over the past year, the beef industry has shown great resilience in the face of numerous challenges.

The COVID-19 pandemic hit when many beef producing regions were starting to recover from drought and bushfires. 2019 was Australia's warmest and driest year on record. A wetter start to 2020 has eased the rainfall deficiency for some in eastern Australia. However the drought has not yet abated, and while some have earned short-term reprieve, recovery will be a slow process.

The scale of summer's bushfires – including the number of people, livestock and wildlife affected, and the amount of infrastructure and vegetation destroyed – was unprecedented.

We recognise this as one of the most (if not the most) challenging seasons for beef producers. Our industry's resilience, support of each other and capacity to rebuild are shining brightly.

Since March, the Australian beef industry has been working hard to continue operations during the COVID-19 pandemic.

Lockdown restrictions to slow the spread of the COVID-19 means international trade has become more complex, volatile and logistically challenging. These restrictions and outbreaks have impacted processing facilities, with meat packers globally running below maximum capacity. The health of those in our industry remains paramount amid the pandemic.

The logistics of getting Australian beef to market have also been impacted, with port bottlenecks, restricted refrigerated container availability, disruptions to air freight and slow customs clearance being observed across the world.

Industry representative bodies continue to advocate for government support to ensure our supply chain remains operational, to provide a nutritious, safe source of protein to Australia and the world.

Through every test, we have shown our resilience. Business along the supply chain implemented extra hygiene and distancing measures, and have found innovative solutions to do business in these uncertain times.

But while we face these immediate challenges, we must also work towards the future and ensure the long-term prosperity of our industry.

In 2019, the Red Meat Advisory Council released *Red Meat 2030* – a 10-year strategic plan for Australia's red meat businesses. It was developed in consultation with people from industry and government, to identify priorities and envisage our industry's future.

We're also pleased to release this year's Australian Beef Sustainability Annual Update. Reviewing and reporting on topics that are critical to our industry's operations, and our ability to grow and prosper, also supports our future.

SPOTLIGHT ON SUSTAINABILITY

This past year has seen sustainability issues take centre stage in the media and the public conscience.

Protests occurred across Australia and around the world, with protests from Extinction Rebellion to school climate strikes, drawing widespread media attention. The 2019 UN Climate Change Conference (COP25), held in December, saw world leaders negotiate the next steps on climate change. These events remind us of the imperative surrounding climate change.

They reinforce the importance of measuring and reporting on the beef industry's progress in meeting these challenges.

There has also been an increase in animal rights activism, including trespasses, which threatened the safety of workers as well as the integrity of farms, feedlots and processing facilities.

This prompted several state governments to introduce stronger penalties for farm trespass such as the Right to Farm Bill.

Animal welfare will always be paramount in the Australian beef industry, and it is important that trespass laws are enforced and respected to protect the safety of our workers.

RISING TO THE CHALLENGE

These examples show that while there are many challenges facing the beef industry, we are facing them head on, and doing the work to become more sustainable and thrive into the future. In our *Red Meat 2030* strategy, we have aspired to become world leaders in environmental and animal welfare practices. Initiatives such as the Australian Beef Sustainability Framework are essential, not only for proving our credentials, but for strengthening and advancing our industry. We must continue to measure and report on our progress, for a more sustainable and prosperous future.

Don Mackay
Independent Chair,
Red Meat Advisory Council (RMAC)

Letter from **Sustainability Steering Group Chair**

Australia is fortunate to be one of the most food secure countries in the world, with the vast majority of Australians being able to purchase basic food stuffs that provide adequate nutrition.

Our beef supports food security by providing a nutritious source of protein, both here and overseas. Australian beef producers are justifiably proud of our role in sustaining and enhancing lives. Our beef production is ideally suited to Australia's extensive non arable rangelands environment – converting nonedible forage into human edible protein.

Despite most of our beef value chain weathering the current unprecedented global crisis relatively well, there are some sectors and businesses that have suffered disruption and impacted revenues. The Sustainability Steering Group is mindful of the effect this has had on our producers, lot feeders, processors, retailers, butchers, live exporters – and all those who contribute in some way to Australian beef finding its way into the meals and onto the plates of our consumers.

To ensure Australian beef remains on plates post-pandemic, our industry will continue to demonstrate how we care for people, land, water, and its animals. We will continue to let our customers, consumers, policy makers, and investors know what we already do, and what we intend to do to continuously improve our product and productions systems.

SUSTAINING THE FRAMEWORK

An independent review of the Australian Beef Sustainability Framework, undertaken by University of Queensland, found that our industry was making headway in telling our story – with solid data to back up that story. The report found that the Framework engages with a variety of groups who all have a stake in our industry and that we were making progress to show the industry's sustainability credentials to our stakeholders.

The independent review highlighted some of the challenges in progressing the Framework. They include how different our stakeholders' expectations can be. The Framework strives to be relevant, inclusive, credible, practical and transparent. Ambitiously, we hope to provide a bridge between the different voices we encounter in our consultation. And we thank those who continue to engage with us.

Throughout the year we have continued to consult with stakeholders, from both within and outside of industry, during the coronavirus pandemic. We held our twice-yearly Consultative Committee Forum face to face in August 2019 and February 2020 but have noticed increasingly stakeholders join online. Our consultation will continue throughout 2020 and beyond – though it may look different. And we continued to promote the Framework and sustainable beef production by sharing our experiences and industry insights in the media, online and through other channels.

The Sustainability Steering Group has continued to expand our engagement in the past year, particularly with industry. We recognise that there is still work to do to show producers, as well as others along the value chain, the benefits of measuring sustainability in the industry and in their businesses.

The team behind the Framework has also worked hard to collect 84% of the data for our indicators. The challenges of the past year, including the coronavirus pandemic as well as drought and summer's extensive bushfires, has meant that not all planned activities could be completed.

NEXT STEPS FOR THE FRAMEWORK

Later in 2020, we will start reviewing the sustainability priorities in the Framework, which were a result of an assessment done in 2016. Since then, the world has changed. This materiality review will consult widely to discover and establish what is now important to our industry and stakeholders. Updating these priorities to reflect the concerns of today couldn't be better timed as we head into a new decade.

The release of *Red Meat 2030*, the red meat industry's 10-year strategy, has made the path ahead even clearer. The Framework is a significant part of industry's role in providing protein in a sustainable way and to meeting our ambition to become world leaders in environmental and animal welfare practices.

Thank you for taking the time to read our 2020 Australian Beef Sustainability Annual Update. If you have any feedback or would like to register your interest in being involved in the Framework process, please email **info@beeffframework.com**

T. Herbert

Tess Herbert
Chair, Sustainability Steering Group (SSG) of the Australian Beef Sustainability Framework

Our industry

PRODUCTION SNAPSHOT

24 million head of cattle in Australia's herd.[4]

3% of the global cattle herd.[5]

FEEDLOT SNAPSHOT

Holds **2-3% of the total cattle herd** at any one time.[6]

Grain fed beef contributes **30-40% of Australia's total beef production**.[7]

SALE SNAPSHOT

174 operating saleyards were identified across Australia in FY2018[8]

4,573,240 cattle were transacted in FY2019[9]

LIVE EXPORT

$1.6 billion live cattle export value in FY2019.[10]

1.2 million head of cattle exported in 2019.[11]

FARM: Beef farms breed, fatten and produce beef cattle.

FEEDLOT: Beef feedlots feed cattle to increase their weight. They are an efficient and sustainable system for nutritional management and they fill feed gaps where it is not sustainable to stay on-farm.

SALE: Beef cattle are sold at saleyard auctions, through direct sales, or through online systems.

LIVE EXPORT: Live export is the transport of livestock across national borders.

PEOPLE IN THE INDUSTRY

41,800 agricultural businesses involved in the cattle industry in FY2018.[1]

In FY2018, the Australian red meat and livestock industry directly **employed just over 172,400 people**, and 232,400 indirectly – a total of 404,800.[2]

90% of red meat employees live in rural areas contributing to Australia's regional communities.[3]

PROCESSING SNAPSHOT

$11.9 billion in exports by meat processors in FY2017.[12]

29,800 full-time employees in the processing industry in FY2017.[13]

HOW MUCH IS IT WORTH?

10% increase in the value of beef sold domestically and internationally up to $19.6b in FY2019.[14]

$65.7 billion red meat turnover, up 1% from previous period in FY2018.[15]

Australia's red meat and livestock industry accounted for **1.5% of Australia's GDP**.[16]

Cattle contributed **41% of Australia's total livestock** and livestock products value.[17]

HOW MUCH IS PRODUCED?

Produced **2.3 million tonnes** carcase weight of beef and veal.[18]

Provided **35.4 billion meals** to the world that met the recommended daily intake of red meat.[19]

PROCESSOR: Meat processors handle the slaughter, processing, packaging and distribution of beef product.

RETAIL: Beef product is sold through wholesalers, retailers (such as supermarkets and butchers) and at restaurants.

CONSUMER: Beef is enjoyed by millions of people worldwide as part of a healthy, balanced diet.

Markets **snapshot**

The emergence of the COVID-19 pandemic saw a range of major disruptions to Australia's red meat industry, including restrictions to air freight capacity, container circulation and labour shortages. 'Panic buying' saw consumption temporarily spike, and MLA consumer research confirmed that consumers in crisis turn to brands they trust, including Australian beef and lamb. Despite initial volatility, consumption has since levelled as beef settled into its role as a key source of protein.

EXPORTING TO THE WORLD

Australia supplies 17% of world beef exports.[20]

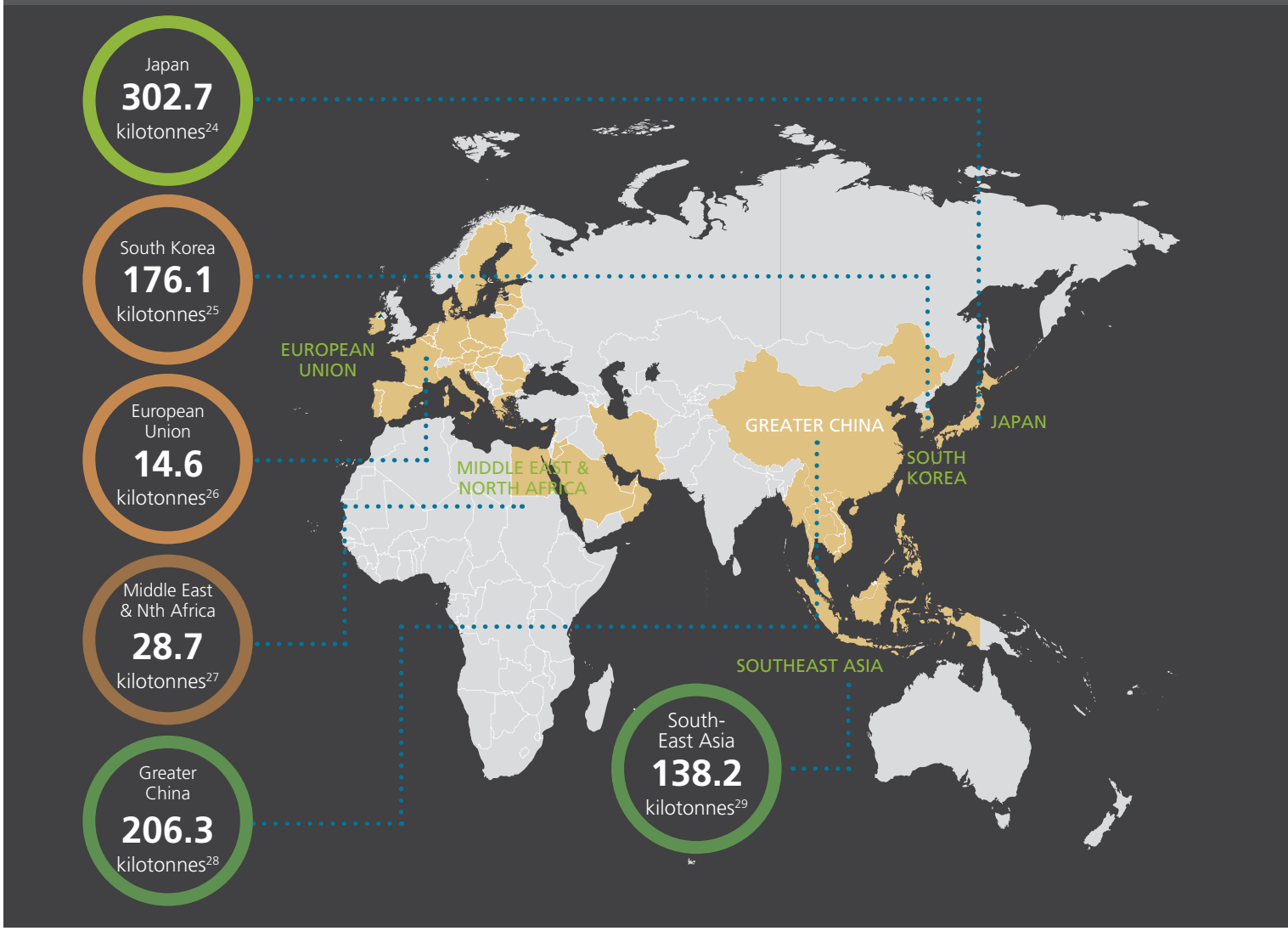
$10.8b

Australia was the world's most valuable beef exporter in 2019, generating A$10.8 billion.[21]

Australia produces 3% of the world's beef supply.[22]

3%

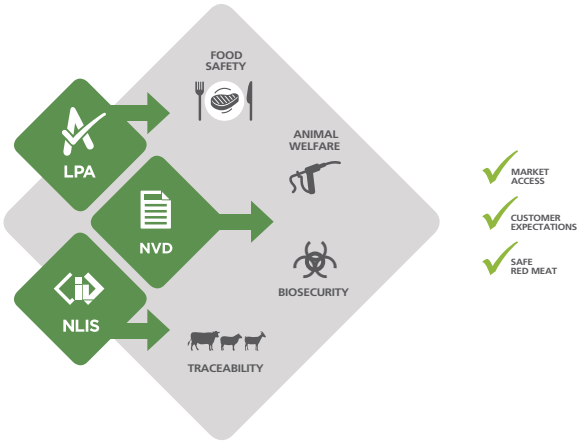
In 2018-19, Australia exported 72% of its total beef and veal production to over 70 countries.[23]



Australia is the third largest beef exporter by volume in the world.[30]

Australian live cattle exports were valued at $1.6 billion in 2018-19, with 1.2 million head exported.[31]

INTEGRITY SYSTEMS



Australian beef enjoys market access to more than 100 countries, due to strong systems that ensure it is safe and free of exotic diseases. Australian beef's reputation as being clean and safe is underpinned by world-leading integrity systems that cover food safety, quality assurance and traceability from paddock to plate.

Three central elements of the red meat integrity system are:

- National Livestock Identification System (NLIS)
- Livestock Production Assurance (LPA)
- LPA National Vendor Declaration (LPA NVD)

NLIS provides information that allows Australia's red meat and livestock industry to track and identify cattle, sheep and goats, wherever they are. This whole-of-value-chain traceability underpins market access for Australian beef globally. It also collects data pertinent to biosecurity, food safety, product integrity, market access, and other issues important to industry.

LPA is an independently audited on-farm assurance program, covering food safety, animal welfare and biosecurity. Producers who participate in LPA commit to carrying out certain on-farm practices, including the safe and responsible treatment of animals, and to record any treatments administered. Producers declare information about livestock history and on-farm practices on LPA NVDs, which are required for any movement of stock between properties, or to processors or saleyards.

The Australian Beef **Sustainability Framework**

OUR VISION

A thriving Australian beef industry that strives to continuously improve the wellbeing of people, animals and the environment.

WHO IS BEHIND THE FRAMEWORK?

The Framework is an initiative of the Red Meat Advisory Council (RMAC). RMAC is the peak body that represents the collective interests of the Australian red meat industry. It is made up Cattle Council of Australia, Australian Lotfeeders' Association, Australian Livestock Exporters' Council, and the Australian Meat Industry Council. RMAC has appointed a grassroots Sustainability Steering Group (SSG) that is representative of industry, to lead the Framework. Read more about the Framework's SSG, governance structure and history in Appendix 2 and 6.

HOW DO WE DEFINE SUSTAINABILITY?

Sustainability is the production of beef in a manner that is socially, environmentally and economically responsible. We do this by caring for natural resources, people and the community, ensuring the health and welfare of animals, and driving continuous improvement.

The Framework is made up of:

- Four themes
- 10 priority areas
- 23 priorities, and
- 50 indicators.

Brahman cattle on a cattle station in the outback of Queensland, Australia. Photo: iStockphoto.com

ANIMAL WELFARE

The wellbeing and health of animals is paramount for producers and the broader beef industry. The industry invests in research, development and adoption programs to ensure high standards of animal welfare and continuous improvement.

Good animal welfare is not only a legal requirement, it is entrenched in our industry's standards and guidelines and has led to Australia becoming world leaders in animal health.

The animal welfare theme of the Framework was developed with the five freedoms and, the more recent, five domains of animal welfare in mind.

1 ENHANCE ANIMAL WELLBEING

1.1 Competent livestock handling
1.2 Safe livestock transport
1.3 Animal husbandry techniques*
1.4 Humane processing

2 PROMOTE ANIMAL HEALTH

2.1 Maintain healthy livestock
2.2 Minimise biosecurity risk

ECONOMIC RESILIENCE

Australia is one of the world's largest exporters and most efficient producers of beef. However, producer profits tend to be low, affecting their ability to withstand unexpected shocks such as drought.

The Framework reports on economic resilience through reducing costs for the industry, which are higher than our major global competitors, and boosting productivity.

As global demand increases, expanding the industry's access to global markets will also help support more profitable and resilient beef businesses.

3 ENHANCE PROFITABILITY AND PRODUCTIVITY

3.1 Profitability across value chain*
3.2 Farm, feedlot and processor productivity and cost of production

4 OPTIMISE MARKET

4.1 Barriers to trade
4.2 Product integrity

ENVIRONMENTAL STEWARDSHIP

As a major land user, the beef industry has a close relationship with the environment and is particularly exposed to environmental risks such as climate variability.

The industry prospers through maintaining a healthy environment and thriving ecosystem, including soil, vegetation, water and air. The beef industry is committed to enhancing the ecosystems that foster productivity, while fulfilling its role as environmental stewards.

The Framework also highlights the need for the industry to adapt to the changing environment.

5 IMPROVE LAND MANAGEMENT PRACTICE

5.1 Minimise nutrient and sediment loss
5.2 Balance of tree and grass cover*

6 MITIGATE AND MANAGE CLIMATE CHANGE

6.1 Manage climate change risk*
6.2 Climate change adaptation and preparedness
6.3 Efficient use of water

7 MINIMISE WASTE

7.1 Solid waste to landfill from processing

PEOPLE AND THE COMMUNITY

A safe, healthy and capable workforce, together with prosperous and resilient regional communities, is essential to the sustainability of the industry.

In Australia well-enforced laws and regulations govern human rights and fair work. As such the Framework strives for a safe and healthy workforce that can continue to grow with greater access to skills and labour.

The industry also supports the community by providing safe and nutritious beef while increasing the prosperity of rural and regional communities.

8 PRODUCE NUTRITIOUS AND SAFE FOOD

8.1 Beef is eaten as part of a healthy balanced diet
8.2 Food safety
8.3 Antimicrobial stewardship*

9 BUILD WORKPLACE CAPACITY

9.1 Education and training
9.2 Diversity in the workforce

10 ENSURE HEALTH, SAFETY AND WELLBEING OF PEOPLE IN THE INDUSTRY

10.1 Health and safety of people in industry*
10.2 Wellbeing of people in the industry

*Six key priorities selected by the Consultative Committee and Steering Group.

EXAMPLES OF COMPANIES UTILISING THE FRAMEWORK

The Framework was established as a whole-of-industry reporting tool, to define sustainable beef production and track the industry's performance. Companies can use the Framework to inform their own sustainability activities outside of the Framework process. Below are testimonials of companies that are utilising the Framework in this way.

NAPCO

"At NAPCO, we've used the Australian Beef Sustainability Framework to define the areas of sustainability that are relevant to us as a producer in the Beef Industry.

A focus on animal welfare, environmental management, and the health and safety of our people, enables us to produce consistent, quality cattle.

Over its 140 years history, NAPCo has worked hard to improve these things, however the way that the industry communicates sustainability is always evolving to keep pace with consumer expectations.

Our team is learning as much as we can about sustainability and engaging with people across the industry to move our sustainability credentials forward. The more we work together on these areas across industry, science and Government, the better the outcomes will be.

TEYS AUSTRALIA

"At Teys Australia, we focus on improving sustainability in our business and providing industry leadership. This includes setting targets around carbon intensity, water efficiency and renewable energy, as well as projects like our proposed Low Emissions Energy Hub at Wagga.

Teys has used the Australia Beef Sustainability Framework to review our internal sustainability strategy and reporting. That's because the Framework is tailored to our industry and outlines what the supply chain, customers and other stakeholders want to address.

It provides valuable context to Teys' sustainability efforts.

As an industry, we face many common challenges, so it makes sense to have a centralised Framework that drives practice change.

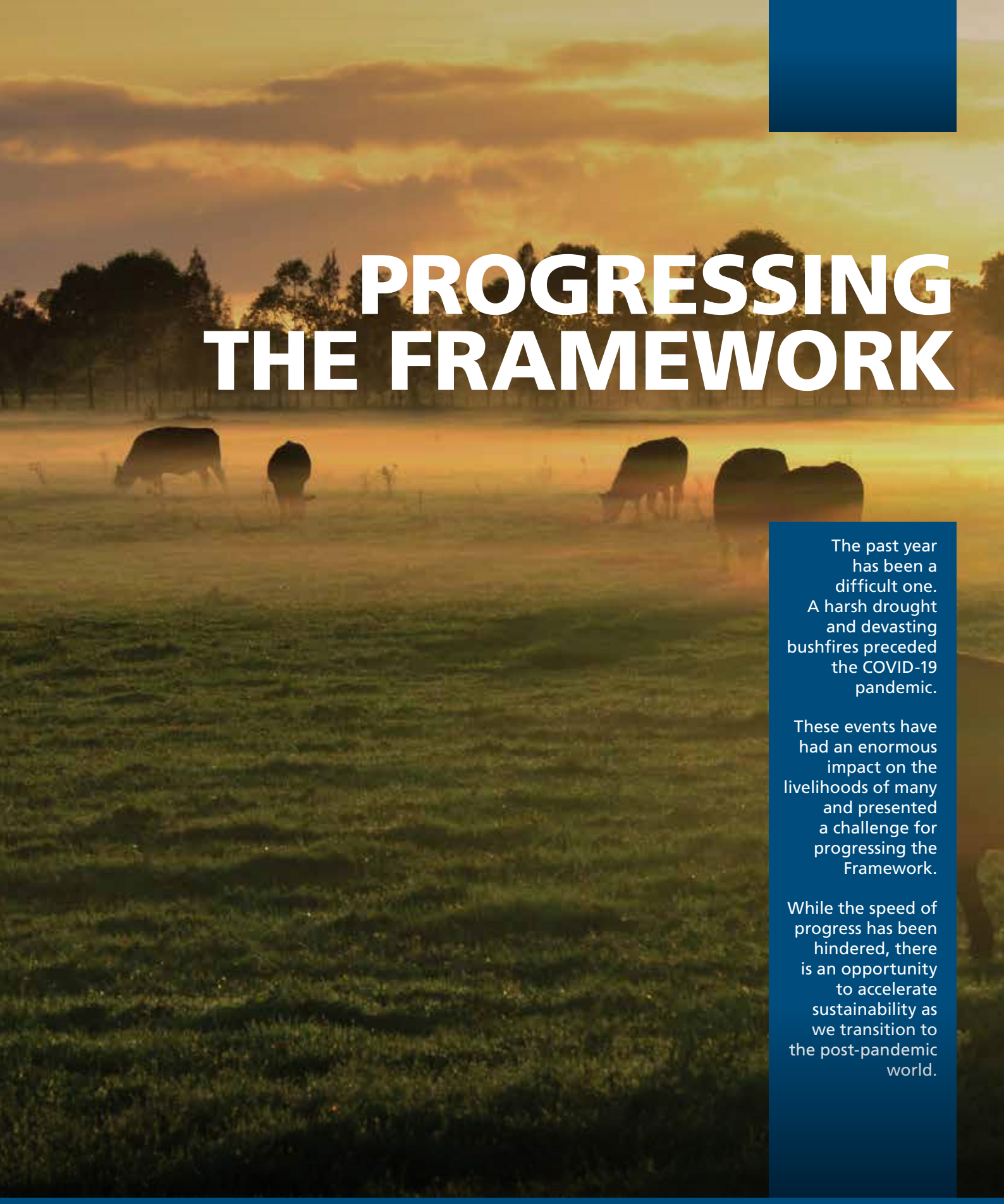
RABOBANK

"Rabobank Australia is proud to bank a significant portfolio of beef producing clients across Australia. We see it vital to contribute to an industry led Framework that drives the long-term sustainability of our beef clients and the supply chains they feed. As the financial world evolves to meet the challenges and opportunities presented by climate change and an increased focus on sustainability; we see real value in engaging with industries who have a collaborative and comprehensive approach to addressing these topics.

WOOLWORTHS

"Woolworths believes collaboration will be the most effective approach in addressing sustainability hot spots surrounding beef production. This is why we continue to support the Australian Sustainability Beef Framework (ABSF) and an active member of its consultative committee. The ABSF will function as a blueprint to what good looks like for the key hotspots in beef production to enable better outcomes for the whole industry.

In the coming years, raising awareness of the Framework across the value chain will assist in highlighting consumer and community areas of focus. Tools will continue to be developed and refined to enable businesses in the beef value chain to demonstrate their performance against these priorities.



PROGRESSING THE FRAMEWORK

The past year has been a difficult one. A harsh drought and devasting bushfires preceded the COVID-19 pandemic.

These events have had an enormous impact on the livelihoods of many and presented a challenge for progressing the Framework.

While the speed of progress has been hindered, there is an opportunity to accelerate sustainability as we transition to the post-pandemic world.

Progressing **the Framework**

In the 2019 Annual Update the SSG revealed its 10-step workplan for the Framework covering 2019-2021. Over the past year the SSG has been working to progress these 10 steps.

Step	Progress
Annual Sustainability Reports	●
Enhanced engagement with industry groups	●
Half-yearly Consultative Committee forums	●
Advocacy in media and at events	●
Data for more Framework indicators	●
Engagements with key stakeholders	●
Goals for all Framework priorities	●
Map of how the SDGs align to Framework priorities	●
Outputs from deep dives into two key priorities	●
Review of key material risks	●

● significantly progressed
● slightly progressed

DEEP DIVES INTO TWO KEY PRIORITIES

Part of the Framework's mandate is improving the credibility of its indicators and measures. While the Framework aims to continuously improve its measures across all 23 priorities, some require more thorough examination.

The SSG has selected *animal husbandry techniques* and *health and safety of people in the industry* as two key priorities for which they will conduct a deep dive.

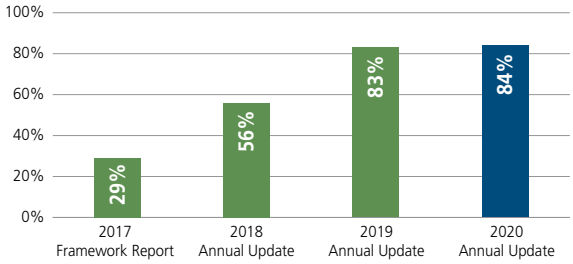
In the past year, the SSG has begun scoping an appropriate and credible approach for the animal husbandry techniques priority. While the COVID-19 pandemic has presented a challenge, these deep dives remain a critical part of the SSG's plan. The group will progress these deep dives by the next report.

DATA FOR MORE FRAMEWORK INDICATORS

This year we have been able to report on 84% of the Framework's indicators, continuing the upward trend.

As part of the Framework's philosophy of continuous improvement, we have increased the indicators we report against each year, and will continue to do so into the future.

Percentage of indicators reported on for each report

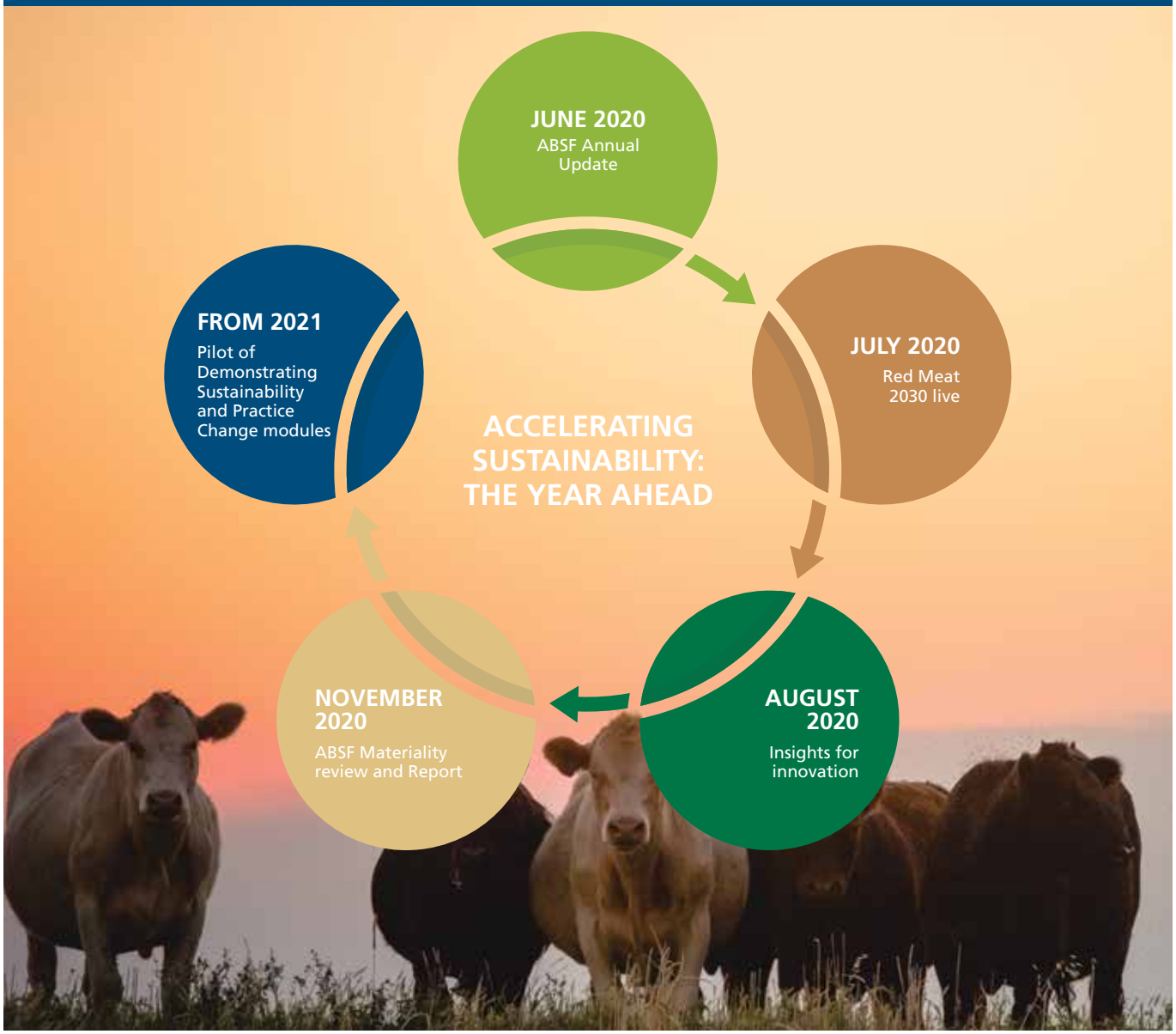


A REVIEW OF KEY MATERIAL RISKS

A materiality assessment was conducted in 2016 guided by the GRI content principles and in accordance with the AA10000 AccountAbility Assurance Standard. This work informed the initial design of the Framework priorities.

In the past few years, the concerns of the beef industry and its stakeholders have changed. To reflect these changes the SSG begun a fresh materiality assessment in early 2020. As part of this materiality assessment, the Framework will be engaging widely with stakeholders. Reviewing the beef industry's material sustainability risks in the landscape of a new decade will ensure the Framework stays on the forefront.

Where the Australian Beef Sustainability Framework's activities fit in with the Red Meat Advisory Council's plans to accelerate sustainability in the year ahead.



A MAP OF HOW THE SDGs ALIGN TO FRAMEWORK PRIORITIES

The UN Sustainable Development Goals (SDGs) represent the world's plan for action on sustainability. When the Framework was released, work was done to show which SDGs the Framework addressed – this can be found in Appendix 6.

In the past year, the SSG has been involved in broader efforts to look at ways to enhance reporting through alignment with the SDGS, led by AgriFutures Australia.

The SSG seeks to take another step and show how the SDGs and their targets map across the Framework's 23 priorities. The aim is to translate the Framework to a common, global language understood by business leaders, governments, and the global investment community to build trust and support collaboration.

ANNUAL SUSTAINABILITY REPORTS

This is the third Australian Beef Sustainability Annual Update. An update is prepared annually with a more comprehensive report to be prepared every five years. This comprehensive report is due for 2021 and will include a formal update of our materiality assessment.

Insights for Innovation

To support this year's Annual Update a further *Insights for Innovation* report will be developed targeted at industry R&DE providers, researchers and knowledge brokers. This report will help provide information for decision makers at R&D institutions.

ENGAGING OUR STAKEHOLDERS

The Framework engages a wide range of people who have an interest in the beef industry and who can affect or be affected by it.

Engaging with these stakeholders ensures the Framework is measuring, reporting and addressing the sustainability issues that the industry and community are interested in. These relationships help the SSG and industry representatives make informed decisions, and allow the Framework to provide stakeholders with the information they need to make better decisions.

In the past year, the Framework has strived to engage with more people from throughout the beef value chain. This has been a key focus because the Framework is by industry, for industry.

How we're engaging different stakeholders

Stakeholder group			
Inside industry		**How we're engaging**	
Beef supply chain (Producers, processors, lotfeeders)	As the group that is doing the work on the ground to progress sustainability, those in the beef supply chain are one of the Framework's most important stakeholders. They also have the most to gain from improvements in industry sustainability.	This group is broad and diverse, making engagement challenging. The Framework directly engages operators through an annual sustainability survey, producer forums and events. Operators are represented on the SSG.	
Industry bodies	Industry bodies represent the collective interests of large sections of the industry. As advocates, policymakers and industry representatives, these groups are vital to involve.	Peak industry councils are engaged through the Framework's relationship with RMAC. These councils and farming organisations are also engaged, alongside other bodies, through direct stakeholder meetings and the Consultative Committee forum.	
Outside industry		**How we're engaging**	
Customers	Beef retailers and wholesalers are a core part of the value chain. Customers are attuned to consumer demands and want to ensure that the beef they purchase meets consumer expectations.	Beef customers are primarily engaged through the Consultative Committee forum and regular stakeholder meetings, and receive regular digital updates.	
Investors	Investors provide capital to those working in the beef industry. Investment in the beef industry is increasingly contingent on demonstrating and reporting on sustainable practices, and ESG criteria make up a significant part of any investment case.	Investors are primarily engaged through the Consultative Committee forum and regular stakeholder meetings, and receive regular digital updates.	
Government	Government policy and regulation significantly impacts on the beef industry and its ability to be more sustainable.	Government is primary engaged through the Consultative Committee forum and regular stakeholder meetings, and receive regular digital updates.	
Civil groups	Civil groups include media, NGOs and special interest groups. Civil groups represent the interests of the broader community and can influence the industry's direction.	Civil groups are engaged through the Consultative Committee forum and ongoing digital updates, and are invited to provide online feedback.	

Our engagement activities

CONSULTATIVE COMMITTEE FORUM

The Consultative Committee is an invaluable reference group for the Framework. It includes representatives from Australian and international retailers, banks, investors, NGOs, industry groups, government and researchers. See the list of participants in Appendix 3.

Consultative Committee forums are held twice a year to share information, identify emerging issues and opportunities, and obtain valuable input and feedback from stakeholders.

Forums were held in August 2019 and February 2020 and each forum drew more than 50 representatives from across the value chain.

EVENTS

Framework representatives presented or had a stall at over 25 events since last year's report in June 2019. These included: Red Meat Update Tasmania, Red Meat 2019, Cattle Council Rising Champions Alumni Forum, Australian Rangelands Conference, QLD Rural Press Club, and the AFI Annual Conference.

STAKEHOLDER MEETINGS

Framework representatives meet regularly with stakeholders through formal briefings, stakeholder committee meetings or informal meetings. These meetings provide an opportunity for discussion with different stakeholders.

SSG members meet with the beef industry peak industry councils and in the past year, met with national and state farming organisations including: the AgForce Cattle Board, Tasmania Farmers and Graziers, NFF, the Northern Territory Cattlemen's Association, and the NSW Farmers Executive Committee. Meetings were also held with domestic and international customers, as well as representatives from the Department of Agriculture, Water and the Environment.

DIGITAL UPDATES

A monthly eNews keeps over 400 stakeholders informed about Framework and industry activities. This is supported by ongoing social media posts and website updates.

ONLINE FEEDBACK

An online feedback form is made available on the website where stakeholders can provide feedback on the Framework and each Annual Update. Readers of the Annual Update are encouraged to provide online feedback.

SURVEYS

The Framework engages producers annually through a producer sustainability survey. Its results are reported in the Framework's Annual Updates. This year's survey received 254 responses, up from 181 in 2019.

GOALS FOR ALL FRAMEWORK PRIORITIES

The Framework was launched in April 2017 with a baseline report. Since then, it has become the bridge between external stakeholders and industry, and a vehicle for constructive dialogue on sustainable beef.

Developing sustainability goals is a natural progression that will make the ambition of the beef industry clearer.

Under the direction of RMAC, the SSG has been exploring the possibility of goals for the Framework to better meet consumer and community expectations, protect access to capital and markets, and provide clearer guidance to the industry on where to invest its efforts for continuous improvement.

Heading into 2021, the Framework will look to engage technical experts and consult widely with industry and external stakeholders to develop sustainability goals that can practically encourage continuous improvement.

A governance approach has been partially developed and will be underpinned by the Framework's overall governance approach in Appendix 2.

The SSG designed five guiding principles for goal development. These principles will serve as the foundation for goal development activities. These principles were confirmed by the Consultative Committee in August 2019 and by RMAC in early 2020.

PRINCIPLE 1

SETTING SIGHTS ON THE YEAR 2030

In general, the SSG will aim to recommend goals for 2030 to align with other initiatives, including Red Meat 2030, CN30 and the National Farmers Federation (NFF) 2030 Roadmap.

PRINCIPLE 2

BALANCING ASPIRATION AND ACHIEVABILITY

When recommending goals, the SSG will balance the ambition to recommend big, aspirational targets with the need for practical/achievable goals, depending on each priority. There are some goals – such as work fatalities – which must be aspirational to be accepted by the wider community.

PRINCIPLE 3

BEING FLEXIBLE WITH SETTING GOALS

In the Framework there are a wide range of priorities with different requirements. The SSG will seek to identify and recommend individual – not standardised – goals on a priority-by-priority basis.

PRINCIPLE 4

CONSULTING WIDELY AND COLLECTIVELY

The process of identifying goals needs rigorous consultation. This allows the SSG to recommend robust goals that are owned by the Australian beef industry and meet stakeholder expectations.

PRINCIPLE 5

SEEKING PROGRESS BEFORE PERFECTION

Pursuing 'perfect' goals is unrealistic. The SSG will put progress before perfection when identifying and recommending goals. It is better to deliver a goal (even a proxy) than wait for everything to align perfectly.

Six key **priorities**

In August 2017, the Consultative Committee selected five of the Framework's 23 priorities for industry focus. These were animal husbandry techniques, profitability across value chain, balance of tree and grass cover, antimicrobial stewardship and manage climate change risk.

The SSG endorsed these and added one: health and safety of people in industry.

While work continues for all priorities, Framework activities focus on progressing these six key priorities.

ANIMAL HUSBANDRY TECHNIQUES

These techniques include castration, horn removal (dehorning), and spaying. The industry aims to find alternatives to practices (e.g. breeding selection for the polled gene) and administer pain relief before carrying out necessary husbandry procedures.

PROFITABILITY ACROSS VALUE CHAIN

To be economically sustainable, the industry must generate a positive rate of return over the long term on all capital used in cattle raising and beef production. Rate of return is measured by a rolling average of farm business profit, total factor productivity across the value chain and cost of production.

BALANCE OF TREE AND GRASS COVER

Well-managed landscapes and cattle production are not considered mutually exclusive. The beef industry is working to protect high-value conservation, and to better understand and capture mutually beneficial practices.

ANTIMICROBIAL STEWARDSHIP

Maintaining the efficacy of antimicrobials so that infections in humans and animals remain treatable is of critical importance. Antimicrobial stewardship aims to improve the safe and appropriate use of antibiotics, and decrease the incidence of antimicrobial resistance.

MANAGE CLIMATE CHANGE RISK

This covers greenhouse gases emitted along the beef value chain, including methane through cattle digestion, fertiliser application and fossil fuel use (both on-farm and in processing). It is measured by kg CO_2e emitted when raising and processing beef, and carbon capture and sequestration.

HEALTH AND SAFETY OF PEOPLE IN INDUSTRY

In recognition of the significance of the wellbeing and safety of those working in the beef industry, the SSG added a sixth priority area for action.

ANIMAL HUSBANDRY TECHNIQUES

These techniques include castration, disbudding, horn removal (dehorning), branding and spaying.

This priority looks at alternatives to practices (e.g. breeding selection for the polled gene, immune-contraceptive desexing, effective electronic identification) and, in the interim, administer pain relief when carrying out necessary husbandry procedures.

73%

The percentage of the national cattle herd genetically polled

21%

Percentage of industry regularly using pain relief when undertaking husbandry practices

Animal husbandry techniques

CONTEXT

The Australian beef industry is committed to best practice animal welfare, to meet community expectations, and because it is the right thing to do.

Animal welfare is also a legal requirement and animal cruelty is a criminal offence.

Australians, and customers around the world, expect that the beef industry does its best by its animals. Participants are also committed to doing the right thing, however the beef industry recognises that it can continuously improve its treatment of animals.

The beef industry is dedicated to ongoing improvements in animal welfare across the Australian supply chain. Only the highest standards of animal welfare are acceptable to the industry. Any form of livestock abuse is highly condemned by industry.

Improving aversive animal husbandry practices is a priority for the industry. These practices are castration, dehorning and spaying.

Producers are guided by the *Australian Animal Welfare Standards and Guidelines for Cattle*. These recommend appropriate husbandry techniques which deliver better welfare outcomes for the animal. The independently audited Livestock Production Assurance (LPA) program, is required by many domestic and international supply chains. It specifies that staff handling animals must be familiar with – and receive training about – these animal welfare standards.

The industry aims to replace certain procedures. As alternatives are developed, the industry is also working to improve pain management methods.

The red meat industry's guiding document, *Red Meat 2030*, sets out the aim for the industry to be "recognised as the world leaders in animal health, welfare and production practices". This is to be achieved through initiatives that include ensuring whole-of-industry animal health and welfare standards and systems, as well as adopting animal health, welfare, biosecurity and production best practices.

MLA is the Australian red meat industry's research and development corporation. MLA is a member of the National Animal Welfare Research, Development and Extension Strategy, and works closely with other research and industry bodies, including Animal Health Australia.

INDUSTRY POSITION

The Australian beef industry:

- Supports the use of pain relief in unavoidable procedures, and aspires to 100% use of pain relief for these procedures by 2030.
- Recognises the five domains and five freedoms of animal welfare as our true north when setting best practice.
- Recognises that Australian law and other industry standards are the minimum compared with best practice.
- Supports the continuous improvement of animal welfare based on science.
- Does not condone cruelty to livestock within in our care.
- Supports and invests in alternatives to animal husbandry procedures.
- Recognises that until suitable and effective arrangements are available, the industry supports practices as identified in the *Standards and Guidelines for Cattle*.
- Supports promoting the benefits of pain relief to producers, decision-makers and the community.
- Australian livestock exporters lead the world in assuring the welfare of exported animals throughout the supply chain.

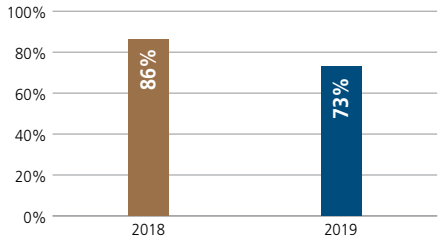
The timeframe for the industry's 100% pain relief goal has changed from 2025 to 2030. After further consultation, 2030 was identified as a more realistic timeframe. This date better aligns with the 10-year red meat strategy, *Red Meat 2030*, and other industry goals (such as the industry's goal to be carbon neutral by 2030). The Cattle Council of Australia sets the grassfed industry policy on animal welfare for production, which can be found at **www.cattlecouncil.com.au/policy-statements**

Aversive husbandry procedure	What it means	Why it's carried out
Castration	Removal of the testicles from male cattle	Castrated males are less aggressive, reducing the risk of cattle injury and injury to handlers. It is also a way to limit unwanted pregnancies, and reduces wandering in male animals.
Dehorning	Removal of horns from young cattle	Dehorned livestock are less likely to hurt themselves, other livestock, and human handlers. 73% of the industry are genetically polled, which is progressively increasing the percentage of polled cattle within the herd.
Spaying	Removal of the ovaries from female cattle.	Spaying is a management tool for preventing unwanted pregnancies which can have serious animal welfare consequences.

WHAT THE DATA IS TELLING US

The percentage of the national cattle herd genetically polled

Indicator 1.3a: The percentage of the national cattle herd genetically polled



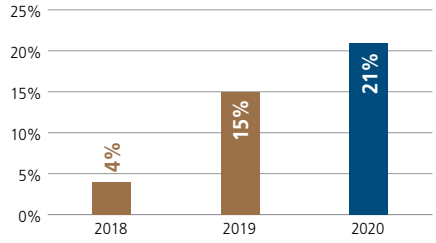
* 2018's Update reported 51% polled cows and 71% polled bulls for 2016.

This figure comes from a different data source this year as the source for last year's data has changed their measurement methodology. This makes it difficult to compare data to last year.

This figure has come by extrapolating the proportion of each breed that is genetically polled to the national herd. Data from this year has been calculated from seedstock. The commercial herd is expected to have a lower percentage due to generational intervals and lag in genetic progress between stud and commercial herds. The data is further limited as not all seedstock herds record poll status comprehensively.

The percentage of industry regularly using pain relief when undertaking aversive husbandry practices

Indicator 1.3b: The percentage of industry regularly using pain relief when undertaking aversive husbandry practices



The uptake of pain relief for regular use when undertaking husbandry practices has increased to 21% this year. This figure is from a 2020 producer survey, where 21% of respondents said they regularly pain relief for husbandry practices.

Self-assessment through surveys is currently the best available data, recognising that it is not an ideal data source. Alternative measures were explored, such as pain relief drug sales which were not feasible. In lieu of better data, the Framework will continue to report on this indicator using survey data.

SNAPSHOT OF ACTIVITY

MLA leads the industry's on-farm animal welfare activities across research, development, adoption, engagement and communications. For animal husbandry, MLA is focusing its efforts on three areas:

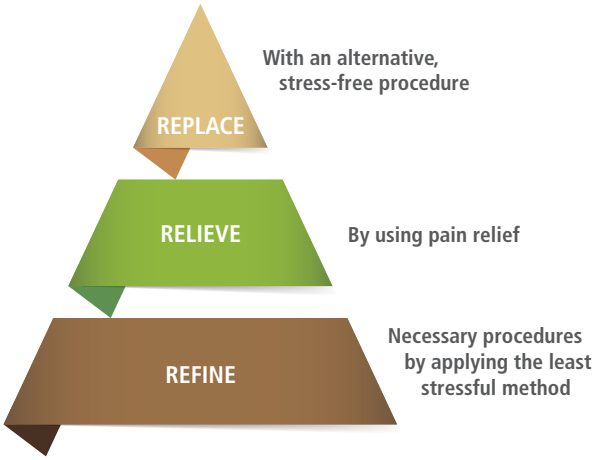


Figure 2: The '3R' model of preferred strategies to manage animal welfare. Replace sits at the top of the hierarchy and is the strategy with priority focus.

Replacing aversive procedures

The developed 'Australian Poll Gene Marker Test' enables producers to accurately breed out horns from their beef production system, removing the need to dehorn. In 2020, another round of optimisation was completed and published leading to accuracy of more than 99%. The completion of further research has led to the development of a single nucleotide polymorphism (SNP) based optimised poll test that is compatible with other genomic products allowing more rapid adoption of the test.

The industry prefers to find alternatives to certain procedures, such as breeding polled (hornless) cattle. Work continues to increase the percentage proportion of cattle that are polled. Immunocontraception offers the possibility of replacing castration and spaying.

Promoting the use of pain relief

MLA has invested in projects to identify suitable pain relief solutions for different situations. These projects include testing different chemical compounds and investigating novel approaches to administering and assessing pain relief.

The MLA Donor Company (MDC) project 'Development of a transdermal technology to deliver analgesia to cattle undergoing surgical husbandry procedures', developed a transdermal formulation of ketoprofen, an anti-inflammatory drug for cattle. The formulation could provide up to 24 hours of pain relief following surgery. The search is now underway for a commercialisation partner.

Work is underway to increase the uptake of commercially available pain relief. An MLA Producer Demonstration Sites (PDS) integrated R&D project is investigating the use of analgesics at the time of castration and/or dehorning, and the resulting impacts on welfare and production outcomes in beef cattle. A pilot study is being conducted on Douglas Daly Research Station, consisting of 400 weaners that will be randomly allocated to four treatment groups. Results from the pilot will then inform a PDS project involving a number of Northern Australia properties in years two and three to assist with broader implementation and practice change. MLA is also working with stakeholders to replicate this type of project across other production regions.

Improving methods for measuring animal welfare

MLA is working with research bodies to investigate new ways of measuring and recording the wellbeing state of cattle, as well as establish benchmarks for enterprise and industry evaluation of livestock wellbeing management.

A commitment to improving the wellbeing of animals under our care, implies that improvement can be measured. Objective assessment of livestock wellbeing takes account of behaviour and condition, and the environment (e.g. feed, water and shelter availability and proximity). MLA's research thus far has covered the areas of animal behaviour (by observation, or accellerometer data capture), physiological and pathological biomarkers (sample analysis and remote sensing technology), and stock handler attitudes and behaviour. In addition to capturing "snapshots" of an animal's wellbeing state at any one time, there is also an expectation that it would be possible to record an animal's exposure to adverse impacts from birth to slaughter. The objective is to synthesise these various wellbeing parameters into a welfare benchmarking system which might support an accreditation scheme.

CASE STUDY

PAIN-FREE SURGERY ESSENTIAL FOR CPC

Safeguarding the welfare of cattle in its care is a moral, ethical and business imperative for Consolidated Pastoral Company (CPC).

CPC operates nine stations occupying 3.2 million hectares, as well as 2 feedlots in Indonesia.

"We are currently running 300,000 head at any one time in Australia and Indonesia," CPC Chief Executive Officer Troy Setter said.

He said animal welfare was a key priority at CPC.

To support animal welfare, CPC uses a range of treatments for pain relief, as well as sanitising open wounds caused by accidents or necessary procedures such as castration and dehorning. Their teams have found the topical anaesthetic and antiseptic solution, Tri-Solfen, effective.

It numbs a targeted body area, minimises blood loss, and prevents infection.

CPC is working to phase out dehorning by using polled genetics where possible. In the interim dehorning remains an essential step in protecting both cattle and workers from injuries inflicted by horns.

"CPC continues to breed [polled] cattle but that's a good 10 year plus project, so in the meantime we're still dehorning," Troy said.

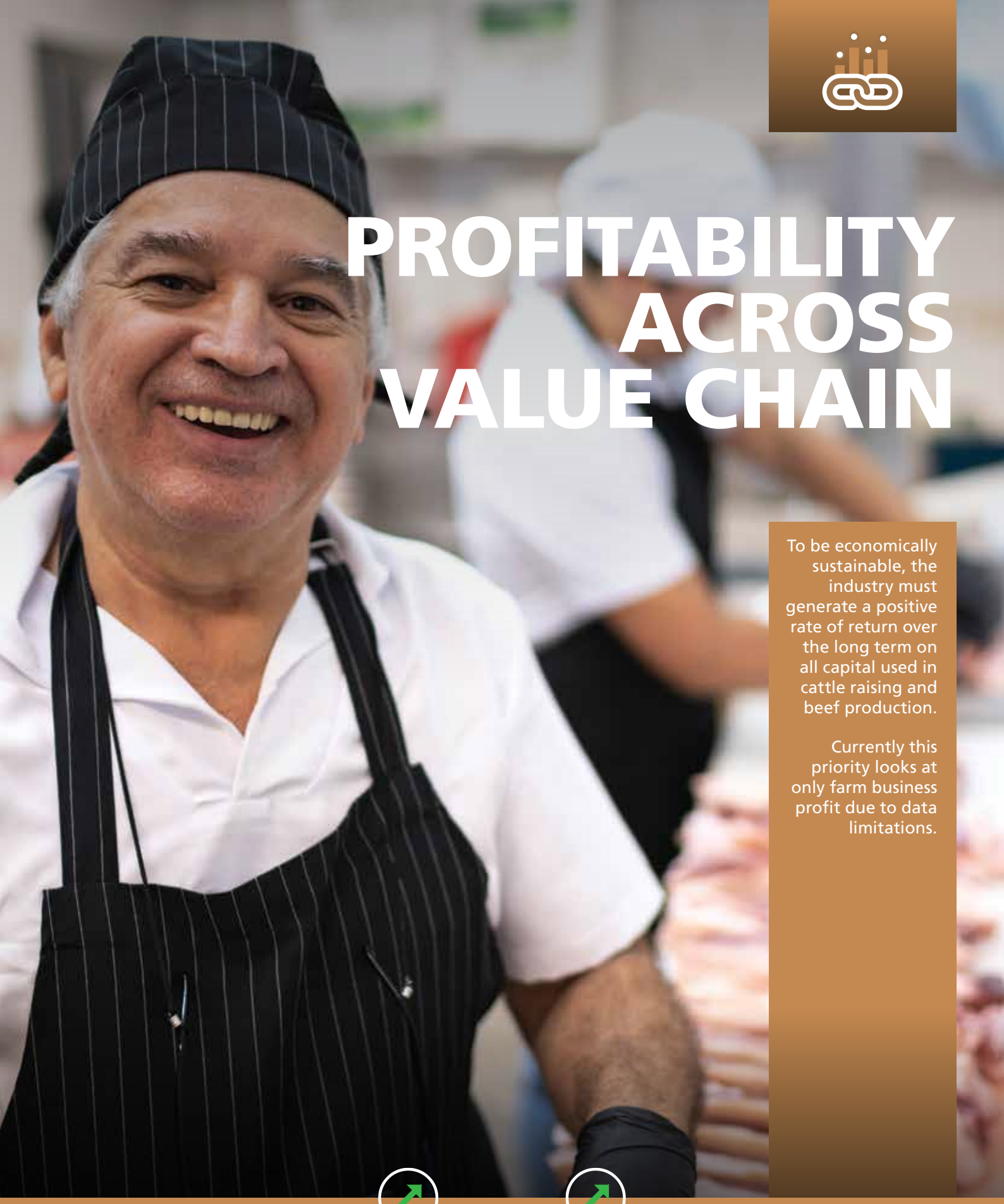
"We're now applying Tri-Solfen to those animals as pain relief that works straight away."

Tri-Solfen is also being used after surgical procedures.

For CPC and its cattle, the use of Tri-Solfen is a win for animal welfare and their business.

Troy said keeping CPC's free from fear and pain was not only "the right thing for us to do" but also benefited the company financially.

"If our cattle are free from fear and pain, and healthy, they perform better and put on extra weight. For us, animal welfare's just so important morally and ethically, and also for our bottom line."



PROFITABILITY ACROSS VALUE CHAIN

To be economically sustainable, the industry must generate a positive rate of return over the long term on all capital used in cattle raising and beef production.

Currently this priority looks at only farm business profit due to data limitations.

All: 5.3%

Top 25%: 9.3%

Rate of return to total capital for beef farms
Rolling five-year average for 2014-2018 covering specialist beef producers

Profitability **across value chain**

CONTEXT

The beef value chain is an inter-reliant system of different sectors, with profit moving between them as market and seasonal conditions shift. The Framework currently tracks farm business profit. However, an economically sustainable industry needs a positive rate of return generated through all stages of cattle raising and beef production.

Increasing productivity and profitability across the industry will improve long-term sustainability and help offset the ongoing cost price squeeze.

The extreme weather events seen in 2019-20, such as drought and bushfires, have kept pressure on producers to closely manage on-farm productivity. Many producers are supplementing farm income with off-farm earnings or producing other commodities on their farm. These factors make it difficult for the Framework to track on-farm profitability solely for beef.

Australian feedlots have also contended with drought and the associated high cost of feed and water, and rising energy prices. While drought has broken in key cattle regions, feedlots are now contending with elevated feeder cattle prices.

In beef processing, the high cost of labour, regulation and energy puts pressure on Australia's ability to be price competitive in global markets.

Other external factors that contribute to profitability of the whole value chain include the movements in the Australian dollar, as well as changing global supply and demand.

The industry has a goal to double the value of Australian red meat sales by 2030 compared to a 2020 baseline.[33] This will require increasing the volume and value of beef sold to our markets supported by reducing costs through efficient management systems and practices. In 2018-19, Australia's red meat and livestock industry accounted for 1.5% of Australia's GDP.[34] In comparison, wholesale trade accounted for 4.1%, manufacturing 6%, construction 7.8% and mining 9%.[35]

This effort is supported by a focus on delivering timely and accurate tools, technology and information, encouraging best practice, and continuing research to raise the profit ceiling.

INDUSTRY POSITION

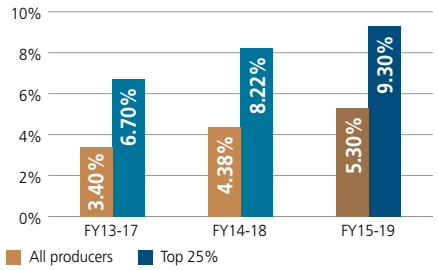
At an industry level RMAC supports investment, policy settings and practices that foster a prosperous and profitable industry.

Red Meat 2030, identifies that the industry can improve its economic resilience by reducing tariff and quota barriers to trade, reducing non-tariff barriers to trade, building on our approach to biosecurity and food safety, promoting investment in industry, and remaining competitive with global markets.

WHAT THE DATA IS TELLING US

Rate of return to capital for beef farms

Indicator 3.1a: Average rate of return to capital for beef farms



A challenge for reporting on-farm profitability is that profit is not the main motivator for all producers. Some producers are motivated by their values or their lifestyle. These factors influence the data. For this reason, the Framework reports on rate of return for all producers and the top quartile.

The Framework uses five-year rolling averages from ABARES to report on this indicator. The last few years have seen an increase in the average rate of return for all producers, and the top quartile. The difference in rate of return between the top quartile and all producers has been increasing slightly over the past three years, at 4% for FY2019.

This increase has been influenced by high global demand for red meat, which further increased as a result of the African swine fever outbreak in Asian countries. Drought has been a significant factor for farm profitability. Low crop production has contributed to higher prices for fodder and feed grains across the country. This has been compounded by the reduced availability of pasture for livestock farms.

SNAPSHOT OF ACTIVITY

State and federal agriculture departments, private consultants and industry service providers drive profitability programs in the red meat sector.

Driving adoption of research and best practice

MLA has increased the focus and investment in the Adoption program, which aims to increase industry prosperity through on-farm adoption of research and technology. The MLA Adoption Strategy, which is driven through the Cattle Council of Australia (CCA), details key areas of focus including:

- Ensuring the all applied on-farm R&D projects have a pathway to adoption, ideally as part of the R&D project.
- Adoption programs which are based on long-term practice change through support of implementation on-farm.
- Building the capability of the advisory sector, which are the critical component to support producers and deliver adoption programs.
- Identifying new methods to raise awareness and undertake training (e.g. online platforms).

Profitable Grazing Systems (PGS) is MLA's long-term supported adoption program that matches producers who want to improve their business and bottom line with like-minded advisors. The adoption program boosts on-farm productivity and profitability by providing advice and training on topics like genetics and reproduction, feed base, managing people and business, or making the most of the value chain. PGS has been delivered to 54 groups of cattle, sheep and goat producers across Australia so far, reporting an average 39% increase in profit achieved from the pilot.

MLA's Producer Demonstration Sites (PDS) is another long-term practice change program, which aims to increase adoption of practices and technologies that improve business profitability, productivity and sustainability. Examples for beef producers include PDS projects about post-weaning management strategies, pain relief, and implementing fixed-time AI and best practice reproduction management (e.g. Critical mating weights and Estimated Breeding Values).

The feedlot sector is prioritising developing tools to increase productivity and reduce costs, through automation and remote monitoring of routine feedlot processes. Adoption is driven through the Australian Lot Feeders' Association (ALFA). In 2019, MLA worked with Bindaree Beef Group to develop – and make commercially available to feedlots – an auto-delivery system "DeliverEase", to increase utilisation and reduce waste.

Unlocking productivity and profitability benefits from genetics

MLA identified the uptake of genetics by commercial livestock producers as low compared with other sectors. Low adoption is being addressed by activities funded via the National Livestock Genetics Consortium and MLA's genetics adoption strategy, which forms part of the broader MLA adoption strategy. One such activity is the development of MLA's genetics marketing campaign, which draws a link between genetics and the commercial profitability of the Australian livestock industry. It also provides tools and resources to help producers get started with genetics. It also directs producers to take the next steps by participating in adoption programs such as Bred Well Fed Well, which offers an introductory one day course on genetics and nutrition. The course has practical componets including assessing bull genetics, designing a breeding objective, and condition scoring cows.

The three-day Breeding EDGE program helps beef producers to develop a breeding objective, or improve an existing strategy. Topics include reproduction issues, genetics, determining breeding objectives, livestock selection and managing the herd to capture benefits. Breeding EDGE is part of the wider EDGEnetwork program, which was developed by MLA to help producers improve their livestock enterprises.

Promoting grazing land and pasture improvement

MLA's Feedbase Investment Plan (FIP) has been completed, with the five-year project improving the scientific understanding of feedbase constraints and opportunities for red meat producers in southern Australia.

During FIP research, producers identified four common areas of concern: weeds, soils, pasture nitrogen and pasture productivity. Key feedbase activities as part of the larger MLA adoption strategy enable practice change and facilitate implementing this research. A decision-making platform called Pasture Paramedic (PP) is being used to assess and evaluate the condition of pasture in the medium and high rainfall zones of southern Australia. This is currently being developed for more regions of Australia. MLA considers PP to be the starting point for a wider range of activities in this space. Profitable Grazing Systems training packages are currently available, with further packages to be developed, once producers identify feedbase gaps and opportunities provided by the PP.

PDS projects are demonstrating the ability of new pasture species or cultivars and associated grazing management practices to increase profitability. May 2020 projections from five trial sites suggest that these learnings could increase the profitability of the red meat supply chain by at least 10%. Other PDS projects are demonstrating that high-quality forage crops and perennial pasture systems can be utilised to meet target weights for finishing steers and increase overall farm profit.

Jeff Dight, Joe McMeniman, and Stuart McCarthy at Myola Feedlot.

CASE STUDY

EFFICIENCIES ARE ON THE FEEDLOT MENU

Carcase weight gain and increased profitability are now on the menu in feedlots, thanks to a new auto-delivery system.

Able to be retrofitted to existing feed trucks, the auto-delivery system "DeliverEase" is now commercially available for lot feeder adoption.

Meat & Livestock Australia (MLA) and Bindaree Beef Group are responsible for the joint project, with automation and robotics company Manabotix behind the design.

MLA Feedlot Project Manager, Dr Joe McMeniman said the benefits of the technology include a more efficient workforce, increased profitability, and a potential boost in animal productivity.

"With this technology we can make sure every animal has equal access to feed in the pen, and that the right feed is delivered to the right pen. We'll have better feeding, more consistent feeding and better feed efficiency, which should lead to better carcase weight gain", Joe said.

The system uses artificial intelligence algorithms to judge the correct speed of feed distribution, according to the length of the pen and the volume allocated in the feed plan. The truck's operator can view screens that provide active feedback on the performance, health and diagnostics of the system.

If the truck arrives at an incorrect pen, it is prevented from delivering feed. Joe said the tighter controls mean fewer resources are wasted.

Myola Feedlot Manager, Jeff Dight, said the feedlot had already seen the potential benefits of the auto-delivery system during testing.

Feeding cattle is all about consistency – cattle are creatures of habit and they need to be fed at a consistent time, and a consistent amount down the bunk.

"The role of a feed truck operator is not easy and we found new drivers had a propensity to drop feed at the end of the bunk or end up short of feed along the bunk, so the cattle were fighting over feed."

"The technology for an auto-delivery system delivers feed evenly, avoids unnecessary reversing of trucks, which can cause damage but also make it a lot harder to feed, and makes it easier to train staff," Jeff said.

BALANCE OF TREE AND GRASS COVER

Beef production is compatible with well-managed landscapes.

This priority looks at industry's care of natural resources and biodiversity, by measuring area of land managed for environmental outcomes and changes in vegetation.

Area of land managed for environmental outcomes

2.25%
of cattle-producing land set aside for conservation or protection purposes

62.50%
of cattle-producing land managed by beef producers for environmental outcomes

Change in vegetation

1.26%
National Forest cover gain

1.09%
National forest cover loss

4.14%
National woodland cover gain

3.23%
National woodland cover loss

Balance of **tree and grass cover**

CONTEXT

The Australian beef industry manages half of Australia's landmass. Much of the beef it produces is the result of grazing cattle on land that cannot support other food production.

The industry manages the land by balancing tree and grass cover for grazing and environmental benefits.

Overwhelmingly, activities to improve production also improve environmental outcomes, for example through nutrient cycling. The industry recognises in some areas, production and environment must be managed separately. In Australia, well-managed beef production systems are integrated with biodiverse ecosystems.

It remains important for the Australian beef industry to prove its environmental credentials, including how it manages tree and grass cover.

Australia is tackling difficult environmental challenges. As managers of so much land, producers recognise their responsibility to protect and improve the land. The beef industry is aware of the negative impact of some operations, and many in the industry are effective environmental stewards with little recognition. Beef producers hope to continue productively collaborating with those inside and outside the industry to achieve what's best for the environment, animals and community.

The industry's strategic plan to 2030 aspires for Australian red meat to be recognised "globally as world leaders in agricultural and environmental management and stewardship practices".[36]

The Australian beef industry has been working closely with key customers, stakeholders and technical experts in this area, including through the Framework process. This includes convening an Expert Working Group to develop the practical, evidence-based measures for this priority. The Framework reported against these measures for the first time last year, and has done so again this year (see pages 56-57).

Caring for the land is becoming more challenging for farming. The climate is becoming more variable and extreme weather events more frequent. The unprecedented bushfires that devastated parts of Australia over the past summer highlight the complexity and importance of managing vegetation and fuel loads in a changing climate.

INDUSTRY POSITION

The industry believes well-managed landscapes and livestock production are not mutually exclusive when looking at the whole farm system. In many landscapes, cattle can be grazed across the property. Others require a mosaic style of management, where some areas are protected to preserve the ecological value on the farm, while other areas are used for production.

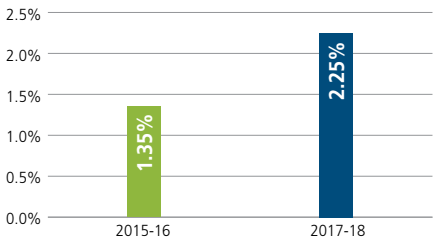
The industry is committed to:

- Responsibly managing vegetation within the landscapes for the dual benefits of food production and ecosystem services.
- Recognising that all federal and state laws to protect and enhance areas of high conservation value are the minimum compared with best practice.
- Managing landscapes in a manner that is regionally appropriate, with consideration to farm planning with an appropriate balance of tree and grass for:
  - Grazing livestock.
  - Conserving – and where possible enhancing – biodiversity.
  - Focussing on maintaining ground cover to prevent soil run-off into waterways.
- Actively managing re-growth to protect existing pastures and grasslands.
- Actively managing vegetation when required for firebreaks, weed and pest control.

WHAT THE DATA IS TELLING US

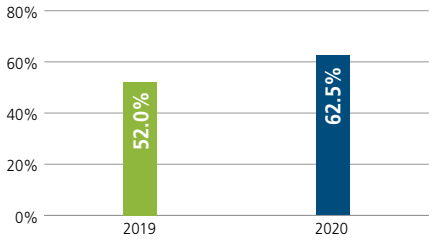
Area of land managed for environmental outcomes

Indicator 5.2a(i): Percentage cattle-producing land set aside for conservation or protection purposes.



Data for both these indicators have been collected from the Framework's annual sustainability survey, which is currently the best available data source. Land set aside for conservation or protection has increased to 2.25%, representing 6.4 million hectares of cattle-producing land. This includes reserves, parks, heritage sites and indigenous protected areas.

Indicator 5.2a(iii): Percentage cattle-producing land managed for environmental outcomes through active management.



There has been more actively managed land this year. Note that as the data came through a survey, this change could be due to a shift in respondents. Active management activities that contribute to environmental outcomes were developed in partnership with NRM Regions Australia. These activities include weed, pest and erosion control, applied soil treatments, fencing waterways and features that require protection to prevent livestock access, and destocking pastured, bushland or riparian areas.

The Framework is continuing to investigate a methodology to measure indicator 5.2a(ii), the amount of land managed by beef producers for conservation outcomes through formal arrangements.

Expert Working Group members

Name	Organisation
Dr. Steven Bray	QLD Department of Agriculture and Fisheries
Dr. Bill Burrows	Former QLD Department of Agriculture and Fisheries principal scientist
Dr. Robyn Cowley	Northern Territory Department of Primary Industries and Resources
Dr. Thomas Davison	Livestock Productivity Partnership
Dr. Teresa Eyre	Queensland Herbarium
Dr. Lachlan Ingram	University of Sydney
Dr. John Leys	NSW Department of Environment
Prof. David Lindenmayer AO	Australian National University
Prof. Jeremy Russell-Smith	Charles Darwin University
Dr. Peter Scarth	University of Queensland
Phil Tickle	Cibo Labs

Measuring changes in tree and grass cover

In 2019, we embarked on developing a world-leading capability for measuring and monitoring changes in tree and grass cover. Following extensive consultation, key indicators were developed by an independent Expert Working Group. Measurement of these indicators has been implemented through a partnership with Cibo Labs. The history of this work, alongside how this data is measured and collected, can be found on the Framework website.

Following advice from this Expert Working Group, data looks at both vegetation loss and gain across regions. The Framework aims to report at a national level, and this may mean that reported data can be very misleading if the regional context is not considered. For this reason, the Framework has outlined vegetation trends across the 56 NRM regions on the website. The Framework is continuing to investigate appropriate ways to report national tree and grass cover changes that also capture regional context.

The Framework has distinguished two classes of woody vegetation – woodland and forest. This differentiation aims to address persistent movement between vegetation classes. A loss in forest can be due to clearing or a loss in density to woodland.

National changes in woody vegetation classes

The table below shows the loss and gain of woody cover across the woodland and forest classes.

- Woodland is counted as vegetation with 5-20% canopy cover
- Forest is counted as vegetation with >20% canopy cover.

A national forest cover gain of 1.3% means that from 2017 to 2018, the conversion of non-woody to forest was responsible for a 1.3% gain in forest extent. Conversely the 1.1% loss means that from 2017 to 2018, 1.1% of the forest extent was converted to non-woody. The net change in extent is shown in the third section of this table.

What's being measured?	Measure	2017/18	Ten-year annual averages (2009-2018)
Measuring woody gains (conversion of non-woody to woody vegetation)	National woody cover gain (forest + woodland)	2.4%	3.7%
	National forest gain	1.3%	1.6%
	National woodland cover gain	4.1%	6.2%
Measuring woody losses (conversion of woody vegetation to non-woody)	National woody cover loss (forest + woodland)	1.9%	2.6%
	National forest loss	1.1%	1.4%
	National woodland cover loss	3.2%	4.2%
Measuring net change in total woody extents	Net change in national woody cover extent (forest + woodland)	+0.5%	+1.0%
	Net change in national forest cover extent	+2.2%	+2.4%
	Net change in national woodland cover extent	-2.2%	-0.8%

Overall Australia's grazed agricultural lands are increasing in woody vegetation. Over the last decade we are also seeing a general increase in the density of woodland areas through a transition from woodland to forest. Trends in the primary woody vegetation removal have declined by more than 90% from 1990 levels, and since 2009 the national annual removal rate has been less than 0.3%. These losses include fires and commercial forestry on private land, so overestimate annual losses from grazing enterprises.

National changes in ground cover

The trends in seasonal ground cover and rainfall (Figure 2) are difficult to unpack at the national scale, though there are certainly long-term trends which have an impact on land resource condition. The severe impacts of widespread drought through 2017-2019 saw ground cover levels for around 50% of Australian land fall below 50% ground cover.

The decline in ground cover levels has been occurring nationally since 2011. National statistics, however, mask much more severe declines in ground cover at regional and property levels where ground cover has been significantly below regional targets in many areas. Regional and local declines in ground cover due to poor seasonal conditions and prolonged drought means producers will need to invest in managing soils and land condition to minimise negative impacts on the environment.

More detailed analyses of regional trends for ground cover are available on: **www.sustainableaustralianbeef.com.au/vegetation-trends**.

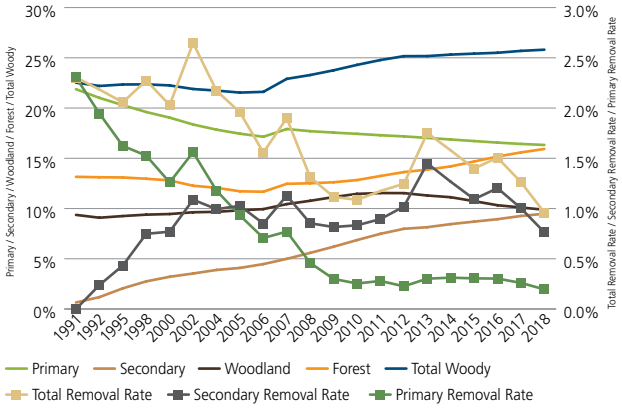


Figure 1: Annual changes in woody vegetation including removal rates from 1991 to 2018.

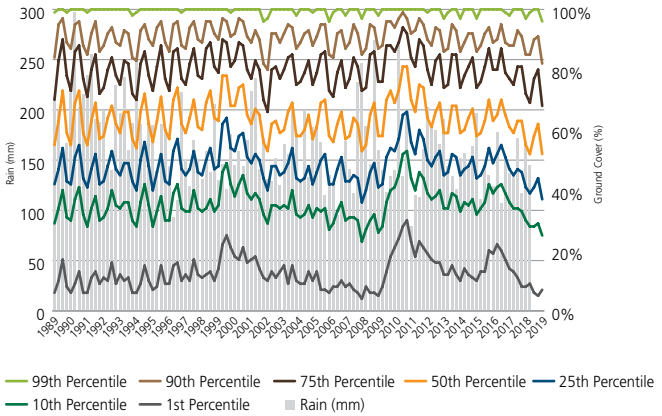


Figure 2: Annual changes in ground cover levels and rainfall from 1989 to 2019, broken down across percentiles. Data taken from December for each year except 2019 where September data is used.

SNAPSHOT OF ACTIVITY

Industry projects to improve how the Australian beef industry cares for the environment, and demonstrate its environmental credentials, include the following.

Verifying sustainable production

Considerable work is being done to develop a way to verify sustainable production. MLA has secured Smart Farm partnership funding from the Australian Government to pilot and roll out an innovative national online sustainability tool which will offer verifiable sustainability credentials for producers who opt in. Five Sustainability Credentials and supporting modules will enable broad-acre graziers to assess their on-farm performance and management:

- Vegetation retention and enhancement
- Grass cover and soil conservation
- Biodiversity stewardship
- Carbon accounting
- Drought resilience.

Participating graziers can have their practices verified against these standards through remote sensing technology. The platform will enable graziers to demonstrate their sustainability and access markets for sustainable beef.

In parallel, MLA has partnered with McDonald's to pilot a whole-of-value-chain beef sustainability program that could utilise this tool. A pilot of this program is being conducted that will test the online sustainability tool, and test how a whole-of-value chain program could operate.

NRM Regions Australia

Across Australia there are 49 NRM service providers acting as delivery agents under the National Landcare Program. They focus on:

- Ramsar wetlands
- Threatened species
- World Heritage properties
- Threatened ecological communities
- Conditions of soil, biodiversity, and vegetation
- Agricultural systems adapted to changes in climate and market demands.

Discussions continue to identify opportunities to partner on delivering positive environmental and production outcomes.

Australian National University Sustainable Farm Institute

Last year's report outlined the establishment of a project with the ANU Sustainable Farm Institute to demonstrate the practicality of populating the Framework with environmental indicators based on real farm data. The trial is due for completion in 2021. If successful, the measures will be scaled to a national level. This project will provide recommendations on the suitability of the Framework indicators, and propose alternative measures where necessary.

CASE STUDY

Left: Megan Gurnett (QLD Department of Agriculture and Fisheries) and Right: Tara Pavey (Mardale Property)

PRODUCERS BENEFIT FROM GRASS PROGRAM

Mat and Tara Pavey purchased their property 'Mardale' in the Biloela district in 2014. The property has a lot of steep undulating country that was encountering areas of degraded land, some with no ground cover at all, and subject to fast overland running water which had formed deeply-eroded gullies.

Mat and Tara's passion to restore these areas inspired them to participate in the Grazing Resilience and Sustainable Solutions (GRASS) program. The GRASS program focuses on identifying actions to improve land that is in C and D condition* and involves jointly developing a Land Management Plan (LMP) with the grazier.

Through completing an LMP on 'Mardale', Mat and Tara were able to examine specific areas of concern in detail and apply the best management options. One option used was to fence off eroded gullies to exclude stock and allow the gullies to revegetate naturally and, thereby, slow the water flow through them. Another strategy they adopted was to use mechanical intervention to widen the path of water flow in a small gully and reduce its intensity, allowing water to move more slowly through grass and minimise erosion.

Since taking over the property, Mat and Tara have adjusted the stocking rate to a sustainable level and have introduced rotational grazing to rest country and keep ground cover levels high.

Tara believes that implementing the changes identified in the LMP will establish better good ground cover in degraded areas and limit runoff, preventing further erosion. She said another advantage of using an LMP is that graziers will be able to demonstrate how they are limiting sediment run-off into Great Barrier Reef catchments.

Department of Agriculture and Fisheries GRASS program leader Matt Brown said graziers participating in the program have access to a range of targeted decision support tools and strategies to manage their land and re-establish ground cover, demonstrating their part in a sustainable grazing industry.

For more information on support for graziers please visit: **www.qld.gov.au/environment/agriculture/sustainable-farming/reef/reef-regulations/producers/grazing/support-programs**

* Read more about the ABCD land condition framework at **www.business.qld.gov.au/industries/farms-fishing-forestry/agriculture/agribusiness/agricultural-land-audit/land-classes**

MANAGING CLIMATE CHANGE RISK

Greenhouse gases are emitted throughout the beef value chain, including methane produced through cattle's natural digestion.

This priority looks at carbon dioxide equivalents emitted when raising and processing beef, as well as carbon sequestration.

12.6kg CO_2e

emitted per kg liveweight when raising beef

432kg CO_2e

emitted per tonne Hot Standard Carcass Weight (HSCW) when processing beef

6.6% of energy use

(Carbon captured and re-used in processing)

56.7% total CO_2e

reduced by the beef industry from a 2005 baseline

Manage
climate change risk

CONTEXT

Climate is the biggest individual driver of production variability in agriculture. It is integral for the beef industry to adapt management practices to reflect our changing conditions, to ensure long-term industry prosperity. The beef industry plays an important role in offsetting national emissions by sequestering carbon in soils and vegetation. Soils are the world's second largest reservoirs of carbon and hold potential for expanded carbon sequestration, providing a way of mitigating the increasing atmospheric concentration of CO_2.

In 2016, Australia (along with 175 other member states) committed to the global Paris Agreement to pursue efforts to keep global warming below 1.5°C above pre-industrial levels.[37]

Like all industries, Australia's beef industry has a responsibility to focus on minimising emissions. The Australian beef and sheep industries currently contribute around 10% of Australia's total greenhouse gas (GHG) emissions and over two thirds of this comes from cattle.[38]

Industry is currently investigating evolving ways of accounting livestock emissions such as GWP*, which more accurately reflect the timeframe for decay of various GHGs in the atmosphere (CO_2 has a longer life in the atmosphere than methane). At this stage, the Framework uses data from the National GHG Inventory which uses GWP100, though this may change based on the ongoing work to update accounting methods.

In addition to methane emitted by cattle, beef production also emits GHGs through:

- Meat processing.
- Loss of soil carbon in overgrazed pastures.
- Savannah burning conducted to manage woody weeds and promote pasture quality.
- Clearing of primary forests.
- Nitrous oxide from manure in feedlots.
- Application of nitrogen fertilisers to pastures and to grow grain.
- Upstream inputs such as chemicals and diesel.

INDUSTRY POSITION

In 2017 the Australian red meat industry committed to achieving carbon neutrality by 2030 (CN30).[39] The CN30 target definition is *Net zero greenhouse gas emissions by 2030*. This means that by 2030 the Australian beef, lamb and goat production, lot feeding, and processing value chain segments will make no net release of greenhouse gas (GHG) emissions into the atmosphere.

Red Meat 2030 outlines that CN30 will be achieved by:

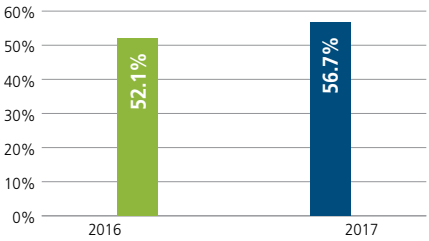
1. Identifying required actions and coordinating across the supply chain to achieve the target.
2. Researching mechanisms and practices relating to pasture-based carbon sequestration, enteric methane emission reduction, and other mitigation technologies.
3. Demonstrably reducing production, processing and consumption waste.
4. Increasing research into, and use of, renewables within the industry's energy mix.

CN30 is a clear message to global customers and consumers that the Australian red meat industry is serious about addressing GHG emissions. It will demonstrate that the red meat industry is a global leader in enteric methane and carbon farming innovation, economic development and environmental stewardship.

WHAT THE DATA IS TELLING US

The Framework publicly tracks the industry's CN30 (Carbon Neutral by 2030) target. Since the baseline year of 2005, the industry has reduced net emissions by 56.7% largely through a focus on improving productivity and vegetation management practices.

Indicator 6.1e: Percentage total CO_2e reduced by beef industry from a 2005 baseline

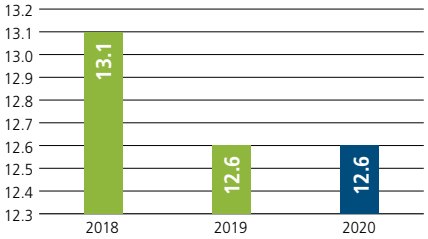


This figure was calculated by CSIRO from datasets contained in the Australian National Inventory Report across the agriculture and land use categories, relating to beef production.

The figure from last year's report has been restated from 55.7 to 52.1%. The Department of Industry, Science, Energy and Resources review and update activity data and the inventory methodology each year, and changes are applied retrospectively to past inventories. The 2016 figure has been restated applying these retrospective changes.

This reduction is reflected in a decrease in emissions intensity, as measured through a Life Cycle Assessment. MLA conducts an LCA every five years and the most recent LCA, completed in 2019, showed a 3.8% reduction in emissions intensity across the industry from 13.1 to 12.6 kg CO_2e per kg liveweight when raising beef from farm to processor.

Indicator 6.1a: kg CO_2e emitted per kg LW when raising beef



Data from the processing sector has not been updated from last year, awaiting a five-yearly AMPC environment report.

Measuring carbon sequestration is a relatively new technology, and trials are currently underway to verify scientifically sound methods which will allow the industry to calculate the amount of carbon stored through farming practices.

SNAPSHOT OF ACTIVITY

CN30 is an aspirational target for the Australian red meat industry to be carbon neutral by 2030. Research, adoption and commercialisation for the red meat industry is led by MLA.

The 2030 target was set following industry-funded research undertaken by CSIRO in 2017. This research showed that, with industry commitment, the right policy settings, and investment in research, development and adoption, the Australian red meat industry can be carbon neutral by 2030.[40]

CN30 aims to unlock $300m per year for the Australian red meat industry by optimising the carbon cycle to improve drought resilience and farmgate profitability and reduce GHG emissions.

Industry is investing in areas such as animal genetics and husbandry procedures, reducing methane emissions from livestock, viable grazing supplement delivery technologies, soil carbon sequestration methods, and integration of trees and shrubs for improved carbon storage.

CN30 activities are grouped into four key work areas.

Emissions avoidance

Enteric methane production in the rumen equates to lost productivity (50-90 kg methane/year is equivalent to 33-60 grazing days lost per year). The emissions avoidance work area includes projects that aim to increase productivity by redirecting more energy from pastures into liveweight gain rather than to enteric methane production.

Research being conducted that may lead to these outcomes includes investigating novel legumes for northern and southern environments, investigating marine and terrestrial plants for methane inhibiting properties, furthering research on additives and supplements that may decrease enteric methane by up to 80% while increasing animal weight gain (such as red asparagopsis algae and 3-NOP), identifying additional compounds and supplements that may reduce enteric methane, and identifying appropriate commercialisation and delivery mechanisms for these additives to facilitate widespread adoption.

A separate project in northern Australia aims to mobilise landholders to earn income from savannah fire management through supporting Emissions Reduction Fund (ERF) methods for sequestering carbon.

Carbon storage

Methane produced from livestock production can be offset by storage of carbon in above and below ground biomass. Some Australian beef producers have already achieved carbon neutral or low carbon systems through practices that allow them to store the same or more CO_2e than is emitted from their operation through enteric methane.

Research being conducted to support farmers to adopt practices that may offset some or all of their emissions includes technology for measuring soil carbon, identifying co-benefits of planting trees in optimal locations within properties, and identifying pasture species that will promote increased soil carbon stocks. A five-year project led by MLA in conjunction with funding and research partners is also investigating the enduring benefits of dung beetle ecosystem engineers in reducing nutrient run-off into waterways and improving soil systems and soil carbon storage.

Integrated management

The integrated management work area aims to create packages of recommended practices from the emissions avoidance and carbon storage work areas, supported with underlying frameworks, software, business cases and models to support their adoption. This work area also includes working with industry stakeholders to ensure carbon accounting measurements and methods for generating carbon credits are scientifically robust.

This work area also includes the Managing Climate Variability Program (MCV), which is the lead research and development program in Australia for providing climate knowledge to primary producers. Current priorities of the program include incorporating seasonal climate information into individual decision-making, improving forecasting of extreme climate events, and helping producers understand what drives seasonal rainfall in their region. Future MLA projects are exploring profitability and resilience through adapting to future climates. Economic modelling suggests that the potential payoff from climate adaptation could be close to $1.1 billion.

CARBON NEUTRAL 2030 – PLAN ON A PAGE

Aspiration: A socially acceptable, profitable, carbon neutral red meat industry in 2030

Emissions avoidance R&D

Activities:

1. Continually improving in animal genetics and husbandry practices to increase production efficiency, reducing methane emissions per kg of production.
2. Developing technology to avoid livestock methane emissions, such as screening of supplements for enteric methane.
3. Developing viable grazing supplement delivery technologies.
4. Assessing new pastures, shrubs and legumes that offer co-benefits of livestock productivity and lower methane emissions.
5. Developing technology to avoid methane emissions from waste management.
6. Developing energy efficiency or renewable energy technology.
7. Developing technology to reduce emissions from manure management and fertiliser us.;
8. Continuing evolution of savanna burning management methods.

Carbon storage R&D

Activities:

1. Developing new legumes, pastures and shrubs to build feedbase and carbon stocks.
2. Advancing soil carbon sequestration methods and measurement technology.
3. Improving integration of trees and shrubs for improved carbon storage, animal health and biodiversity.
4. Optimising vegetation regrowth management.
5. Optimising carbon storage in dead woody biomass.
6. Investigation of carbon storage increases from dung beetle activity in grazing lands.

Integrated management

Activities:

1. Analysing farming systems to determine appropriate combinations of emissions avoidance and carbon storage technologies and practices.
2. Incorporating emissions avoidance and carbon storage practices into existing extension and adoption platforms.
3. Developing resources and tools to support adoption of emissions avoidance and carbon storage practices.
4. Linking outcomes from carbon farming projects into the National GHG Inventory.
5. Developing new scientific methods to generate carbon credits.
6. Developing new measurement and reporting mechanisms to improve carbon accounting.
7. Investigating new accounting metrics for GHGs from livestock.

Leadership building

Activities:

1. Industry leadership and development initiatives.
2. Aligning relevant industry strategies and frameworks, such as Red Meat 2030 and the Australian Beef Sustainability Framework.
3. Working with Peak Industry Councils and government to design policy to support research, development and adoption activities.
4. Developing science communication initiatives for all stakeholders.

Leadership building

The leadership building work area includes activities that aim to build leadership capacity and competency across industry to enable the transition to a carbon neutral position in 2030.

As part of this work area, MLA is working with producers to build capability around carbon accounting and identifying practices to balance net emissions with stored carbon.

MLA is also nurturing existing relationships, and developing new ones, to identify industry leaders. They are also aligning relevant industry strategies and frameworks, such as *Red Meat 2030*, and working with government to set clear and stable evidence-based policy that supports research, development and adoption.

CASE STUDY

LOW EMISSIONS ENERGY HUB TO POWER TEYS AUSTRALIA WAGGA PLANT

Teys Australia is developing a $42 million low emissions energy hub (LEEH) at its facility in Wagga Wagga, NSW.

The hub will include a combination of renewable energy technologies to make the site energy self-sufficient, a first in the Australian (and possibly global) red meat processing industry.

Teys Australia Group Manager Resource Efficiency & Sustainability Carl Duncan said the new hub would generate significant returns for the facility, Wagga and the environment.

"The hub will include baseload bio-generation, solid waste digestion, solar photovaltaics, energy storage and thermal system to produce steam. Together, these technologies will provide stable baseload power that integrates with the grid, improving energy security, and reducing emissions", Carl said.

There is potential for local farms to sell their waste to Teys to use as fuel for energy production.

The hub will help Teys Australia manage rising energy costs. In the 2017-18 financial year, energy and water costs at the Wagga facility skyrocketed by $2 million. Australia's processing costs are up to three times higher than its international competitors.

John Langbridge, General Manager of Industry and Corporate Affairs, said that "Teys will continue to invest in sustainability measures, not just because it's great for the environment, but also a perfect fit for our business".

Teys Australia's sustainability commitments include using renewables to fulfil 30% of its energy needs, reducing carbon intensity by 20%, and reducing water intensity by 10%, by 2023. Teys also supports the red meat industry target of being carbon neutral by 2030.

"The thing that excites me most about this project is the opportunity to demonstrate what can be achieved when co-locating a variety of renewable energy technologies and energy productivity in one location", Carl said.

ANTIMICROBIAL STEWARDSHIP

Maintaining the efficacy of antimicrobials so that infections in humans and animals remain treatable is of critical importance.

This priority looks at industry use of antibiotics and surveillance programs to detect resistance to them.

58.50%

The percentage of feedlots covered by an antibiotic stewardship plan

Antimicrobial **stewardship**

Kerwee feedlot, Queensland. Photo: ALFA

CONTEXT

The term 'antimicrobial' refers to medicines that act to selectively kill or inhibit the growth of microorganisms like bacteria in humans and animals. Antimicrobials are one of many vital tools available in the Australian cattle industry that help ensure the health and welfare of animals in our care.

Antimicrobial resistance (AMR) occurs when a disease-causing microrganism becomes resistant to antimicrobial medicines used as treatment. AMR is a growing concern for both medical and livestock policy-makers, medical professionals, veterinarians, producers and the wider community, and is recognised as a global health priority. These concerns, along with fewer antimicrobials being discovered, means the effectiveness of antimicrobials currently available must be preserved.

Australia has one of the most conservative approaches to antimicrobial use in the world, and is a world leader in minimising the use of antibiotics in food-producing animals.[41]

The Australian Pesticides and Veterinary Medicines Authority's (APVMA) conservative approach to the registration of antimicrobial agents, combined with farm management practices, has resulted in very low levels of AMR in Australian cattle. Nevertheless, it remains paramount to ensure antimicrobials are preserved for future use.

Responsible antimicrobial stewardship aligns with RMAC's *Red Meat 2030* priority to "set the standard for world class animal health, welfare, biosecurity and production practices".

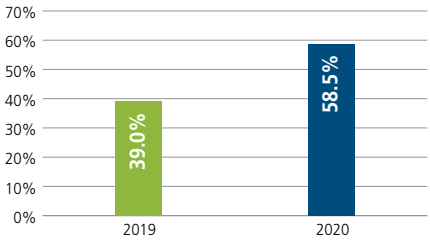
INDUSTRY POSITION

The appropriate use of antimicrobials is a shared responsibility between the prescribing vet and farm or feedlot managers. The veterinarian accepts responsibility for the decision to use an antimicrobial agent. The farm or feedlot managers and staff are responsible for good animal care practices (including infection control and prevention), following all directions for use, and implementing management changes over time. This approach safeguards the health and welfare of the animals, while minimising the likelihood of adverse impacts on individual animals, other livestock, or on public health due to bacterial disease or treatment involving antimicrobials.

WHAT THE DATA IS TELLING US

The percentage of feedlots covered by an antimicrobial stewardship plan

Indicator 8.3a: The percentage of feedlots covered by an antimicrobial stewardship plan



In 2018 the Australian Lot Feeders' Association (ALFA) voluntarily established the *Antimicrobial Stewardship Guidelines*. Following the release of the guidelines there has been increasing uptake, with an initial 39% of the industry feedlots implementing antimicrobial stewardship plan in the first year. This year, this number has risen to 59%, a very positive indication that the guidelines are taking effect within the industry. This figure has been verified through several hundred independent audits.

Antimicrobial surveillance

This year's report has removed the antimicrobial surveillance program, noting this reflected an ongoing activity, rather than a measure. Previous AMR testing has not identified any resistance in *critically important* or *highly important* antimicrobials such as tigecycline, daptomycin, vancomycin, third generation cephalosporins and linezolid.

The research found that the cattle industry's low levels of antimicrobial resistance can be attributed to comprehensive controls around antimicrobial use. Continued monitoring of the effects of all antimicrobial use is necessary to support Australia's reputation as a supplier of safe and healthy food.

In 2020, the Australian Government released a new national antimicrobial resistance strategy, following industry consultation in 2019. This will replace the first National Antimicrobial Resistance Strategy (2015-2019) that expired on 31 December 2019. It aimed to minimise the development and spread of antimicrobial resistance, and ensure the continued availability of effective antimicrobials. The new strategy will cover a 20 year period and will expand its focus to include the environment, food and other antimicrobials.[42]

The Department of Agriculture, Water and the Environment's National Residue Survey (NRS) monitors the residue of antimicrobials in animal products. The 2018-2019 results found 99.9% compliance across 4,877 random cattle samples. This very high rate of compliance has been maintained, or bettered, every year for 10 years.[43]

SNAPSHOT OF ACTIVITY

There are a range of activities targeting antimicrobial resistance across the value chain.

Vigilant vets

The Australian Veterinary Association, the professional body for veterinarians, is producing antibiotic prescribing guidelines for both grass-fed and feedlot cattle, which should be completed in early 2021. The guidelines will outline when antimicrobials should be used, and which ones are most appropriate. Nearly all antimicrobials used in animals must be prescribed by a vet, so these guidelines serve an important role in helping vets prescribe antimicrobials judiciously.

Feedlot leadership

The release of the *Antimicrobial Stewardship Guidelines* by MLA and ALFA established a framework for antimicrobial stewardship best practice in feedlots, and serve as a framework for continuous improvement. MLA and ALFA also offer a training course in antimicrobial stewardship that aims to help feedlot managers implement antimicrobial stewardship plans.[44]

Photo courtesy of Angus Australia

CASE STUDY

HEALTHIER CATTLE, LESS ANTIBIOTICS WITH NEW BREEDING TOOL

In a world first, Angus Australia and CSIRO collaborated to create a tool to help producers select for stronger immune systems in beef cattle.

The ImmuneDEX breeding value is a genetic description of an animal's ability to resist disease. It can help beef producers make breeding decisions with the goal of improving animal health and reducing antibiotic use.

The first list of Angus sires ranked on their ImmuneDEX breeding value was released in May 2019 with additional sires to be added to the list in July 2020. New genomic selection tools from commercial Angus heifers and feeder steers, that will include ImmuneDEX values, are also under development.

To develop ImmuneDEX, Angus Australia and CSIRO collected information about the immune competence phenotypes at weaning of about 3,000 Angus steers and heifers. Funding was provided by Meat & Livestock Australia. They combined this information with genotypes to estimate the heritability and correlations of immune competence.

Christian Duff, Angus Australia Strategic Projects Manager, said work continued to develop ImmuneDEX and validate its potential to deliver health benefits to beef cattle.

In particular, these benefits could be realised in feedlots, where cattle are often exposed to a range of diseases for the first time. With that in mind, researchers examined disease incidence in 900 steers at feedlots. They found that animals with a superior immune competence phenotype had significantly lower health-related costs and mortality rates.

Dr Brad Hine, CSIRO research scientist, said if industry continues breeding with a sole focus on production, it will inadvertently increase susceptibility to disease.

"We envisage that ImmuneDEX will provide a long-term strategy to help address this problem," Dr Hine said.

"By allowing producers to consider immune competence when making selection decisions, they will be able to breed animals that are both productive and have a better ability to resist disease."

HEALTH AND SAFETY OF PEOPLE IN THE INDUSTRY

Working environments through the beef value chain, especially on-farm, expose employees and contractors to risk.

This priority looks at notifiable fatalities, however industry recognises further investigation of injuries could highlight risk factors and improve work safety.

Penrider at Kerwee Feedlot. Photo MLA

Notifiable fatalities

Farms	Processing
7	0

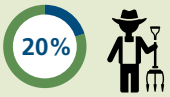
Health and **safety of people in the industry**

CONTEXT

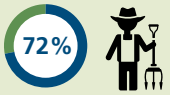
Working environments vary considerably between farms, feedlots and processors. Within the industry, work health and safety procedures, practices and incident rates differ significantly by sector. As a whole, agriculture is one of Australia's most dangerous industries to work in, making up 2.3% of our workforce, but accounting for 20% of worker fatalities.[45]

Australia's red meat processing sector has well-established work health and safety procedures, systems and practices to protect its workforce.

HEALTH AND SAFETY IN AGRICULTURE STATS



From 2014-18 there were
188 worker fatalities
in Australian agriculture
making up 20% of all worker fatalities in that period.



72% of fatalities impacted **workers aged**
45 and over.

Beef, sheep
and grain farming
accounted for 57% of those fatalities (2014-18).

28% of agriculture **fatalities involved**
vehicle collisions
(2014-18).

15% of agriculture **fatalities involved**
quad bikes
and 23%
tractors (2014-18).

All taken from SafeWork Australia (2018)
www.safeworkaustralia.gov.au/collection/work-related-traumatic-injury-fatalities

For feedlots, work health safety is managed within the National Feedlot Accreditation Scheme (NFAS). For livestock transporters, the Australian Trucking Association's TruckSafe scheme sets out standards for driver health and safety.

Farms are unique business environments. Producers face the highest risk to life across the industry – managing plant, chemicals, noise, dust, sun exposure, animals, and – for many – solitary work or work in remote locations. Additionally, farms are often both workplaces and residences, which can leave family members exposed to hazards. Cattle, sheep and grain farming account for the highest numbers of fatalities in agriculture.[46] Safe Work has identified agriculture as a priority industry in its *Work Health and Safety Strategy 2012-22*.[47]

INDUSTRY POSITION

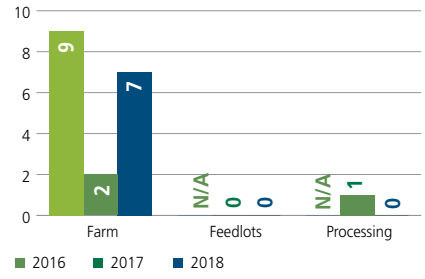
The Australian red meat and livestock industry prioritises the wellbeing of people and has a zero-harm policy for any individuals within the supply chain.

The industry supports policies that incentivise businesses across the supply chain to improve work health and safety.

WHAT THE DATA IS TELLING US

Notifiable fatalities

Indicator 10.1: Notifiable fatalities



On-farm fatalities saw an increase in 2018 compared to the previous year however is still trending down from the 2016 baseline. Positively there were no notifiable fatalities in processing. Currently data for the feedlot sector is not available.

SNAPSHOT OF ACTIVITY

Processing

It is a legal requirement for individual companies to provide safe workplaces, and report any incidents. Processors invest in their own work health and safety programs to reduce the inherent risks of processing meat.

At an industry level, the Australian Meat Industry Council (AMIC) maintains a substantial body of health and safety resources for members. These include guidelines, publications, risk management guides, injury management procedures, training videos and tutorial guides. AMIC is undertaking a project with Deakin University to more accurately understand the causes of injury in meat processing, and calculate lost time from injuries.[48]

The Australian Meat Processor Corporation (AMPC) is currently investing $3.15 million into an industry capability program. This includes workplace safety and ergonomics projects, and $0.81 million for vocational training, including professional development and maintenance upskilling.[49]

On farm

Research and Development Corporations (RDC) including AgriFutures, Dairy Australia and MLA have partnered to form the Rural Safety and Health Alliance (RSHA). From late 2019, the RSHA is driving cross-sectoral collaboration on research, development and adoption (RD&A) initiatives. RD&A activities aim to reduce death, injury and illness, and enhance health and wellbeing in Australian agriculture.

The NFF aspires for zero farm fatalities by 2030. The NFF works with a number of farm safety initiatives to develop tools and ensure a culture of safety in the industry, and seeks to "close the gap between the psychological wellbeing of producers and the broader community".[50]

NSW Producers has secured funding from SafeWork NSW to deliver the Farm Safety Advisory pilot program. The program helps businesses analyse where they currently sit in regard to Work Health and Safety (WHS), and develop a WHS program that is custom fit for the business. The program includes face-to-face meetings with Farm Safety Advisor Charles Laverty, and aims to reduce risk for all members of the farm.[51]

NFF and Safe Work Australia partner to produce videos showcasing best practice in health and safety on the farm. MLA has created a series of online resources that include checklists, templates and guidelines to help beef producers plan and implement health and safety initiatives. The FarmSafe Australia Safety Induction Tool is an easy-to-use online guide that can be used by farm managers to induct and train new workers in farm safety.

The Central Highlands Regional Resources Use Planning (CHRRUP) Cooperative has developed Safe Station, a WHS system that helps agricultural property owners and operators meet their WHS responsibilities, and provide safer workplaces. The system operates in a practical way that suits the nature of rural business.

CHRRUP
community • environment • sustainability

Safe Station is customised for businesses and can be delivered to individual businesses or small groups.

Mental health

Many farmers find the work they do rewarding and fulfilling. However, farmers also face many pressures that are out of their control such as drought, natural disasters and trade shocks. When prolonged, these pressures, coupled with the isolation of rural life, can have a real impact on the mental health and wellbeing of farmers and farming families. This fact is even more relevant in the midst of the COVID-19 pandemic.

CASE STUDY

SERVICES TARGET RURAL MENTAL HEALTH

Rural Alive & Well Inc (RAW) is a not-for-profit organisation that helps individuals, families and the community with their mental health, with a focus on suicide prevention.

RAW provides outreach support to rural Tasmania, and works with the community to undertake wellbeing initiatives. Initially, its team focused on supporting farmers. In past 11 years it has expanded to include individuals from other rural industries and communities.

"Outreach staff conduct regular farm and house visits, making contact with those who traditionally have been isolated or overlooked, or are simply 'doing it tough'," said RAW Chief Executive Officer Barb Walters.

"Our approach to client engagement is 'non-clinical' in style. We present as caring, confidential, non-intrusive, and available when and where the help is most needed."

Barb said there were a range of factors contributing to mental health issues and suicide in rural communities. These include the cumulative effects of difficult conditions such a drought, flooding, fire, economic and financial factors, family pressures and domestic violence, as well as a lack of immediate access to key services or reluctance to use those that are available.

RAW strives to overcome those barriers by delivering low-cost, low-stigma mental health and suicide prevention programs.

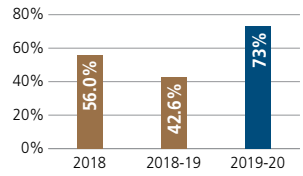
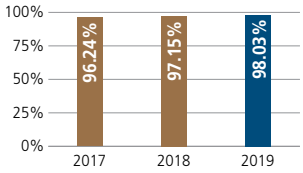
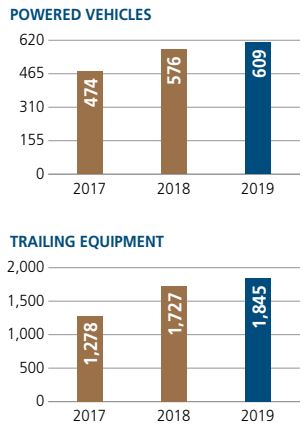
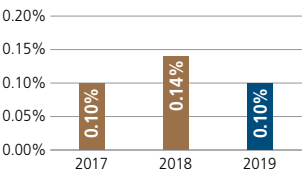
One of their programs is RAW Response for Recovery which provides a strategic and coordinated response to pandemics, bushfire, flood, industry downturn and other natural disasters. The organisation has two industry-specific RAW Response for Recovery coordinators: one focussing on supporting drought-affected farmers, and the other focussing on seafood industry members.

Another of their programs, RAW Reach Out, provides 24/7 outreach support to rural communities across Tasmania. RAW staff talk to people on the phone (on 1300 HELP MATE – 1300 4357 6283) or travel to people. Their work has continued during the COVID-19 pandemic, with the use of personal protective equipment, social distancing, and hygiene protocols.

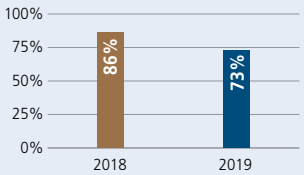
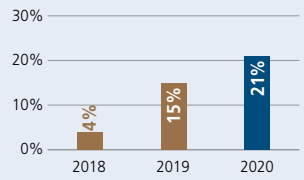
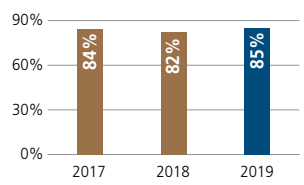
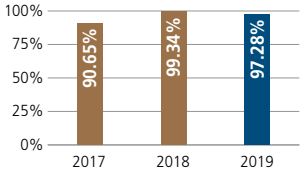
RAW staff offer a friendly ear in a difficult time. They provide information, support and strategies, as well as link people to relevant services.

The Framework
Scorecard

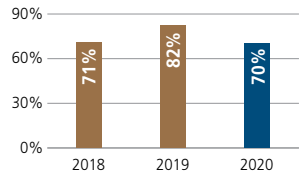
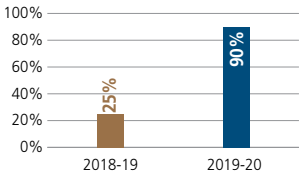
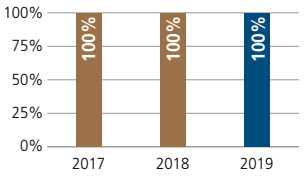
ANIMAL WELFARE

Indicator	Data	Trends	Explanation
PRIORITY AREA 1: ENHANCE ANIMAL WELLBEING			
PRIORITY 1.1: COMPETENT LIVESTOCK HANDLING			
1.1a **The percentage awareness of the Australian Animal Welfare Standards for Cattle.**		Upward trend, improvement	Source: LPA audit outcomes since 1 Jan 2019-Apr 2020 There has been significant improvement in the last year. It should be noted that data collected for 2018 was sourced from self-reporting surveys, so is difficult to compare to the more recent audit data. The industry understands that awareness is not a strong indicator for practice, and is investigating alternative measures.
1.1b **The percentage compliance with National Feedlot Accreditation Scheme (NFAS) Animal Welfare requirements.**		Upward trend, improvement	Source: 2019, ALFA – NFAS Audit Outcomes NFAS is an independently-audited quality assurance scheme that was initiated by the feedlot industry. There were 406 audits conducted in 2019, with 8 instances of non-conformance against element 3.4 Animal Welfare.
1.1c **Percentage awareness of the Australian Animal Welfare Standards for Saleyards and Lairages.**	No Data Available	No data available	Due to the recency of these Standards, there is currently no data available. Australian Livestock Markets Association (ALMA) is conducting a project that will monitor the Standards, including collecting data on awareness. This project is expected to be complete in time to report on this indicator in the 2021 Annual Update.
PRIORITY 1.2: SAFE LIVESTOCK TRANSPORT			
1.2a **Number of powered vehicles and trailing equipment which operate under TruckSafe Animal Welfare.**		Upward trend, improvement	Source: 2019, Australian Trucking Association TruckSafe is an independently-audited quality assurance program for the Australian livestock transport industry. It has a voluntary module. The module adhered to ALRTA's National Animal Welfare Policy. Data for the percentage of trucks under TruckSafe is not available.
1.2b **The percentage of reportable incidents of shipboard mortalities.**		Flat trend, little to no change	Source: 2019, Department of Agriculture, Water and Environment There has been minimal change, with a flat trend for mortalities over the past three years. The industry recognises that mortalities are a limited indicator, and do not capture welfare during transport. The live export industry is developing on-transport welfare measures which may be used in future.

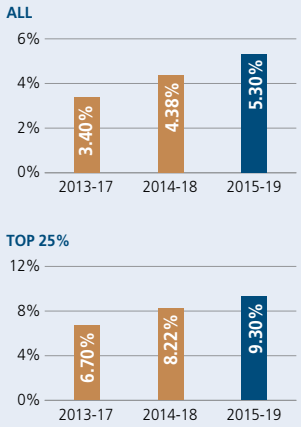
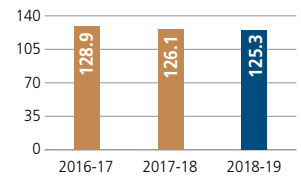
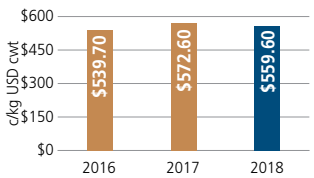
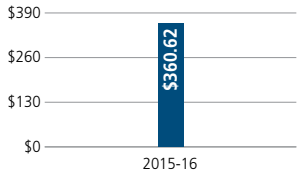
ANIMAL WELFARE

Indicator	Data	Trends	Explanation
PRIORITY AREA 1: ENHANCE ANIMAL WELLBEING			
KEY PRIORITY 1.3: ANIMAL HUSBANDRY TECHNIQUES			
1.3a The percentage of the national cattle herd genetically polled.	 * 2018's Update reported 51% polled cows and 71% polled bulls for 2016.	New baseline, data not comparable to past years	Source: 2019, MLA This figure comes from a different data source this year because the source for last year's data has changed their methodology. For this report, MLA has identified the proportion of each breed genetically polled from the L.GEN.1713 report and extrapolated this to the national herd using each breed's share of the total herd. Note that this figure is calculated from seedstock, and so assumes seedstock registrations represent breed representation within the industry. As it is calculated from seed stock, the commercial herd is expected be lower due to generational intervals and lag in genetic progress between stud and commercial herds. This data is further limited as not all seedstock herds record poll status comprehensively.
1.3b Percentage of industry regularly using pain relief when undertaking aversive husbandry practices.		Upward trend, improvement	Source: 2020, Beef Producer Sustainability Survey These procedures include dehorning, castration and spaying. This indicator has included the descriptor 'aversive' to align with the language of the Animal Welfare Standards, and focus on practices for which pain relief is prescribed by vets and other welfare experts. In the absence of better data sources, this indicator is measured through an annual survey that represents a statistically relevant sample of herd size and geography.
PRIORITY AREA 2: PROMOTE ANIMAL HEALTH			
PRIORITY 1.4: HUMANE PROCESSING			
1.4a The percentage of cattle slaughtered through an establishment accredited under the Australian Livestock Processing Industry Animal Welfare Certification System (AAWCS).		Upward trend, improvement	Source: 2019, MLA 56 of the 74 plants contributing to the National Livestock Reporting Service are AAWCS-accredited. These 56 plants represent 85% of the national total slaughter for cattle.
1.4b The percentage compliance with Exporter Supply Chain Assurance System (ESCAS).		Upward trend, improvement	Source: 2019, Department of Agriculture, Water and Environment ESCAS is an Australian Government regulatory program which regulates welfare practices of overseas purchasers of Australian livestock. The Department of Agriculture, Water and the Environment's consignments and non-compliance data were used to develop this indicator. At the time of reporting, an additional three reports of non-compliance were under investigation, and could not be reported on.

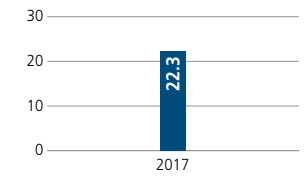
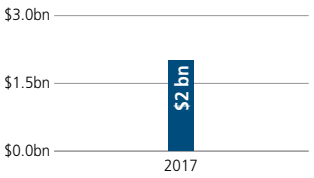
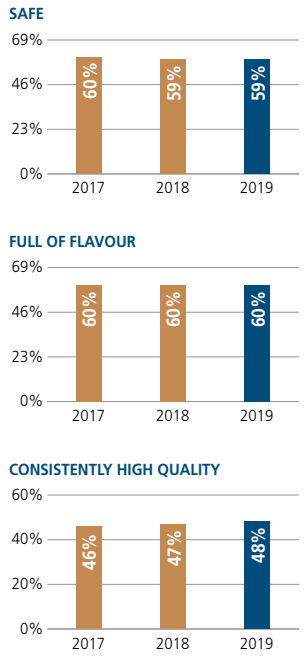
ANIMAL WELFARE

Indicator	Data	Trends	Explanation
PRIORITY AREA 2: PROMOTE ANIMAL HEALTH			
PRIORITY 2.1: MAINTAIN HEALTHY LIVESTOCK			
2.1a Vaccination rates for clostridial diseases.		Downward trend, decline	Source: 2020, Beef Producer Sustainability Survey Clostridial diseases are caused by bacteria that are widespread in the environment and are normally found in soils and faeces. In many area, these diseases present such a low risk of occurrence that vaccination isn't required. In the absence of better sources, data has been collected through an annual survey.
PRIORITY 2.2: MINIMISE BIOSECURITY RISK			
2.2a The percentage of Australian cattle properties covered by a documented biosecurity plan.		Upward trend, improvement	Source: LPA audit outcomes from Jan 2019-Apr 2020 Improvements can be attributed to the addition of the biosecurity module to LPA. Note, this figure only captures properties accredited under LPA. This covers the vast majority of cattle properties.
2.2b Australia continues to be declared free from exotic diseases by World Organisation for Animal Health (OIE).		Flat trend, little to no change	Source: 2018, Animal Health Australia Australia aims to continue being officially recognised as free from exotic diseases in cattle. Exotic diseases include foot and mouth disease, BSE, CBPP and Rinderpest.

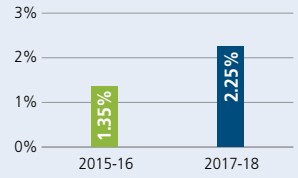
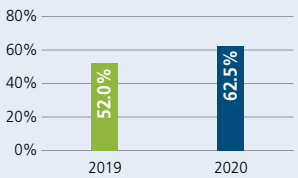
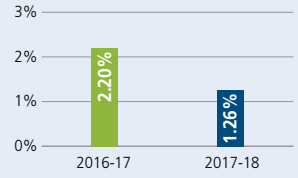
ECONOMIC RESILIENCE

Indicator	Data	Trends	Explanation
PRIORITY AREA 3: ENHANCE PROFITABILITY AND PRODUCTIVITY			
KEY PRIORITY 3.1: PROFITABILITY ACROSS VALUE CHAIN			
3.1a Rate of return to total capital for beef farms.		Upward trend, improvement	Source: FY2015-2019 average, ABARES Five year rolling average ending FY2018-19. The measure includes capital appreciation, the wealth generated through land value appreciation. Note that last year's figures have since been updated by ABARES.
PRIORITY 3.2: FARM, FEEDLOT AND PROCESSOR PRODUCTIVITY AND COST OF PRODUCTION			
3.2a Total factor productivity (TFP).		Downward trend, decline	Source: FY2015-2019 average, ABARES TFP is a ratio of a market outputs index to a market inputs index expressed as a five-year rolling average. 100 points on this index represents the 1981-1985 baseline. A national TFP of 125.3 shows a 25.3% increase on this baseline. The figure reported last year for 2017-18 was 125.9 and has since been updated by ABARES to 126.1.
3.2b Cost of beef produced on Australian farms.		Upward trend, decline	Source: 2018, agri benchmark Average cost of production for 2018 – only includes grassfed production systems and includes all on-farm costs of production. There is currently not enough data available to report a five-year rolling average for this indicator.
3.2c Average cost of cattle processing per head.		Flat trend, little to no change	Source: 2018, SG Heilbron Economic and Policy Consulting, Analysis of Regulatory and related costs in red meat process. Project code: 2017-2062, AMPC 2019 data was collected from a one-off AMPC-led study into 2015-16 processing costs. The AMPC study revealed that Australia's cost of processing is considerably higher than competing countries – 24% above the US and over twice the cost of Brazil.

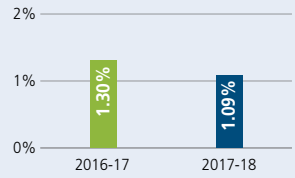
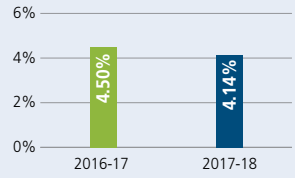
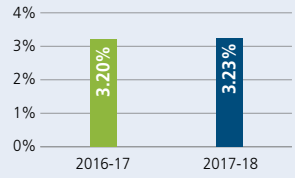
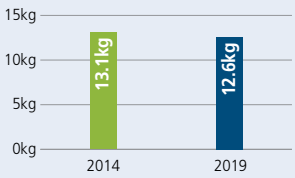
ECONOMIC RESILIENCE

Indicator	Data	Trends	Explanation
PRIORITY AREA 4: OPTIMISE MARKET			
PRIORITY 4.1: BARRIERS TO TRADE			
4.1a Market Access Index.		Flat trend, little to no change	Source: 2017, Barnard & Quirke, Report prepared to develop a Market Access indicator, MLA Previous data was collected from a one-off MLA-commissioned study. Consequently no new data is available. The Market Access Index has been developed using tariffs faced in each major beef export market. A lower index value indicates more favourable market access conditions. Other major beef exporters have an average index score of 57.5, indicating very high levels of market access for Australia compared to competitors.
4.1b Costs of technical trade barriers.		Flat trend, little to no change	Source: MLA-commissioned report Previous data was collected from a one-off MLA-commissioned study. Consequently no new data is available. Technical trade barriers such as the use of import permit restrictions, failure to grant export clearance, or phytosanitary regulations, represent significant costs to the industry.
PRIORITY 4.2: PRODUCT INTEGRITY			
4.2a The percentage of consumers nationally that consider Australian beef safe, full of flavour and of a consistent quality.		Upward trend, improvement	Source: 2019, MLA AU Equity Tracker Measured through MLA domestic market insights tracking, based on weekly consumer survey of grocery buyers aged 18-64, representative of the five main capital cities. The wording of this indicator has changed from 'tasty' to 'full of flavour' to align with the language used in the MLA tracker.

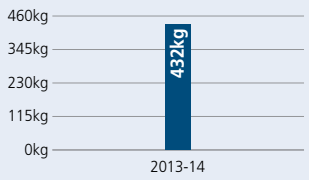
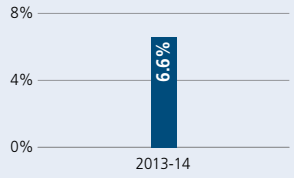
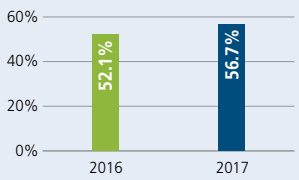
ENVIRONMENTAL STEWARDSHIP

Indicator	Data	Trends	Explanation
PRIORITY AREA 5: IMPROVE LAND MANAGEMENT PRACTICES			
PRIORITY 5.1: MINIMISE NUTRIENT AND SEDIMENT LOSS			
5.1a Number of days per year soil covered by vegetation.	No Data Available	No data available —	Measuring soil health and water quality on a national scale is difficult from both a technical and practical standpoint. After initial investigation, no agreed methodology exists. While data exists in different regions, it is challenging to bring data sets together at a national level. The SSG is continuing to investigate options to measure this critical area.
5.1b Soil health.	No Data Available	No data available —	
5.1c Water quality.	No Data Available	No data available —	
KEY PRIORITY 5.2: BALANCE OF TREE AND GRASS COVER			
5.2a (i) Percentage cattle producing land set aside for conservation or protection purposes.		Upward trend, improvement ↗	Source: 2017-18, ABS This represents 6,375,000 hectares of cattle-producing land set aside for conservation or protection purposes. This includes reserves, parks, heritage sites and indigenous protected areas.
5.2a (ii) Land managed by beef producers for conservation outcomes through formal arrangements.	No Data Available	No data available —	An appropriate method is being developed to collect data on formal arrangements.
5.2a (iii) Percentage cattle-producing land managed for environmental outcomes through active management.		Upward trend, improvement ↗	Source: 2020 Beef Producer Sustainability Survey This represents 360 million hectares where on-farm management activities contribute to positive environmental outcomes. The measured activities align with the sustainability recommendations from government agencies, regional NRM organisations and other environment groups including Landcare and WWF.
5.2b (i) Percentage national forest cover gain.		Flat trend, minimal change →	Source: CIBOLabs National forest gain and loss from 2017 to 2018 across beef properties. To put this in perspective, the net change in national woody (forest and woodland) cover extent was +0.46%. At this stage, without regionality and context , these figures are difficult to interpret. It is difficult to determine whether these figures represent an improvement or decline for this priority. The Framework is investigating how healthy vegetation levels for each region can be represented in this national indicator.

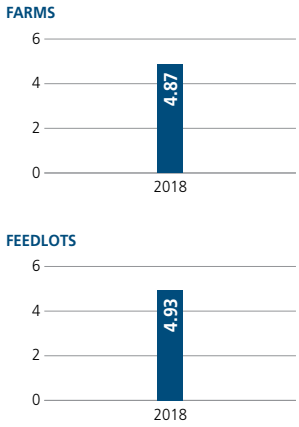
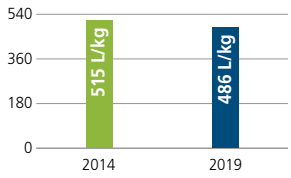
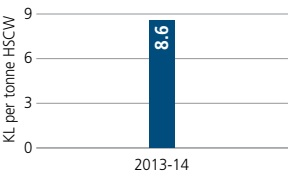
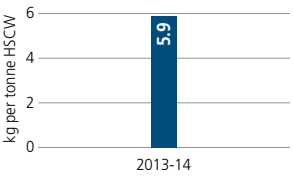
ENVIRONMENTAL STEWARDSHIP

Indicator	Data	Trends	Explanation
PRIORITY AREA 5: IMPROVE LAND MANAGEMENT PRACTICES			
KEY PRIORITY 5.2: BALANCE OF TREE AND GRASS COVER			
5.2b (ii) Percentage national forest cover loss.		Flat trend, minimal change →	Source: CIBOLabs National forest gain and loss from 2017 to 2018 across beef properties. To put this in perspective, the net change in national woody (forest and woodland) cover extent was +0.46%. At this stage, without regionality and context , these figures are difficult to interpret. It is difficult to determine whether these figures represent and improvement or decline for this priority. The Framework is investigating how healthy vegetation levels for each region can be represented in this national indicator.
5.2b (iii) Percentage national woodland cover gain.		Flat trend, minimal change →	
5.2b (iv) Percentage national woodland cover loss.		Flat trend, minimal change →	
5.2b (v) Percentage of regions achieving healthy ground cover thresholds.	No data Available	No data available —	56 NRM regions, ground cover levels over 30 years are reported on the Framework website. The Framework aims to work with regions to develop a national indicator that takes into the account the different healthy levels of gruond cover for each region. A regional breakdown of ground cover levels is available on **www.sustainableaustralianbeef.com.au/vegetation-trends**
PRIORITY AREA 6: MITIGATE AND MANAGE CLIMATE CHANGE			
KEY PRIORITY 6.1: MANAGE CLIMATE CHANGE RISK			
6.1a kg CO_2e emitted per kg liveweight when raising beef.		Downward trend, improvement ↘	Source: 2019, S.G. Wiedemann et al Data was taken from a Life Cycle Assessment (LCA) conducted every five years. This LCA was conducted in 2019 and reported in the 2019 Annual Update. This Annual Update reports the same data. LCAs are a globally accepted environmental measure that assesses all emissions associated with grazing, feedlotting and associated activites of cattle production up to the point of processing.

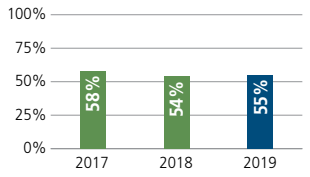
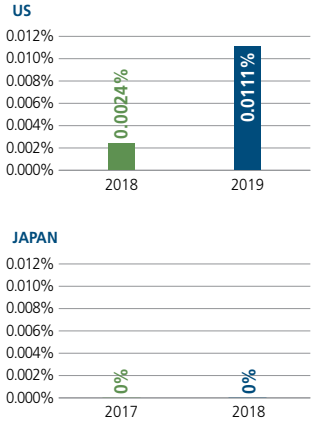
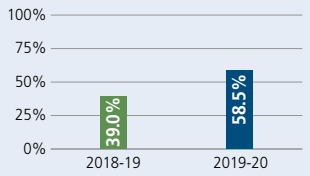
ENVIRONMENTAL STEWARDSHIP

Indicator	Data	Trends	Explanation
PRIORITY AREA 6: MITIGATE AND MANAGE CLIMATE CHANGE			
KEY PRIORITY 6.1: MANAGE CLIMATE CHANGE RISK			
6.1b **kg CO_2e emitted per tonne Hot Standard Carcass Weight (HSCW) when processing beef.**		Flat trend, little to no change →	Source: AMPC Environment Report 2015 Data was sourced from a five-yearly report that has not been released for 2020. Consequently, no new data is available for this report.
6.1c **Carbon captured and re-used in processing.**		Flat trend, little to no change →	Source: AMPC Environment Report 2015 Data was sourced from a five-yearly report that has not been released for 2020. Consequently, no new data is available for this report.
6.1d **Carbon sequestration.**	No Data Available	No data available —	The cattle industry is able to sequester carbon to reduce net CO_2 emissions, and draw down atmospheric carbon. The practice increases soil organic carbon levels and improves on-farm productivity. Currently there is no agreed method to measure carbon sequestration nationally across the industry. Work continues to investigate possible options.
6.1e **Percentage total CO_2e reduced by beef industry from a 2005 baseline.**		Upward trend, improvement ↗	Source: 2020, CSIRO The industry is continuing to make progress towards its carbon neutral by 2030 target. This figure captures net emissions from beef and land-use related emissions. A baseline year of 2005 has been chosen, as it is the earliest available data for federal national accounting, and aligns with the Paris Agreement. The figure from last year's report has been restated from 55.7 to 52.1%. The Department of Industry, Science, Energy and Resources review and update activity data and the inventory methodology each year, and changes are applied retrospectively to past inventories. The 2016 figure has been restated applying these retrospective changes.

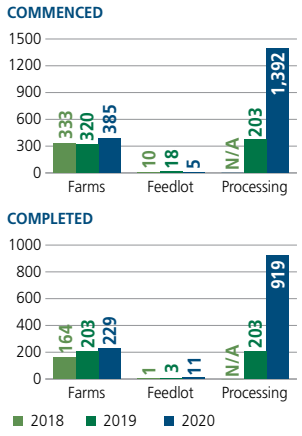
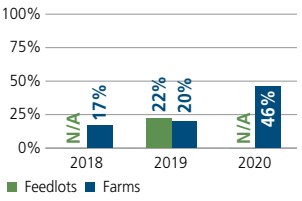
ENVIRONMENTAL STEWARDSHIP

Indicator	Data	Trends	Explanation
PRIORITY AREA 6: MITIGATE AND MANAGE CLIMATE CHANGE			
PRIORITY 6.2: CLIMATE CHANGE ADAPTATION AND PREPAREDNESS			
6.2a Producer confidence in having the information, tools, technologies and resources (both business and biophysical) to be able to adapt to change over time.		Flat trend, little to no change	Source: 2018 Regional Wellbeing Survey, University of Canberra No data could be obtained from the survey for this year's report. Last year's figure was a combined mean score (between 1-7) of respondent's confidence in coping and achieving what they want for the future. Last year's figures indicate that producers and lot feeders are only moderately confident in achieving future management outcomes.
PRIORITY 6.3: EFFICIENT USE OF WATER			
6.3a Kilolitres of water used per tonne of liveweight for raising cattle.		Downward trend, improvement	Source: 2019, S.G. Wiedemann et al Data was taken from a Life Cycle Assessment (LCA) conducted every five years. This LCA was conducted in 2019 and reported in the 2019 Annual Update. This Annual Update reports the same data. LCAs are a globally accepted environmental measure that assesses all emissions associated with grazing, feedlotting and associated activites of cattle production up until the point of processing.
6.3b Kilolitres water used per tonne Hot Standard Carcass Weight (HSCW) when processing beef.		Flat trend, little to no change	Source: AMPC Environment Report 2015 Data was sourced from a five-yearly report that has not been released for 2020. Consequently, no new data is available for this report.
PRIORITY AREA 7: MINIMISE WASTE			
PRIORITY 7.1: SOLID WASTE TO LANDFILL FROM PROCESSING			
7.1a Kilograms of solid waste per tonne Hot Standard Carcass Weight (HSCW) when processing beef.		Flat trend, little to no change	Source: AMPC Environment Report 2015 Data was sourced from a five-yearly report that has not been released for 2020. Consequently, no new data is available for this report.

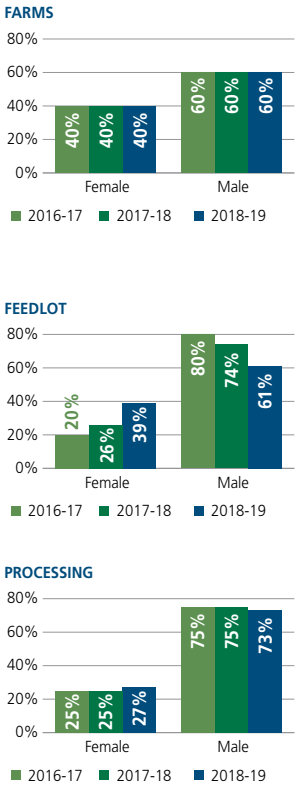
PEOPLE AND THE COMMUNITY

Indicator	Data	Trends	Explanation
PRIORITY AREA 8: PRODUCE NUTRITIOUS AND SAFE FOOD			
PRIORITY 8.1: BEEF IS EATEN AS PART OF A HEALTHY BALANCED DIET			
8.1a The percentage of consumers in Australia who consider beef part of a healthy balanced diet.		Downward trend, decline	Source: Q1 2020, Milward Brown Quarterly Consumer tracking Proportion of consumers who agree with the statement that Australian beef "is an important part of a healthy, balanced lifestyle". While the overall three-year trend is downward, there was an increase on last year's reported figures.
PRIORITY 8.2: FOOD SAFETY			
8.2a The percentage of exported raw beef product rejected for food safety reasons.		Upward trend, decline	Source: MLA commissioned tracking This indicator looks at raw beef rejected at the border. Raw beef is measured, as the industry does not have control over the product beyond this stage. Data is only available for the US and Japan.
KEY PRIORITY 8.3: ANTIMICROBIAL STEWARDSHIP			
8.3a The percentage of feedlots covered by an antibiotic stewardship plan.		Upward trend, improvement	Source: Based on NFAS audits This represents the proportion of NFAS accredited feedlots audited between March 2019 and March 2020 which indicated they had voluntarily implemented an antibiotic stewardship plan in their enterprise.

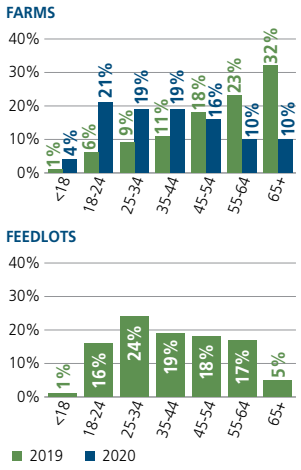
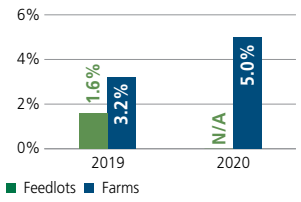
PEOPLE AND THE COMMUNITY

Indicator		Data	Trends	Explanation
PRIORITY AREA 9: BUILD WORKFORCE CAPACITY				
PRIORITY 9.1: EDUCATION AND TRAINING				
9.1a	**Number of traineeships and apprenticeships enrolled and completed.**		Upward trend, improvement	Source: National Centre for Vocational Education Research Meat processing figures are an estimate. Available data includes all meat commodities. To make it beef-specific, processing figures have been adjusted based on the percentage of processed cattle as compared to all processed meats.
9.1b	**On-the-job training completed.**	No Data Available	No data available	More work is required to identify a way to measure this indicator, recognising the difficulty of capturing this data from across the industry.
9.1c	**Percentage of industry participants with a higher education qualification.**		Upward trend, improvement	Source: 2020 Beef Producer Sustainability Survey No data was available for the feedlot sector this year. It should be noted that the data source has changed for this year, which explains the significant variance. Last year's data came from the ABS Census, which will not be repeated for some time.

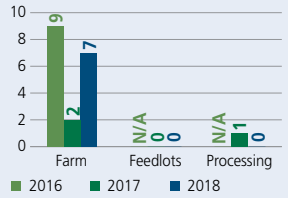
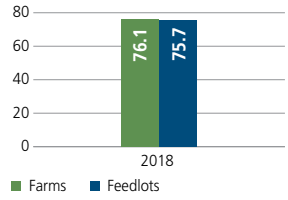
PEOPLE AND THE COMMUNITY

Indicator	Data	Trends	Explanation
PRIORITY AREA 9: BUILD WORKFORCE CAPACITY			
PRIORITY 9.2: DIVERSITY IN THE WORKFORCE			
9.2a The percentage of women and men in the workforce.		Upward trend, improvement	Source: Gender Equality Agency, Apr 2018 – Mar 2019 The percentage of women in the feedlot and processing sector has been trending up. There are limitations with the accuracy of data for this indicator. Meat processing includes all meat except poultry, not just beef. It is not possible to separate out beef processing. Therefore, figures are deduced using ABS data on cattle processing.

PEOPLE AND THE COMMUNITY

Indicator	Data	Trends	Explanation
PRIORITY AREA 9: BUILD WORKFORCE CAPACITY			
PRIORITY 9.2: DIVERSITY IN THE WORKFORCE			
9.2b The age breakdown of the workforce.		No trend available	Source: 2020 Beef Producer Sustainability Survey It should be noted that the data source changed this year, which explains the significant variation. Last year's data came from the ABS Census, which will not be repeated for some time. No data was available for the feedlot sector this year.
9.2c The percentage Indigenous representation in the workforce.		Upward trend, improvement	Source: 2020 Beef Producer Sustainability Survey It should be noted that the data source changed this year, which explains the significant variation. Last year's data came from the ABS Census, which will not be repeated for some time. No data was available for the feedlot sector this year.

PEOPLE AND THE COMMUNITY

Indicator	Data	Trends	Explanation
PRIORITY AREA 10: ENSURE HEALTH, SAFETY AND WELLBEING OF PEOPLE IN THE INDUSTRY			
KEY PRIORITY 10.1: HEALTH AND SAFETY OF PEOPLE IN THE INDUSTRY			
10.1a Notifiable fatalities.		Downward trend, improvement	Source: 2018, SafeWork This year's data has been extracted from Safe Work Australia's Traumatic Injury Fatalities Database. The industry is aware that fatalities are a very limited indicator for health and safety, and has selected this priority for a deep dive.
PRIORITY 10.2: WELLBEING OF PEOPLE IN THE INDUSTRY			
10.2a Global Life Satisfaction (GLS) Index.		Flat trend, little to no change	Source: 2018 Regional Wellbeing Survey, University of Canberra No data was able to be obtained from the survey for this year's report. This index measures life satisfaction on a scale of 0-100. A low score is less than 65 while is high score is 85 or higher. Australia's average score is 73. The figures indicate that producers and lot feeders are, in general, above average life satisfaction.

Appendices

1. PRINCIPLES

The Framework principles are:

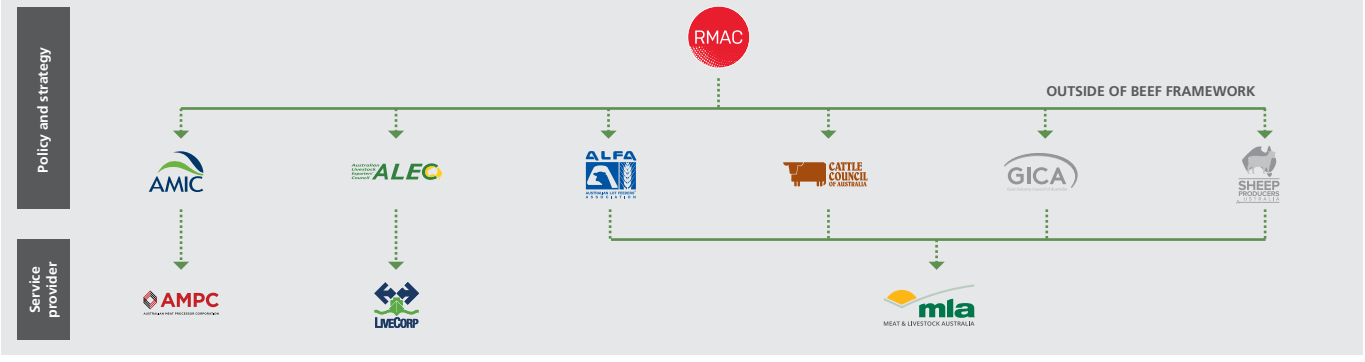
Relevance	Inclusivity	Credibility	Practicality	Transparency
The priority is important to our customers, the community and the Australian beef industry, and is within the industry's scope of influence.	The constructive views of industry, customers, consumers, government and community groups as to how industry can continuously improve performance will be considered.	Decisions about themes, priorities, indicators and recommendations are grounded in evidence. They can, or have the potential to be, monitored and managed.	Indicators are realistic. The industry is able (within scope of influence) to make changes that represent value to the value chain through continuous improvement.	The industry can provide an open and honest picture of performance using the most appropriate data.

2. GOVERNANCE

The Framework is an initiative of the Red Meat Advisory Council (RMAC). RMAC has appointed a grassroots Sustainability Steering Group (SSG) that is representative of industry, to lead the Framework.

Approve	RMAC		Ongoing measurement
Direct	Sustainability Steering Group		
Consult	Consultative Committee	Technical experts	
Support *Deliver research, development, extension and secretarial support*	Industry service companies (MLA, AMPC and Live Corp)		
Adopt best practice	Producers, processors, feedlots, transport		

AUSTRALIAN RED MEAT INDUSTRY STRUCTURE



3. CONSULTATIVE COMMITTEE PARTICIPANTS

Organisation/companies

INDUSTRY ORGANISATIONS

AGFORCE · ALEC · ALFA · ALMA · AMIC · AMPC · Australian Dairy Sustainability Framework · CATTLE COUNCIL OF AUSTRALIA · Dairy Australia · mla · National Farmers' Federation · NSW FARMERS · RMAC

BEEF BUSINESS

AA CO · AUSTRALIAN COUNTRY Choice · CPC · Feedlot Adventures · GREENHAM · GUNDAMAIN FEEDLOT · JBS · JOHN DEE · NAP · NCMC · obe organic · TEYS · RANGELAND QUALITY MEATS · RM ROBERTS MEATS

OTHER

Altech E-CO2 · BrightWater · cibolabs · ClimateWorks AUSTRALIA · Hort Innovation · Primary Purpose · RACING AUSTRALIA · WORLD PERSPECTIVES

FINANCIAL INSTITUTIONS AND AGRIBUSINESS

ANZ · CommonwealthBank · Elders · nab · Rabobank · Westpac

CUSTOMERS

ALDI · coles · COSTCO WHOLESALE · DAVID JONES · fmg FULTON MARKET GROUP · KEYSTONE · OLGA'S · Woolworths

SPECIAL INTEREST GROUPS AND NGOS

RESEARCH AND ACADEMIA

GOVERNMENT AND REGULATORS

MEDIA

4. SSG

The Red Meat Advisory Council (RMAC) appoints an independent grassroots group, representative of the beef value chain, to progress the Framework on behalf of industry. This group is called the Sustainability Steering Group (SSG).

The first SSG was appointed in 2016 to guide development of the Framework. Subsequent SSG members have been responsible for refining the indicators, gathering data, reporting on progress, consulting industry and external stakeholders, and promoting the Framework to industry, customers, investors, government, regulators and other stakeholders. Read more about the group here at **www.sustainableaustralianbeef.com.au/sustainability-steering-group**

The Sustainability Steering Group:

Tess Herbert
Chair of the SSG
Feedlot and mixed farming owner and operator

Kim McDougall
General Manager for Livestock at Harvest Road Beef

Carl Duncan
Teys Australia Group Manager Resource Efficiency & Sustainability

Stephen Moore
General Manager Corporate and Commercial at NAPCO

Greg Campbell
Former CEO S.Kidman & Co
Former member of NFF Natural Resources Committee

Trevor Moore
Group Systems and Compliance Manager at NCMC

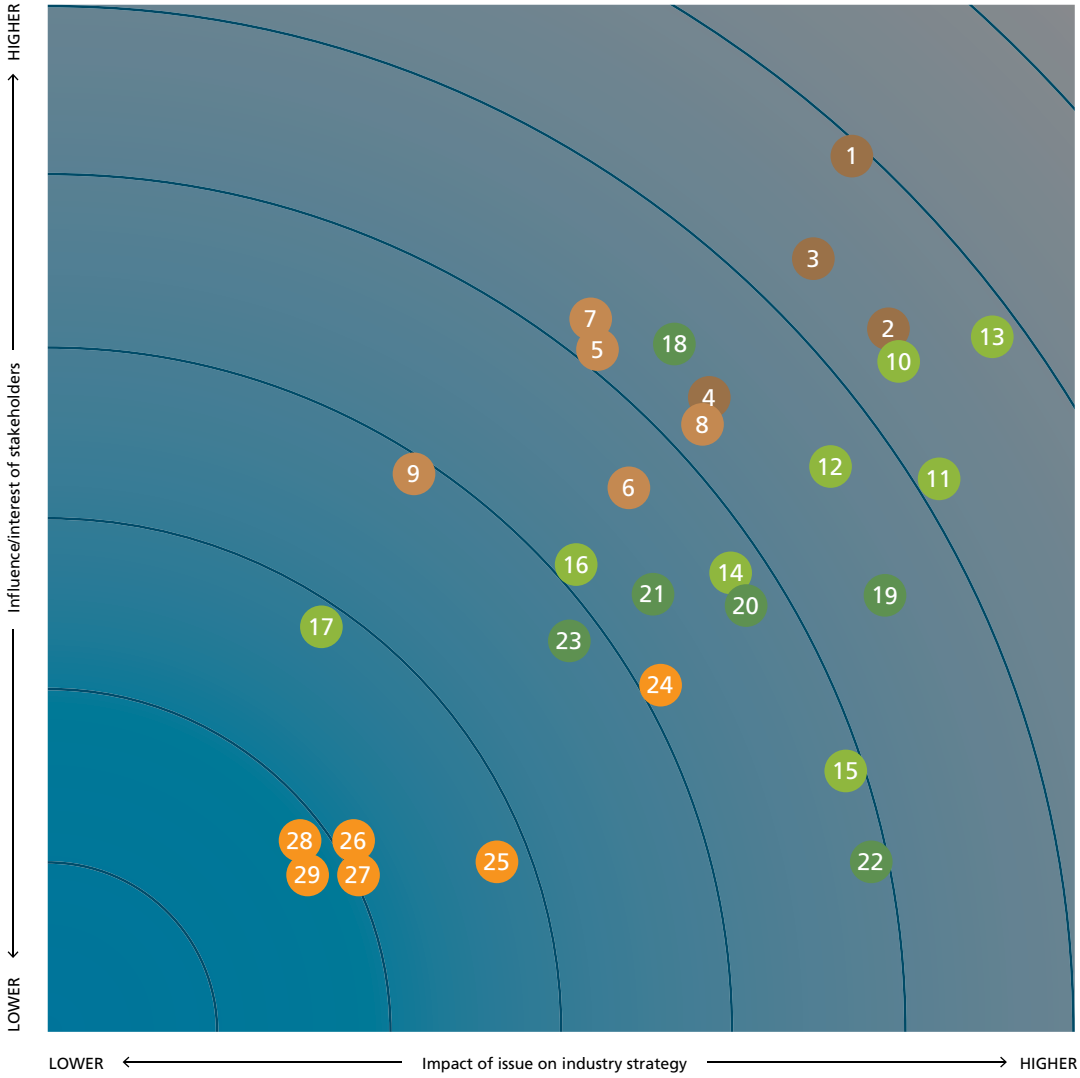
Melinee Leather
Cattle station and breeding operation owner and operator

Jenny O'Sullivan
Mixed farming owner and operator and Principle of agri-tourism business

Dr Michael Maxwell
Partner at HFW, Regulatory & International Risks with a focus on live exports

5. MATERIALITY

MATERIALITY MATRIX 2016



ANIMAL WELFARE
1. Livestock health and welfare
2. Animal husbandry
3. Transport
4. Biosecurity

ECONOMIC RESILIENCE
5. Market access
6. Profitability
7. Product integrity
8. Productivity
9. Economic contribution to the GDP

ENVIRONMENTAL STEWARDSHIP
10. Water
11. Waste
12. Biodiversity
13. Emissions
14. Deforestation
15. Climate change
16. Ground cover
17. Sequestration

PEOPLE & THE COMMUNITY
18. Nutrition
19. Work health and safety
20. Capacity building
21. Social impact
22. Treatment of people in the industry
23. Diversity

OTHER
24. Industry transparency
25. Regulatory changes
26. Image of primary producer
27. Weed and pest control
28. Longevity
29. Annual health plans; Market building; Systems to track performance; Holistic stewardship

6. ALIGNMENT TO SDGS

The 2030 Agenda for Sustainable Development and the Sustainable Development Goals (SDGs) represent the world's plan of action for social inclusion, environmental sustainability and economic development.

Highlighted below are the SDGs that the Australian Beef Sustainability Framework addresses.[52]

Communities, investors and other stakeholders increasingly expect industries to prove their sustainability. Aligning with the SDGs helps the Australian beef industry meet these changing expectations.

7. FRAMEWORK HISTORY

In response to changing consumer and community expectations, the beef industry sought to understand and improve its sustainability.

The industry gathered information between 2011 and 2016, culminating in a materiality review.

In 2016, a Sustainability Steering Group (SSG) was appointed to lead the development of the Australian Beef Sustainability Framework. It consulted widely and launched the Framework in April 2017.

The second SSG progressed the Framework between 2017 and 2019.

In early 2019, the third (and current) SSG was formed to drive industry implementation.

2011-2015

Initial steps

- Initial materiality review completed in 2011 using AA1000 methodology
- Industry and external stakeholders consulted
- Data systems review conducted
- Social licence review undertaken

2016-2017

Designing the Framework

- First SSG formed to lead development of the Framework
- 40 face-to-face consultations with industry and external stakeholders
- Call for detailed written input from all stakeholders
- Public consultation conducted through online engagement platform
- Framework officially launched in April 2017

2017-2019

Laying the foundations

- Second SSG formed to lay the foundation for Framework implementation
- Consultative Committee established
- Six key priorities decided
- Activity stocktake conducted
- Expert Working Group on tree and grass cover created
- First Annual Update published
- The balance of tree and grass cover indicators finalised with expert and stakeholder input

8. GLOSSARY

AAWCS

Australian Livestock Processing Industry Animal Welfare Certification System. An independently-audited certification program used by Australian livestock processors to demonstrate compliance with the industry best practice animal welfare standards.

ABARES

Australian Bureau of Agricultural and Resource Economics.

ABS

Australian Bureau of Statistics.

ALEC

Australian Livestock Exporters' Council. The peak industry body for the Australian livestock export industry.

ALFA

Australian Lot Feeders' Association. The peak national body for the Australian cattle feedlot industry.

ALMA

Australian Livestock Markets Association. National advocacy body working to improve the long term sustainability of the saleyard and lairage industry in Australia

ALRTA

Australian Livestock and Rural Transporters' Association. Representative body of road transport companies which works with governments at all levels, industry groups, community organisations, regulators and the media to ensure that rural trucking is protected and promoted as a sustainable, responsible and safe contributor to rural and regional Australia and primary industries.

AMIC

Australian Meat Industry Council. The peak council that represents retailers, processors, exporters and smallgoods manufacturers in the post-farm-gate meat industry.

AMPC

Australian Meat Processing Corporation. The Rural Research and Development Corporation that supports the red meat processing industry throughout Australia. AMPC's mandate is to provide research, development and extension services that improve the sustainability and efficiency of the sector.

APVMA

Australian Pesticides and Veterinary Medicines Authority. An Australian Government statutory agency responsible for the management and regulation of all agricultural and veterinary chemical products in Australia.

AMR

Antimicrobial resistance. The ability of a microbe to resist the effects of medication that once could successfully destroy the microbe. Microbes include bacteria, viruses and other microscopic organisms.

ATA

Australian Trucking Association. ATA is the peak body that represents trucking operators, including major logistics companies and transport industry associations.

b

Billion.

Branding

The placing of permanent identifying marks on the hide of an animal by destroying the hair follicles and altering the hair regrowth.

BMP

Best Management Practice.

BOTGC

Balance of tree and grass cover. One of the six key priorities of the Framework.

BSE

Bovine spongiform encephalopathy, commonly known as mad cow disease.

Canopy cover

The fraction of ground area covered by the vertical projection of tree crown perimeters.

Carbon sequestration

A process of capturing and storing atmospheric carbon dioxide, which has the potential to mitigate climate change.

Carcase

The body of an animal after being dressed (removal of head, feet, hide and internal organs).

CBPP

Contagious Bovine Pleuropneumonia, a highly contagious infectious disease of cattle that attacks the lungs and thoracic membrane, with a high mortality rate.

CN30

Initiative and target relating to the red meat industry becoming carbon neutral by 2030.

CO_2e

Carbon dioxide equivalent, a standard unit for measuring greenhouse gas emissions.

CSIRO

Commonwealth Scientific and Industrial Research Organisation. An Australian federal government agency responsible for scientific research.

DAWE

Department of Agriculture, Water and the Environment

Dehorning

The removal of horns from cattle. It is a labour-intensive, skilled operation with important animal welfare implications, and is totally avoidable by breeding polled (hornless) cattle.

Ear marking

Also known as notching. It has business benefits by enabling livestock to be identified on-farm, leading to improved management.

ESCAS

Exporter Supply Chain Assurance System. An Australian Government regulatory program based on four principles: animal welfare, control through the supply chain, traceability through the supply chain and independent auditing.

EWG

Expert Working Group. Established to develop indicators and measures for the balance of tree and grass cover key priority in the Framework.

Five Domains of Animal Welfare

The Five Domains of Animal Welfare that extend on the Five Freedoms (see below). They support the evolved understanding of animal welfare as the state of an animal in relation to its ability to cope with its own environment, not just freedom from cruelty.

Five Freedoms of Animal Welfare

The Five Freedoms were created by the UK Farm Animal Welfare Council, and provide a base from which to consider the welfare of an animal.

GDP

Gross Domestic Product.

GHG

Greenhouse gas.

GLS

Global Life Satisfaction. Quantifies a person's subjective wellbeing in a 'global' sense - taking into account all aspects of their wellbeing.

GRI

Global Reporting Initiative, an international independent standards organisation that helps businesses communicate their sustainability impacts, and is a global standard for sustainability reporting.

ha

Hectare.

HSCW
Hot Standard Carcase Weight. Used to describe the weight of an animal, particularly when the animal is sold directly from a farm to an abattoir.

Kg
Kilogram.

KL
Kilolitre.

L
Litre.

LCA
Life Cycle Assessment. A technique to assess environmental impacts associated with a product across a supply chain.

Lotfeeding
The process of feeding cattle on grain in a feedlot, where cattle are fed a high-protein grain-based diet to reach exact market specifications, before being supplied to processors.

LPA
Livestock Production Assurance. The Australian livestock industry's on-farm assurance program covering food safety, animal welfare and biosecurity. It provides evidence of livestock history and on-farm practices when transferring livestock through the value chain.

LPA NVD
LPA National Vendor Declarations. A form that documents the movement of livestock when they are bought, sold or moved off a property. This form accompanies all such movements.

LW
Liveweight. The weight of a live animal.

m
Million or metre.

Materiality
The principle of reporting against and addressing the industry's most material issues. These are issues with a direct or indirect impact on an organisation's ability to create, preserve or erode economic, environmental and social value for itself, its stakeholders and society at large.

MLA
Meat & Livestock Australia. A producer-owned industry service provider that provides marketing and research and development services to cattle, sheep and goat industries.

MoU
Memorandum of Understanding. The Red Meat MoU was put in place 20 years ago to define the roles, responsibilities and funding of Australia's red meat industry bodies.

MSA
Meat Standards Australia. A grading system for meat that has met strict eating quality criteria.

NFAS
National Feedlot Accreditation Scheme. An independently-audited quality assurance scheme initiated by ALFA that includes quality assurance, welfare and other components.

NFF
National Farmers Federation. A non-profit, membership-based organisation representing farmers and the agricultural sector in Australia.

NGO
Non-governmental organisation.

NLIS
National Livestock Identification System. Australia's system for identifying and tracing cattle, sheep and goat.

NRM
Natural resource management. This refers to the protection and improvement of environmental assets such as soils, water, vegetation and biodiversity.

NSW

New South Wales, a state on the east coast of Australia.

OH&S

Occupational health and safety. A field concerned with the safety, health and welfare of people at work.

OIE

World Organisation for Animal Health. An intergovernmental organisation coordinating, supporting and promoting animal disease control.

Paris Agreement

An international agreement under the United Nations Framework Convention on Climate Change. dealing with the mitigation of greenhouse gas emissions, adaptation to climate change, and climate change-related finance. The Paris Agreement commits members to the long-term goal of keeping the increase in global average temperatures to well below 2°C above pre-industrial levels, and to limit the increase to 1.5°C.

Polled livestock

Livestock, including cows and bulls, born without horns due to the poll gene tfor which they can be selectively bred.

RD&A

Research, development and adoption.

RDC

Research Development Corporations. These are the main way the Australian Government and primary producers co-invest in R&D for industry and community benefits. These include LiveCorp, AMPC and MLA.

RELRP

The Australian Government's Reducing Emissions from Livestock Research Program. A three-year national collaborative program coordinated by MLA aimed to develop knowledge and technologies on methane emissions.

Rinderpest

An infectious viral disease of cattle characterised by fever, dysentery and inflammation of the mucous membranes.

Red Meat 2030

A 10-year strategic plan for Australia's red meat businesses, developed in consultation with industry and government.

RMAC

Red Meat Advisory Council. A network of producers, lot feeders, manufacturers, retailers and livestock exporters that represent Australian beef, goatmeat and sheepmeat businesses from gate to plate.

Safe Work Australia

An Australian government statutory body established to develop national policy relating to work health and safety and workers' compensation.

SFO

State Farming Organisations. Organisations that represent farmers within a state, such as AgForce, NSW Farmers and the Victorian Farmers Federation.

TruckSafe

An independently-audited accreditation scheme for truck operators that ensures quality, safety and best practice. TruckSafe includes an animal welfare module.

WHO

World Health Organisation. A UN agency that is concerned with international public health, directs international health initiatives, and leads partners in global health responses.

Woody vegetation

Plants that produce wood as their structural tissue and have woody stems, such as trees.

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FOR FURTHER INFORMATION PLEASE CONTACT:

Jacob Betros, Secretariat for the Sustainability Steering Group

jbetros@mla.com.au

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