Australian Beef
Sustainability
Framework

2018

Australian Beef Sustainability Annual Update

What is the Framework

Launched in April 2017, the Australian Beef Sustainability Framework (the Framework) was developed by the Australian beef industry to meet the changing expectations of consumers, customers, investors and other stakeholders. The Framework defines sustainable beef production and tracks performance over a series of indicators annually. The indicators will continue to be refined through a process of consultation with both stakeholders and technical experts.

The Framework supports the strategy outlined in the *Meat Industry Strategic Plan 2020* to deliver for the longevity and prosperity of our people, our livestock and the communities we serve.

The Framework is used to:

- Direct industry investment for continuous improvement in areas most important to our customers and other stakeholders
- Help protect and grow access to investment and finance by providing evidence of performance and a clear path to continuous improvement
- Foster constructive relationships with stakeholders to work collaboratively on continuous improvement
- Promote our industry to the community and customers.

The Framework does not:

- Establish or endorse measurement systems at an individual business level
- Provide an accreditation or certification system
- Endorse prescriptive management practices
- Create paperwork for individual businesses – existing data is used where available.

What does it mean to producers and industry?

At an individual business level, the Framework does not require any direct input since businesses already provide a wide-range of information to government and other agencies. The Framework is used by industry to guide and track performance on-farm and through the value chain to ensure that Australia continues to be recognised as a global leader in sustainable beef production. A focus on aligning environmental, welfare, social and economic practices with best evidence and community expectations, while growing profitability will help ensure continued access to markets and capital for Australian beef businesses.

What does it mean for consumers and customers?

Consumers, customers, industry and other interested stakeholders can get a clear snapshot of the beef industry's performance across environmental, welfare, social and economic areas. The process of consultation provides stakeholders with a forum to provide constructive feedback.

The Framework transparently acknowledges not only achievements made by industry but also where further work is required.

Our vision

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

How do we define sustainability

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

About this report

This is the Australian beef industry's first annual update of the Framework.

This update:

- Shows the progress of the Framework against a five-step implementation plan
- Outlines activity underway or planned for six key priority areas selected by stakeholders
- Provides a situation statement and, where data permits, reports on industry performance across 23 priority areas
- Provides case studies of sustainable practice through the value chain.

This update has been prepared following the reporting principles of the Global Reporting Initiative (GRI), but not in accordance with the Standards recognising that the Standards have been established for entities and not for whole-of-industry reporting.

Materiality

A formal materiality assessment was undertaken in 2016 based on both the AA1000 AccountAbility Assurance Standard and GRI content principles. The results of this materiality assessment are presented in our 2016 Materiality matrix in Appendix 1, which has informed the development of the Framework's 23 priority areas.

A materiality assessment will be conducted every five years in line with the *Meat Industry Strategic Plan's* development. Our approach to materiality can be found in more detail on our website.[1]

Stakeholder inclusiveness

The Framework's Sustainability Steering Group has identified and consulted with 12 stakeholder groups over the past 12 months. In particular, the Steering Group has engaged both industry and external stakeholders through a biannual Consultative Committee.[2] The stakeholder groups engaged and all methods of engagement are highlighted in Appendix 2.

Report boundary

This report includes all 23 priority areas of the Framework and provides data where available. The six key priority areas identified through consultation (see page 23) are reported on in detail.

The scope of the Framework covers the Australian beef industry including farm, feedlot, processor, saleyard, land transport and live export. The Framework's scope does not include domestic and overseas customers, or consumers.

We welcome your feedback

As always, feedback is welcomed from all industry and external stakeholders. We encourage feedback on this report and the Framework through our website at **www.sustainableaustralianbeef.com. au/annual-update-2018**.

Our approach to materiality:

Phase 1: Review
- Review of the material issues from the 2012 materiality assessment

Phase 2: AccountAbility Five Part Test
- Context, risk, media and peer review
- Stakeholder engagement
- Identification of preliminary material issues

Phase 3: Validation
- Validation of preliminary issues by the independent 2016 Sustainability Steering Group

Six key priority areas

Six key priority areas were selected in 2017 for industry focus. All 23 priority areas remain critical to stakeholders and industry and activity continues across all of them.

Animal husbandry techniques

Profitability across value chain

Balance of tree and grass cover

Antimicrobial stewardship

Manage climate change risk

Health & safety of people in the industry

1 https://www.sustainableaustralianbeef.com.au/How-we-got-here.

2 https://www.sustainableaustralianbeef.com.au/consultative-committee.

Highlights

FRAMEWORK HIGHLIGHTS

Established an expert panel on balance of tree and grass cover

Decided on 6 key priority areas for industry focus

Established the 2nd Sustainability Steering Group, with representation across the beef value chain

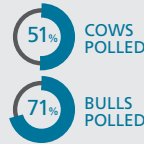29% Collected data for 29% more indicators

Held two Consultative Committee forums with stakeholders

ANIMAL WELFARE

$35m research partnership established

51% COWS POLLED
71% BULLS POLLED

High proportion of cows and bulls are polled and don't require dehorning

Pain relief made commercially available for use on cattle in late 2016

ECONOMIC RESILIENCE

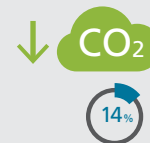$120m $120m in farmgate returns from the Meat Standards Australia beef program

30% PRODUCER KNOWLEDGE AND SKILLS

Rollout of Profitable Grazing Systems, with a potential 30% boost to producer knowledge and skills

ENVIRONMENTAL STEWARDSHIP

CO_2 NEUTRAL 2030 Pathways investigated for the red meat industry to become carbon neutral by 2030

↓ CO_2 14%
Reduction in emissions by 14% over past 30 years

PEOPLE & THE COMMUNITY

Established a proactive antibiotic monitoring program in Australian feedlots

58% 58% of Australians consider beef part of a healthy, balanced diet

Contents

Letters from the Chairs

Letter from the Red Meat Advisory Council Chair

The first report of the Australian Beef Sustainability Framework recognised that many of our customers want to know where and how their beef is produced.

One year on there is now no denying that stakeholders across all industries are actively seeking out more information than ever before. Stakeholder groups including customers, investors, government and consumers, are better informed and hungrier for transparency. Sustainability is now well established as a mainstream issue in Australia and globally.

The Australian $12.7 billion beef industry operates in a complex global trading environment, with many structural uncertainties. The industry needs to adapt to climate, unpredictable rain patterns, changing trade agreements and protocols, varying state and territory legislation and, critically, customer and stakeholder expectations.

Over the past years within the operating environment, energy and other costs continued to rise while a dry winter for several key locations across the nation increased supply pressure. Profitability remains a challenge across the value chain due to seasonal conditions and supply.

The industry is aware and working through the Framework to address stakeholder concerns across environmental, animal welfare, economic and social areas. We know that concerns about climate change and the ability to feed the growing world population have led to consumers questioning what they put on their plates. We are seeing the emergence of meat alternatives and promotion of meat-free diets.

At the same time, we see a megatrend of people moving to higher protein diets, and whole and natural food. This places Australian beef in a great position. The starting point for all Australian beef is grass-fed systems across almost half of the Australian landscape. Management of these lands is critical to not only the ability of our industry to produce some of the world's greatest beef, but also to ensuring a healthy and resilient environment for all Australians, present and future. We underpin this with world-leading integrity systems that ensure food safety, provenance, quality and evidence of sustainable practice.

Taking action to adapt

The Red Meat Advisory Council (RMAC) is the peak representative group of the industry and manages the Meat Industry Strategic Plan (MISP 2020). Our current MISP 2020 plan articulates policy settings that can lead to $7 billion additional value to Australian red meat and livestock businesses by 2030. On the flip-side, we could lose up to $6 billion in value to those same Australian businesses if we get it wrong.

The Australian Beef Sustainability Framework is about addressing this. By listening to our stakeholders we can identify current emerging priorities. Responding to these priorities will grow the prosperity and longevity of the businesses, families and communities that make up the beef industry.

The Australian industry has announced that it could lead the world in becoming a carbon-neutral industry by 2030. Over the next year, we look forward to working with our stakeholders to develop the industry's carbon-neutral strategy.

Since the Framework was released, the Sustainability Steering Group (SSG) that RMAC appointed has been driving the implementation plan outlined in this update. I'd like to thank everyone on the current and past SSG for directing this process. The development and implementation of the Framework has been guided by the values established by the first SSG: transparency, inclusivity, credibility, practicality and relevance.

Collaboration is the key to progress

On a personal level, it has been incredibly insightful to be involved in the consultation that has been fundamental to implementing the Framework. In particular it has been a privilege to hear from the Consultative Committee. Established last year, this new reference group consists of people with a diverse range of knowledge, expertise and perspectives on sustainable development. There is huge value to industry in being able to work collaboratively with a variety of stakeholders so that we can continue to understand and meet consumer and customer expectations.

Australia is not the only beef-producing country focused on improving transparency across sustainability. Some of our major competitors globally are now identifying their sustainability risks.

The Australian approach has been to ensure that industry is in the driver's seat of the process, with genuine and constructive consultation from our stakeholders. I believe this approach is world-class.

We have listened to what industry and external groups collectively agree are the key priority areas to focus on. We are keeping everyone informed and clearly reporting on progress. With the release of this update we're continuing this practice of transparency and engagement.

Letter from the Sustainability Steering Group Chair

Listening and cooperating with stakeholders in order to deliver value to the industry is what attracted me one year ago to chairing the SSG.

As a beef producer with properties and a feedlot in Queensland, I know that Australia produces great-tasting beef. Like most producers, I also know that we do this in a way that strives for our land to be left in better condition, the bank balance healthier and our local communities in a more resilient state for future generations. We do this while trying to provide the best possible care for our animals, natural resources, and importantly, our families and the employees who work in our operations.

Of course, our customers, investors and other important stakeholders increasingly require evidence of this. That is fundamentally what the Australian Beef Sustainability Framework does. It is about continuing to engage with our stakeholders to ensure we are reporting on what they want to know and working with experts on the best ways to measure performance.

The SSG that I chair is the second steering group and I'd like to acknowledge the incredible work of the previous group in establishing the Framework, through an exhaustive process of consultation. The previous group established the key steps in the implementation plan, which are outlined and reported against in this update.

One of the key tasks we have completed this year is to prioritise six of the 23 priority areas in the Framework. As a producer, working with our customers, investors and other stakeholders to select these key priority areas was incredibly insightful. It brought out the similarity between the industry and external stakeholder views on priorities. From an industry perspective, it was great to see the emphasis our external stakeholders place on profitability across the supply chain. Clearly, profitability is critical.

I think this Framework process is a clear conversation with our stakeholders, in part to acknowledge that no one has all of the answers. We don't know how this process, or the issues contained in the framework, will evolve over time. The ideas we can gather from external stakeholders, whether they be access to data, approaches to issues or unique networks to progress continuous improvement, are all incredibly valuable.

Unashamedly, this process is also about promoting all of the great work that industry has delivered and continues to deliver across the four themes of environment, welfare, people and economics. We won't shy away from positive stories and I'm pleased to share some of those with you in this update. We will also continue to acknowledge where there is further work needed and I hope you find this update to be an honest and open account of where we are in year two of the Framework process.

Don Mackay
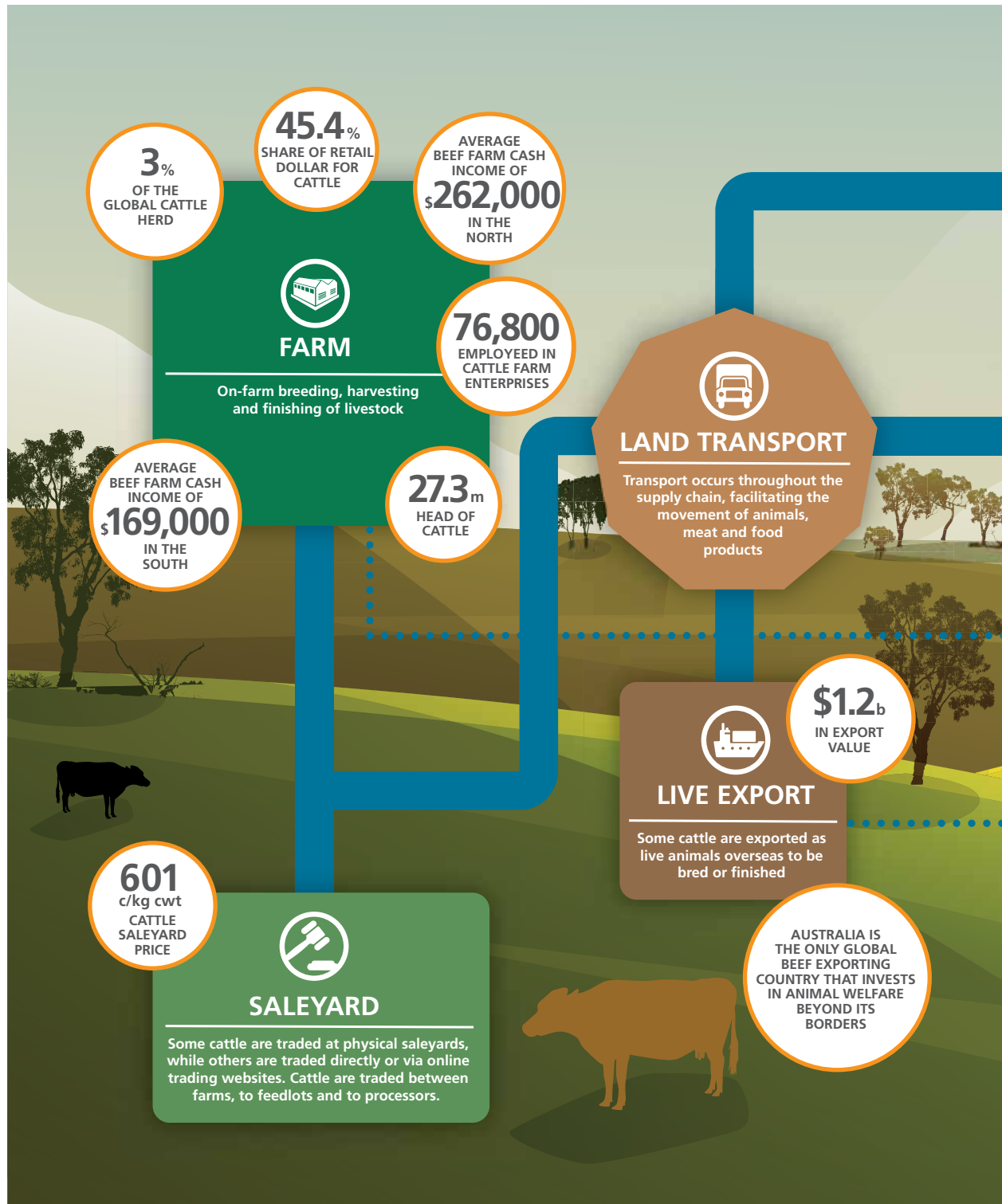Independent Chair,
Red Meat Advisory Council

Bryce Camm
Chair,
SSG for the Australian Beef Sustainability Framework
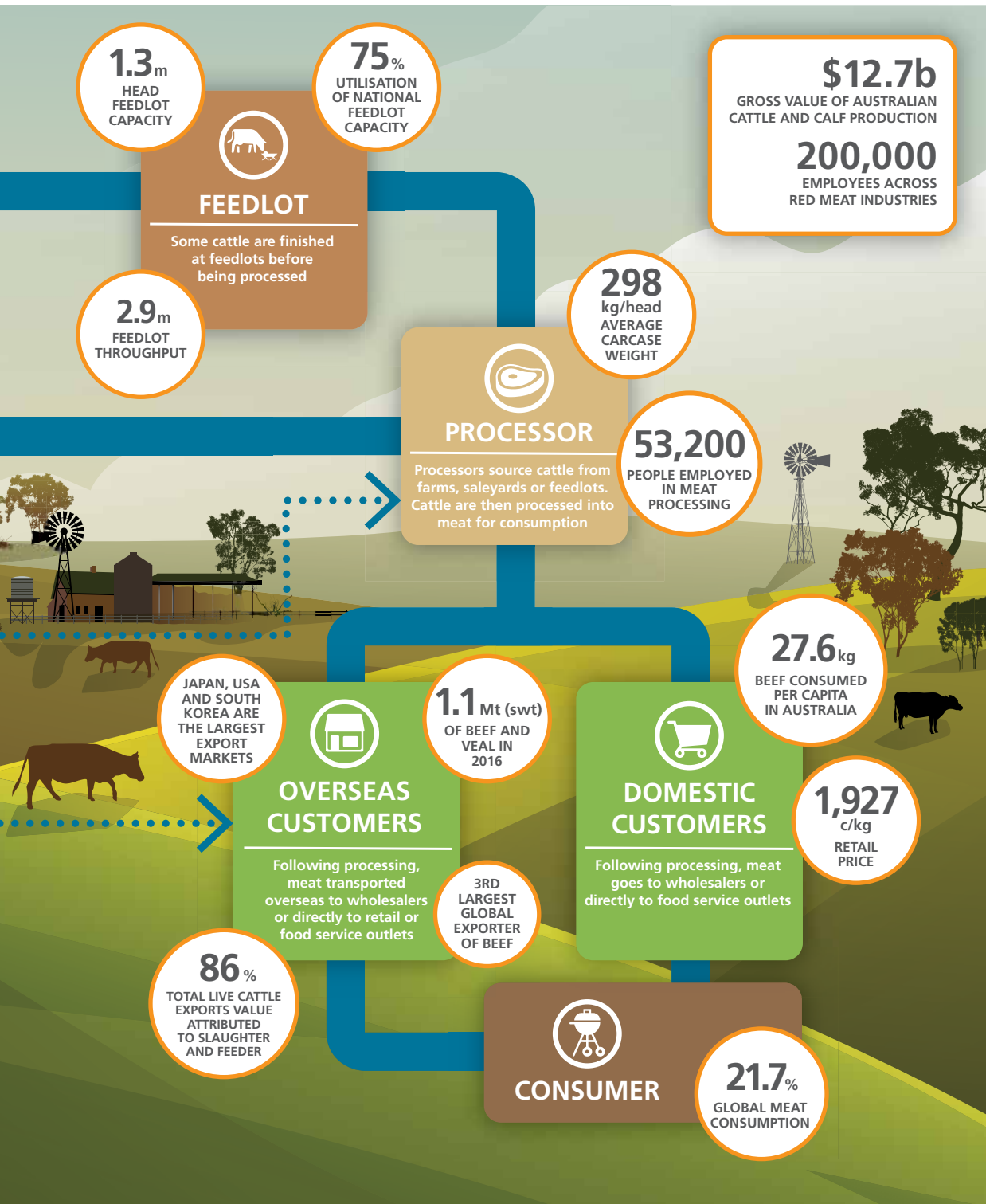
About the beef industry

Our supply chain

3%
OF THE GLOBAL CATTLE HERD

45.4%
SHARE OF RETAIL DOLLAR FOR CATTLE

AVERAGE BEEF FARM CASH INCOME OF
$**262,000**
IN THE NORTH

FARM

On-farm breeding, harvesting and finishing of livestock

76,800
EMPLOYED IN CATTLE FARM ENTERPRISES

AVERAGE BEEF FARM CASH INCOME OF
$**169,000**
IN THE SOUTH

27.3m
HEAD OF CATTLE

LAND TRANSPORT

Transport occurs throughout the supply chain, facilitating the movement of animals, meat and food products

$1.2b
IN EXPORT VALUE

LIVE EXPORT

Some cattle are exported as live animals overseas to be bred or finished

601
c/kg cwt
CATTLE SALEYARD PRICE

SALEYARD

Some cattle are traded at physical saleyards, while others are traded directly or via online trading websites. Cattle are traded between farms, to feedlots and to processors.

AUSTRALIA IS THE ONLY GLOBAL BEEF EXPORTING COUNTRY THAT INVESTS IN ANIMAL WELFARE BEYOND ITS BORDERS

Primary sources and date periods can be found in Appendix 4.

1.3m
HEAD FEEDLOT CAPACITY

75%
UTILISATION OF NATIONAL FEEDLOT CAPACITY

$12.7b
GROSS VALUE OF AUSTRALIAN CATTLE AND CALF PRODUCTION

200,000
EMPLOYEES ACROSS RED MEAT INDUSTRIES

FEEDLOT

Some cattle are finished at feedlots before being processed

2.9m
FEEDLOT THROUGHPUT

298
kg/head AVERAGE CARCASE WEIGHT

PROCESSOR

Processors source cattle from farms, saleyards or feedlots. Cattle are then processed into meat for consumption

53,200
PEOPLE EMPLOYED IN MEAT PROCESSING

27.6kg
BEEF CONSUMED PER CAPITA IN AUSTRALIA

JAPAN, USA AND SOUTH KOREA ARE THE LARGEST EXPORT MARKETS

1.1 Mt (swt)
OF BEEF AND VEAL IN 2016

OVERSEAS CUSTOMERS

Following processing, meat transported overseas to wholesalers or directly to retail or food service outlets

3RD LARGEST GLOBAL EXPORTER OF BEEF

DOMESTIC CUSTOMERS

Following processing, meat goes to wholesalers or directly to food service outlets

1,927
c/kg RETAIL PRICE

86%
TOTAL LIVE CATTLE EXPORTS VALUE ATTRIBUTED TO SLAUGHTER AND FEEDER

CONSUMER

21.7%
GLOBAL MEAT CONSUMPTION

About the beef industry (continued)

Our markets

Australian beef can be found across the world. Exporting to more than 100 countries, Australia was the third largest global exporter of beef in 2016. A total of 1.01 million tonnes (swt) of beef valued at $7.45 billion was exported in this period. Our top three international markets (on a volume basis) were Japan (292,364 tonnes), United States (234,112 tonnes) and South Korea (148,552 tonnes).

While we are a key player in international trade, the Australian domestic market remains our largest single market consuming approximately 30% of the beef produced.

Australia beef exports (% by volume, 2017)

TOP 5 COUNTRIES
29.2% Japan
23.4% USA
14.8% South Korea
11.0% China
4.9% Indonesia

■ Beef export destinations
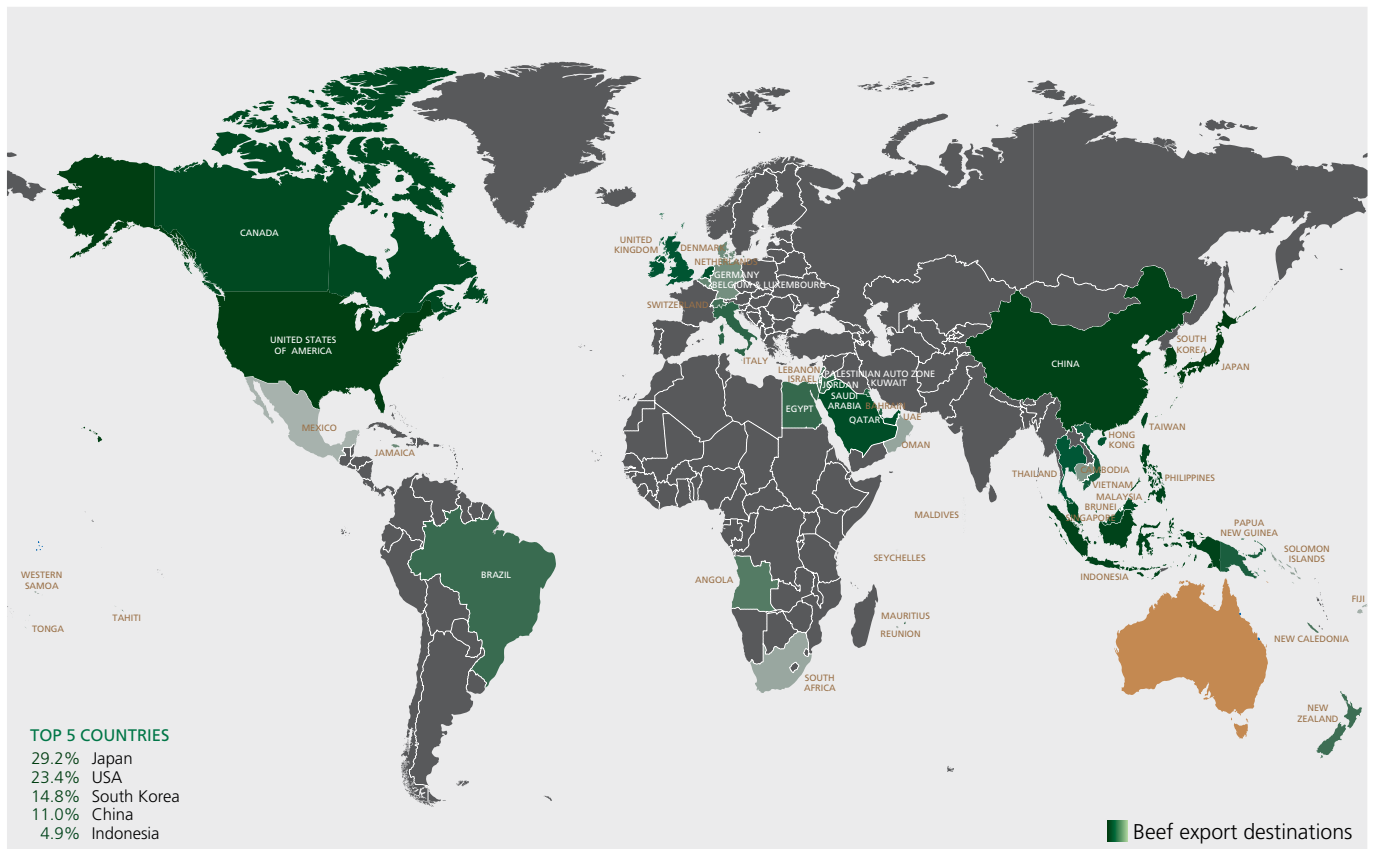
Chart 1: Heatmap of the volume of Australian beef exports to different markets. A darker green colour indicates higher export volume.

Our integrity systems

Red meat integrity systems

Australian beef enjoys market access to over 100 countries due to consistent quality and strong systems that guarantee the integrity of Australian beef. Australian integrity systems lead the world in food safety measures, quality assurance and traceability from paddock to plate.

The three central elements of the red meat integrity system are:

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

NLIS enhances Australia's ability to track livestock during disease and food safety incidents. It provides information through identification and traceability of livestock that underpins market access for Australian red meat globally.

LPA is an independently audited, 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.

Producers declare this information on LPA NVDs, which are required for any movement of stock to processors, saleyards or between properties.

NLIS, LPA and LPA NVDs are complemented by off-farm food safety initiatives, which together build a culture of shared responsibility among all Australian livestock owners – one that acknowledges and embraces their role and reputation as suppliers of safe, ethically-produced and high-quality food.

In addition to these whole-of-industry integrity systems, other accreditation and regulatory systems have been created to guarantee the quality, environmental and animal welfare credentials for particular sectors. Audited systems include:

- National Feedlot Accreditation Scheme (NFAS)
- Australian Livestock Processing Industry Animal Welfare Certification System (AAWCS)
- Exporter Supply Chain Assurance System (ESCAS)
- The Pasturefed Cattle Assurance System (PCAS)

A suite of voluntary standards guide continuous improvement, including:

- TruckCare
- Australian Model Code of Practice for Livestock Saleyards and Lairages
- Grazing Best Management Practice (BMP)

Individual supply chains have also established audited systems to provide assurance for environment and welfare as well as the type of production.
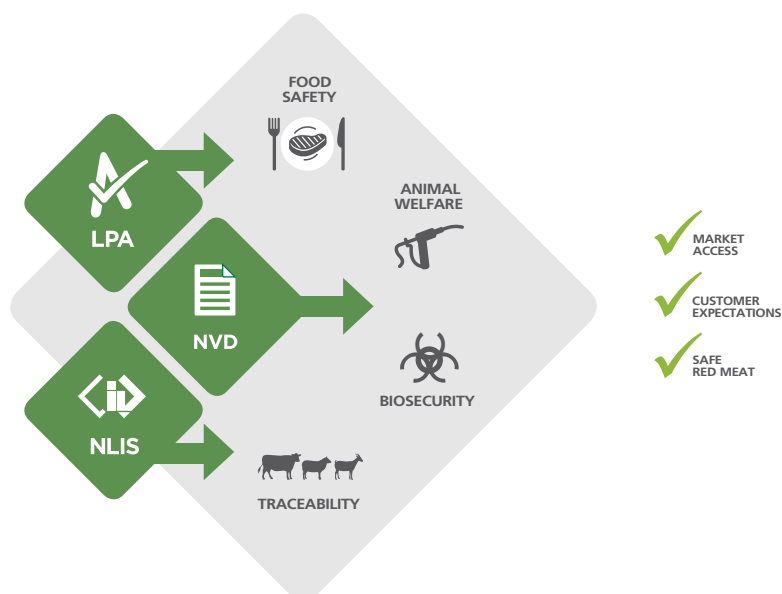
Implementing the Framework

P12

In the Framework Report released last year, five steps were outlined to commence implementation of the Framework. Since then, activity has been conducted across all five steps and are either complete or remain underway.

Establishing the Consultative Committee was a major milestone in 2017. Through the Committee's collective wisdom, five key priority areas were identified. A sixth area was selected by the SSG, making up the industry's **six key priority areas**. These are explored on pages 20-44.

STEP 1	STEP 2	STEP 3	STEP 4	STEP 5
Sustainability Steering Group	Establish a multi-stakeholder Consultative Committee	Expert panels to progress indicators and measures for reporting	Stocktake of activity across the value chain	Report progress
Complete.	Complete.	Expert panel formed for balance of tree and grass cover. Further groups to be established as required.	Initial high-level stakeholder stocktake complete. This is continuing in more detail.	First annual update complete.

Step 1 – Sustainability Steering Group (SSG)

An independent grassroots group, representative of the beef value chain, was appointed by the Red Meat Advisory Council (RMAC) to continue to progress the Framework on behalf of industry.

The seven-person grassroots SSG has responsibility for establishing Framework reporting guidelines, co-ordination of consultative and expert panel activities, developing indicators to report against the priority areas, managing sustainability priorities and reporting to RMAC on progress.

The current SSG retains two members from the SSG group that developed the Framework, Jim Cudmore and Tony Hegarty.

Members of the Sustainability Steering Group

Bryce Camm: The SSG Chair is CEO of the Camm Agricultural Group, Vice Chair of Beef Australia Limited and a member of the Executive of the Australian Lot Feeders Council; he was the Rabobank Emerging Leader Award recipient in 2014.

Greg Campbell: Recently retired CEO of S. Kidman & Co, Greg started with Kidman as Landcare manager in 1993 before becoming chief executive in 2001; strong interests in production – both landscape and cattle management, including several years on the National Farmers' Federation Natural Resources Committee.

Jim Cudmore: Led the initial review of how the Australian beef industry should promote its sustainability credentials as the precursor to this group being formed. A well-respected industry contributor with experience in extensive and intensive livestock production. Jim sat on the first SSG which developed the Framework.

Tony Hegarty: New South Wales cattle producer with a focus on natural resource management and almost 30 years' involvement in the Landcare movement. Tony sat on the first SSG which developed the Framework and is also Vice Chair of Cattle Council of Australia.

Susan McDonald: From a Cloncurry-based beef producing family, Susan is Managing Director of Super Butcher, a retail group of six stores and online butchers; she is a registered CPA, and most recently was Chief of Staff to the Minister for Natural Resources and Mines in the Queensland Government.

Kim McDougall: As General Manager for Livestock at Harvest Road Beef, Kim is responsible for all livestock procurement for WA's largest export beef processor as well as management of the beef operations as part of the Forrest family's Minderoo Station properties in the Pilbara region.

Dr Michael Maxwell: Over 20 years' experience as a consultant and lawyer, focused on regulatory issues, international risk management, corporate culture, governance and product liability issues; legal skills complemented by a scientific research background in pharmacology and toxicology. Michael has a particular focus on the live export industry.

To find out more and hear directly from each of the SSG on why they are involved, visit **www.sustainableaustralianbeef.com.au/ sustainability-steering-group**

Implementing the Framework (continued)

P14

Step 2 – Establish a Consultative Committee

During the development of the Australian Beef Sustainability Framework, over 80 groups were consulted. These included Australian and overseas retailers, banks, investors, environment and welfare non-government organisations, researchers, government, policy organisations and industry groups.

The input received from these stakeholders was invaluable. To continue to benefit from the collective wisdom of diverse stakeholders, the industry has formed a Consultative Committee.

The establishment of the Consultative Committee recognises those within and outside of the industry must work together for the Framework to be valuable, relevant and robust. The commitment made to the Consultative Committee is that all views are listened to and considered, with clear reporting of why or why not suggestions were actioned.

The Consultative Committee has met twice since the inaugural Framework report was released and will continue to meet twice a year to:

- Share information and insights about emerging trends, issues and opportunities for sustainable food production
- Identify emerging issues and opportunities for industry
- Confirm the priority areas of sustainable beef production for reporting progress to stakeholders and the wider community
- Enable the SSG (and therefore, industry) to better anticipate emerging focus areas for customers and other stakeholders
- Provide the SSG with more information to better implement the Framework.

These six key priority areas for industry focus are discussed in detail on pages 20-44.

The presentations, agendas, attendees and post-workshop reports from the first two Consultative Committee workshops are available on the website: **www.sustainableaustralianbeef.com.au/ consultative-committee**

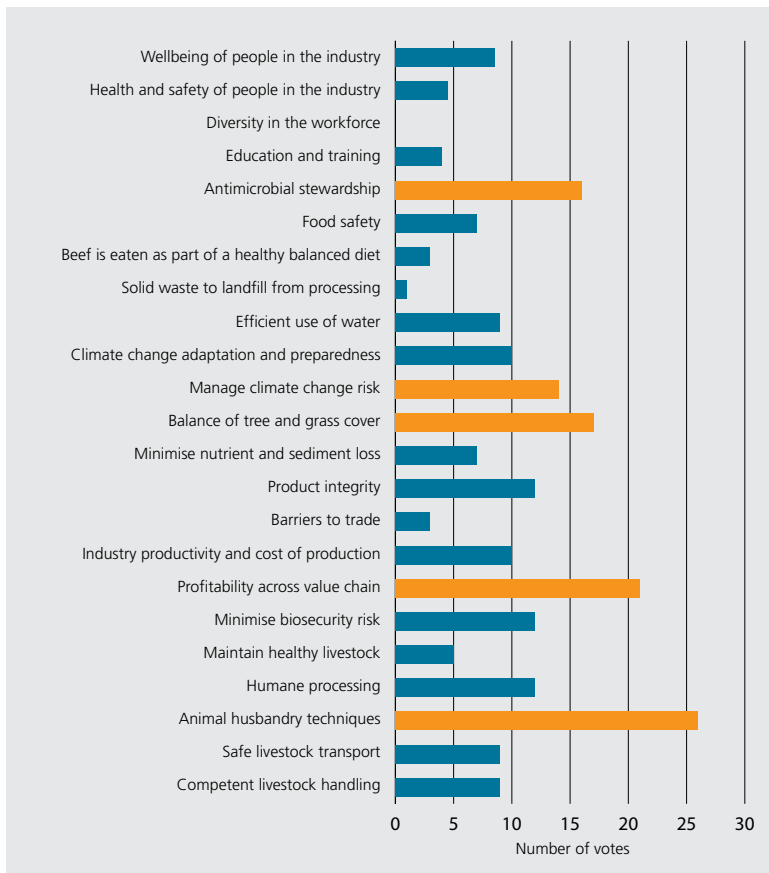## PRIORITY AREAS VOTED ON BY THE CONSULTATIVE COMMITTEE

Chart 2: The Consultative Committee voted across the 23 priority areas to guide industry focus. The top five are highlighted in orange and make up the five of the six key priority areas discussed in this report.

Industry organisations

Research and academia

Financial institutions and agribusiness

Customers

Special interest groups and NGOs

Government and regulators

Table 1: List of company attendees of the Consultative Committee forums held in August 2017 and February 2018.

Implementing the Framework (continued)

P16

Step 3 – Establish panels to progress indicators and measures for reporting

In the first report, only data that was easily accessible in the six weeks between the online consultation ending and the report's release was included. In this update 28 indicators have data. However, there are some indicators where stakeholders or experts are yet to agree on how to measure a priority area.

In order to address this, multi-disciplinary experts are being invited to help develop suitable indicators.

The first expert group established is for the key priority area of *balance of tree and grass cover*. The group was established following engagement with stakeholders and technical experts, which revealed that there was no agreement on what or how to accurately measure the management of trees and grass, across Australia, by the beef industry.

Thought-leaders across the fields of ecology, remote sensing, biodiversity, conservation, forestry, grasslands and zoology were invited to participate.

Consulting these experts will help the industry and other stakeholders to identify credible and practical measures and definitions for the balance of tree and grass cover. Their advice will shed light on indicators for deforestation, healthy grassland systems, thinning and regrowth. Details on this process are available on the Framework website.

The outputs from this expert group will form the basis of a workshop with stakeholders, including industry, environmental groups, customers and investors, to work towards agreed definitions and indicators that are evidence-based.

Over the next 12-months an expert panel will also be formed for managing climate change, to assist industry's development of a strategy to deliver carbon neutral beef by 2030.

Step 4 – Stocktake of activity across the value chain

Industry and government directly invest in the beef industry through industry service companies. These companies were prioritised for an initial stocktake of activities. This initial stocktake was followed by a high-level stocktake across third party organisations. Third parties reviewed include NRM regions, service providers to industry and government agencies.

To focus efforts, the preliminary stocktake in year one was undertaken across the six key priority areas to capture initiatives and reporting already underway across the value chain. The assessment identified gaps and duplication which will guide and coordinate continuing efforts between industry and external organisations.

Details from the snapshot are outlined across the six key priority areas on pages 20-44.

Step 5 – Report progress

This is the first Australian Beef Sustainability Update. An update will be prepared annually, with a more comprehensive report prepared every five years. This will include a formal update of our materiality assessment.

The comprehensive report every five years will also provide detailed information to inform the development of the next Meat Industry Strategic Plan (MISP) managed by RMAC.

As we look to continue reporting progress, one of our key activities is managing whole-of-industry data. Identifying data systems that exist, collating and coordinating data across the whole industry, and setting up new data collection systems is a task that constantly evolves.

Activity stocktake

KEY PRIORITY AREAS	RESEARCH	ADOPTION	INDUSTRY & DATA SYSTEMS
Animal husbandry techniques	significantly progressed	progressed	progressed
Profitability across value chain	progressed	progressed	early stages
Balance of tree and grass cover	progressed	progressed	progressed
Antimicrobial stewardship	progressed	progressed	progressed
Manage climate change risk	significantly progressed	significantly progressed	significantly progressed
Health and safety of people in the industry	significantly progressed	progressed	early stages

- Activities have been significantly progressed
- Activities have been progressed
- Activities are in their early stages

Table 2: Stocktake of the industry's activity progress across the six key priority areas, looking at the three areas of research, adoption, and industry and data systems.

Implementing the Framework (continued)

P18

Evolving data over time

Rapidly evolving monitoring capabilities

One of the key objectives of the Framework is to report at an industry level using available data where appropriate, whilst identifying and addressing where there is a need to develop or improve indicators that better inform the understanding and attainment of sustainable practices.

Across the entire value chain there is a lot of activity and development with new technologies and data sources. We will continue to monitor developments to improve the data contained in the framework.

This report contains data for 28 of the 48 indicators. The data is from a variety of available sources, both within and external to industry including ABARES, published research, producer surveys, audited industry integrity systems and government databases.

The indicators and reporting structure are intended to evolve over time. Indicators will also advance with improved understanding of the issues and the most effective ways of monitoring and reporting which minimise the need for additional expensive data collection. The data sources will also evolve over time with the emergence of new technologies as well as the expansion of voluntary on-farm systems that provide more robust datasets as a by-product of day-to-day management.

To begin exploring how different data approaches could evolve, two case studies have been developed.

Both case studies focus on Queensland, where 49.5% of the beef herd is located. The two case studies highlight two different approaches to industry reporting and directing on-farm management:

- **Remote Sensing** – Provides an opportunity to provide on-farm data at scale, without requiring producer systems on-farm. This approach can monitor at paddock level to national outcomes (Case study page 35); and

- **On-Farm Systems** – Such as the Queensland Grazing Best Management Practice (BMP) program that enables on-farm benchmarking and a pathway to improved practices that improve profitability and sustainability (Case study page 19).

Together these two approaches will provide industry and stakeholders with valuable insights on overall performance from the property to national scales. BMP looks at what practices are being undertaken and the remote sensing looks at the outcome of those practices. This will allow for greater targeting of adoption services and the potential for market reward for leading producers.

The technical expert group for balance of tree and grass cover will consider the capability of remote sensing data to develop suitable indicators and data for the 2019 update.
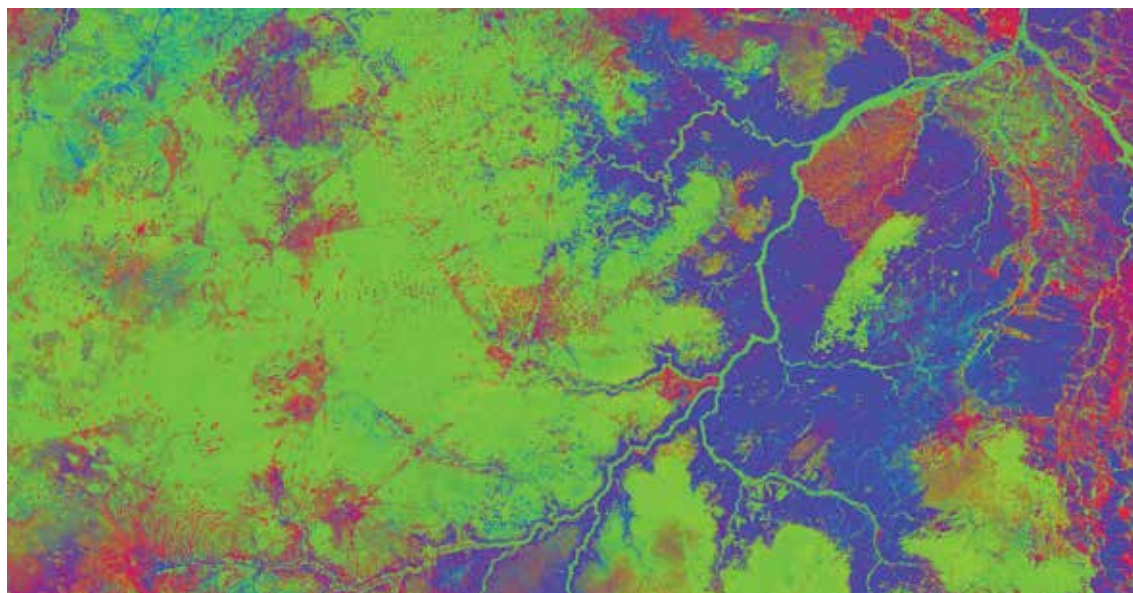
Figure 1. 10m resolution imagery which is now acquired every 5 days showing the percentage of photosynthetic (green) and non-photosynthetic (blue), and bare ground (red) over a 6km x 4km area. Property fence lines are also shown.

Grazing BMP

Grazing BMP is an industry-led, voluntary program that allows graziers to benchmark their current practices against industry standards, identify improved practices and determine the steps they need to take to incorporate best management practices into their enterprise to improve their long-term profitability and sustainability.

In time the program will also allow the grazing industry to demonstrate good ethical and environmental management to the wider community.

The Grazing BMP program was developed from the collaborative efforts of the Queensland Department of Agriculture and Fisheries (QDAF), Fitzroy Basin Association (FBA) and AgForce Queensland.

The Grazing BMP program has seen investment from the Australian and Queensland governments and principally been used by graziers in Queensland to date.

The Grazing BMP program presents an opportunity to look at which practices are occurring on-farm against the priority areas in the Framework. Indicators from the Grazing – BMP self-assessment tool that align with the areas reported in the Framework are outlined at an aggregated level in the following graph.

RMAC INDICATORS AGAINST GRAZING BMP*
(JAN 2017 - DEC 2017)

Legend: % at below industry standard | % at industry standard | % above industry standard
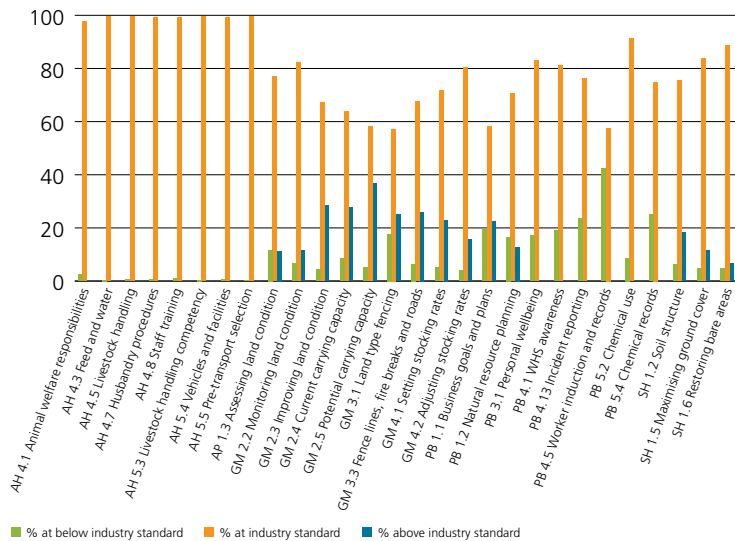
Source: AgForce Queensland Farmers Ltd

Chart 3: Industry performance data collected from Grazing BMP against the Framework's priority areas.

Grazing BMP – Fast Facts

- **140.33 million hectares** of grazing land in Queensland.
- **28.913 million hectares** involved across Queensland.
- **1.3 million hectares** under accreditation management.
- **Over 2000 approved businesses** engaged to date.
- **105 enterprises** have gone through the accreditation process.

Six key priority areas

P20

At the first Consultative Committee meeting held in August 2017, industry stakeholders were asked which of the 23 priority areas in the Framework industry should focus on.

This consultation resulted in the identification of five key priority areas, with a sixth added by the SSG.

Without excluding other priority areas, these six key priority areas will focus industry and Framework activities to drive continuous improvement across the value chain. Work continues for all other priority areas.

ANIMAL HUSBANDRY TECHNIQUES

These techniques include castration, horn removal (dehorning), branding, and ear marking. The industry aims to find alternatives to invasive practices (i.e. breeding selection for the polled gene) and where practicable 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 ensure protection of high-value conservation 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, reduce patient harm, 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), 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

Definition	Husbandry procedures used on cattle include castration, horn removal (dehorning), branding, and ear marking. The industry aims to find alternatives to invasive practices and where practicable administer pain relief before carrying out necessary husbandry procedures.	
Indicators	**1.3a** The % of the national cattle herd with poll gene	51% polled cows[3] 71% polled bulls
	1.3b The % of the national cattle herd using pain relief regularly for husbandry procedures	4%[4]

P21

Table 3: Definition, indicators and data for he animal husbandry techniques priority area.

The context

Good animal welfare is a legal requirement in Australia, and cruelty to animals is a criminal offence. In raising, breeding, transporting and processing animals, the wellbeing and health of animals is a paramount concern for the beef industry. The industry works within a framework of significant legislation and codes of practice. As a result, a great deal of research, development, innovation and effort goes into maintaining high standards of animal welfare.

The industry is committed to continuously improving the welfare of livestock by using husbandry techniques that research indicates deliver better welfare outcomes for the animal.

In the past 20 years intense scientific effort has gone into understanding the welfare impacts of surgical husbandry procedures on cattle. Scientific evidence continues to inform the practices used by producers.

The livestock industries, government and researchers have collaborated to prepare new Australian Animal Welfare Standards and Guidelines. The Australian cattle guidelines recommend the use of appropriate pain relief when castrating and dehorning cattle, unless cattle are under six months old or are under 12 months old the first time they are in the handling yards, which is relevant to extensive northern properties.

Approved anaesthetic has only been commercially available in Australia since late 2016.

3 National producer survey of cattle husbandry practices undertaken in 2016.
4 National producer survey of cattle husbandry practices undertaken in 2016.

Animal husbandry techniques (continued)

What is the data telling us?

Data show 4% of beef producers are using pain relief for husbandry procedures. This figure is from a producer survey undertaken in 2016 and it should be noted that pain relief for use on cattle only became commercially available in late 2016.

Recognising that self-assessment is not an ideal outcomes measure, pain relief drug sales were explored as an alternative. It is unlikely that data for pain-relief sales will be used as it is understood that it will be very difficult to isolate what is used for cattle compared to other species where drugs are used across species. The SSG is confident that the figure of 4% is not an over-representation and as such comfortable to use the available data set for this update.

The 2016 producer survey also showed that 51% of cows are polled and 71% of bulls are polled. Outside of self-assessment data, genetic data from breed associations is being explored and appears to be a promising alternative.

3R MODEL - WELFARE

REPLACE
Replacing the stressful procedure with a non-invasive, preferably stress-free procedure (such as breeding for poll gene to remove the need to dehorn).

RELIEVE
Using pain relief.

REFINE
Applying the least stressful method in the least stressful way (e.g. quick, expert application, using least stressful handling approach in animals of the most appropriate age).

Figure 2: The '3R' model of preferred strategies to manage animal welfare. Replace sits at the top of the hierarchy.

Snapshot of activity

Meat & Livestock Australia's (MLA) principles for managing animal husbandry research, development and on-farm adoption are to:

- Develop replacements for, or minimise the pain of, aversive procedures
- Increase uptake and demonstration of welfare best practices
- Use the '3R' model to provide a hierarchy of preferred strategies to manage the welfare implications of particular practices.

In addition to an annual investment of around $4m into animal welfare that is managed by MLA, a $35m partnership over five years was announced in May 2017.

This strategic partnership includes a group of organisations with a shared commitment to improving the Australian livestock industry's already world-class animal welfare practices. The Partnership involves MLA's Donor Company collaborating with research bodies including CSIRO Armidale; Animal Welfare Science Centre (AWSC) which includes the University of Melbourne, Agriculture Victoria and South Australian Research and Development Institute (SARDI); University of Queensland; Charles Sturt University; University of Western Australia; University of Sydney; NSW Department of Primary Industries; and University of Adelaide.

The unprecedented funding commitment will allow for strategic, innovative research that will lead to valuable and long-lasting outcomes.

To date, eight R&D projects related to the beef industry have been approved and will look at issues including the improvement or replacement of aversive practices such as branding, dehorning, and castration. Tools to improve the early detection of disease, test immunity and reduce mortality rates will also be explored.
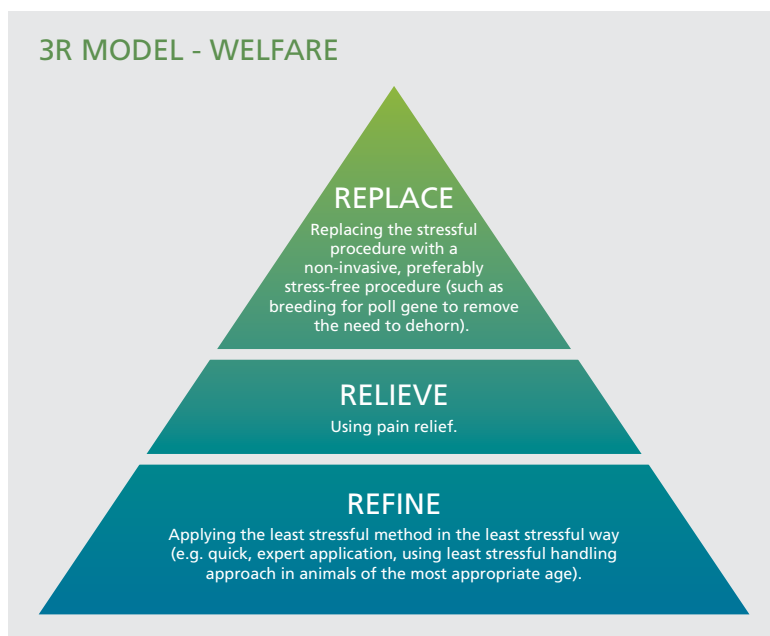
Overview of the Strategic Partnership for Animal Welfare Research, Development and Adoption program

Projects relevant to the beef industry include:

Project	Research Partners	Objective
Practical measures of animal welfare	University of Adelaide, SARDI	Develop a kit of biomarkers to assess the welfare of sheep and cattle, measurable in blood, which could lead to rapid on-farm assessment of animal health and welfare.
Identifying public and producer attitudes	AWSC University of Melbourne	Evaluate trust, attitudes towards animal welfare issues and animal welfare relevant behaviours, knowledge of the welfare issues and information sources. An approach that combines these assessments will enable the red meat industry to be proactive in disseminating factual information to address public lack of knowledge or exposure to misinformation.
Induction stress in feedlots	Charles Sturt University, Elanco Animal Health	Research the development of a feed additive to reduce induction stress in feedlot animals.
Welfare benchmarking and management	CSIRO, NSW DPI, University of Melbourne	Develop a framework for risk assessment, monitoring and data analysis in order to improve welfare management of beef cattle and meat sheep as they move through the supply chain.
Immune fitness	Sydney University	Investigate the overall wellbeing of livestock in respect of their immune fitness. This aligns with susceptibility to disease and response to common external stressors encountered during production. The aim is to develop simple immune measures as a correlate of physiological health and wellbeing for use as a benchmarking tool for overall herd health and welfare and to identify/select productive livestock.
Reducing mortality rates	Sydney University, Consolidated Pastoral Company	Reduce mortality rates of cattle and sheep using new technologies and prediction models for early warning and detection of the risk. In-paddock walk-over-weighing systems fitted with digital and thermal cameras will provide livestock health information in near-real time from at least eight different properties throughout Australia. This information, together with weather and vegetation data, will be used by prediction models to identify risk of mortality in near-real time.
Improving welfare – pain relief	Sydney University, 4 Seasons	The application of topical anaesthetics to inhibit pain sensation requires supplementation of longer-acting analgesics to reduce sensitisation of wound pain and improve overall welfare outcomes. Options for practical administration of analgesics and the potential for long-acting analgesics to provide prolonged therapy will be investigated, including development of a novel self-medication strategy for use in extensive farming systems. Furthermore, emerging evidence of the efficacy of these therapeutic agents for a wide range of husbandry procedures suggests the potential for a pain management regime to be applied to other painful conditions in sheep and cattle. The outcome will provide producers with an affordable, efficacious and practical protocol for delivering pain relief on-farm.
Objective, robust, real-time animal welfare measures	Sydney University, Allflex, Consolidated Pastoral Company	When animal welfare is compromised, low resilience behaviours are reduced and the underlying structure of behaviour (bout-lengths, frequency of transitions between activities) is affected. These behaviours and their structure are unknown for beef cattle. This project will determine these behaviours which will then form objective measures of cattle welfare from birth to slaughter. Robot platform-based light detecting and ranging (LIDAR) systems, and ear-tag based technology will be simultaneously used to remotely monitor and collate these behaviours to detect practices and situations that compromise welfare and allow rectification.

Table 4: List of beef-related projects, partners and objectives that are part of a $35 million strategic partnership for animal welfare.

Animal husbandry techniques (continued)

CASE STUDY:

Pain relief trialled in the Pilbara

When a practical pain relief method came onto the market for Australian beef producers, Annabelle Coppin was keen to try it.

Annabelle trialled the new pain relief spray on the family's Yarrie Station in the East Pilbara region of Western Australia.

Annabelle owns and manages the property, which has been in the Coppin family for five generations. She and her team run cattle over two properties (one on the Pilbara and one in the mid west of WA) that span 250,000 hectares (617,700 acres).

Last year, Annabelle used an anaesthetic spray when she and her team castrated calves.

"We'd been waiting a long time for a pain relief product that was efficient to use and that works," Annabelle said.

She said previously the only pain relief option was getting a veterinarian to come out and inject the cattle, which is not possible, especially for a remote station such as Yarrie.

Annabelle found the numbing spray was promising (not yet proven). She said it was easy to spray on, although it was difficult to measure. She plans to use it again this year and keep observing the benefits. She supports Meat & Livestock Australia (MLA), the producer-owned company that provides marketing and research and development services for the red meat and livestock industry, in doing more trials into pain relief options.

"A practical, effective and efficient pain relief for our husbandry practices is not only vital for the future of our industry, should lift our production,

decrease mortality and make this practice easier to carry out," Annabelle said.

"We need to be proactive in the industry," she said, adding meeting consumers' expectations (including about animal welfare) was paramount for the beef industry's sustainability.

The Australian Beef Sustainability Framework's Consultative Committee chose animal husbandry techniques as a priority area for focus, and one of its indicators is the percentage of the Australian cattle herd using pain relief regularly for husbandry practices.

"And the pain relief needs to work for producers, so it's not only a feel-good story."

Using pain relief is not the only animal welfare measure that the Coppin family and their employees undertake. Other measures include Annabelle running a week-long course to teach their staff to best handle young cattle when they are first brought into the yards. She said the course, which was developed with a livestock consultant Boyd Holden, helps handlers develop a positive relationship with the young cattle, which makes future handling easier and safer throughout their lives on the station and beyond.

"Quiet cattle are less stressed in any situation, whether it be on property, on trucks, in a feedlot, abattoir or on a ship," Annabelle said.

"A practical, effective and efficient pain relief for our husbandry practices is not only vital for the future of our industry, should lift our production, decrease mortality and make this practice easier to carry out."

Profitability across value chain

Definition	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.	
Indicators	**3.1a** Farm business profit at full equity (expressed as a rate of return to total capital)	3.1% rolling average[5] 6.4% for top 25%
	3.1b Profitability across all industry sectors	No data

Table 5: Definition, indicators and data for the profitability across value chain priority area.

The context

Increasing productivity and profitability across the industry will assist red meat and livestock participants to raise their competitiveness and long-term sustainability and help offset the long-running cost-price squeeze.

This update will focus on the indicator for profitability on-farm due to available data. The SSG recognises the critical importance of profitability through the value chain, however the complex relationship of profitability between sectors has made collecting data difficult. Profitability between different sectors is cyclical and interdependent relying on a large range of factors including seasonal conditions, value of the Australian dollar and global demand. There continue to be ongoing discussions within industry on how to address this. These discussions will help refine indicators in the Framework, and guide the collection of relevant data.

Reporting on-farm profitability is inherently difficult. A significant number of producers supplement farm income with off-farm earnings. Furthermore, many cattle producers earn income from other commodities from the same farm, making farm cost allocations exclusive to beef problematic. Another key challenge is that not all beef producers view profit as a key or even main motivator. Some producers are motivated by simply wanting to farm, their values and beliefs about farming or their overall lifestyle. There is a percentage of the cattle industry who are part-time 'hobby farmers' and not necessarily focused on profit. These factors can influence the data. For these reasons, the SSG has chosen to report on rate of return for both the industry average and the top 25% of producers (Chart 4).

What is the data telling us?

It is important to note that while the top 25% of industry outperforms the industry average, there are large structural impacts beyond the control of individual businesses that impact on return on capital. As shown in Chart 4, there was rate of return growth between 2000 and 2008. This was underpinned by big increases in property values. Following 2008, property prices levelled-out before the drought hit in 2013 with a matching decline in rate of return. A break from drought (in many areas) and subsequent lift in cattle prices has been a factor in the latest rise in the rate of return.

This update contains data for rate of return including capital appreciation. Data for the rate of return was analysed from ABARES data. The SSG explored other options to report on-farm profitability, including business-benchmarking data, however it was viewed that this would likely skew to the more profitable operators. While it is recognised that ABARES data is not perfect, it is systematically controlled in its collection from a wide cross-section of industry and the best basis for presenting profitability data on-farm. A report developed by Oliver & Doam during the Framework's development outlines the profitability and economic indicators explored. This report is available on our website.[6]

In addition to this indicator, charts below present historical data for total factor productivity and cost of production.

An indicator for profitability through the supply chain was not able to be developed for this update. The development of this indicator requires the cooperation of businesses in sectors that do not currently aggregate financial information. Discussions have been instigated with both the feedlot and processing sectors. There are several data projects being investigated by industry, which could lead to data being available to report on this indicator in the coming years.

Profitability across value chain (continued)

RATE OF RETURN TO TOTAL CAPITAL* (Data used for indicator)

■ Specialist beef producers ■ Top 25%   Source: ABARES, *5-year rolling average of specialist beef producers, includes capital appreciation. P: 2016-17 are provisional estimates.
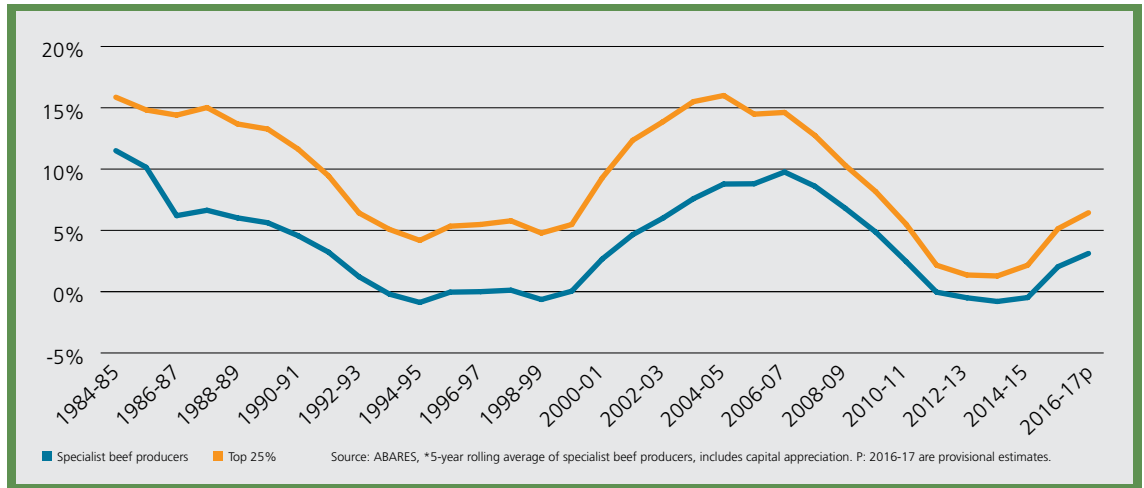
Chart 4: The rate of return, including capital appreciation, for all beef producers and the top 25% performers.

TOTAL FACTOR PRODUCTIVITY*

■ Southern farms ■ Northern farms ■ National   Source: ABARES, *5-year rolling average
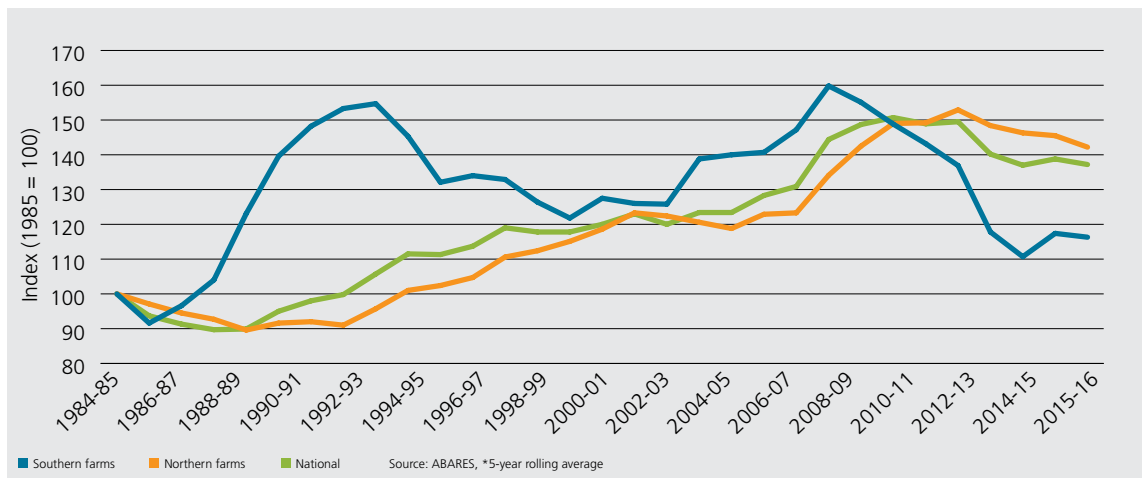
Chart 5: Total Factor Productivity is measured as the ratio of total output to total input. Output is measured as an aggregate index of crops, livestock, wool, dairy and other farm income on beef producing farms. Input is measured as an aggregate index of land, capital, labour, materials and services for beef producing farms.

CATTLE FINISHING COST OF ON-FARM PRODUCTION

▪▪ min   ■ average   ▪▪ max   ■ COP ratio (RHS)   Source: agri benchmark
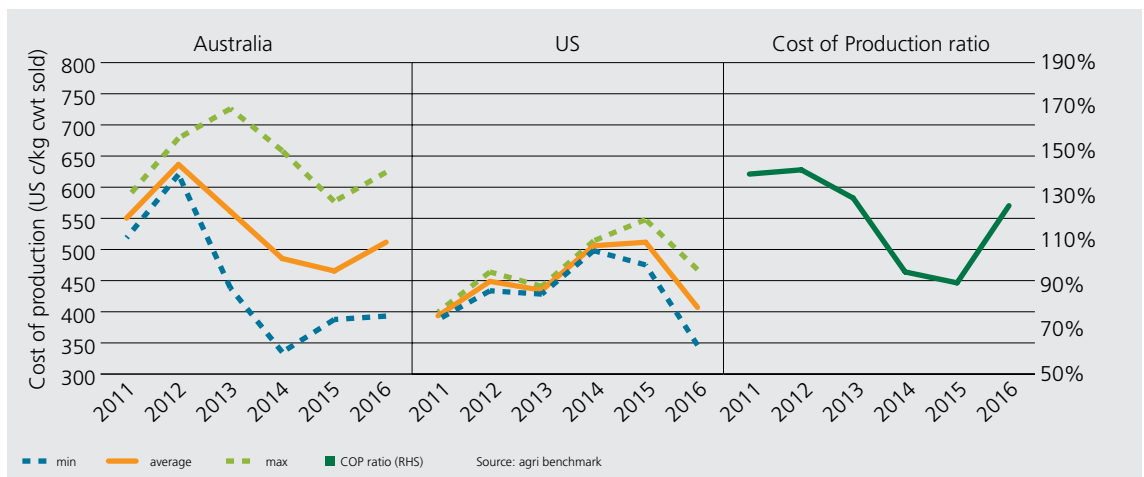
Chart 6: The minimum, average and maximum costs of beef production compared between Australia and the US.

Snapshot of activity

Industry-led plans focus on encouraging the value chain to increase its productivity through adoption of research and development. To drive adoption it is critical to demonstrate commercial benefits to producers, lotfeeders, livestock exporters and processors. Also critical is the supply of timely, accurate and relevant tools, technologies and information to assist in decision-making.

Organisations that deliver programs focused on improved profitability include state agricultural departments, private consultants and industry service providers including MLA and the Australian Meat Processor Corporation (AMPC).

Looking at on-farm profitability, MLA is responsible for industry-led projects. This includes both research and producer adoption programs that aim to build the capability of producers and advisors to increase on-farm productivity and profitability.

Withdrawal of state governments from extension or adoption services in most Australian jurisdictions has dramatically changed the way research and development is delivered to producers. Today's environment demands new commercial business models that deliver adoption services and support red meat producers' decision making. Developing private-sector capacity and capability will support continued delivery of high-quality adoption services.

Disruptive platforms, technologies and programs such as Livestock Data Link, digital agriculture, objective measurement and Meat Standards Australia (MSA) enable data sharing throughout the value chain and provide opportunity for new and more sophisticated business models. Data sharing, analysing and reporting create new insights and opportunities for value chain stakeholders. Whole of value chain extension and adoption programs could link market requirements to on-farm producer and resource capability.

On-farm productivity and profitability gains can be achieved through new research that results in production efficiencies, reduced costs and higher returns on investment.

In the area of livestock genetics, there is an opportunity to increase the rate of genetic gain and improve commercial profitability by aligning genetic investment to value chain outcomes that

meet consumer needs. Through this new approach, investment in genetics aims to improve overall productivity by addressing key profit drivers such as market specification compliance, costs, growth rates, fertility and livestock production efficiency. Genetics will also play a key role in reducing industry emissions.

Future increases in animal production depend on efficiently managing the feedbase to ensure a stable supply of forage in the face of variable seasons and competition from undesirable plants and pest animals. This will be addressed by new plants and varieties with improved genetic gain, enhanced management of grasses, legumes and shrub-tree combinations, better utilisation (grazing frequency and intensity), and biological controls for pest animal and plants.

Seasons can greatly impact pasture-based production systems. The priorities for the northern beef industry remain live weight gains and increased breeder herd fertility. In the south, where enterprise sizes are smaller and more intensively managed, the priorities are profitably managing pastures, reducing reproductive wastage and the impact of disease carried by pest animals that affect the mortality and fertility of livestock.

Lotfeeding remains an integral part of the beef industry supporting a consistent supply of quality product for an expanding population. Priorities include the development of tools to increase productivity and reduce costs, through automation and remote monitoring technologies of routine feedlot processes and genetic pursuit of feed efficient animals.

Profitability across value chain (continued)

P28

MLA's beef productivity program seeks to increase beef productivity and enterprise profitability through improved nutrition and supplementation including manipulation of rumen function, enhanced breeder herd fertility, increased calf survival and optimising market specification compliance of grass-finished cattle.

These investments are complementary to producer adoption activities that will create opportunities to achieve impact and practice change.

A huge volume of research, development and adoption programs are focused on or relate to profitability. These programs include, but are certainly not limited to:

FutureBeef aims to assist graziers and the beef supply chain in northern Australia to increase production profitability and sustainability. FutureBeef is driven by the National Beef production Research, Development and Extension Strategy, which aims to build wealth for those in all sectors of the beef industry, by being market-driven and sustainable. A key adoption program under this platform is Grazing Land Management which can be viewed at **www.futurebeef.com.au**

Meat Standards Australia (MSA) is an independent eating quality standard developed in Australia 7 years ago. MSA continues to enjoy strong uptake throughout the supply chain. During 2016–17, the MSA beef program returned an additional $120m in farmgate returns despite tighter supplies due to reduced slaughter numbers. Nationally, 40% of adult cattle slaughtered were graded for MSA. Feedback from MSA is now flowing back to producers who are able to individually tailor benchmarking parameters to gain context of their herd's performance. They can apply that knowledge to better inform their on-farm decisions and realise additional profit.

Objective Carcase Measurement

Objective carcase measuement, with technologies such as DEXA (Dual Energy X Ray Absorptiometry) provides timely, accurate and objective information on the lean meat, bone and fat composition of each carcase at processing. This information can help the entire red meat value chain make more informed business decisions to improve on-farm and processing efficiency and deliver a product which is preferred by consumers.

Livestock Data Link (LDL), an online carcase feedback resource designed to inform the supply chain of the opportunity cost of missing market specifications, is becoming a more powerful and useful tool for producers. Introduced as a pilot project in 2012, LDL is now being used, at varying levels of capability, by 25 different processors across multiple sites Australia wide.

Increased use of legumes – Leucena is a legume that is highly palatable to cattle and improves productivity as well as reducing emissions from their ruminant digestion systems. Recently a 'redlands' variety of leucena has been developed with two commercial seed suppliers established in Queensland. A partnership between the Department of Primary Industries and Regional Development, Western Australia; University of Queensland; and MLA Donor Company is also developing a sterile hybrid of leucaena, which will mean it is able to be used in new regions including NT and northern WA.

The industry's new on-farm extension and adoption program, **Profitable Grazing Systems (PGS)**, is being rolled out to producers following the success of the MLA pilot program. The pilot included 10 groups of beef, sheepmeat and goatmeat producers, with each group working in a supported learning environment under the guidance of specialist coaches. A total of 130 producers and 96 businesses participated in the pilot. The aim of the PGS program is to encourage and support red meat producers to develop and implement management skills and lift productivity and profitability. A review of the pilot found that producer knowledge, attitude, skills and aspirations increased from an average of 46% before the pilot started to 76%.

Grazing BMP – Established initially to focus on reducing soil and nutrient run-off to the Great Barrier Reef. The Queensland program is a partnership between Department of Agriculture and Fisheries, AgForce, and Fitzroy Basin Association. This partnership now delivers the program with NRM groups across Queensland. Grazing BMP uses a voluntary online self assessment tool to develop and implement a best management practice program for the grazing industry. The tool consists of five modules covering all aspects of the enterprise that ultimately help lead to a more profitable enterprise:

- Soil health
- Grazing land management
- Animal production
- Animal health and welfare
- People and business.

Pasture health is essential for profitability. Following reports by producers across central Queensland about widespread dieback of pastures including buffel grass and native bluegrass, a project was instigated by MLA in April 2017 to map and address recent pasture dieback. The plan brings together producers, researchers and experts to better understand the extent of the pasture dieback and to find both short and long-term solutions.

Genetics – Improved genetics is a critical pathway to improved productivity and profitability. In a world-first in the field of genetic evaluations for cattle, a move to 'single-step genetic analysis' for the Brahman breed in Australia has been undertaken. Single-step genetic analysis combines genomic and pedigree information with performance records to calculate estimated breeding values (EBVs). It enables Brahman breeders and buyers who use EBVs to have access to more accurate, reliable data and increased ability to select for a wider range of production traits when using BREEDPLAN. Single step genetic analyses have also been tested for the Angus, Hereford and Wagyu breeds and have begun to be implemented.

Profitability across value chain (continued)

P30

CASE STUDY

Young Farmer Business Program

A NSW Government-funded program is enhancing the business skills of the state's young primary producers.

The NSW Department of Primary Industries (NSW DPI) and the NSW Farmers Association jointly developed the Young Farmer Business Program, which was launched in mid-2017.

The four-year program will provide professional development, coaching, workshops, scholarships and mentoring to more than 8,000 young farmers and fishers.

"The objective of the program is to ensure our young farmers are business ready, financially savvy and, in turn, able to engage with financial lenders on a more equal playing field," said Niall Blair, Minister for Primary Industries, at the program's launch.

More specially, the Young Farmer Business Program aims to:

- Provide knowledge and skills to improve social and business resilience, manage risk, execute effective plans and make decisions that ensure viability of agricultural and fishing businesses
- Provide access to new business ideas, tools and techniques
- Support access to a range of products and services that engage with a wide diversity of skills, knowledge and experience within the primary industries business sector
- Connect young farmers and fishers with opportunities that enable them to establish and/or expand their business.

Surveys of NSW farmers aged 18 to 35 years old have shaped the program to ensure it is reaching young farmers and helping them develop the skills they need to succeed in business.

For example, the Young Farmer Business Program has a strong focus on social media and how these tools can be used to drive engagement and build supportive networks.

Program participant Julie Monroe, of Coolah, said she enjoyed the bank ready workshop. "It helped me focus my goals in the beef industry of increasing my herd and farm. My goals for buying a larger farm seem more attainable than I previously thought, and I learnt valuable tips about how to approach the banks for help funding my agricultural goals," said the young beef producer and agronomist.

The NSW Government has invested $6m in the program.

Balance of tree and grass cover

These indicators are currently being reviewed by a technical expert group, further details on page 16.

Definition	Well managed biodiverse landscapes work harmoniously with cattle production and the two are not mutually exclusive. The Australian industry is working towards a definition for deforestation to ensure protection of high conservation areas without unintended environmental or production consequences.	
Indicators	**5.2a** Area of native vegetation managed for conservation outcomes on-farm	No data
	5.2b Maintaining grassland systems from unproductive encroachment of native and introduced species	No data
	5.2c No deforestation of primary forests	No data
	5.2d Increase in healthy grassland systems	No data

Table 6: Definition, indicators and data for the balance of tree and grass cover priority area.

The context

Australia's livestock industry utilises 46% of the Australian landscape.[7] As such, the industry has a large role in effectively managing the landscape and the subsequent ecosystem services that benefit both the production and broader communities. In many instances active land management, including management of weeds, pests and fire is only possible due to cattle producers. This ranges from the direct impacts of grazing approach, vegetation management, livestock density and fire practices to indirect impacts such as the introduction of weeds, changes to fire regimes, altered hydrological flows and major impacts on soil. The State of Environment report indicates grazing has a high impact on land and biodiversity.[8]

Livestock production relies on natural resources, with forage production dependant on soil, water supply and quality and biological diversity. Changes in climate, nutrients, regulations, market requirements and community concerns demand that livestock producers and value chain partners continually adapt to this evolving operating environment.

Industry's long-term prosperity depends on short-term productivity and continuing to take a proactive and preventative approach to environmental sustainability, rather than a reactive one that only deals with the symptoms of resource degradation: poor soil and water quality and lack of biodiversity.

The industry recognises stakeholders' interest and concern around vegetation management, including deforestation. This is a particularly contentious issue and one where an evidence-based approach is required to inform the debate.

Vegetation plays an important role in not only productivity and ecosystem services, but also preventing soil run-off into waterways. Soil run-off not only results in productivity losses for the grazing industry but results in sediment and contaminant build-up in waterways. Ensuring well-managed pastures is a mutual benefit for productivity and ecosystems, including the Great Barrier Reef. Pastures provide ground cover which retains soil and nutrients on property and prevents them being washed away with rain.

---

7 https://soe.environment.gov.au/theme/land/topic/land-use-and-management
8 https://soe.environment.gov.au/theme/land/topic/land-use-and-management

Balance of tree and grass cover (continued)

What is the data telling us?

For this update, no data is available at a national level for the current indicators. A process has commenced to work with an expert panel including ecologists and remote sensing experts to develop indicators for next year's update that meet the expectations of both industry and external stakeholders including retailers, foodservice, government and environment groups. These stakeholders will be involved in reviewing the recommendations from the expert panel and participating in the development of new indicators for the balance of tree and grass cover priority areas. A sustainability consultancy with ecology expertise is managing this process, to ensure an independent non-biased outcome. Details on the process and expert group can be found on our website.

Considering available data, Queensland has the most established management system, the Statewide Landcover and Trees Study (SLATS). The SLATS Report shows that the total statewide woody vegetation clearing in 2015-16 equated to 0.45% of the total area of woody vegetation in Queensland. This represents an increase of about 33% from the 2014-15 clearing rate and was approximately 395,000 hectares.

The relationship between cattle grazing and afforestation (woody thickening) has received less attention but may have combined to substantially increase forest cover and carbon sequestration in some parts of northern Australia. Higher rainfall,

less fire management and higher atmospheric carbon dioxide levels are believed to contribute to increased woody thickening in the far north of Australia. The federal government notes that "In net terms, forests are re-appearing on land previously cleared faster than land managers can manage weeds and re-clear bush encroachment. The area of new secondary forest regenerating on land previously cleared was 526,000 hectares in 2015, which is 225,000 hectares more than the estimated clearing of secondary forest".[9]

As outlined above, the Framework process recognises an evidence-based approach, agreed to by stakeholders. This approach enables useful and robust measures to be developed to help inform industry decisions that lead to better outcomes for production and the environment.

Two case studies are outlined on pages 35-37 that look at vegetation and ground cover using both remote sensing technology and on-farm management systems. The remote sensing case study provides a snapshot of a comprehensive report that will be considered by the technical expert group as they develop new indicators for this key priority area.

There is significant work required to agree what and how to measure industry impact for the balance of tree and grass cover. It is essential that an agreed evidence-based approach can guide industry and external positions on effective land management for the mutual benefit of industry and environment.

---

9 Focus on Land Sector Estimates, 2017.

Snapshot of activity

Throughout the Framework there are interlinkages between priority areas. The balance of tree and grass cover is a clear example of significant interdependencies with climate and climate adaptation, water health and profitability.

MLA's environmental sustainability program creates opportunities for producers to efficiently and effectively manage soil health, weeds, invasive animals, water, methane emissions, biodiversity and climate variability.

This includes researching, designing and demonstrating new grazing systems that manage ground cover, encourage retention of desirable species, new species (grasses, legumes), exploring climate adaptation actions and plants to deal with hotter and drier future climates.

Programs specifically targeted to address the environmental issues facing the industry include, but are not limited to:

Grazing BMP – Established initially to focus on reducing soil and nutrient run-off to the Great Barrier Reef, the Queensland program is a partnership between Department of Agriculture and Fisheries, AgForce, and Fitzroy Basin Association. This partnership now delivers the program with NRM groups across Queensland. Grazing BMP uses a voluntary online self-assessment tool to develop and implement a best management practice program for the grazing industry, enabling:

- producers to identify and access training to improve knowledge and skills which will enable adoption of best practice
- producers and industry to accurately monitor and report on improvements in management practice at a range of levels
- producers to benchmark their own practices against industry accepted best practice, and design and implement actions to improve.

NRM Groups – There are 56 regional NRM organisations across Australia that act as delivery agents under the regional stream of the National Landcare Program. Programs that NRM groups manage include are focused on addressing:

- Loss of vegetation
- Soil degradation
- The introduction of pest weeds and animals
- Changes in water quality and flows
- Changes in fire regimes.

The Wambiana grazing trial, south-east of Charters Towers, began in 1997 with support from the Great Barrier Reef Marine Park Authority. MLA has provided funding support of $1.37m for the Wambiana trial since 2002. This project has researched and demonstrated long-term results of different stocking rates on beef production, pasture production and soil stability. The findings have been critical in demonstrating the linkages between moderate stocking, good land condition, reduced run-off and erosion, reduced risk, and increased productivity and profitability.

Smart Farms Program (Department of Agriculture and Water Resources) – The federal government is allocating $134m to support the development and uptake of best practice management practices, tools and technologies that help farmers, fishers, foresters and regional communities improve the protection, resilience and productive capacity of our soils, water and vegetation, and in turn support successful primary industries and regional communities.

In addition there has been significant investment by the federal government in weeds of national significance including through Cooperative Research Centres. In addition a national Environmental Science program with a focus on water quality and water quality improvements for the Great Barrier Reef.

Balance of tree and grass cover (continued)

P34

CASE STUDY

Rangelands NRM managing threats to biodiversity

The Fortescue River catchment in Western Australia's Pilbara region is the focus of a six-year project to protect and improve existing native vegetation and manage threats to biodiversity.

It involves landscape-scale activities that connect across management boundaries providing coordinated responses to biodiversity threats. Rangelands NRM WA partners with Greening Australia WA and the WA Department of Parks and Wildlife to engage with pastoral, Indigenous, mining and conservation land managers in the region.

The project team is working with the Department of Fire and Emergency Services, Department of Parks and Wildlife (DPaW), Aboriginal groups and pastoralists to improve fire management and develop a plan for the Fortescue catchment.

Twelve Environmentally Sustainable Rangelands Management (ESRM) plans have been completed on pastoral properties.

Weed management has been coordinated with the Pilbara Mesquite Management Committee working with pastoral stations, mining companies and Indigenous rangers. This has included land management training for the Ngurrawaana Rangers.

Working with the Pilbara Regional Biosecurity Group, Pastoralists, the Department of Primary Industries and Regional Development and DPaW, feral herbivores are being managed using radio telemetry collar technology. "Judas" animals with collars are allowing feral populations of donkeys to be located and managed using aerial culling on 2.6m hectares.

Using remote sensing to understand the balance of tree and grass cover

Internationally, country level monitoring and reporting frameworks associated with land resource use, state and condition take many forms. They range from high resolution mapping of vegetation extent and ground cover, through to surveys such as Australia's Farm Surveys conducted by the ABS and ABARES that provide broad regional level information statistics on production, management practices.

Due to privacy concerns and a lack of the necessary data and methods, the task of aligning production and environmental data and reporting has been problematic. The challenge is further amplified by Australia's highly variable climate which drives spatially and temporally variable land utilisation.

One option to overcome many of these limitations is to facilitate industry reporting using "spatially explicit" methods based on time-series satellite imaging and enormous advancements in computational analysis capabilities (often called Big Data) combined with our traditional survey approaches.

To demonstrate some of these opportunities a case study was undertaken for every land parcel and every rural property in Queensland from 1999 to 2016 (financial years). Land use mapping was used to identify which land parcels were likely to be carrying cattle. This amounted to 110,000 individual land parcels, and around 25,500 individual properties. Eighteen years of 30m resolution Landsat satellite data was compiled into the four seasons and analysed for every land parcel and rural property and summarised for each of the eight Queensland ABARES regions.

For every land parcel and rural property, changes in land condition indicators (woody vegetation density, ground cover, clearing and rainfall) for each season from 1999-2016 financial years were analysed. The data was then aggregated to ABARES regions to allow comparisons with beef herd productivity indicators (stocking rate and herd productivity) derived by ABARES and Bush Agribusiness Pty Ltd (McLean and Holmes 2017).

These results are not adjusted for any climatic impacts.

Figure 3. Average Bare ground in the Springs of 2014-16.

Figure 4. The properties that achieved an average ground cover of 50% over more than 50% of the property (Green) in the Springs of 2014-16.

Figure 5. The properties on which clearing occurred during 2014-16, and the area/proportion cleared.

Figure 6. Trends in Ground Cover 1999-2016. Dynamic Reference Cover Method (Bastin et al. 2012). Orange is a significant decline in spring ground cover 2014-16 relative to 1999-01 (P=0.95). Green is a significant increase in cover and blue is no significant change.

Balance of tree and grass cover (continued)

Results

Analyses have been completed for the entire state of Queensland and all ABARES regions for review by the expert technical working group and stakeholders. A single region is highlighted here as an example of some of the results.

Figure 7 highlights that over the 18-year analysis period most properties are maintaining groundcover levels. However, a small number of properties saw overall increases, and significant number had declining ground cover levels. It highlights the need to target specific sub-regions within the state and demonstrates the limitations of regional level statistics without an understanding of the spatial variability across the state.
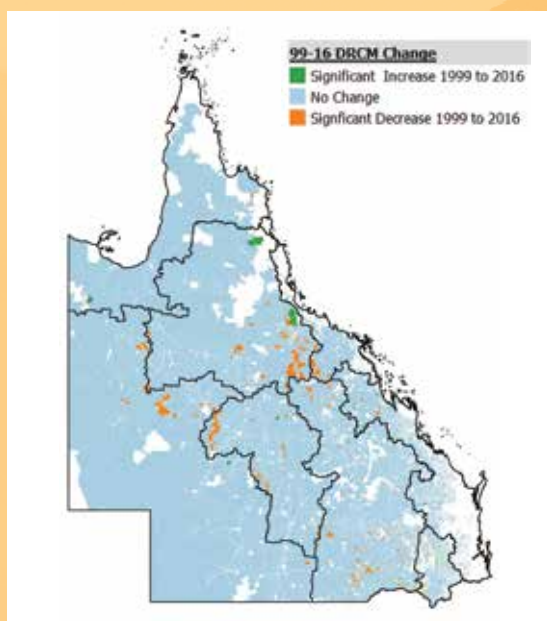
Figure 7. Trends in Ground Cover 1999-2016. Dynamic Reference Cover Method (Bastin etal. 2012). Orange is a significant decline in spring ground cover 2014-16 relative to 1999-01 (P=0.95). Green is a significant increase in cover and blue is no significant change.

QLD CHARLEVILLE - LONGREACH
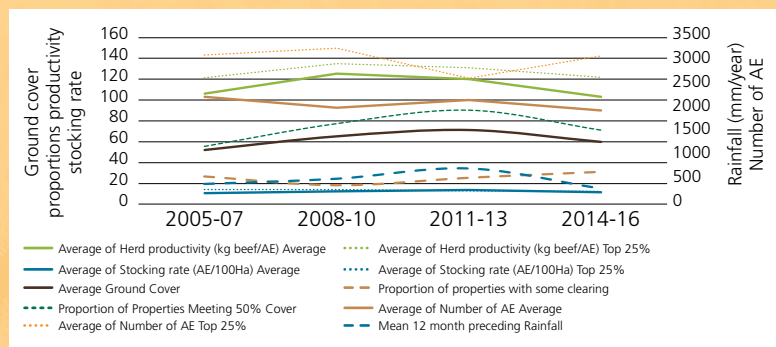
Figure 8. Integrated comparison of production and land condition indicators for the Longreach-Charlieville ABARES region.

Figure 8 provides for the first time, a regional level comparison of herd productivity levels (kg/Animal Equivalents (AE)); stocking rates (AE/100ha); ground cover (average spring and proportion of properties achieving 50% cover over 50% of the property); rainfall in the preceding year and clearing rates for the Charlieville-Longreach Region.

- There has been an overall decline in herd productivity, although the top 25% of producers are generally seeing higher productivity (kg/AE) while carrying larger herd sizes, and slightly higher stocking rates;

- The proportion of properties achieving 50% ground cover has increased significantly, with average ground cover levels generally varying with the preceding 12 months rainfall;

- Overall the number of properties carrying out some level of clearing has increased since 2008-10. Figure 8 however, demonstrates that most properties that carried out clearing in 2014-16 did so on only 1-6 percent of their property. Clearing of regrowth hasn't been accounted for.

Figure 9 provides maps of the variability in these indicators from 2005-7 to 2014-16. Data back to 1999-01 will be available in May 2018.

This brief pilot project has demonstrated the significant potential for the industry to lead an entirely different approach to monitoring, reporting and benchmarking. Technology is no longer the limiting factor. We can cost-effectively image the entire country at 10m resolution every five days using publicly available (non-commercial) satellite imagery and can routinely quantify changes in ground cover and woody vegetation density. The challenge is now to align this with the associated production data.

Clearly privacy is a significant issue, particularly regarding production and financial information, but individuals must also recognise the enormous amount of publicly available data (as used in this pilot). This can be easily overcome by providing producers with direct access to information as presented here through platforms such as FarmMap4D to make more informed decisions. Data presented here is at a state level, but can be replicated nationally or at a higher resolution for single properties.

Tools of this type can provide incentives for producers to contribute production and land resource condition data as a by-product of day-to-day management which can be aggregated regionally to de-identify individual data to meet privacy requirements for the Census Act (1905).

Figure 9. State-wide Time-Series Summaries

	(a) Properties Achieving 50% Ground Cover 50% of the time	(b) Proportion of a property cleared	(c) Herd Productivity (kg/AE)	(d) Rainfall (mm)
1. 2005-07				
2. 2008-10				
3. 2011-13				
4. 2014-16				

Legend:

(a)
- ■ Below 50% Cover over 50% of property
- ■ Above 50% Cover over 50% of property

(b)
- ■ 22-30% of property cleared
- ■ 12-22% of property cleared
- ■ 6-12% of property cleared
- ■ 1-6% of property cleared
- ■ 0-1% of property cleared

(c)
- ■ 30 - 60
- ■ 60 - 80
- ■ 80 - 100
- ■ 100 - 120
- ■ 120 - 140
- ■ 140 - 160
- ■ 160 - 190

(d) **Annual Rainfall**
- ■ 0 - 200
- ■ 200 - 300
- ■ 300 - 400
- ■ 400 - 500
- ■ 500 - 600
- ■ 600 - 800
- ■ 800 - 1200
- ■ 1200 - 1500
- ■ 1500 - 1800
- ■ 1800 - 5000

Antimicrobial stewardship

P38

Definition	Antimicrobials are a valuable shared resource. Maintaining their efficacy 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, decrease antimicrobial use over time and decrease the incidence of antimicrobial resistance.	
Indicators	**8.3a** The % of cattle covered by an antibiotic stewardship plan	No data
	8.3b Antimicrobial surveillance program	No data

Table 7: Definition, indicators and data for the antimicrobial stewardship priority area.

The context

Antimicrobials (principally antibiotics) are a vital tool in both human and animal medicine. In the Australian cattle industry, antimicrobials play an indispensable role in helping us manage the health and welfare of cattle under our care.

Antimicrobial resistance (AMR) has become a concern of both medical and livestock policy-makers, medical professionals, veterinarians, producers and the general community. AMR occurs when the bacteria causing people or livestock to be ill become resistant to antimicrobial treatment. This can be caused by overuse or inappropriate use of antimicrobials. Concerns about reduced antimicrobial effectiveness, coupled with fewer new antimicrobial technologies being discovered, means the effectiveness of antimicrobials currently available must be preserved.

The Australian Lot Feeders Association (ALFA) has taken the lead by developing a stewardship guideline on the responsible use of antimicrobials. The Australian beef industry has a great reputation to uphold with responsible antibiotic use. Previous surveillance research has reported levels of antimicrobial resistance in Australian cattle are either absent or very low.

The Australian industry is involved in the ad hoc Codex Intergovernmental Task Force on Antimicrobial Resistance. This task force was established to "develop science-based guidance on the management of foodborne antimicrobial resistance, taking full account of the WHO Global Action Plan on Antimicrobial Resistance, in particular objectives 3 and 4, the work and standards of relevant international organizations, such as FAO, WHO and OIE, and the One-Health approach, to ensure that Members have the necessary guidance to enable coherent management of antimicrobial resistance along the food chain."

What is the data telling us?

This update does not have any data available for this indicator. The feedlot industry is in the early stages of implementing a monitoring program, which will be able to be used to report on uptake of the antimicrobial stewardship guideline by the industry.

The Australian industry is contributing to the development of a national antimicrobial surveillance program which will underpin an indicator that can be included in the Framework.

Snapshot of activity

The Antimicrobial Stewardship Guideline developed by ALFA provides a continuous improvement framework that will help feedlotters understand and ensure appropriate use of antimicrobials and therefore reduce the risk of AMR. This guideline is aligned with Australia's First National Antimicrobial Resistance Strategy (Australian Government 2015). The guideline is also aligned with international initiatives to preserve the effectiveness of antimicrobials for people and animals.

The Guidelines outline five stewardship principles which are collectively termed the '5 Rs'. These principles are designed to guide best practice management use of antimicrobials and prevent over-use which may contribute to the development of antimicrobial resistance.

5Rs – ANTIMICROBIALS

REVIEW: Regularly review and evaluate compliance with Antimicrobial Stewardship Plan and adopt a process of continuous improvement to ensure that antimicrobial use practices reflect contemporary best practice.

REDUCE: Wherever possible adopt preventative measures to reduce the need for medically important antimicrobials without compromising the health and wellbeing of the animals.

REFINE: Refine and continuously improve Antimicrobial Stewardship Plan by ensuring the correct antimicrobial is used for the correct disease diagnosis and that the antimicrobial is administered correctly (dose, route of administration, duration) and at the correct time. Monitoring these practices over time will help make improvements in treatment protocols and antimicrobial use patterns, and demonstrate best practice standards to stakeholders, trading partners and consumers.

RESPONSIBILITY: Ensure everyone at the feedlot, including the consulting veterinarian, feedlot management and staff, nutritionist, and stock feed manufacturer recognises the need to preserve the effectiveness of antimicrobials and that antimicrobial stewardship becomes a priority through the formation of a management team that is responsible for developing and implementing an Antimicrobial Stewardship Plan for the feedlot.

REPLACE: Consider replacement of a medically important antimicrobial whenever available evidence supports the efficacy and safety of an alternative; again without compromising the health and wellbeing of the animals under care.
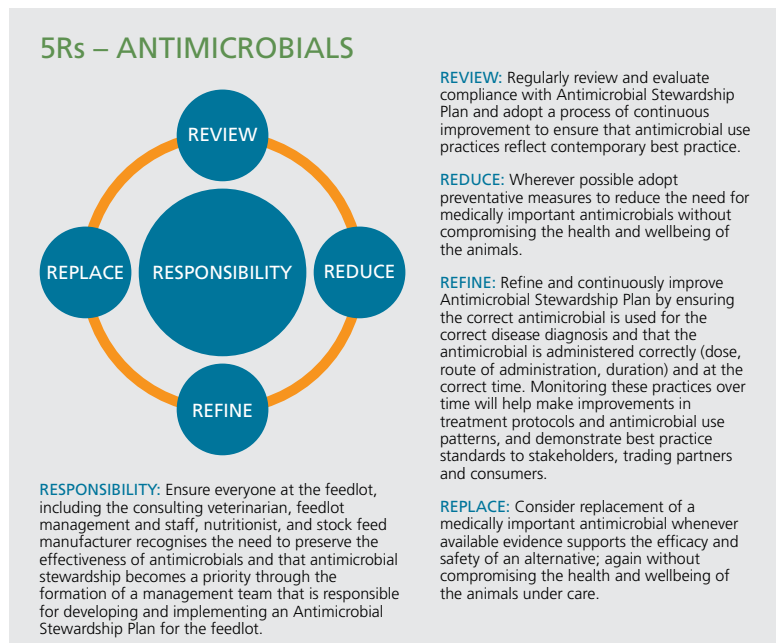
Figure 10: The 5R principles of antimicrobial stewardship that are outlined in ALFA's Antimicrobial Stewardship Guideline.

Managing climate change risk

Definition	Greenhouse gases are emitted along the entire beef value chain, including methane through cattle digestion, fertiliser application, effluent management and fossil fuel use (both on-farm and in processing). The beef industry also has a role to play in sequestering carbon in healthy soils and vegetation.	
Indicators	**6.1a** kg CO_2e emitted per kg liveweight when raising beef	13.1 kg CO_2-e / kg LW[10]
	6.1b kg CO_2e emitted per tonne Hot Standard Carcass Weight (HSCW) when processing beef	432 kg per tonne HSCW[11]
	6.1c Carbon captured and re-used in processing	6.6% of energy use[12]
	6.1d Carbon sequestration	No data

Table 8: Definition, indicators and data for the managing climate change risk priority area.

The context

The digestion process of ruminant animals, including cattle, produces a waste by-product: methane, a greenhouse gas (GHG).

Livestock emissions account for about 10% of Australia's total GHG emissions and about two-thirds of these emissions come from cattle. As well as being a potent GHG, energy lost through methane production is a waste of energy, which has the potential to be redirected to animal growth, presenting a productivity opportunity.

In addition to methane, beef production also produces emissions through:

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

The Australian beef industry has achieved a 14% emissions intensity reduction since 1981, as reported in *Agricultural Systems Journal*. The Life Cycle Assessment study (LCA) quantified the environmental impacts of Australian beef production, using Life Cycle Assessment methodology.

The processing sector generates 9% of the industry's emissions. Considerable focus has been placed on reducing emissions by the sector, which is reflected in a 22% reduction in GHG emissions intensity since 2008/09.

Agriculture has contributed more to reducing GHG emissions than any other sector in the Australian economy since 1990. The beef and lamb supply chains has played a major role in this through their involvement in the Australian Government's Emissions Reduction Fund. Further opportunities exist to substantively reduce the industry's GHG footprint, including through carbon sequestration in vegetation and soils with suitable methodologies already approved and further ones under development.

What is the data telling us?

Australian red meat already has a proud history of reducing emissions. Since the baseline year of 2005 we have reduced emissions from 20% to 13% of the national total, as shown in Chart 7. This has been done alongside a relentless focus on improving productivity.

There is no available data set for the fourth indicator of carbon sequestration. It is expected that a reliable measure will be developed for carbon sequestration in both vegetation and soils that the industry manages through MLA's Carbon Neutral 2030 initiative.

NATIONAL INVENTORY ACCOUNTS
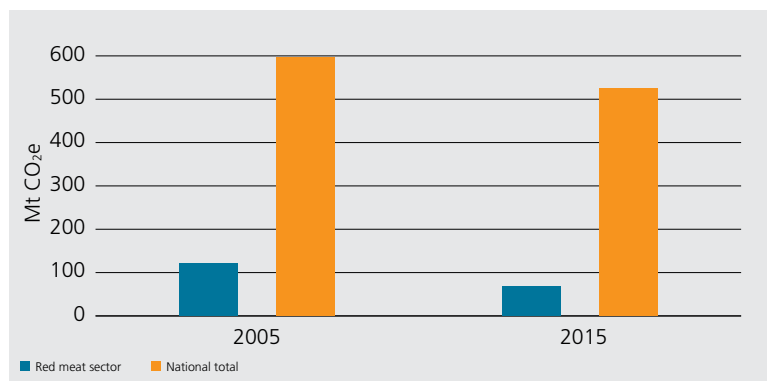
Chart 7: The red meat sector's GHG emissions contribution to the national total, based on the National Inventory Accounts.

10 Wiedemann S.G., Henry B.K., McGahan E.J., Grant T., Murphy C.M., Niethe G., 'Resource use and greenhouse gas intensity of Australian beef production: 1981-2010', ScienceDirect, vol. 133, pp. 109–118, 2015.

11 AMPC, Environmental Performance Review: Red Meat Processing Sector, 2015.

12 AMPC, Environmental Performance Review: Red Meat Processing Sector, 2015.

Managing climate change risk (continued)

P40

The data for the on-farm measure is taken from a Life Cycle Assessment (LCA).[13] An LCA is used, rather than the national greenhouse inventory, as it includes all emissions related to the production of beef. As outlined in chart 7, the contribution of the industry as reported in the national inventory has also significantly reduced.

Snapshot of activity

Since 2009 the federal government and livestock industries have invested significantly in two major programs of work.

The Australian Government's Reducing Emissions from Livestock Research Program (RELRP) was a three-year national collaborative program coordinated by MLA. The program ran over the period 2009-12 and developed knowledge and technologies on methane emissions to enable producers to reduce livestock emissions while maintaining or improving livestock productivity.

A second body of work, the National Livestock Methane Program (NLMP), was undertaken in 2012-16. This program had $14.4m of federal government funding and $3.5m from MLA. Outcomes from this program are featured in the publication *More meat, milk and wool: less methane* (published in July 2015).

In 2017 a CSIRO paper initiated by MLA reported that the Australian red meat industry could be carbon neutral by 2030.[14]

This study involved:

- Collaboration with the Federal Department of Environment
- Establishing contributions from the beef, sheep grazing, feedlot and processing sectors to overall industry GHG emissions
- Exploring options for sequestration and mitigation of GHG emissions presented by over 50 experts and then quantifying the impact on GHG emissions from these options

- Constructing a number of pathways based on various combinations of these options to gain carbon neutrality by 2030 (CN30).

All reductions to date in emissions have been due to improved productivity, a win-win for industry and environment. Productivity gains that resulted in emissions reductions:

- Heavier slaughter weights (474kg-574kg liveweight) 13.5% on average
- Increased growth rates of grass-fed cattle
- Improved survival rates (mortality rates declines from 4-2.7%)
- More cattle being finished on grain.

MLA is developing a CN30 implementation plan for industry consideration that will ensure improved productivity at the same time as continuing to reduce the industry's emissions.

This follows a report by CSIRO that modelled that it is possible for the industry to become carbon neutral by 2030.

There will be some novel technologies developed, but the focus will remain on improving productivity which has a direct influence on reducing emissions.

The report does highlight the importance of vegetation management in achieving carbon neutrality. This requires an evidence-based approach. The expert group developing indicators for the balance of tree and grass cover key priority area will inform the vegetation management component of the industry's CN30 plan.

To achieve the target of carbon neutrality, the industry will work with government to ensure the right policy settings are in place to incentivise industry and enable reductions, including sequestration in soils to be accurately recorded in the national greenhouse inventory.

The benefits for industry to pursue this ambitious goal include increased productivity in the red meat industry, additional farm income from carbon mitigation projects, a major contribution to government targets on emissions reduction, and another strong assurance for consumers of the quality and integrity of our naturally produced, great tasting Australian red meat.

What are some of the potential pathways?

Improved productivity	Expanded use of dung beetles	Savannah fire management in northern Australia	Feed supplements	Expanded use of legumes
Lotfeeding	Vegetation managment	Potential vaccine	Genetic selection	

13   Wiedemann S.G., Henry B.K., McGahan E.J., Grant T., Murphy C.M., Niethe G., 'Resource use and greenhouse gas intensity of Australian beef production: 1981-2010', ScienceDirect, vol. 133, pp. 109–118, 2015.

14   Dianne Mayberry, Harriet Bartlett, Jonathan Moss, Stephen Wiedemann, Mario Herrero. Greenhouse Gas mitigation potential of the Australian red meat production and processing sectors

Victorian farm catches carbon

Victorian beef producers Bob and Anne Davie have added 'carbon neutral' to their list of environmental credentials.

Their diverse enterprise on Gippsland's Phillip Island is home to beef, honey, agri-tourism, free-range eggs and, now, carbon farming.

In 2009 they began reducing greenhouse gases emissions and carbon accounting and in July 2014 Bimbadeen became carbon positive – a status Bob believes can be achieved on any farm.

"We are just trying to do our little bit, it gives us a good feeling that we are trying to help the planet," Bob said.

His strategies include reducing carbon emissions and planting deep-rooted pastures and crops to absorb carbon from the atmosphere and store it in the soil.

The Davies turn off Angus steers and heifers at 250-300kg carcase weight by 16-18 months of age. They achieve this by selecting genetics for carcase quality, high growth rates and moderate frame, and maintaining nutritious feed.

"This allows us to turn cattle off quicker, saving months of methane emissions," Bob said.

This year, they are trialling plant species that sequester the most carbon while also providing the nutrients required to improve soil health and plant production.

Bob said the formula was simple: "Carbon sequestration in soil is the best way to remove CO_2 and grow crops – every 2.7t of total organic carbon (TOC) sequestered into the soil as a result of photosynthesis removes 10t of CO_2 from the atmosphere."

The Davies have hosted farm health research with RMIT University for several years, which has provided the soil test data key to establishing baseline carbon levels.

The first soil tests established a baseline of 67.72t TOC/ha – no carbon below this baseline is allowed to be traded or offset.

Offsets such as greenhouse gas emissions are removed from the carbon inventory – Bimbadeen's audited emissions for 2017 were 578.05t CO_2e.

Bimbadeen's most recent carbon test was 100.47t TOC/ha, with a total carbon sequestration of 12,861.82t TOC. This is the equivalent of taking 2,144 cars off the road a year.

Gippsland Natural, the brand under which beef from Bimbadeen is sold, is organising a program to help producers with carbon farming. Bob sees this as a crucial step towards making the beef industry carbon positive.

"We hope in the future producers can receive a premium for carbon neutral beef," Bob said.

Health and safety of people in the industry

P42

Definition	Working environments through the beef value chain, especially on-farm expose employees and contractors to risk. Currently reliable data only exists for notifiable fatalities, however the industry recognises that injuries resulting in time off work present a significant risk to our people and productivity.	
Indicators	**10.1a** Notifiable fatalities	9 fatalities[15]

Table 9: Definition, indicators and data for the health and safety of people in the industry priority area.

The context

Work, health and safety preparedness and systems vary widely across the beef value chain as well as between various operators.

In the processing sector there are well-established systems for systematically managing work-health-safety and formal reporting requirements. In feedlots work-health-safety is managed within the National Feedlot Accreditation Scheme.

Transportation and points where handling occurs, such as saleyards, present obvious risks for people.

Farms are where the highest rate of incidents occur.

According to Safe Work Australia, farms are unique business environments from a health and safety point of view. While other industries share some of the hazards of farming, such as plant, chemicals, noise, dust, sun exposure and working with animals, the combination of hazards found in farming as well as the context in which farm work is done, make farming one of the most dangerous industries in Australia.

Agriculture has the highest proportion of self-employed workers of any industry. Self-employed farmers face the demands and stress of running a business, as well as undertaking the hard physical labour involved in farm work.

Farm workers often work alone. There are fewer opportunities for sharing practices, and observing and learning from others. Farm workers are often at a distance from help or first aid should an incident occur. If a farmer is injured or trapped there are often no workmates to assist and get medical help.

In addition to being places of work, farms are unique in that they are also homes, often with children.

The agriculture sector also employs a higher proportion of older workers than any other industry. While increasing age brings increased experience and skills, it also brings challenges, such as reflexes being slower, reduced physical strength and hearing difficulties.

What is the data telling us?

Data included in the Framework is sourced from the most recent available data from Safe Work Australia's Traumatic Injury Fatalities Database.

In 2016 nine fatalities were recorded for the beef industry. All of these occurred on-farm, with zero reported deaths in the feedlot and processing sectors. In the previous reporting period, 10 fatalities were recorded.

An indicator for lost time for injury has been added to the Framework this year. The industry will work with the the Australian Centre for Agricultural Health and Safety to develop an indicator for lost time for injury for next year's update.

The data obtained from Safe Work Australia is not able to break down to beef enterprises specifically and includes sheep, beef cattle and grain. This industry will work with Safe Work Australia to attempt to capture data for the beef industry specifically to assist with policy, program direction and reporting.

Snapshot of activity

On-Farm

Most activities promoting the health and safety of people on farms are coordinated state-by-state. State based bodies include:

- Farmsafe Queensland
- Farmsafe NSW
- Farmsafe Victoria
- Farmsafe South Australia
- Safe Farms WA
- Farmsafe Tasmania.

Farmsafe Australia is the umbrella entity for agencies that share a common interest in agricultural health and safety. It is a not-for-profit organisation that assists in the coordination of efforts to address farm safety issues in Australia.

Specifically for the red meat industry, MLA has created a series of online manuals that offer practical resources such as comprehensive and easy-to-follow checklists, templates and guidelines to help producers plan and implement on-farm health and safety initiatives.

The guidelines were developed through MLA's membership of the Primary Industries Health and Safety Partnership (PIHSP), from consultation with hundreds of livestock producers from around Australia led by Associate Professor Tony Lower from the Australian Centre for Agricultural Health and Safety.

The preliminary high-level stocktake of Framework's six key priority areas has identified that further work is required to understand the state-based delivery network and delivery of industry-specific tools and training. A greater understanding of the social barriers to farm safety is also required.

Processors

Significant investment has been made to ensure the safety of people working in the meat processing industry. At an individual company level there is a legislative requirement to provide safe work places and a requirement to report any incidents.

At an industry level the Australian Meat Industry Council (AMIC) have developed substantial resources that are available to members on Work Health Safety. The member database contains guidelines publications, risk management guides, injury management procedures and videos and tutorial guides to assist processors in their WHS programs and training.

AMIC is undertaking a project with Deakin University to more accurately understand lost time from injury rates and causes across the processing industry. This project involves 40 processors from across the country and the results will be able to inform the next Framework report.

Health and safety of people in the industry (continued)

P44

CASE STUDY

Industry partnership makes processing meat safer

Processing beef and sheep carcases can be dangerous work. Band saws are an essential tool in meat processing, but accidents can result in cuts, muscle and nerve damage, or even amputations.

The beef industry partnered with SCOTT Automation and Robotics (SCOTT) to develop a mechanism that could reduce the number and severity of such injuries.

BladeStop™ is a braking mechanism that can protect butchers from severe injuries caused by band saws.

"The challenge was to develop a unique system for the meat industry that could kick in fast enough to stop a band saw blade before causing major injury to the operator," said Andrew Moussa from SCOTT.

When BladeStop senses the blade contacting the operator's hand, it stops the blade within nine milliseconds. This can be the difference between a small skin cut and an amputated finger.

BladeStop incorporates a new band saw with an integrated electronic board and a blade stopping mechanism and a body sensing strap, positioned on the operator's waist.

Many different prototypes were tested and multiple plant trials conducted to refine the design.

The final system is only available as part of a new band saw purchase to avoid reliability issues with retrofitting the injury minimisation device.

Since launching the technology, more than 400 units have been sold nationally and internationally. Most major Australian processors now have multiple BladeStop band saws and are progressively replacing all existing standard band saws.

The Site Safety Manager of a Woolworths' Meat Co's processing plant, Jeff Sabel, said BladeStop had reduced risk and boosted morale at the site.

"The site has recorded five instances where the BladeStop has significantly reduced the severity of the outcome. Instead of having potential amputations we've had some really successful outcomes, we've had some minor lacerations, bandaid injuries," Jeff said.

Bladestop has also led to sustainable business outcomes.

"The band saw technology is reducing the risk of injuries for employees in the meat processing sector while decreasing lost production time and compensation claims from injuries," said Andrew Moussa.

The success of BladeStop has opened even more health and safety opportunities. SCOTT has also developed GloveCheck, an add-on sensing system that detects operator gloves moving at high speed in a zone directly upstream from the band saw blade, and triggers the BladeStop mechanism to stop the blade before contact is made with the operator.

A subsidiary of Meat & Livestock Australia – the producer-owned company providing marketing, research and development services to cattle, sheep and goat producer members and the broader industry – worked with SCOTT for nine years to bring BladeStop to market.

These technology developments are examples of the industry taking action to improve the health and safety of people who work in it, which is a priority area for action for the Australian Beef Sustainability Framework.

The Framework

Framework Principles

Five principles were established to guide development and implementation for the framework.

Relevance	Inclusivity	Credibility	Practicality	Transparency
The priority area is important (or likely to be 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 valued and considered.	The decision (about a theme, priority area, indicator, KPI or recommendation) is grounded in evidence. It can or has the potential to be monitored and managed.	The indicator is realistic. The industry is able (scope of influence) to make changes that represent value in the value chain through continuous improvement.	The industry can provide an open and honest picture of performance using the most appropriate data available.

The Framework (continued)

Four themes of sustainability for the Australian beef industry

Sustainability for the beef industry is reported under four themes. Under each theme is a series of priority areas, or what is important to stakeholders. Under each priority area an indicator or series of indicators has been developed to report and track progress. In the first Framework report data was available for 15 indicators. This update contains data for 29 indicators.

Animal welfare

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

In addition, good animal welfare is a legal requirement in Australia and cruelty to animals is a criminal offence.

The animal welfare theme in the Framework has been developed with the five freedoms and the more recent five domains of animal welfare in mind:

1. Freedom from hunger and thirst: by giving ready access to fresh water and a diet to maintain full health and vigour
2. Freedom from discomfort: by providing an appropriate environment, including a shelter and a comfortable resting area
3. Freedom from pain, injury or disease: by prevention through rapid diagnosis and treatment
4. Freedom to express normal behaviour: by providing sufficient space, proper facilities and company of the animal's own kind
5. Freedom from fear and distress: by ensuring conditions and treatment which avoid mental suffering.

Economic resilience

Australia is one of the world's largest exporters and most efficient producers of beef. However, on-farm rates of return for the Australian beef industry are often marginal and lower than those achieved in many other industries. Additionally, off-farm costs are consistently higher than all of our major global competitors.

The Australian industry's commitment to maintain and improve the integrity systems that underpin our international reputation is essential as is continued investment into improving productivity and profitability through the value chain.

The Framework focuses on maintaining economic resilience and optimising market access.

Environmental stewardship

The beef industry is particularly exposed to environmental risks, including climate variability which can impact on water and feed availability. Without a healthy natural environment, including soil, water, air and a thriving natural ecosystem, the industry is unable to thrive.

The beef value chain is committed to ensuring that any environmental impact is minimised. Working in partnership with the natural environment is essential on-farm.

The Framework focuses on:

*   Improving land management practices
*   Minimising waste
*   Mitigating and adapting to climate change, including efficient water use.

In Australia strong environmental laws and regulations govern on-farm, feedlot and processor production.

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. Providing safe, nutritious and consistent beef is critical for consumers and for the longevity of our industry. In Australia well-enforced laws and regulations govern human rights and fair work and as such the Framework focuses on the areas of building workforce capacity and ensuring a safe and healthy workforce, as well as the provision of safe and nutritious food to consumers.

The Framework

ANIMAL WELFARE

Indicator	Data	Notes	On-farm	Feedlot	Sale yard	Processing	Export	Transport	Consumer
PRIORITY AREA: Competent livestock handling									
1.1a The percentage awareness of the Australian Animal Welfare Standards for Cattle.	56%[16]	In January 2018, the on-farm LPA audit process began collecting data related to awareness of the Australian Animal Welfare Standards for Cattle. This audited figure will be used from the 2019 report. Industry will consider measures beyond awareness of the Standards in future reports.	■						
1.1b The percentage compliance with National Feedlot Accreditation Scheme (NFAS) Animal Welfare requirements. NFAS is an independently audited quality assurance scheme that was initiated by the feedlot industry and is managed by the Feedlot Industry Accreditation Committee.	96.24%[17]	394 NFAS audits were completed with 13 (3.76%) noncomformities identified in the Livestock Management elements of the Standard which include: animal welfare, biosecurity; and excessive heat load. This figure covers 2.9m cattle through feedlots in 2017 to align with NFAS 2017 data.		■					
1.1c Percentage awareness of the Australian Model Code of Practice for Livestock Saleyards and Lairages. People who handle livestock in saleyards and lairages should be familiar with this guide, which will help them meet required standards.		The saleyards sector plans to develop this measure for the 2019 report.			■	■			
PRIORITY AREA: Safe livestock transport									
1.2a The number of trucks, trailers and crates operating under TruckCare. TruckCare is an independently-audited quality assurance program for the Australian livestock transport industry. It addresses animal welfare, food safety, OH&S and biosecurity risks.	474 trucks 1278 trailers/ crates[18]	This indicator was reworded in 2018 from 'percentage of transporters TruckCare accredited'. The aim is for this indicator to evolve to be 'percentage of cattle transported by TruckCare accredited trucks'. This is not currently possible with available data systems. ALTRA has provided the following data: 28 members accredited which represents 474 trucks and 1278 trailers/crates.						■	

16 National producer survey of cattle husbandry practices undertaken in 2016.

17 National producer survey of cattle husbandry practices undertaken in 2016.

18 Data provided by Australian Livestock and Rural Transporters' Association (ALRTA).

The Framework (continued)

Indicator	Data	Notes	Value chain impact						
			On-farm	Feedlot	Sale yard	Processing	Export	Transport	Consumer
PRIORITY AREA: Safe livestock transport (continued)									
1.2b The number of reported incidents of shipboard mortality incidents. The Australian Standards for the Export of Livestock (ASEL) defines a reportable mortality level by species on a voyage or air journey. For cattle and buffalo on journeys of under 10 days, this is 0.5% and for journeys over 10 days this is 1%. Exporters must comply with the standards to be permitted by the Australian Government to export livestock.	0.1%[19]	The live export industry is embarking on piloting indicators for the measurement of animal wellbeing through the live export supply chain. Until these animal welfare indicators are piloted the shipboard reportable mortality incidents provides a useful proxy measure. Indicator moved in 2018 from the competent livestock handling section to transport as ASEL is more relevant to transport. Figure is for the total percentage across all cattle shipments for the most recent reporting period. 2015 report: 0.11% (1,451 mortalities)					■		
KEY PRIORITY AREA: Animal husbandry techniques									
1.3a The percentage of the national cattle herd with poll gene. Polled cattle naturally do not have horns. Selective breeding of the poll gene will eradicate the need for dehorning, leading to better animal welfare and work safety outcomes.	51% polled cows 71% polled bulls[20]	Currently the poll gene is only tracked via a producer survey undertaken every five years. Attempts have been made to obtain data from another source. One option explored was obtaining BREEDPLAN data from breed societies. At this stage, this option is not yet viable as the data is commercially sensitive and a process for collecting data would need to be established.	■						
1.3b The percentage of the national cattle herd using pain relief regularly for husbandry procedures. These procedures could include castration, dehorning and branding.	4%[21]	Reliable data on the use of pain relief products is currently unavailable as many products are used across multiple species. Alternatives are being investigated. Currently data is taken from a producer survey.	■	■					

19 Report to Parliament on Livestock Mortalities During Export by Sea, Department of Agriculture and Water Resources, 2017.

20 Calculated figure from NFAS audits and cattle in feedlot numbers in 2016.

21 National producer survey of cattle husbandry practices undertaken in 2016.

Indicator	Data	Notes	On-farm	Feedlot	Sale yard	Processing	Export	Transport	Consumer
					Value chain impact				
PRIORITY AREA: Humane processing									
1.4a The percentage of cattle slaughtered through an establishment accredited under the Australian Livestock Processing Industry Animal Welfare Certification System (AAWCS). The AAWCS is an independently audited certification program used by Australian livestock processors to demonstrate compliance with the industry best practice animal welfare standards.	84%[22]	Reworded in 2018 from 'the percentage compliance with the Australian Livestock Processing Industry Animal Welfare Certification System (AAWCS)'.				▮			
1.4b The percentage compliance with Exporter Supply Chain Assurance System (ESCAS). ESCAS is an Australian Government regulatory program based on four principles: **1. Animal welfare:** animal handling and slaughter in the importing country conforms with the World Organisation for Animal Health's (OIE) animal welfare recommendations. **2. Control through the supply chain:** the exporter has control of all supply chain arrangements for livestock transport, management and slaughter. All livestock remain in the supply chain. **3. Traceability through the supply chain:** the exporter can trace all livestock through the supply chain. **4. Independent audit:** the supply chain in the importing country is independently audited.	90.65% compliance with ESCAS[23]	The live export industry is committed to introducing Livestock Global Assurance Program (LGAP) to strengthen the assurance sought through ESCAS by increasing the commitment, oversight and management of welfare along the supply chain while also encouraging continual improvement and the attainment of best practice. An indicator from LGAP may be an appropriate replacement for this ESCAS measure in future reports. ESCAS is a regulatory requirement. The Department of Agriculture and Water Resources does not strictly measure compliance with ESCAS. In order to develop an indicator for compliance rates for consignments export data and non-compliance data were analysed. Current figures indicate there were 1,114,547 cattle exported in 2016.[23] A review of performance reports shows that approximately 4,436 cattle were involved in 30 cattle-related noncompliance's in 2016 and industry is working to continuously improve compliance.[24]					▮		

22 Figure calculated from AUS-MEAT audits of AAWCS accredited facilitiies and MLA and ABS data for number of cattle processed in 2017.

23 Based on: Cattle export figures in 2016 and ESCAS performance reports (analysing individual reports for 2016 to identify cattle related reports). Data from the Department of Agriculture and Water Resources directly for feeder/slaughter cattle in 2016.

www.mla.com.au/globalassets/mla-corporate/prices--markets/documents/trends--analysis/livelink/1711---australia---livestock-exports---global-summary.pdf

www.agriculture.gov.au/export/controlled-goods/live-animals/livestock/regulatory-framework/compliance-investigations/investigations-regulatory-compliance

24 National producer survey of cattle husbandry practices undertaken in 2016.

The Framework (continued)

P50

Indicator	Data	Notes	Value chain impact						
			On-farm	Feedlot	Sale yard	Processing	Export	Transport	Consumer
PRIORITY AREA: Maintain healthy livestock									
2.1a Vaccination rates for clostridial diseases. Clostridial diseases are caused by bacteria that are widespread in the environment and are normally found in soil and faeces. They can survive in the environment for very long periods so vaccination is required for good animal health.	71%[25]	This measure is from a producer survey and looks at vaccination for all clostridial diseases excluding botulism. In many areas these diseases are in such low occurrence that vaccination isn't required. Recognising that self-assessment is not an ideal outcome there have been attempts to obtain other data sources, including sales of vaccines. The information is commercially sensitive and a process for reporting on and releasing this needs to be established for this to be used as a data source in future years.	■	■					
PRIORITY AREA: Minimise biosecurity risk									
2.2a The percentage of national cattle herd covered by a documented biosecurity plan. A documented plan that outlines the simple, everyday biosecurity practices to protect the health of livestock, limit production losses and help maintain market access for Australia's beef producers.		Data will be available for this indicator from 2019. Biosecurity began to be included in the LPA audits in January 2018. Sufficient audits had not taken place by the printing of this report. In the first year of the new LPA biosecurity module, producers are required to work through learning modules online.	■						
2.2b Australia continues to be declared free from exotic diseases by World Organisation for Animal Health (OIE). Australia aims to remain free from exotic diseases in cattle.	100% free from exotic diseases[26]	The industry works hard in partnership with the federal government to keep Australia free of exotic diseases. In the past, combined focus eradicated the diseases brucellosis and tuberculosis for the Australian herd.							

---

25 National producer survey of cattle husbandry practices undertaken in 2016. 22 OIE reportable diseases list.

26 OIE reportable diseases list.

ECONOMIC RESILIENCE

Indicator	Data	Notes	On-farm	Feedlot	Sale yard	Processing	Export	Transport	Consumer
KEY PRIORITY AREA: Profitability across value chain									
3.1a **Farm business profit at full equity (expressed as a rate of return to total capital).** A five-year rolling average of farm business profit at full equity divided by operating capital – as produced by ABARES.	3.1% average and 6.4% for top 25%[27]	Capital appreciation was included as it more truly reflects the financial position of many producers, particularly as, at times, a lot of wealth is generated through the appreciation of land values. Beef specialists were selected to more accurately reflect wealth generated by beef producing assets. The top 25% were selected as an auxiliary measure to illustrate higher performing producers.	■						
3.1b **Profitability across all industry sectors.**		The development of this indicator requires the cooperation of businesses in sectors that do not currently aggregate financial information. Discussions have been initiated with both the feedlot and processing sectors and there are several data projects being investigated by industry, which could lead to data being available to report on this indicator in the future.	■	■		■	■		
PRIORITY AREA: Farm, feedlot and processor productivity and cost of production									
3.2a **Total farm productivity.** A five-year rolling average Total Factor Productivity (TFP) for beef specialist farms, as produced by ABARES, is the ratio of an index of market outputs relative to an index of market inputs.	137.2[28]	Southern and northern TFP were included as auxiliary measures to demonstrate the regional variation in productivity performance. Southern TFP is more volatile due to having a greater sensitivity to changing seasonal conditions and representing a larger proportion of smaller, less efficient producers (more hobby farmers). Due to the north having a greater proportion of beef production, it is more closely aligned with the national indicator. TFP is an index that compares relative productivity over time. TFP can be interpreted as measuring the total amount of inputs relative to total outputs. A value above 100 means productivity has increased relative to the base period. National TFP of 137.2 (2011-2015 ave) means productivity has increased 37.2% relative to the base (1981-1985 average).	■						

Value chain impact

27 ABARES.

28 ABARES.

The Framework (continued)

Indicator	Data	Notes	On-farm	Feedlot	Sale yard	Processing	Export	Transport	Consumer
PRIORITY AREA: Farm, feedlot and processor productivity and cost of production (continued)									
3.2b Cost of beef produced on Australian farms. A rolling five-year average cost of beef produced on Australian farms using existing agri benchmark data.	1.2 times the cost of production compared to the US[29]	The cost of production ratio can be used as a measure to track the relative competitiveness of Australia with US producers. While important, other beef producing countries were excluded as it overcomplicated the calculation without adding significantly more value. By and large the US has the far greater presence in key export markets and provides a product more in line with what Australia produces. Further extensions could include adding more countries on a weighted basis or breaking it down on regional/climate basis – compare northern Australia with Brazil and southern with the US. A new group of farms were included in agri benchmark's 2018 report, the 'AU 2300/750' that included Queensland Gulf enterprises. The group was not included in this report to avoid a shift in the indicator. Australian data only goes back to 2011 so difficult to report on a 5-year rolling basis but it could be explored in future.	■						
3.2c Average cost of cattle processing per head.		Would require new data collection – currently there is no data on which to base an indicator.				■			
PRIORITY AREA: Barriers to trade									
4.1a Market Access Index. A Market Access Index has been developed using tariffs faced in each major beef import market and the tariff equivalents of quotas and major disease related trade restrictions. The index for Australia has been compared to that of other major beef exporters. Lower values of the Index indicate more favorable market access conditions.	22.3[30]	The value of the index in 2017 for Australia is 22.3 and for other major beef exporters, 57.5, indicating very high levels of market access for Australia compared to other suppliers. Over the last five years the value of the market access index has improved by almost 20% for Australia.	■	■		■	■	■	

29   Agri benchmark.

30   Barnard & Quirke, Report prepared to develop a Market Access indicator, 2017.

Indicator		Data	Notes	Value chain impact						
				On-farm	Feedlot	Sale yard	Processing	Export	Transport	Consumer
PRIORITY AREA: Barriers to trade (continued)										
4.1b	**Costs of technical trade barriers.** Technical trade barriers, such as the use of import permit restrictions or delays, failure to grant exporter clearance or spurious phytosanitary regulations represent significant costs to the industry.	$2bn per annum[31]	It is estimated that technical trade barriers cost the Australian industry $2bn (2017 MLA estimate). This work is updated periodically.	■	■	■	■	■	■	
PRIORITY AREA: Product integrity										
4.2a	**The percentage of consumers nationally that consider Australian beef safe, tasty and of a consistent quality.** Market access ultimately relies on consumers desire to purchase Australian beef.	Safe: 60% Tasty: 60% Consistently high quality: 47%[32]	This indicator was changed in 2018 to be a domestic consumer survey, rather than a global average. Data from MLA's tracking in the Australian domestic market is used for this indicator.							■
4.2b	**Comprehensive integrity systems (which ensure that market access is maintained).** Measure to include information on the percent of the national herd covered by LPA, the percent of feedlots covered by the NFAS, the percent of processing establishments accredited under AUS-MEAT and the percent of saleyards covered by the National Saleyard Quality Assurance program.		The development of this indicator requires different data systems to be aligned. This is being explored as part of the digital value chain program being led by MLA.	■	■	■	■	■	■	

---

31 2017, MLA estimate.

32 MLA market insights data based on weekly domestic consumer survey of grocery buyers, aged 18-64, representative of the 5 main capital cities. Statements made relating to:"is full of flavour" 60% agree; 'is consistently high quality" 47% agree; "I trust the safety of this meat" 60% agree.

The Framework (continued)

P54

ENVIRONMENTAL STEWARDSHIP

Indicator	Data	Notes	Value chain impact						
			On-farm	Feedlot	Sale yard	Processing	Export	Transport	Consumer
PRIORITY AREA: Minimise nutrient and sediment loss										
5.1a Number of days per year soil covered by vegetation. Any groundcover, whether it be native vegetation, pastures or even weeds will protect waterways from runoff and soil erosion.		Until a measure is available to segment quality from poor groundcover a measure of any vegetation cover will be developed. For this report no data is available at a national level. Data for Queensland is available in the case study on page 35. It is anticipated that national data will be available for the 2019 report.	■						
5.1b Soil health.		A measure to be developed to understand healthy productive soils and soil degradation across the beef industry.	■						
5.1c Water quality.		A measure is to be developed to track tree and groundcover changes on riparian areas and wetlands which protect hydrological processes and minimise farm sediment runoff to waterways. For this report no data is available at a national level. Data for Queensland is available in the case study on page 35. It is anticipated that national data will be available for the 2019 report.	■						
KEY PRIORITY AREA: Balance of tree and grass cover										
5.2a Area of native vegetation managed for conservation outcomes on-farm.* This indicator is under review.		For this report no data is available. It is anticipated that revised indicators from the work of the technical expert group outlined on page 16 of this report will be available in the 2019 report. While conserving native vegetation can have environmental benefits including for biodiversity, active management must be applied to achieve the benefits. The present indicator doesn't recognise that in many landscapes the weed and pest animal control by graziers and the fire suppression by grazing are achieving good conservation and biodiversity outcomes.	■						
5.2b Maintaining grassland systems from unproductive encroachment of native and introduced woody species. Thickening and encroachment reduces carrying capacity and can have negative effects on biodiversity and farm income.* This indicator is under review.		A measure will be developed for regrowth and non high value vegetation to ensure that vegetation management leads to optimal environmental and production outcomes. For this report no data is available. It is anticipated that revised indicators from the work of the technical expert group outlined on page 16 of this report will be available in the 2019 report.	■						

Indicator	Data	Notes	Value chain impact						
			On-farm	Feedlot	Sale yard	Processing	Export	Transport	Consumer
KEY PRIORITY AREA: Balance of tree and grass cover (continued)									
5.2c No deforestation of primary forests.* This indicator is under review.		A possible measure could focus on high value forests in order to track any conversion that may occur outside of existing state regulations that govern vegetation management. For this report no data is available at a national level. Data for Queensland is available in the case study on page 35. It is anticipated that revised indicators from the work of the technical expert group will be available in the 2019 update.	■						
5.2d Increase in healthy grassland systems. Managing grasslands and pastures, both native and/or introduced species is good for soil health, soil carbon, soil organic matter and for quality ground cover that has environmental and productivity benefits. * This indicator is under review.		A measure of what constitutes healthy grasslands systems needs to be developed. For this report no data is available. It is anticipated that revised indicators from the work of the technical expert group outlined on page 16 of this report will be available in the 2019 report.	■						
KEY PRIORITY AREA: Manage climate change risk									
6.1a kg CO$_2$e emitted per kg liveweight when raising beef. Life Cycle Assessments are a globally accepted environmental measure that attributes all emissions associated with grazing, feedlotting and associated activities of cattle production up until the point of processing.	13.1 kg CO$_2$e / kg LW[33]	An update from 2011-2016 is being prepared and will be available for the next framework report. Over the 30 years since 1990 emissions were reduced by 14%.	■	■					
6.1b kg CO$_2$e emitted per tonne Hot Standard Carcass Weight (HSCW) when processing beef.	432 kg per tonne HSCW[34]	Processing plants produce greenhouse gases from energy use and waste treatment.				■			
6.1c Carbon captured and re-used in processing. Methane and other gases are able to be captured during wastewater treatment to create biogas that is then used in the facility reducing the use of natural gas.	6.6% of energy use[35]					■			

33 Wiedemann S.G., Henry B.K., McGahan E.J., Grant T., Murphy C.M., Niethe G., 'Resource use and greenhouse gas intensity of Australian beef production: 1981-2010', ScienceDirect, vol. 133, pp. 109–118, 2017.

34 AMPC, Environmental Performance Review: Red Meat Processing Sector, 2015.

35 AMPC, Environmental Performance Review: Red Meat Processing Sector, 2015.

The Framework (continued)

Indicator	Data	Notes	On-farm	Feedlot	Sale yard	Processing	Export	Transport	Consumer
KEY PRIORITY AREA: Manage climate change risk (continued)									
6.1d Carbon sequestration. The cattle industry is be able to sequester carbon through effectively managing the integration of soil, water and plant assets assists in reducing CO_2 emissions, increases CO_2 draw down from the atmosphere and increases soil organic carbon levels, thus improving on-farm productivity.		Currently there is no widely agreed methodology to measure sequestration across the cattle industry. A measures to be developed for future reports as part of the Carbon Neutral project.	■						
PRIORITY AREA: 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. A changing and unpredictable climate has a direct impact on agricultural industries. Individual businesses ability to adapt and respond to incidents is essential.		A measure is not currently available. However both seasonal and weather forecasting tools are improving and are widely available to and utilised by farmers.	■						
PRIORITY AREA: Efficient use of water									
6.3a Kilolitres of water used per tonne of Hot Standard Carcass Weight (HSCW) for raising cattle. Life Cycle Assessments are a globally accepted environmental measure that attributes all water use associated with grazing, feedlotting and associated activities of cattle production up until the point of processing.	515 litres per kg HSCW[36]	Over the 30 years since 1990 water use was reduced by 65%.	■	■					
6.3b Kilolitres water used per tonne Hot Standard Carcass Weight (HSCW) when processing beef. In processing water is primarily used to ensure food safety and hygiene during operations.	8.6 KL per tonne HSCW[37]					■			
PRIORITY AREA: Solid waste to landfill from processing									
7.1a Kilograms of solid waste per tonne Hot Standard Carcass Weight (HSCW) when processing beef. The majority of waste solids (85%) generated are organic in nature and are recycled.	5.9 kg per tonne HSCW[38]	Since 2003, there has been a 57% reduction in waste solids sent to landfill.				■			

36 Wiedemann S.G., Henry B.K., McGahan E.J., Grant T., Murphy C.M., Niethe G., 'Resource use and greenhouse gas intensity of Australian beef production: 1981-2010', ScienceDirect, vol. 133, pp. 109–118, 2017.

37 AMPC, Environmental Performance Review: Red Meat Processing Sector, 2015.

38 Environmental Performance Review: Red Meat Processing Sector 2015, AMPC.

PEOPLE AND THE COMMUNITY

Indicator	Data	Notes	Value chain impact						
			On-farm	Feedlot	Sale yard	Processing	Export	Transport	Consumer
PRIORITY AREA: 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.** Australian Dietary Guidelines recommend 65g/day (455g/week) cooked fresh red meat. Red meat is defined as beef, lamb, pork, kangaroo and game meat.	58%[39]	Measurement is limited to the Australian market due to access to data.							■
PRIORITY AREA: Food safety									
8.2a **The number of food safety incidents relating to raw beef.** Number of recalls for raw beef for food safety reasons.	0.00084% by weight	Data for this indicator is for beef rejection at entry into the US, for food safety reasons. Currently, data is only available for the US - further opportunities for data are being explored. Measure limited to fresh beef due to industry control over food safety up until the point of meat processing and does not extend to product that has been manufactured.	■	■		■			
KEY PRIORITY AREA: Antimicrobial stewardship									
8.3a **The percentage of cattle covered by an antibiotic stewardship plan.** A documented plan that outlines practices to ensure responsible treatment of cattle for health reasons.		The 2018 report does not have any data available. The feedlot industry is in the early stages of implementing a monitoring program, which will be able to be used to report on judicious use of antibiotics from the 2019 report.	■	■					
8.3b **Antimicrobial surveillance program.** The Australian Antimicrobial Resistance Prevention and Containment (AMRPC) Steering Group is being consulted in the development and implementation of a national surveillance program for the use of, and resistance to, antimicrobials in the Australian cattle industry.		The Australian industry is contributing to the development of a national antimicrobial surveillance program. Once this program is developed a measure will be developed for the beef industry specifically for inclusion in the framework.	■	■					
PRIORITY AREA: Education and training									
9.1a **Number of traineeships and apprenticeships enrolled and completed.**	Commenced • Farm: 333 • Feedlot: 10 • Processing Completed • Farm: 164 • Feedlot: 1 • Processing[40]	There are limitations with the accuracy of the available data for this indicator. Codes for just beef courses or beef cattle related industries have been used, but codes that could also relate to other industries have been omitted. Meat processing includes all meat for human consumption but excludes poultry. It is not possible to deduce how many of them work in processing cattle.	■	■		■			

39   Milward Brown Quarterly Consumer tracking Q4, 2017.

40   National Centre for Vocational Education Research (NCVER)'s VOCSTAT database, Jan-Dec 2016.

The Framework (continued)

Indicator		Data	Notes	Value chain impact						
				On-farm	Feedlot	Sale yard	Processing	Export	Transport	Consumer
PRIORITY AREA: Education and training (continued)										
9.1b	**On-the-job training completed.**		A measure to be developed, recognising the difficulty in capturing this data from across the industry. It is expected data will exist in corporate farm operations, feedlots and processing but will be difficult to capture for family farms.	■	■	■	■	■	■	
9.1c	**Percentage of industry participants with a higher education qualification.**	17%[41]	In 2018 this was reworded from 'Number of degrees around this enrolled and completed'. Contact was made with National Centre for Vocational Education Research (NCVER), National Meat Industry Training Advisory Council Limited (MINTRAC), the Department of Education and Training (DET) and Australian Universities and all have indicated that this data is not collected. The only available data for reporting on this indicator is from a member survey that MLA undertakes annually to track members satisfaction.	■	■		■			
PRIORITY AREA: Diversity in the workforce										
9.2a	**The percentage of women and men in the workforce.**	**Farms:** Female: 39.5% Male: 60.5% **Feedlots:** Female: 20.0% Male: 80.0% **Processors:** Female: 25.2% Male: 74.8% **Industry combined:** Female: 25.9% Male: 74.1%[42]	Only large corporate organisations report to the Gender Equality Agency so the sample size for the beef industry is limited. Further work is required to develop a more representative measure across the value chain.	■	■	■	■	■	■	
9.2b	**The age breakdown of the workforce.**		Measure to be developed across the value chain.							
9.2c	**The percentage Indigenous representation in the workforce.**		Measure to be developed across the value chain.							

41 MLA member survey, 2017.

42 Gender Equality Agency, 2016 data.

Indicator	Data	Notes	Value chain impact						
			On-farm	Feedlot	Sale yard	Processing	Export	Transport	Consumer
KEY PRIORITY AREA: Health and safety of people in industry									
10.1a Notifiable fatalities. The combination of hazards found in farming as well as the context in which farm work is done, makes farming one of the most dangerous industries in which to work.	9[43]	Farm: 9 Feedlots: 0 Processing: 0 Previous report: 10 fatalities in 2013/14	■	■	■	■	■	■	
PRIORITY AREA: Wellbeing of people in the industry									
10.2a Global Life Satisfaction (GLS) Index. GLS quantifies a person's subjective wellbeing in a 'global' sense, which is to say the whole of someone's wellbeing, rather than any specific aspect of it. Survey participants are asked to think about their life and personal circumstances and to rate how satisfied they are with that life on an 11 point scale. This measure is widely used internationally and has been shown to be highly correlated with a number of health and other outcomes in a person's life.		The University of Canberra undertakes an annual Regional Wellbeing Survey in January and publishes the *Wellbeing, Resilience and Liveability in Regional Australia* report in June. This report includes a GLS Index for rural and regional Australia but is not segmented by production. The industry is working with the University of Canberra to provide data on this Indicator for the 2019 update.	■						

43   Safe Work Australia's Traumatic Injury Fatalities Database, 2016.

The Framework (continued)

Indicators removed from the last report

Since the last report, the Sustainability Steering Group (SSG) has been reviewing indicators and seeking the relevant data, in consultation with industry and external stakeholders. As a result of these efforts, three indicators have been removed from the Framework since the previous report.

The % compliance with the Australian Standards for the Export of Livestock (ASEL)

ASEL requires a whole-of-chain risk-based approach to be applied to preparation of cattle for export, from the farm through to the discharge of animals in the country of destination.

This entails oversight over a large number of specific and general animal welfare and stringent reporting obligations. The industry is working with Government to identify how best to report on indicators across the supply chain, whilst properly capturing the complexity and context of animal welfare outcomes. In the meantime, mortality data from ASEL has been used in indicator 1.1d as a useful proxy measure.

The % of national cattle herd covered by a documented animal health plan

This indicator was removed, with a focus on prevention measures such as vaccination. There is no system for developing or recording animal health plans. It should be noted that many aspects of an animal health plan are now covered under the new farm biosecurity plans. The adoption of these biosecurity plans will be tracked as an indicator.

The % of producers with a drought plan

This indicator was removed, as indicators including groundcover and soil health as well as business measures were deemed more relevant to drought preparedness than the presence of a documented plan. There is also no way of capturing the existence of a drought plan, unlike biosecurity plans which are part of LPA, an audited system.
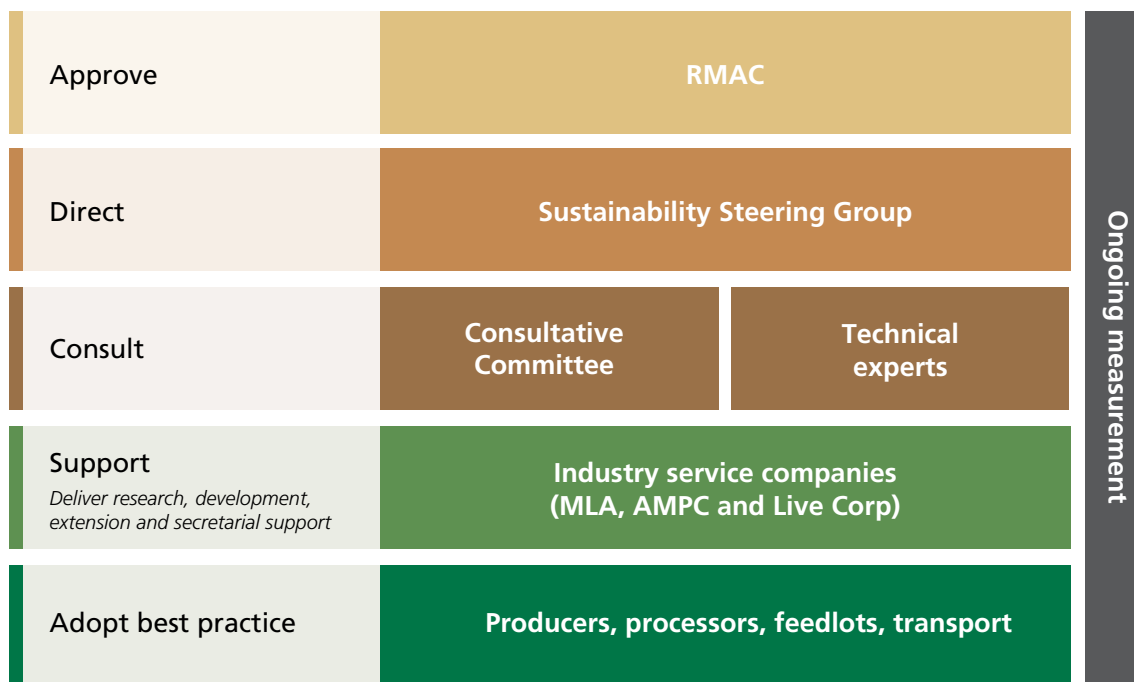
Background to the Framework

Governance

The Framework is an initiative of the Red Meat Advisory Council (RMAC). RMAC has appointed a seven person grassroots Sustainability Steering Group (SSG) to lead the implementation of the framework. The SSG continues the process from the inaugural SSG, that developed the Australian Beef Sustainability Framework through extensive consultation with stakeholders.

Approve	**RMAC**	
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**	

Ongoing measurement

Funding and resourcing

The Australian Beef Sustainability Framework is an industry-led project managed by an RMAC-delegated SSG. Day-to-day management and funding is through industry service company MLA and funded through levy funds from the grass-fed, feedlot and processor levies. AMPC and LiveCorp as the industry service companies for processing and live export, retrospectively manage related projects and activity that are captured in the Framework.

AUSTRALIAN RED MEAT INDUSTRY STRUCTURE
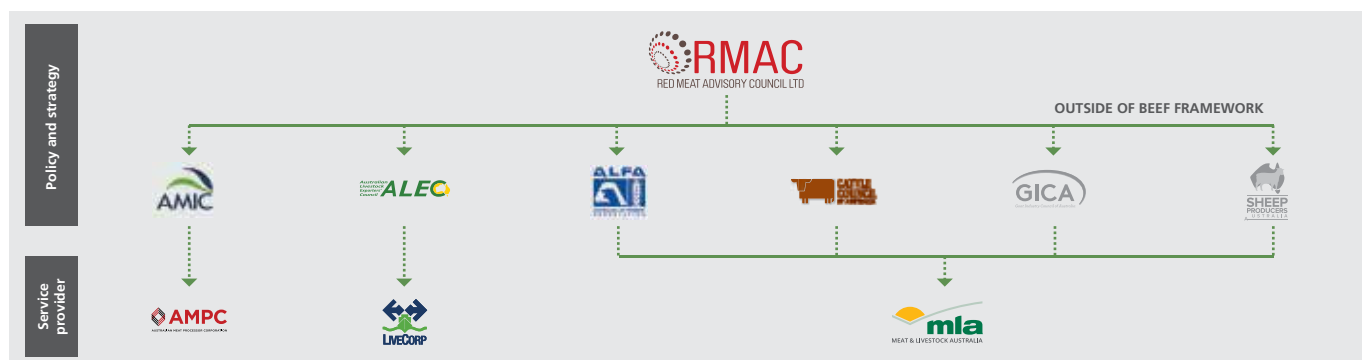
Background to the Framework (continued)

P62

Alignment with the UN Sustainable Development Goals

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. As a global citizen in a global industry we are committed to taking a leadership position to deliver on the goals. Below are the SDGs that the Australian Beef Sustainability Framework addresses. Mapping of SDGs to the priority areas contained in this report is available at **www.sustainableaustralianbeef.com.au**

By aligning to the SDGs, the Australian beef industry can show how it is contributing to sustainability in a global context. Community, investors and other stakeholders increasingly want industries to report on sustainability. As a pressing global issue, sustainability is changing the regulatory and market access landscape. Aligning with the SDGs helps the industry meet these ever-shifting expectations.
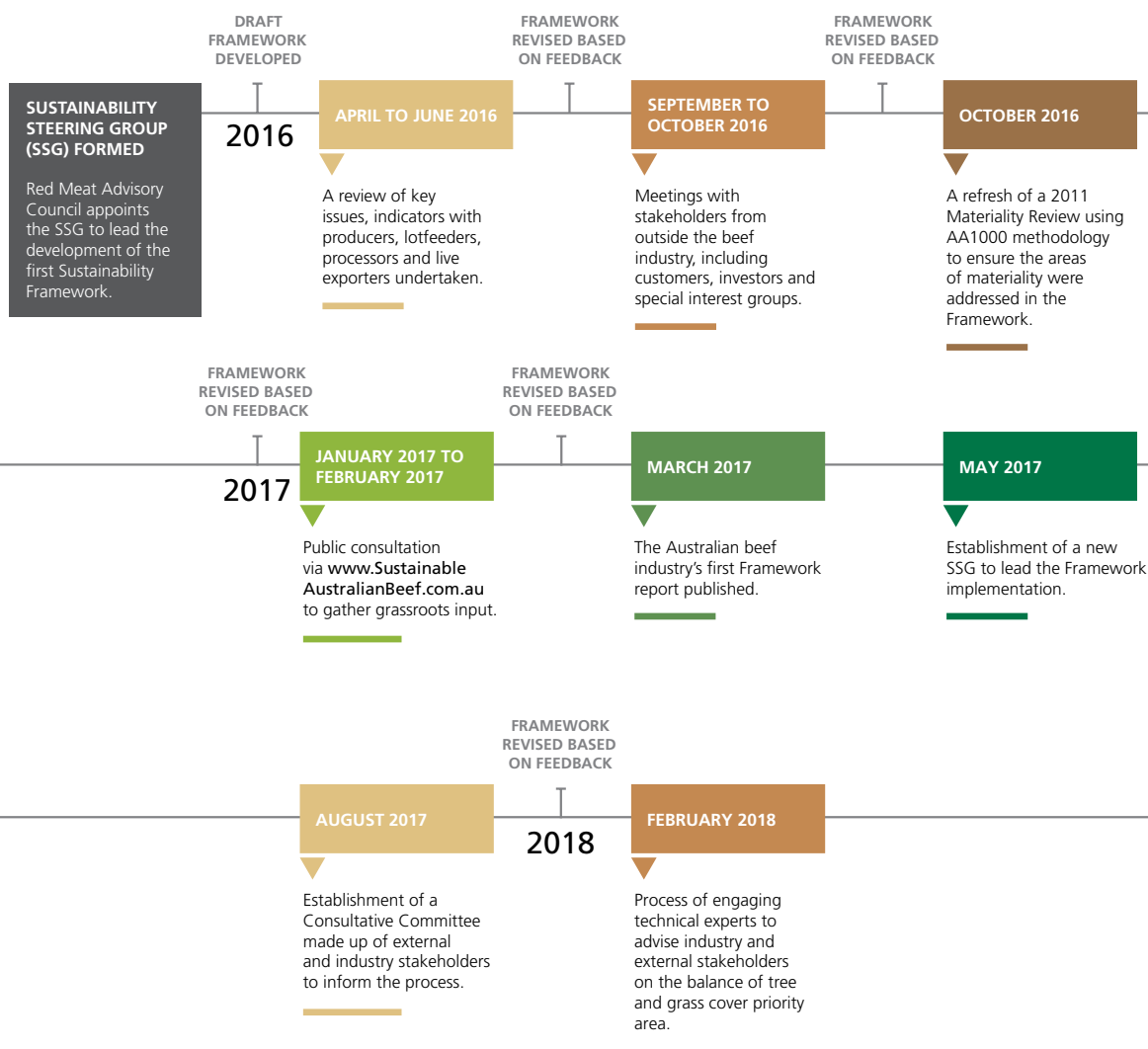
There is a strong international commitment to the SDGs. They were adopted by 193 countries, including Australia and our major trading partners, and global businesses are following suit by supporting and in some cases aligning to and reporting against the SDGs. They have become a shared language or shorthand by which people around the world can talk about sustainable development.

How the Framework was developed

During development of the Framework three phases of consultation were undertaken, providing anyone with an interest in the beef industry a chance to provide input. At the conclusion of each phase of consultation the Sustainability Steering Group (SSG) met to review the feedback and revise the Framework accordingly.

The three versions of the Framework that were taken to consultation can be found on the website **www.sustainableaustralianbeef.com.au**

The website also provides further detail on the process for agreeing to the priority areas and indicators contained in this report.

DRAFT FRAMEWORK DEVELOPED

FRAMEWORK REVISED BASED ON FEEDBACK

FRAMEWORK REVISED BASED ON FEEDBACK

SUSTAINABILITY STEERING GROUP (SSG) FORMED

Red Meat Advisory Council appoints the SSG to lead the development of the first Sustainability Framework.

2016

APRIL TO JUNE 2016

A review of key issues, indicators with producers, lotfeeders, processors and live exporters undertaken.

SEPTEMBER TO OCTOBER 2016

Meetings with stakeholders from outside the beef industry, including customers, investors and special interest groups.

OCTOBER 2016

A refresh of a 2011 Materiality Review using AA1000 methodology to ensure the areas of materiality were addressed in the Framework.

FRAMEWORK REVISED BASED ON FEEDBACK

FRAMEWORK REVISED BASED ON FEEDBACK

2017

JANUARY 2017 TO FEBRUARY 2017

Public consultation via www.Sustainable AustralianBeef.com.au to gather grassroots input.

MARCH 2017

The Australian beef industry's first Framework report published.

MAY 2017

Establishment of a new SSG to lead the Framework implementation.

FRAMEWORK REVISED BASED ON FEEDBACK

AUGUST 2017

Establishment of a Consultative Committee made up of external and industry stakeholders to inform the process.

2018

FEBRUARY 2018

Process of engaging technical experts to advise industry and external stakeholders on the balance of tree and grass cover priority area.

Ongoing activity:

- **July 2017** – SSG meeting
- **September 2017** – SSG meeting
- **January 2018** – SSG meeting
- **February 2018** – Second meeting of the Consultative Committee
- **May 2018** – SSG meeting

- Ongoing consultation with stakeholders
- Ongoing communication to stakeholders through e-Newsletters and media
- Ongoing communications to industry through Peak Industry Councils, State Farming Organisations and industry media

Glossary

Framework priority areas definitions

ANIMAL HUSBANDRY TECHNIQUES

Husbandry procedures used on cattle include castration, horn removal (dehorning), branding, and ear marking. The industry aims to find alternatives to invasive practices and where practicable administer pain relief before carrying out necessary husbandry procedures.

ANTIMICROBIAL STEWARDSHIP

Antimicrobials are a valuable shared resource. Maintaining their efficacy so that infections in humans and animals remain treatable is of critical importance. Antimicrobial Stewardship aims to improve the safe and appropriate use of antimicrobials, reduce patient harm and decrease the incidence of antimicrobial resistance.

BALANCE OF TREE AND GRASS COVER

Well managed landscapes work harmoniously with cattle production and the two are not mutually exclusive. The Australian industry is working towards a definition for deforestation to ensure protection of high conservation areas without unintended environmental or production consequences.

BARRIERS TO TRADE

Maintain and enhance access to beef and live cattle markets globally by combatting trade barriers that are either economic (tariffs) or technical (labelling requirements, standards on technical specifications and quality standards).

BEEF IS EATEN AS PART OF A HEALTHY BALANCED DIET

The beef industry advocates the consumption of beef as part of a healthy, balanced diet as recommended by the Australian Dietary Guidelines. The Guidelines recommend 65g/day (455g/week) cooked fresh red meat. Red meat is defined as beef, lamb, pork, kangaroo and game meat.

CLIMATE CHANGE ADAPTATION AND PREPAREDNESS

Agricultural industries are particularly vulnerable to a changing climate. Emergency preparedness and adaptation to expected increases in drought, storms and other environmental risks are necessary to manage business risks.

COMPETENT LIVESTOCK HANDLING

Competent skills in livestock handling results in optimal animal wellbeing and reduced stress which improves meat quality. Compliance with best practice guidelines including the Australian Animal Welfare Standards for Cattle and the National Feedlot Accreditation Scheme, along with training in stock handling, all facilitate improved wellbeing.

DIVERSITY IN THE WORKFORCE

Embrace the well-documented benefits to the value-chain of gender, age and cultural background diversity.

EDUCATION AND TRAINING

Sustainable beef production is enhanced through workforce capacity building. This can be achieved in many ways, including traineeships and apprenticeships, degrees, other formal industry qualifications as well as on-the-job training.

EFFICIENT USE OF WATER

Producing beef requires water for cattle hydration through to the water required for processing. The internationally accepted measure for water use in cattle production is a life cycle assessment figure, which looks at how much 'blue water', or water diverted from another potential use is used. Processing is measured by town water used.

FARM, FEEDLOT AND PROCESSOR PRODUCTIVITY AND COST OF PRODUCTION

A 5-year rolling average Total Factor Productivity for beef specialist farms, as produced by ABARES, which is the ratio of an index of market outputs relative to an index of market inputs.

FOOD SAFETY

Ensuring that the procedures which guarantee the safety and quality of Australian beef is critical to maintaining customer confidence in our product.

HEALTH AND SAFETY OF PEOPLE IN INDUSTRY

Working environments through the beef value chain, especially on-farm, expose employees and contractors to risk. Currently reliable data only exists for notifiable fatalities, however the industry recognises that injuries resulting in time off work present a significant risk to our people and productivity.

HUMANE PROCESSING

When preparing cattle for food they must be restrained, stunned and slaughtered in a humane and effective manner. The animal must be either killed instantly or rendered insensible to pain until death supervenes.

MAINTAIN HEALTHY LIVESTOCK

Prevent and treat disease where possible through the use of vaccines, nutritional supplements, antibiotics, pasture management, appropriate husbandry and infection control.

MANAGE CLIMATE CHANGE RISK

Greenhouse gases are emitted along the entire beef value chain, including methane through cattle digestion, fertiliser application and fossil fuel use (both on-farm and in processing). The beef industry also has a role to play in sequestering carbon in healthy soils and vegetation.

MINIMISE BIOSECURITY RISK

Observe biosecurity measures to prevent, respond to and recover from pests and diseases that infect cattle in order to keep Australia free of major diseases such as Foot and Mouth Disease and BSE. Essential to this is the national plans and funding to prevent disease incursion and successfully eradicate any incursions that do occur.

MINIMISE NUTRIENT AND SEDIMENT LOSS

Ground cover primarily protects the valuable soil surface and reduces soil and nutrient loss into river systems. Maintaining good land condition and matching stock numbers to available feed helps ensure valuable soil is kept on the property and not washed into adjacent waterways.

PRODUCT INTEGRITY

Consumers choose Australian beef domestically and internationally because they experience it as fresh, safe, tasty and of a consistent quality backed by a trusted reputation.

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.

SAFE LIVESTOCK TRANSPORT

Ensure the safety and wellbeing of livestock during transportation on trucks/train domestically and by sea / air internationally to reach processors or end-markets, in accordance with industry standards and government regulations that govern the transportation of animals.

SOLID WASTE TO LANDFILL FROM PROCESSING

Solid waste to landfill from the processing sector represents the most material waste stream. The industry recognises that the majority of waste occurs at the consumer and retail end through food and packaging waste; however for the first report the scope excludes waste at the consumption end, and will consider inclusion in the future.

WELLBEING OF PEOPLE IN THE INDUSTRY

Emotional wellbeing is as essential to worker health and safety and industry productivity as physical wellbeing. It is important to look at both the satisfaction of people in the industry at the same time as being mindful of the wellbeing of Australia's farmers.

Other terms

ABARES: Australian Bureau of Agricultural and Resource Economics

Adult Equivalent (AE): The standard measure of grazing loads used in extensive grazing areas across northern and pastoral Australia.

AMPC: Australian Meat Processor Corporation

AUS-MEAT: A not-for-profit industry owned company set up to manage red meat trade descriptions.

Australian Livestock and Rural Transporters' Association (ALRTA): 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 our primary industries.

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

Australian Lot Feeders' Association (ALFA): The peak national body for the Australian cattle feedlot industry.

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

Glossary (continued)

P66

Australian Standards for the Export of Livestock (ASEL): Sets out standards for the sourcing of export livestock, their management in registered premises, loading onto a vessel, management onboard a vessel and air transport.

BMP: Best Management Practice

Biomarkers: A biological characteristic by which a particular pathological or physiological process or disease can be identified.

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

BREEDPLAN: A genetic evaluation system for beef cattle.

Carbon sequestration: A process of capturing and storing atmospheric carbon dioxide which has the potential mitigate climate change.

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

Castration: The removal of the testicles from a male animal. Castration may be either immediate (surgical, using a blade) or delayed (non-surgical, using an elastic ring).

CO$_2$-e: Carbon dioxide equivalent, a standard unit for measuring greenhouse gas emissions.

Consumers: Consumers are the end-users of beef, purchasing it at retailers or restaurants.

Customers: Customers are the final point in the beef supply chain, before it is purchased by consumers. Examples of customers are supermarkets, restaurants and food-chains.

Dehorning: The removal of the 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: Ear marking or notching is a mandatory requirement in some states. It has business benefits by enabling livestock to be identified on-farm, leading to improved management.

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

FAO: Food and Agriculture Organisation of the United Nations

Gender Equality Agency: An Australian Government statutory agency responsible for promoting and improving gender equality in Australian workplaces.

Global Life Satisfaction (GLS): Quantifies a person's subjective wellbeing in a 'global' sense, which is to say the whole of someone's wellbeing, rather than any specific aspect of it.

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

GHG: Greenhouse gas

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

Induction stress: The stress felt by cattle that have newly arrived at a feedlot or intensive finishing system.

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

Livestock Data Link: An online application facilitates the flow of information between processors and their suppliers with the aim of optimising supply chain performance.

Livestock Global Assurance Program (LGAP): An industry developed conformity assessment program designed to demonstrate compliance with ESCAS.

Livestock Production Assurance (LPA): 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.

Liveweight: The weight of a live animal.

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

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.

Materiality: 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.

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

Meat Industry Strategic Plan 2020 (MISP): Developed by the Australian red meat and livestock industry to drive coordinated action and unlock value for the industry.

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

National Centre for Vocational Education Research (NCVER): The national professional body responsible for collecting, managing, analysing and communicating research and statistics on the Australian vocational education and training sector.

National Feedlot Accreditation Scheme (NFAS): an independently audited quality assurance program for the Australian lotfeeding industry.

National Inventory Accounts: Published by the Department of the Environment and Energy, the Accounts track national greenhouse gas emissions from 1990 onwards across Australia.

National Livestock Identification System (NLIS): Australia's system for the identification and traceability of cattle, sheep and goat.

National Meat Industry Training Advisory Council Limited (MINTRAC): A company which represents the red meat, port and game meat industries on training matters.

National Saleyard Quality Assurance (NSQA): A quality assurance program for the saleyard sector of the livestock industry.

NLMP: National Livestock Methane Program developed to coordinate national research to reduce methane emissions from livestock while increasing productivity.

NGO: Non-governmental organisation

NRM: Natural Resource Management, the protection and improvement of environmental assets such as soils, water, vegetation and biodiversity.

OIE: World Organisation for Animal Health

Polled livestock: Livestock, including cows and bulls, born without horns due to the poll gene that can be selectively bred for.

Primary Industries Health and Safety Partnership (PIHSP): A partnership between several industry service companies that aims to drive sustainable improvements to work health and safety outcomes in agriculture, forestry and fishing.

Red Meat Advisory Council (RMAC): A network of producers, lotfeeders, manufacturers, retailers and livestock exporters that represents Australian beef, goatmeat and sheepmeat businesses from gate to plate.

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.

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

SLATS: Statewide Landcover and Trees Study

Sustainability Steering Group (SSG): An independent group comprised of members across the beef value chain who direct the implementation of the Framework.

TruckCare: An independently audited quality assurance program for the Australian livestock transport industry. The program is built around the quality assurance principles contained in international standards and Australian laws. It addresses animal welfare, food safety, OH&S and biosecurity risks.
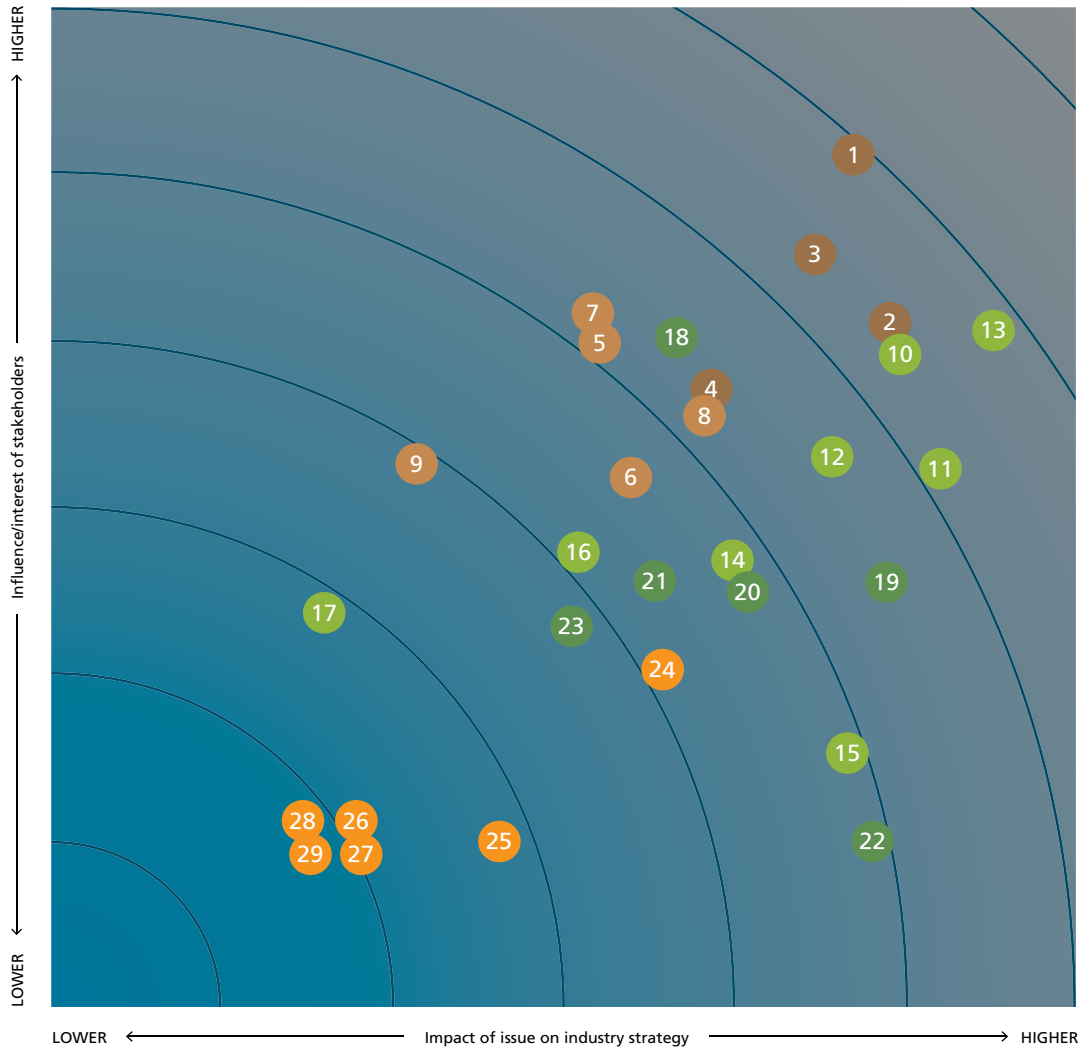
WHO: World Health Organisation

World Health Organization (WHO): A specialised agency of the United Nations that is concerned with international public health.

Appendices

Appendix 1: Materiality matrix (2016)

MLA MATERIAL ISSUES MAPPING 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

Appendix 2: Stakeholder tables

Stakeholder groups	Engagement mechanism	Frequency
Industry		
Beef industry bodies	• Face-to-face	Ongoing
Beef producers	• eNews	
Feedlots	• Social media	
Beef processors	• Industry events	
Beef transportation	• Website	
	• Consultative Committee forum	Biannual
External		
Customers and retailers	• Face-to-face	Ongoing
Government and regulators	• eNews	
Special interest groups and NGOs	• Social media	
Industry associations	• Industry events	
Financial institutions	• Website	
	• Consultative Committee forum	Biannual
Research and academia	• Expert panel	Ongoing
Consumers	• Website	Ongoing

Appendices (continued)

P70

Appendix 3: Consultative Commitee forum company attendees

Forums held in August 2017 and February 2018

- Animal Health Australia
- Animal Medicines Australia
- ANZ
- Australian Livestock and Property Agents
- Australian Livestock and Rural Transporters Association
- Australian Livestock Export Industry
- Australian Meat Industry Council
- Australian Meat Processor Corporation
- Australian National University
- Australian Saleyards
- Australian Veterinary Association
- Beef Producers
- Cattle Council of Australia
- Coles
- CSIRO
- Dairy Australia
- Dairy Sustainability Framework
- David Jones
- Department of Agriculture & Water Resources
- Elanco
- Elders
- Grazing BMP
- Grazserv
- JBS Australia
- Keystone Foods
- McDonald's
- Meat & Livestock Australia
- National Australia Bank
- National Farmers' Federation
- NSW Department of Primary Industries
- OSI Foods
- PrimeSafe Victoria
- Rabobank
- Red Meat Advisory Council
- Roberts Meats
- RSPCA
- Soils for Life
- Sustainability Steering Group
- Sustenance Asia
- The Wilderness Society
- University of Melbourne
- Westpac
- Woolworths
- Worldwide Fund for Nature
- Yugilbar Station

Appendix 4: Supply chain and exports fact check

Section	Supply chain facts	Source	Date period
Whole-of-industry	$12.7b gross value of Australian cattle and calf production	ABARES Agricultural commodities outlook, June 2017	2016-17
	200,000 employees across red meat industries	(MISP2020 from ABARES Agricultural Commodities 2012-13 and MINTRAC Employment profile of the Australian Meat Industry March 2012)	2012-13
Farm	3% of the global cattle and buffalo inventory	USDA	2017
	Average beef farm cash income of $262,000 in the north	ABARES	2016/17
	27.3m head of cattle	MLA estimates for 2017	2017
	78,600 employed in cattle farm enterprises	MISP 2020 sourced from ABARES Agricultural Commodities 2012-13 and MINTRAC Employment profile of the Australian Meat Industry March 2012	2012-13
	Average beef farm cash income of $169,000 in the south	ABARES	2016/17
Saleyard	601.23c/kg cwt cattle saleyard price average over the year	MLA	2017
Live export	$1.2b in export value	GTA	2017
Feedlot	973,176 cattle on feed	MLA/ALFA	Dec quarter 2017
	1.3 million head feedlot capacity	MLA/ ALFA	Dec 2017
	75% utilisation of national feedlot capacity	MLA/ALFA	Dec 2017
Processor	298kg/head average carcase weight	ABS	2017
	53,200 people employed in meat processing	(MISP2020 sourced from ABARES Agricultural Commodities 2012-13 and MINTRAC Employment profile of the Australian Meat Industry March 2012)	2012-13
Overseas customers	Japan, USA and South Korea are the largest export markets	DAWR	2017
	86% total live cattle exports value attributed to slaughter and feeder		2017
	1.01 Mt (swt) of beef and veal in 2016	DAWR	2017
	3rd largest global exporter of beef	USDA	2017
Domestic customers	26kg domestic utilisation of beef and veal	MLA estimates, ABD and DAWR	2017
	1,927c/kg retail price average over the year	MLA estimates based on ABS	2017
Consumer	21.7% global meat consumption	OECD-FAO Only includes beef, veal, pigmeat, poultry and sheepmeat	2017

Australian Beef Sustainability Framework

For further information please contact:

Pip Band, Secretariat for the Sustainability Steering Group
✉ pband@mla.com.au