

**National Livestock
Genetics Consortium**

Strategic Plan
to 2030 and beyond



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**The National Livestock Genetics
Consortium Strategic Plan is available
online at mla.com.au/nlgc**

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Overview/Executive Summary

The National Livestock Genetics Consortium (NLGC) was initiated to be the vehicle that drives collaboration, transparency, communication and investment in livestock genetic research, development and adoption (RD&A).

This document details the third NLGC *Strategic Plan*. To date, the NLGC has delivered improved rates of genetic progress of key traits that drive value chain productivity in the beef and sheep supply chains. The NLGC will function as a collaborative taskforce that provides a transparent vehicle and process for investment into the red meat livestock genetics sector.

The NLGC has reviewed and endorsed multiple projects since its inception in 2016 that address and contribute to industry priorities. The projects that have been completed and are currently in progress total an investment of \$90 million.

Through consultation with key industry stakeholders and by linking genetics to the key goals of the strategic priorities of the shared direction outlined in *Red Meat 2030*, the following outcomes are key objectives to be delivered through the NLGC:

- An industry improvement of 2% in the rate of genetic gain annually through access to world leading genomic/genetic technologies.
- Genetics is an established long-term enabler for achieving productivity and sustainability goals.
- Genetic tools addressing sustainability outcomes are available to users across the supply chain.
- Data platforms that enable genetic data to be leveraged in R&D to underpin continual data capture are established.

These outcomes will be achieved through:

- Enabling transparent and flexible investment.
- Continuous improvement of world leading genetic tools.
- Improved social, economic and environmental outcomes.
- Delivering direct impact of genetic investment to industry through adoption.
- Facilitating bold, collaborative and impactful RD&A.

Plan on a page

Red Meat 2030

- Double the value of sales of Australian red meat
- Achieve carbon neutrality

Red Meat 2030 priorities impacted by genetics



Our Livestock

Genetic improvement



Our Environment

Traits for improvement



Our Systems

Central data system

Outcomes

- An industry improvement of 2% in the rate of genetic gain annually through access to world leading genetic/genomic technologies.
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NLGC Strategic Pillars



Enabling transparent and flexible investment



Continuous improvement of world leading genetic tools



Improved social, economic and environmental outcomes



Delivering direct impact of genetic investment to industry through adoption



Facilitating bold, collaborative and impactful RD&A



Situational analysis

A situational analysis has been developed to help form the basis of understanding from which the 2023–2030 NLGC Strategy has been developed.

The below analysis describes the operating environment of genetic improvement in the red meat industry in 2023 under which this strategy was developed.

Environmental

- Improved productivity gains have been the focus to reduce the environmental impacts of livestock production.
- R&D projects that aim to develop Estimated Breeding Values (EBVs)/Australian Sheep Breeding Values (ASBVs) for direct traits such as methane and feed intake.
- There is no incentive for genetics/genetic improvement for environmental traits in the marketplace currently.
- Industry is currently reducing emissions.
- Limited traits can be accessed to meet goals for environment and sustainability.

Technical

- Single-step genetic evaluations are available in major sheep and beef breeds.
- Genomic products are available, and uptake is increasing in the seedstock and commercial industry for major sheep and beef breeds, including flock profiles and individual animal genomic predictions.
- A majority of commercialised genomic tools have been built from Single Nucleotide Polymorphism (SNP) chips. Some exploration has occurred into GBS (genotype by sequence technology) and other genotyping platforms.
- Increase in number of service providers offering genomics only and genetic evaluation services.
- Newly enhanced single database platform in sheep.
- Three end point associated multi-breed evaluations continue to be delivered in sheep.
- There are some multibreed evaluations for beef but no industry-wide multi-breed evaluation.
- Beef and dairy genetic evaluations are separate.
- Separate, disconnected databases are run in the beef industry.
- Ultrasound scanning systems/technologies are old and need to be updated.

Social

- Animal health and welfare continues to be an important focus. There has been investment in areas such as temperament, immune competence and poll genes.
- Growing consumer interest in knowing animal product credentials. This includes climate impacts, sustainability, biodiversity and welfare.
- Alternate meats are available in the marketplace but the penetration is not as high as expected.
- Stigmas around breeding values still exist.
- Mixed consumer views on gene editing/modification and education.
- Attracting graduates, succession options and transfer of genetics knowledge into research and the supply chain is difficult.
- Adoption of EBVs/ASBVs among commercial producers has grown in the last five years.

Political

- There is a growing appetite to develop international collaborations for the broader benefit of the industry that extends across borders e.g. sustainability and climate traits.
- Need to improve leveraging and diversification of funding sources to ensure future resilience of research funding.
- Trade regulations of importing countries need to be continually reviewed to ensure Australian products meet these requirements e.g. Genetically Modified (GM).
- Current uncertainty around environmental and carbon accounting and what these mean for export and domestic markets – not all cattle are equal in these traits.
- Current reviews around the delivery of industry genetic evaluation services.
- Emergence of artificial intelligence (AI).
- Lack of centralised and socialised data – open source/coding platforms.
- Ability to review/validate genetic products in the best interest of achieving genetic progress is not currently available.

Economic

- Consumers are prepared to pay more if satisfied. This includes products that align with consumer and market expectations that include eating quality, welfare and environmental signals.
- Pricing model for genomics needs to consider the cost and value of phenotyping.
- Some focus on short-term challenges and opportunities over long-term benefits.
- RD&A funds declining, increase in cost of completing RD&A.
- Whilst genetic uptake has improved, a large proportion of producers do not appreciate the value/benefit (or correlation between genetic improvement and profit).
- Cost of performance recording is becoming increasingly disincentivised for producers.
- No economic value attached to animals that have higher genetic merit.

Legal

- Patents in the genomic space must be monitored closely as they can pose a threat to future investment. They can also provide some potential opportunities.
- Protection of intellectual property (IP) of current and future works needs to be resolved to create opportunities to pool data for greater access, accuracy and adoption.
- Improvement on clarity of data ownership including how and where data is stored is required. Producers owning data foremost is the first principle.

SWOT analysis

A SWOT analysis has been developed for the operation of the NLGC to assess the internal and external factors that may impact the operation of the consortium.

Strengths

- Capability to tackle significant challenges that require collaboration with stakeholders across the genetics value chain.
- Foster collaboration to deliver efficiencies and cost savings through minimising duplication of resources, administration and operations.
- Ability to draw upon research in one area to contribute to research in another area, thus avoiding duplication and ensuring the best minds are engaged.
- Transcends funding restrictions by bringing together strong teams to create compelling investment opportunities.
- Reduces the risk associated with RD&A investments by aligning to the NLGC strategic areas.
- A clear, transparent investment pathway for red meat genetics investment.
- Oversight across the genetics supply chain to ensure that emerging genetic technology is considered as part of the overall investment.

Weaknesses

- Potential to become too much of a governance process with high overhead costs.
- Attracting new funding sources other than researcher and Research and Development Corporation (RDC) funding.
- Ensuring fresh and current views are represented by the NLGC whilst maintaining sound understanding across aspects of the supply chain.

Opportunities






- Lower cost of new technologies, tools and resources is progressing rapidly.
- Opportunity for sharing, creating and compounding the return on investment in genetic technologies throughout the value chain.
- Creating a platform to leverage funding opportunities.
- International collaboration and funding to address global problems.
- Showcase the value of genetic improvement across the whole value chain.
- Generate collaboration of databases to stimulate research, innovation and adoption to build a trusted genetic information pipeline.

Threats

- Purpose of the NLGC may be compromised by the lack of intent to truly collaborate, leading to individuals leveraging off the consortium for their own agenda.
- Lack of investable funds into Livestock Genetics.
- Lack of skilled people to continue the NLGC into the future.
- Inconsistency or inability to define RD&A projects that must go through the consortium pipeline.
- If the call process becomes too inflexible to accommodate creative thinking and effective collaboration.
- Failure to demonstrate/articulate clearly the value of participation from stakeholders across the value chain, including external investment in RD&A.
- To become more focused on research and neglect the value of development and adoption.
- Perceived control that the NLGC would have over the projects proposed.

Strategic Pillars

Strategic Pillars outline the key areas that the NLGC will focus on to achieve its outcomes.

Pillar 1	Pillar 2	Pillar 3	Pillar 4	Pillar 5
				
<p>Enabling transparent and flexible investment</p>	<p>Continuous improvement of world leading genetic tools</p>	<p>Improved social, economic and environmental outcomes</p>	<p>Delivering direct impact of genetic investment to industry through adoption</p>	<p>Facilitating bold, collaborative and impactful RD&A</p>
<p>Processes that allow the genetics investment to:</p> <ul style="list-style-type: none"> ▪ be flexible ▪ incorporate new ideas ▪ pivot to adjust. <p>The NLGC is enabled to:</p> <ul style="list-style-type: none"> ▪ be independent ▪ consider the bigger picture ▪ operate under a clear and transparent cycle. 	<p>Develop data systems that leverage future and previous investment that are not limited to just genetic data.</p> <p>Products and tools relating to genetic improvement are developed and delivered. This includes improved phenotyping and genotyping technologies.</p>	<p>Investment to drive growth and demand for Australian product by improved genetics in relation to consumer expectation for quality and sustainability.</p>	<p>Outcome-driven research where deliverables consider current and future commercial feasibility.</p> <p>Understanding the clear value proposition of genetic technologies.</p> <p>Genetic tools are valued and trusted in industry.</p>	<p>Cross-institutional collaboration to address multiple industry priorities.</p> <p>Leveraging off existing and new funding opportunities.</p>

Governance

The NLGC will be governed by a skills-based taskforce established and funded by Meat & Livestock Australia (MLA).

The role of the NLGC Taskforce is to provide a formal industry consultation platform for the investment in livestock genetics led by key industry stakeholders. The NLGC Taskforce will act in an advisory capacity and make recommendations, seek out and refer interested third parties and monitor the investment into genetics and genomics RD&A. The Taskforce acts in an advisory capacity in accordance with the Taskforce Terms of Reference (TOR).

The NLGC Taskforce representation is balanced across the following sectors:

- Northern beef producer
- Southern beef producer
- Breed societies (x2)
- Researchers (x2)
- Merino producer
- Prime lamb producer
- Integrated supply chain
- Processor
- Composite breeder
- Adoption and extension
- Industry genetic evaluation
- External chair.

Recommendations from the Taskforce will be considered by the MLA approval processes in making decisions on major investments into genetics and RD&A that address the goals of the NLGC.

The Taskforce will particularly focus on:

- analysing and providing recommendations on the genetics RD&A landscape including gaps, priorities and opportunities
- identifying opportunities to facilitate collaboration across organisations to address industry priorities, including funding opportunities and collaboration
- undertaking calls for and/or assessment of concept notes and proposals
- undertaking evaluation and monitoring of projects or programs.

The role of the Taskforce will be to:

- ensure the objectives of the NLGC are achieved
- ensure effective management and stakeholder consultation and communication
- ensure governance processes are maintained
- ensure the objectives in line with the *Red Meat 2030 Strategic Plan* are on track
- lead the process in prioritising the areas of investment
- be structured on a program/sub-program basis, over a five and ten year timeframe
- ensure evaluation and reporting arrangements that will provide accountability and transparency to investors but allow for flexibility to capture new opportunities.

Project assessment

Projects will be asked to address Terms of Reference that reflect investment in the key priority areas of the NLGC Strategy and Strategic Pillars.

Project applicants are required to submit a project application using the MLA preliminary and then full project application forms for MLA or MLA Donor Company (MDC) applications.

Projects will be assessed based on the call priorities set by the NLGC at the annual priority setting meeting.

A Project Call will go out once per year, however project applications will be able to be submitted in preliminary and full application form for review, feedback and prioritisation across the 12 month project cycle at multiple opportunities to ensure flexibility.

The NLGC Taskforce are charged with undertaking an expert review of the proposals and will make recommendations to the MLA and MDC boards for projects to be funded.

Critical success factors

For the NLGC to deliver against its strategic principles, the Consortium must:

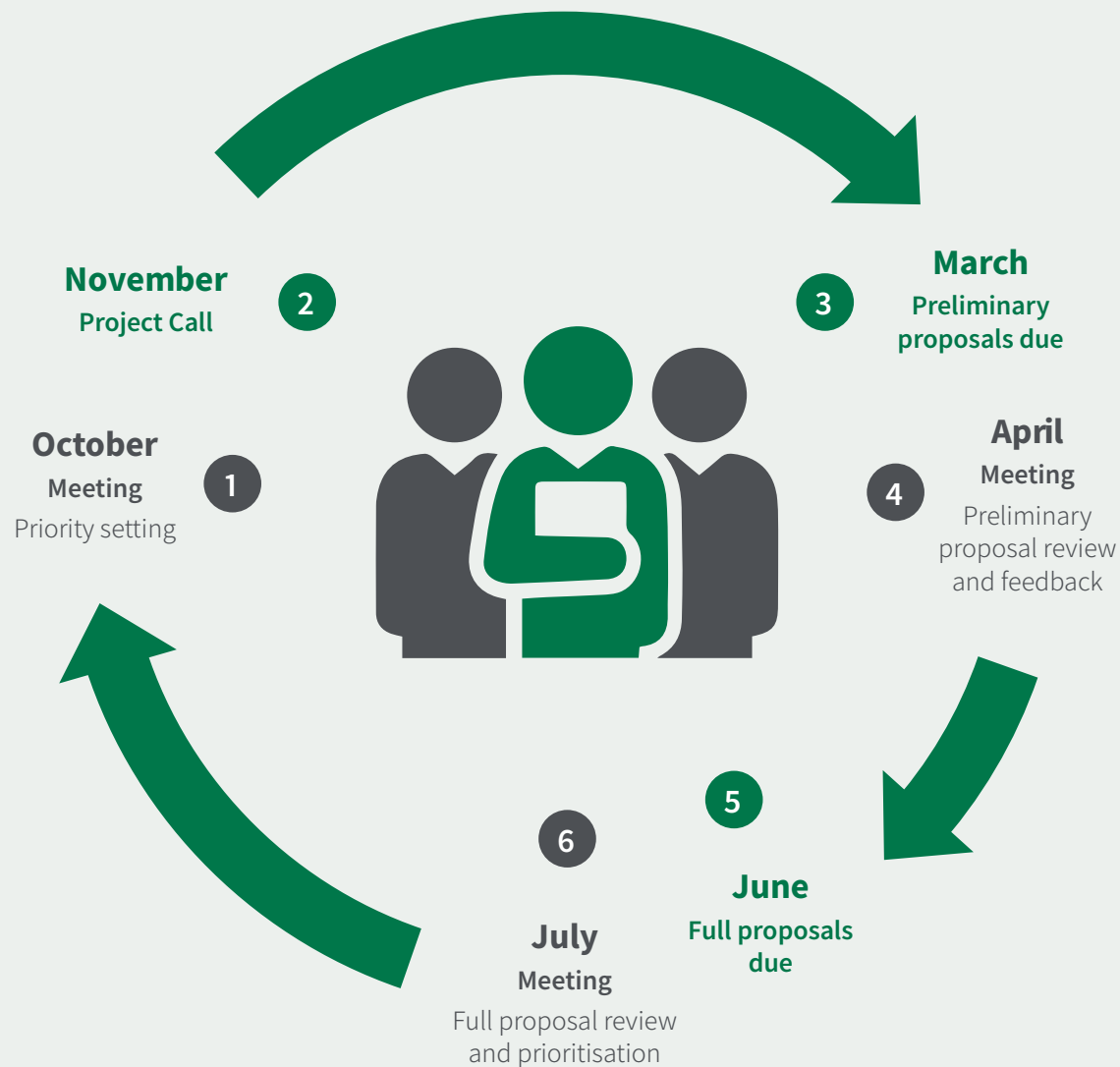
- ensure transparent processes for planning, decision making, feedback, consultation, monitoring and reporting
- have a mandate to operate throughout the value chain and be able to interact and enable two-way communication and knowledge sharing with all stakeholders, including other industry established regional and national entities
- develop clear, commercially motivated value propositions for the adoption of genetic technologies and genetic gain for each participant in the value chain
- identify reportable measures of genetic improvement
- implement mechanisms to identify new funding opportunities, draw appropriate teams together and develop clearly defined compelling proposals for funding
- develop a long-term plan, utilising varied funding mechanisms, for the ongoing collection and maintenance of industry reference populations currently underpinning the industry genetic analysis
- develop a long-term plan for genetic technologies, and define feasibility of commercial application, which transcends the immediate priorities of the individual stakeholders and ensures collaborative and consultative investment which benefits the whole industry
- develop compelling incentives and the culture for collaboration and provide a vehicle to develop large and complex ideas and solutions.

Project Call process

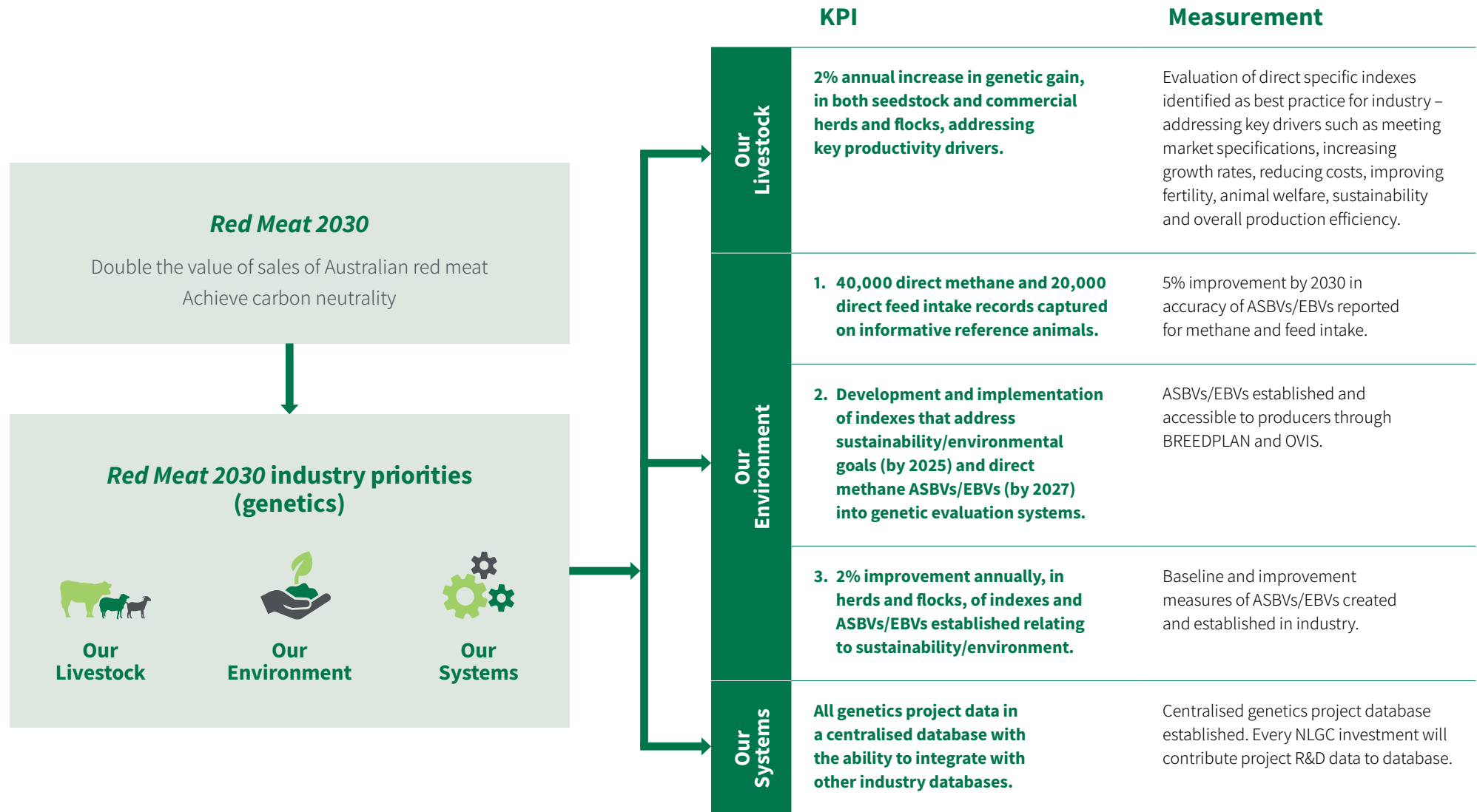
The aim is to establish and maintain a continual cycle of project proposals and applications to be considered, reviewed and prioritised by the NLGC in alignment with priority setting for industry genetic investment.

The purpose of the cycle is to allow for:

- preliminary proposals to be given feedback for review and full proposals to meet NLGC priorities
- collaboration and identification of funding opportunities within preliminary proposals submitted
- sufficient timeframes for project proposals developed from preliminary to full
- priority setting introduced as a standing agenda item for October every year.



Key Performance Indicators



What does success look like?

The strategic priorities from *Red Meat 2030* that the Livestock Genetics investment contributes to have been outlined below. What success for the *NLGC Strategic Plan* looks like for each of these has been detailed.

<i>Red Meat 2030</i> priority	Our Livestock	Our Environment	Our Systems
What does <i>NLGC Strategic Plan</i> success look like by 2030?	<p>We set the standard for world class animal health, welfare, and production practices</p> <ul style="list-style-type: none"> ■ Genetics is a key tool that is available to be used to improve the profitability and productivity of sheep and beef businesses. ■ Commercial producers have access to world-leading technology underpinned by genomic technologies to enhance selection decisions through individual animal testing and profiling at the herd/flock level. ■ Seed-stock producers have access to highly accurate animal selection tools to drive productivity and enhance animal health and welfare. 	<p>We demonstrate leadership in sustainability, delivering on community expectations in the areas of land, water, biodiversity, climate variability and biosecurity</p> <ul style="list-style-type: none"> ■ Genetics has established itself as a long-term enabler to improve the global environment. ■ Genetic tools addressing sustainability outcomes are available to users across the supply chain. 	<p>We are a trusted brand because of our integrity systems, built on trust and respect that supports strong partnerships and sharing of information, reducing unnecessary industry and government regulation</p> <ul style="list-style-type: none"> ■ Centralised data repositories for research and industry data are in use. ■ Industry (both seedstock and commercial) data contributes to genetic evaluation and appropriate funding models are able to be implemented to underpin continual data capture.





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