The National Livestock Genetics Consortium

for the genetic improvement of beef cattle and sheep

AN INVITATION TO CO-INVEST IN ALTERNATIVE MODELS OF COLLABORATION IN THE GENETICS AND GENOMICS RESEARCH, DEVELOPMENT AND ADOPTION PIPELINE
Executive summary

Support and co-investment is being sought to form the National Livestock Genetics Consortium ... a new model of collaboration in genetics and genomics research, development and adoption (RD&A) for new and existing projects across Australia.

The National Livestock Genetics Consortium (NLGC) is designed to provide a new structure for investment that will enable the industry to increase genetic gain and adoption to underpin profitability through the beef and sheep value chains.

Its objectives are to:
- Increase adoption of genetic technologies by industry.
- Improve access to industry databases with better functionality and interaction.
- Enable greater engagement in data acquisition, including commercial information, such as commercial livestock and processing data.
- Deliver genetic innovations to industry in a timely, coordinated manner.
- Support the existing and develop new reference populations to underpin future research and development.
- Initiate governance structures that will enable greater co-ordination of investment, improved communication, accountability and transparency in delivery.

Members of the consortium will be part of world-leading genetic research and development, evaluation and delivery services. The consortium will ensure coordinated research delivery, reducing timelines and delivery costs of each partner operating separately. It will deliver a seamless transfer of information to industry and provide easy-to-use products and services.

Through development of a consortium, the aim is to increase the level of investment in genetic and genomic research, development and adoption (RD&A) projects in the Australian beef and lamb industries from the currently funded $18.3 million up to $70 million over five years. This includes significant co-investment that could be matched by industry and government sources, which includes continual funding as existing projects finish and new projects commence.

Industry consultation has uncovered concerns that the structure and capacity of the current genetic evaluation services have served industry very well over the past 30 years, but may not be sufficient to fully capture future opportunities. As a result, four key objectives have been identified for investment in the National Livestock Genetics Consortium to achieve its goals and aims.

- **OBJECTIVE 1.** Increase the adoption of genetic evaluation services by seedstock and commercial breeders
- **OBJECTIVE 2.** R&D to improve the effectiveness with which breeders use genetic evaluation
- **OBJECTIVE 3.** R&D to stimulate demand along the value chain for genetic information
- **OBJECTIVE 4.** An industry structure that ensures the genetics pipeline has a transparent, collaborative and constructive approach to problem identification and resolution, R&D priority setting and introduction of new technology.

“Members of the consortium will be part of world-leading genetic research and development...”
Meat & Livestock Australia (MLA) seeks to change the way in which it partners with industry to manage industry investment in genetic and genomic RD&A for beef cattle and sheep. The change follows extensive industry consultation and broad agreement on the need to better co-ordinate stakeholder investments in RD&A.

The overall vision for more enhanced and integrated RD&A is to double the annual rate of improvement in industry genetic value by 2022.

To achieve this, MLA is seeking to establish a new collaborative co-investment structure from July 1, 2016, which will incorporate existing MLA and MLA Donor Company (MDC) funding agreements as well as new investments in genetics and genomics. The proposed new structure has the working title of the National Livestock Genetics Consortium (NLGC) and it will foster larger and longer term strategic partnership investments in conjunction with key co-investors.

Co-investors will have the opportunity to be represented on the consortium’s governance structures and will have direct input into the sub-programs and projects that are funded on a co-investment basis. They will need to commit to making a significant RD&A investment and agree with the objectives and processes established to operate the consortium.

MLA, investing both directly and via MDC funds, currently has a range of commitments in genetic improvement, particularly in the Sheep Cooperative Research Centre, Animal Genetics and Breeding Unit (AGBU) beef and sheep research programs, sheep and beef resource flocks and herds, and in specialist extension services, such as Sheep Genetics, Southern Beef Technology Services (SBTS) and Tropical Beef Technology Services (TBTS).

The consortium will incorporate these existing funding commitments, complement the proposed annual call process, and coordinate AGBU core-funded activities with new projects funded via a contestable process and with commercial co-investments.

A comprehensive investment plan for July 2016 to June 2021 will be required to enable budget planning by co-investors and ensure retention of key RD&A staff and resources. That plan will primarily focus on beef and sheep genetics, but include co-investments with application to other livestock industries, such as dairy, pork and poultry, where possible.
The National Livestock Genetics Consortium proposal is the result of nearly 18 months of industry consultation which engaged key stakeholders throughout the genetics and genomics RD&A pipeline. Key feedback amongst those consulted was mainly focused around beef genetics and was distilled down to the following opportunities and released in industry discussion papers:

1. Maintain and further improve the current genetic evaluation system but with greater emphasis on increasing profit, not just output and income.

2. Develop a data-sharing culture and transparent exchange mechanism for data from all segments along beef supply chains and from similar international evaluation schemes that enhances the value of local genetic data and encourages increased data supply and integration.

3. Expand the focus from the current stud and breed-centric model by developing tools that allow non-stud bull breeders to increase their genetic gain other than through buying performance bulls (composite EBVs, multi-breed comparisons, genomic selection).

4. Capture greater benefit from genomics and maintain the genetic diversity of breeds currently available, develop and implement a lower cost multi-breed analysis system that includes minor breeds and composites herds, and increase the benefits from structured crossbreeding.

5. Develop systems to reward breeders for submitting hard-to-measure phenotypes based on both ‘industry value’ and quality, either through a payment/trading system or enhanced services that optimise breeding programs.

6. Ensure all players in the beef value chain understand the value of genetics for their business and increase education and focus on the unconverted parties, such as agents, processors, financiers, influencers.

7. Improve coordination and communication to all beef genetics stakeholders on decisions involving the priorities and resource requirements for research, development, implementation and adoption activities. Greater transparency and accountability to co-investors and end users will encourage greater participation, recognising that these decisions impact on the timeliness of research implementation and adoption, which ultimately affects bull selection decisions, commercial producer profitability and the return on RD&E investment.

Overall, industry feedback during the consultation period was largely supportive of a new model of investment. Respondents listed the following specific areas for consideration:

- The consortium will need to further the aims of the Meat Industry Strategic Plan and the sheep and cattle strategies that support it and be aligned with priorities in both documents.

- The consortium needs to recognise the importance of extension and education in sparking interest among beef producers in the power of genetic evaluation and performance recording to put us ahead of global competitors.

- There should be increased communication about the opportunities of using beef genetic evaluation tools.

- Genetic evaluation outputs need to be simple, relevant and easily understood by the end user for their production system.

- The consortium should be ensuring all forms of technology are considered – particularly given rapid advances are being made in other industries.

- To achieve the outcomes raised in the discussion papers, long-term funding and resourcing will be required.

- Multi-breed EBVs are likely to increase competition between breeds, make EBVs more understandable for the average producer, and be of greater relevance to many commercial producers.

- There was support for streamlining databases and data collection but recognition of what might be achievable and the best use of resources.

- Breed societies can be a conduit for change and competition pushes most stud breeders to improve their performance however the societies should not be able to restrict access to group Breedplan analyses.

- Northern Australia requires special attention to increase uptake of genetic evaluation services, recognising what works in the south does not necessarily work in the north.
Genetic evaluation co-investment in the broader industry context

The Meat Industry Strategic Plan 2020 frames the overarching strategic priorities for Australia’s red meat and livestock industry, comprising the production, processing and livestock export sectors of Australia’s beef, sheepmeat and goatmeat supply chains. The plan outlines opportunities to increase demand for volume and quality of red meat with a growing population and incomes. However, it re-emphasises the need to drive efficiencies and integrity – in terms of product quality and safety – through the meat value chain to maintain the industry’s competitiveness.

Broadly, the plan outlines a need to improve on-farm productivity, recognising that the industry’s performance is below productivity improvements being secured by competitors, such as the chicken and pork industries domestically and South American countries internationally. Specifically, the consortium proposal fits with MISP pillars 3 and 5, as outlined below.

### MISP pillar | Pillar’s imperative | Consortium activities that further the MISP’s pillars and imperatives
--- | --- | ---
| Pillar 3 – Supply chain efficiency and integrity | Improving quality and compliance via enhanced supply chain information | The plan anticipates that achieving this objective will contribute to a 2:1 benefit cost ratio by 2020 … within the scope of the consortium’s investment period. The consortium will achieve this by delivering a series of investment programs and activities.

| Pillar 5 – Productivity and profitability in red meat and livestock enterprises | Decision support to improve farming businesses | The consortium proposal directly aligns with this imperative in providing improved tools to allow producers to choose the right sires and seedstock producers to breed the best bulls or rams.

| | Increasing livestock productivity through new research | When producers buy bulls or rams with improved levels of Meat Standards Australia compliance for their environment and production systems, this flows through to increasing productivity.

### Timeline for delivery of the National Livestock Genetics Consortium

- **November 2014** – The MLA Board recommended a ‘strategic partnership’ for genetic improvement should be investigated and a Genetics Steering Group was formed to identify key RD&A priorities to underpin investment for potential partners in a NLGC.
- **May 2015** – MLA and the Genetics Steering Group convened a scoping workshop – “Exploring New Models for the Genetic Improvement of Beef Cattle and Sheep” – to address key issues and plan a way forward. Majority of participants agreed there would be value in working more closely together to achieve a well-planned and delivered RD&A pipeline.
- **June to October 2015** – The steering group met regularly to discuss concepts and changes for industry consultation and discussion papers.
- **February 2016** – The consultation and feedback gathering period closed. All feedback was compiled and summarised into this investment prospectus.
- **April 11, 2016** - the due date for submissions to register intent to be a co-investor in the NLGC for genetics and genomics RD&A

- **April 20-22 2016** – Potential co-investors will meet in Sydney, NSW, to formulate and sign-off on the consortium priorities and identify what governance structure will be required.
- **May and June 2016** – Work will continue on the structure and identity of projects for the consortium to commence July 1.
- **July 1, 2016** – The new model of RD&A co-investment will start.
The National Livestock Genetics Consortium will drive progress to a more enhanced and integrated genetics and genomics RD&A strategy. Using industry input and feedback, four outcome driven investment objectives have been compiled below, that can be addressed through four different categories of activities – Strategic R&D; Applied R&D; Infrastructure; and Adoption, Capacity Building and Industry Communication – and through three different co-investment streams – Sheep, Southern Beef and Tropical Beef.

**OBJECTIVE 1**
Increase service adoption

**OBJECTIVE 2**
Improve genetic evaluation effectiveness

**OBJECTIVE 3**
Stimulate value chain demand

**OBJECTIVE 4**
Improve coordination and collaboration
Investment objective areas and activities, cont...

Detailed discussion with consortium partners will be required and, once levels of interest and likely investments are known, a comprehensive process of developing an investment plan can start. At present, the four key objectives are:

**Objective 1. Increase the adoption of genetic evaluation services by seedstock and commercial breeders**

Surveys have found that use of genetic evaluation services and genetic information in beef and sheep has plateaued throughout Australia. Common reasons for the lack of continued uptake include that producers do not see a value proposition in making the investment, and that important performance traits such as structural soundness, disease resistance and conformation are missing or do not apply in tougher grazing environments.

While the beef seedstock extension projects (SBTS and TBTS) have been important partnered investments by the breed societies and MDC, they primarily service existing breed society members and their clients. Both organisations are under-resourced to expand their services, particularly for the tropical breeds.

Increasing adoption would be helped by simplifying the language and interface to rank animals on genetic merit. More education is needed to ensure widespread understanding of what genetic merit contributes to a producer’s bottom line.

**Priority activities for investment to increase adoption:**
- Develop a nationally-coordinated livestock extension and adoption service that increases effectiveness of use and demand by commercial producers. It must focus on building market demand, such as through feedlots, corporates, abattoirs and brand owners.
- Provide a two-tier extension service that incorporates greater involvement of the private sector. This includes breeding program optimisation on a fee-for-service basis by consortium partners.
- Sheep Genetics, SBTS and TBTS must enhance their engagement with seedstock breeders, with a particular focus in northern Australian beef where genetic service uptake is lower than in other areas.
- Establish a project that ensures stud and commercial breeders have a much better understanding of the value proposition for investment in objective measurement.
- Customise the language, tools and interface around delivery of genetic information for different users to ensure that it is simple, relevant and easily understood.

**Objective 2. R&D to improve the effectiveness with which breeders use genetic evaluation**

Evidence suggests breeders only capture a small portion of the total benefit created by their investment in genetic improvement, primarily through the increased prices received for high merit rams or bulls.

Improving the effectiveness for breeders will draw on a number of strategic research and core infrastructure requirements. This will involve the development of genomic tools and statistical methods to enhance breeding value prediction accuracy, including capacity for across-breed and composite evaluations. Phenotype and genotype databases that integrate with industry value chain information systems will also lead to improvements in how breeders can use genetic evaluation will improve effectiveness, delivering greater on-farm productivity increases.

**Priority activities for investment to improve effectiveness:**
- Develop a variant of Breedplan that can accommodate the needs of different breeders, but provide a common language and common bases for comparison.
- Deliver lower level breeding values for breeding units with poor data structure.
- Commercial breeders have a suite of new tools to assist them to increase genetic gain, in addition to the option of buying EBVs from stud breeders.
- Multi-breed genetic evaluations are used to streamline analyses and service commercial breeders.
- Genomics tests for all hard-to-measure traits and reference herds/flocks are used to maintain accuracy.
Objective 3.  
R&D to stimulate demand along the value chain for genetic information

For breeders, as the phenotypic data that can be combined on breeding animals to predict genetic merit increase, that prediction becomes more accurate. For buyers, knowledge of the genetic value of cattle to be purchased will have more value when it can be combined with data from their own businesses to predict which animals will generate more profit.

At present, data on an individual animal’s performance, their progeny and the end product (carcase and eating quality) is held in multiple databases and is usually commercial-in-confidence, limiting access by other parties. A more open access system and exchange rules would potentially unlock greater value from this information.

Priority activities for investment to stimulate demand:
- Link genetics to the products consumers want. This will require RD&A that provides stud and commercial breeders a much better understanding of the value of investment in objective measurement and genetics.
- Develop data capture systems and information exchange platforms that can connect genetic, on-farm, feedlot and carcase data, as well as provide analytics on individuals or groups of animals.

Objective 4.  
An industry structure that ensures the genetics pipeline has a transparent, collaborative and constructive approach to problem identification and resolution, R&D priority setting and introduction of new technology.

Transparency and accountability will be improved by involving more stakeholders in decision-making, and increasing the communication to industry on the rationale behind those decisions. This will require more resourcing and a more structured effort than has been available in the past. For example, funding of new R&D should be structured in a way that encourages collaborative input using expertise from a range of organisations. Co-investors will play a major role in the achievement of this outcome.

Priority activities for investment to improve coordination and collaboration:
- Develop an industry-owned governance structure and entity that strategically and operationally co-ordinates and integrates genetic investment to achieve best value outcomes for industry.
- Establish funding mechanisms that provide security and reflect the benefits the NLGC will achieve.
- Support international collaboration and data exchange, especially regarding genomics.
- Develop and maintain a monitoring and evaluation framework that enables impact of investment to be measured using systematic and robust measurement tools.
Until recently, the major vehicles for large and complex consortia in Australia have been the Cooperative Research Centres (CRC). CRCs in livestock that have been judged to be successful have the following attributes:

- A mandate and objectives that all participants are willing to support.
- Have attracted substantial additional government and industry funding.
- Taken a long-term perspective with the flexibility to adapt to changing knowledge and conditions.
- Been driven by a strong and focused management team.
- Benefited from an independent and skills-based governing board.

While there are many lessons to learn from this success, the CRC structure is unlikely to continue for sheep beyond 2019. The following models have been proposed by the Genetics Steering Group, which has significant industry representation, for improved pipeline coordination.

**Model 1: Improved status quo**

This model recognises MLA is the entity with the greatest interest across the whole genetics RD&A pipeline. However, having staff members with the time and experience to facilitate pipeline function is a constant challenge. A solution would be to fund a position that brings participants together to identify RD&A needs and match them to research opportunities, costs and benefits.

**Model 2: An informal consortium**

This model differs from the status quo in that key stakeholders agree to come together informally on a regular basis to explore needs and opportunities for red meat genetics RD&A. This informal consortium would provide advice to MLA and other funders on opportunities and priorities and ways to pursue them. A sub-set of stakeholders may be required to create a more formal arrangement to develop a new opportunity, but only when it is believed likely to be funded. However, this model will only work if there is an individual or group able to bring the stakeholders together regularly and can convert ideas into action. This will require an incentive to continually engage stakeholders.

**Model 3: A formal consortium**

This model requires that participants agree to clear objectives, business methods and governance arrangements, and commit to invest their time and resources to fulfil the consortium’s objectives. If a formal consortium jointly executes RD&A, then management of IP, creation of a legal entity, and governance and management requirements will make the costs of a formal consortium higher but will deliver results directly to industry.

For a more detailed overview on potential collaboration models, please see the Discussion Paper on the Livestock Genetics Investment Priorities page at www.mla.com.au/geneticsinvestment
The next step to co-investment and partnership

There are many ways in which the NLGC could proceed, from being a stand-alone initiative that is isolated from commercialisation services to being part of a completely new industry-owned structure. Regardless of the final decision by co-investors, at this stage, there needs to be a clear indication on what industry funding will be available in order for the proposed consortium structure to proceed.

Organisations are invited to submit an Expression of Interest (EOI) which outlines the areas they wish to be part of for co-investment. The template for co-investment is attached, and requires details on the key objective areas for investment into new research, development, delivery or adoption activities, and whether that investment would be untied funds and in-kind support or tied to specific R&D areas, projects, organisations or personnel. An indicative budget for co-investment is also required to be outlined, indicating the cash and in-kind contributions to be made.

To register intent to be a co-investor in the NLGC to deliver the identified activities, the Expression of Interest form needs to be emailed to livestockgenetics@mla.com.au by April 11, 2016.

Consortium Question and Answer

What is the timeframe for co-investment commitment?
The motivation behind the NLGC is to facilitate investment into long-term research, development and adoption programs. Therefore, a minimum of three to five years of co-investment needs to be considered, with the option of continuing for up to 10 years.

What form of co-investment does MLA require?
Co-investment into new or current RD&A activities can be in the form of untied funds, tied funds or in-kind resources (capacity and infrastructure).

Expressions of interest will need to identify if the funds or in-kind support are linked to specific RD&A areas, projects, organisations or personnel.

How will projects in program areas be developed?
Co-investors are encouraged to submit preliminary project proposals with their Expressions of Interest that meet the objectives across the four categories of Strategic R&D; Applied R&D; Infrastructure; and Adoption, Capacity and Communication. Co-investors will then determine whether the proposed projects address current RD&A gaps and prioritise projects for funding or further development.

How will governance structures be decided on?
The identification and initiation of governance structures will be decided at a meeting of co-investors in Sydney in the week of April 20-22, 2016. Governance structures will be able to provide oversight and feedback on the four categories of NLGC projects (listed above) and within or across livestock genetic streams (tropical beef, southern beef and sheep). Each governance structure will contain industry, technical and co-investor representatives.

What is the return on investment for co-investors and how will it be monitored?
Co-investors will determine the appropriate short and long-term monitoring and evaluation framework that will take into account the value returned back to industry in the form of genetic value, as well as internal performance to demonstrate that a NLGC is achieving the desired aims of improved coordination of activities, better internal and external communication, and greater accountability along the genetic value chain.

For more information, visit www.mla.com.au/geneticsinvestment

Please direct responses or questions about this prospectus to:
Sam Gill, Meat & Livestock Australia
sgill@mla.com.au | 0428 248 552