Livestock Breeding and Genetics Forum
Brisbane, 21 February 2018
Feedback summary

MLA's Livestock Breeding and Genetics Forum covered four sessions:

- Session 1: Data platform
- Session 2: Linking genetics to the product and consumer
- Session 3: Disruptive technology and the future of genetics
- Session 4: Culture change (including presentation of MLA's genetics adoption strategy).

The purpose of the forum was to update attendees on the latest genetic and genomic research, development and adoption, and present MLA's genetics adoption strategy (see Figure 1). Attendees were also encouraged to provide feedback after each session.

The following is a high-level summary of feedback provided by attendees.

Session 1: Data platform
This session covered three topics:
- How can an accessible data platform add value to the Australian industry? **Andrew Skinner**
- Developing a large scale data platform **Dr Rod Polkinghorne**
- How does an accessible data platform work? **Andrew Cooke**

Most attendees saw value in the development of a data platform that is accessible across the value chain. Likewise, many saw benefit in looking for commonalities with how other countries had achieved this, though understanding our differences in production systems. The development of an accessible data platform would require clear guidelines and agreement across the value chain regarding data ownership, integrity of the data and how it is collected, who funds it and the need to address issues with current traceability/NLIS
Specific feedback from this session included the following:

What ideas/insights were most valuable? (Including other thoughts and comments)	What would assist in adoption/wider industry uptake?
• The need for agreement and alignment to share data across the value chain via a data platform – currently there is a lack of transparency through the value chain including between stud and commercial producers. Need agreement on how it will be funded, who will own and drive it and collect the data. How will MSA/eating quality information be incorporated? • Industry isn't using/analysing the data it currently has	• Work with willing producers • Confirm reliability and integrity of the data • Use standardised commercial/meaningful/common language across the value chain/data platform and easy to use tools • Address the cost/funding component and data ownership/IP issues • Drive the commercial industry to push genetic change • Collaboration of industry bodies including processor/feedlots, breed societies/across breeds

What ideas/insights were most valuable? (Including other thoughts and comments)	What would assist in adoption/wider industry uptake?

• "Outcome up" starting with the endpoint/consumer/end product then linkage from outcome to breeding
• Look for commonalities with the Irish/NZ/other species systems which can assist Australia – possibilities for Australia will be realised though understanding the differences/limitations of overseas systems
• Requirement for change will be price driven
• Needs to be in a common language/standard measurements across the value chain and in commercial language + the tools to be able to use the data in a productive manner
• Digital tech is one avenue for attracting young people to the industry
• Restrict access of information to those who require it e.g. breeder through value chain by animal – not "open" access
• Need to address current issues with traceability first
	• Financial incentives/compensation encouraging producers to make change:
	    o quality/productivity/yield payments
	    o collect accurate/useful data in commercial operations
	• Real time access balanced with security preventing misuse of information
	• Reduce cost/time of genomics
	• Address NLIS tag and connectivity issues

Session 2: Linking genetics to the end product and consumer

This session covered three topics:
• The influence of genetics across the value chain **Jason Strong**
• Value based marketing – valuing genetics **Tom McGuire**
• Utilising the tools available to improve a consumer outcome **Dr Alex Ball**

There was widespread agreement on the importance of aligning consumer demands along the value chain to genetic direction and objectives on farm. An accessible data platform is essential to drive this connection, with value based marketing being the first step to create market signals to facilitate on farm genetic and management change. Whilst the theme of this session focused on eating quality, the importance of other factors in genetic direction such as reproduction, is accounted for in the NLGC and MLAs strategic R&D. This will be highlighted through various channels such as regional forums/programs and within the adoption strategy.

Specific feedback from this session included the following:

What ideas/insights were most valuable? (Including other thoughts and comments)	What would assist in adoption/wider industry uptake?
• Collaborative sharing through a data platform is essential across the whole supply chain and in a meaningful/useful format. Ownerships and IP need to be addressed. • Align consumer demands (eating quality and other consumer drivers) along the supply chain back through stud to commercial breeders to drive industry objectives – currently there's a disconnect • Important to connect the value of the end product to the producer which incentivises change, though balancing them with valuable on farm traits e.g. reproduction and cow efficiency	• Value based system reward for genetics/performance/eating quality e.g. value based marketing, and explore ways of implementing for saleyard/store/feedlot payments. Possibly develop a baseline genetics standard for brands. • Address the cost of implementing a data platform, including the cost/benefit to collect data • Deliver the data platform and make accessible from commercial producer through the value chain and in clear, common, commercial language

What ideas/insights were most valuable? (Including other thoughts and comments)	What would assist in adoption/wider industry uptake?
• Major processor willing to make the first step to pay and provide the data i.e. value based marketing • Need to address data usage/flow along the value chain to prevent misuse • Need to act now/be proactive otherwise it will be done for us • Breeding for a brand...brands capture consumer requirements	• Need clear market signals to change selection decisions • Rewards to flow across the value chain • Connect breeding traits to markets/consumer without sacrificing important on farm traits • Need proactive advice/extension to producers to maximise information use and implementation • Address the disconnect with the "value chain orphans" • Need a system to benefit multi-breed commercial systems

Session 3: Disruptive technology and the future of genetics

This session covered three topics:
• Opportunities for a multi-breed analysis **Tom Bull**
• The next generation of genetic technologies **Professor Ben Hayes**
• Advancement in Australian genetic evaluations **Dr Rob Banks**

There was consensus of the need for a beef multi-breed analysis. There was interest in future technology opportunities for the industry – including crush-side genotyping and genotyping for potential feedlot performance and the benefits it may provide for hard to measure traits such as fertility – and the need to value phenotype data collection

Specific feedback from this session included the following:

What ideas/insights were most valuable? (Including other thoughts and comments)	What would assist in adoption/wider industry uptake?
• The future technology opportunities for the industry e.g. crush-side genotyping, genotyping for feedlot performance and earlier selection • Breeding for markets and performance, not breeds and colours • Biggest beneficiaries of genomics are non-BREEDPLAN studs. • Need to incentivise phenotype collection • Opportunities for a multi-breed analysis plus advantages of hybrid vigour • Need to understand the influence of the rumen micro-biome • The advances in genomic and single step methodology to improve genetic gain • Need to value data-sharing in Australia and globally • Beef industry is lagging behind the sheep industry	• Information/data/feedback in a common language/useful format and accessible through an accessible data platform • Availability of new technology e.g. crush-side genomic tools • Improve cost/benefit of genomics (including accuracy) and new technology • Deliver a multi-breed analysis • Education and extension for the current and new technology/tools, including to a wider audience e.g. next generation • Collaboration across the value chain including breed societies and processors • Compensate/value for data collection across the value chain, and increase reference populations • Producers need proof of profit

Session 4: Culture change

This session covered two topics:
- Creating a culture for adoption: will you play your part? **Ruth Nettle**
- Approach to adoption **David Packer**

The livestock genetics adoptions strategy received widespread support. Most tables (73%) agreed with the four pillar approach to increase the adoption of genetics. It was pleasing to see that much of the feedback captured during the earlier sessions such as using standardised commercial language, incentivising the commercial industry to drive genetic and production change, proactively extending messages to a wider group of commercial livestock stakeholders, and demonstrating the value of genetics/genomics – all form part of the livestock genetics adoption strategy.

Attendees at some tables were unsure the genetics adoption strategy could successfully increase the adoption of genetic tools in the commercial livestock sector (22%). We have addressed some of these concerns below:

Timeline

The strategy will be initiated immediately, though some parts of the strategy are a longer term goal (10+ years). There may have been some confusion around the NLGC goal displayed: "By 2022, >$400M million industry improvements through doubling the rate of genetic gain in the commercial livestock industry value chain". Whilst the adoption strategy will underpin and assist with achieving this NLGC and industry goal, which includes the roll-out of important R&D (some of which was detailed at the forum), there are components of the strategy e.g. processors/feedlots paying on genetic merit/performance of animals and simplifying EBVs, which are longer term, though by 2022 clear progress will hopefully be made.

Similarly, in regards to the fourth pillar around aligning R&D to adoption, this will also be dependent on the timeline of delivering the research (e.g. Multi-breed, data platform). Your feedback captured within the first of the three sessions is critical in developing the adoption plans to maximise industry impact and uptake by stud and commercial producers, along with the value chain (refer to fourth pillar comments). The adoption team will be working with the wider research team to ensure timely implementation of projects to ensure the timeline to adoption is reduced.

Monitoring and evaluation guidelines

This strategy will be monitored alongside other genetic projects. Measures to demonstrate changes in adoption can be difficult and hence this will be monitored through the multiple channels outlined below. This will determine the success of particular strategies/tactics and allow for ongoing modifications.

Genetic improvement:
- The number of animals registered in BREEDPLAN, MERINOSELECT and LAMBPLAN as an indicator of animals being provided with breeding values – this is driven through both the demand from the commercial sector and new studs adopting evaluations
- Genetic gain through traits and indexes – this is an indicator that seed stock producers are using the tools to increase gain, and therefore directly or indirectly increasing the genetic merit of the national flock/herd. Whilst this does not measure adoption per se, it does demonstrate a continual desire to for animal and industry improvement, generated through increased competition between breeds and studs through buyer demand, along with market signals. With the introduction of a multi-breed platform this will no doubt further increase the desire for continual genetic improvement.

Adoption rate:
- Market research conducted, which assisted in guiding the initial adoption strategy, will be used as a benchmark for the industry (Ipsos survey link). This research is aimed to be replicated in approximately five years to understand a hopefully positive change and identify any gaps.

Further adoption metrics will be captured through the following avenues:

- Producer/industry stakeholders surveys conducted at workshops/forums/training programs
- Further market research which is more species and region specific similar to the (ABRI, 2015 link)
- Direct and indirect feedback received through the genetics network, producer/industry days etc.
- Producer demonstration sites, producer involved research
- Each of these avenues for feedback will measure the following in regards to genetics/genetic tools:
    - Confidence/knowledge/understanding of genetic evaluations
    - The use of the available information and tools
    - Attitudes towards the information tools
    - Producer recommendation score i.e. the willingness of a producer to recommend the tools to a peer producer
    - Where possible, these will be monitored within a program or research to demonstrate change and followed up post programs to measure on-going adoption

Productivity improvements:

Where applicable, key production criteria will be collected to show improvements in productivity in both stud and commercial settings e.g. producer demonstration sites and producer involved research. By capturing the change in productivity (e.g. kg/beef-lamb/ha over area grazed of participants) we can demonstrate both the value of the project and the influence genetics has made towards improving productivity. This demonstration of value can be further developed into the genetics campaign (pillar one – demonstrate value and grow demand).

Resourcing and commitment

Long term resourcing and commitment is key to ensuring the success of this strategy. MLA has aligned this strategy with the NLGC taskforce and has committed to the long term support and resourcing to improve the genetic merit of the national flock/herd.

Your feedback and alignment is critical to the ongoing success.

Strategy/elements of the strategy have been done before with no success

Whilst some felt that the strategy or elements or the strategy are not new or innovative, its believed that these have not been executed in a coordinate or impactful manner in the past, particularly with a focus on the commercial sector. By having monitoring and evaluation guidelines, the efficacy of the strategy can be evaluated and adjusted as required.

MLA, the genetics and adoption team are continually open to strategies and tactics to improve adoption of genetics and other technologies in the livestock sector. Please feel free to reach provide feedback and suggestions ongoing.

Specific feedback and commentary regarding "the four pillars"

1. **Demonstrate value and grow demand**
   - Strong agreement that there is a lack of value proposition across the industry and the below strategies are agreed to be an avenue to address this.
   - Commercial producers case studies are an effective method of demonstrating value and "proof of profit" e.g. these are commercial producers who can demonstrate an improvement in e.g. reproductive performance, MSA index, kg/beef/ha, whereby genetics has been an important tool that they have implemented to achieve this goal. These stories will be told on a whole farm basis i.e. all management that has led to the improvement, but highlight genetics as being an important component.
   - Develop a marketing campaign to create wider awareness of the benefit of genetic improvement
     - These case studies will be developed into a marketing campaign which will have clear key messages that demonstrate the importance of genetics as a tool to improve productivity.
     - This campaign aims to increase awareness across the wider commercial sector and will have regionally/species focussed components e.g. improvement in reproductive performance in Northern AU and Merino operations, improvements in eating quality (MSA) and productivity in Southern AU.
     - The aim is to create awareness amongst the wider commercial industry that genetics is an important tool that can help address some productivity issues and goals, and should be considered in all breeding livestock systems.
     - This will delivered through multiple platforms including online, social media, printed materials, and MLA publications and platforms.
   - These case studies will not be limited to the campaign, but will also be utilised and forums and workshops to maximise impact and uptake of message.
   - Agreement that demonstration sites involving stud and commercial producers will increase the long-term adoption success rate.
   - Key research project and findings will be incorporated into the campaign to reinforce the importance of genetic selection in influencing key productivity drivers such as reproductive performance.

   - Strong agreement that a demand for good genetics through the value chain (processor, feedlot/finishers, saleyards/store sales, market/consumer) may drive change. We will be continuing to form partnerships with the value chain and most importantly ensuring once more feedback is available through the value chain (data platform), it is in simple common language with a clear understanding and guidance of how to continually improve on-farm. Value Based Marketing is the first step in this direction. The future influence of genomics may assist with executing this strategy with both live animal transactions and predicting eating quality.

2. **Pathway to learning**

- The genetics network aims to include more livestock industry stakeholders in the genetics conversation; A platform for alignment, collaboration, education and feedback. This grows the current limited genetic resource base which is lacking for wider commercial adoption, and was strongly highlighted as important in the feedback. This includes:
    o A wider group of extension and consultant staff
    o Livestock agents and merchandise staff
    o University lecturers, TAFE and school teachers
    o Processors and feedlots
    o Banks and insurance agencies
    o Vets/Reproduction services
    o Other service providers

- The network is the resource base/platform for producers wanting to know/do more following the awareness created by the genetics campaign
- Two tiered approach to the network:
    o Alignment of technical and extension experts who are providing advice to the leading end of the stud stock industry – workshops rather than dictation/lectures (e.g. Breed societies, SBTS/TBTS, Sheep Genetics, leading extension/consultants)
    o Inclusion, education and alignment for stakeholders who provide advice to producers (outlined above). Not in-depth technical training, but adequate to provide confident advice to particular stud and commercial producers wanting to know and do more.

- Strong positive feedback to continue an annual/biennial conference, and further scope to provide regional/species specific regional programs. Ideally these can leverage existing networks/programs.
- The network will be kept informed through communication channels that are existing along with developed pathways to continue momentum of the genetics conversation:
    o Webpage/site will be developed underpinning the genetics marketing campaign. This will be a reference point for both producers and other stakeholders to provide a source of education through training and information materials in a variety of media (videos, written), programs/workshops which provide further training (e.g. BredWell, FedWell, Profitable Grazing Systems) along with key contacts for more information
    o Updates can be provided to people registered to the network in between formal events through email, social media and other printed and online avenues. This will provide updates of new materials and information including, e.g. research findings and case studies.
    o Importantly, it will also provide an avenue for feedback on adoption strategies and R&D.

- It is important that these messages and programs are delivered with a balanced view of animal selection and on-farm management with whole of farm/value chain approach:
    o Importance of visual appraisal/structural soundness of animal balanced with breeding values for selection.
    o Good dam/sire management – e.g. good nutrition to reach joining weights, BBSE, culling animals who have failed to wean a lamb/calf, shorter joining periods.
    o The influence of other on farm management which impact the consumer outcome/value chain i.e. genetics programs delivered alongside e.g. MSA, pasture and nutritional programs.

3. **Simplify the language and tools**

- The feedback generally agreed with simplifying EBVs and ASBVs into easy to read visuals that can be understood and used by the wider commercial sector.
- It is intended that the importance of breeding values and related information **will not** be removed. All information currently available on animals will still be available and accessible for those who use it.
- Grouping of traits (a method of sub-index) can be represented in a meaningful straightforward visual approach (e.g. represented in stars or a simple grouped-trait percentile graph), but again, all breeding values be available by e.g. one click of a website/app or below when printed. Industry consultation will be critical to confirm any changes are appropriate and aligned.
- Agreement that $indexes need to be more meaningful and have much more producer consultation/buy-in to have better uptake. Less indexes for each breed and more meaningful weightings/traits to represent different production systems.
- BreedObject – used to create personalised indexes – increase awareness in the commercial sector and explore ways of making more user friendly.
- Sire selection tools – develop easy to use tools for sire selection. The 'Good Bulls" app is a demonstration of how to simplify selection, but still maintaining the integrity of the technical information.
- Incorporating a value (economic or productivity) to these selection tools will enhance the uptake and understanding and hence use.
- Explore opportunity for aligning breeding value and index language with value chain language e.g. MSA index, Eating Quality, MSA Marb. instead of IMF EBVs
- Update the BREEDPLAN and Sheep Genetics platforms/websites to align with any advancements in tools, language and display.

- It is important that in the future when we introduce the data platform, multi-breed and potential genomic tools such as feedlot and carcase/eating quality prediction, that simplified uniformed common language is used to increase the chances of adoption by the wider sector.

4. **Align adoption and R&D**

- Much of the research requires a specific adoption plan initiated alongside the research.
- This pillar focusses on the adoption of new technologies, some of which was detailed at the forum, by proving support to **both** the stud and commercial sector.
- This pillar includes the adoption of currently available technology to the **stud sector**; we are working closely with the research and extension base to increase adoption of available tools with an aim of maximising genetic gain.
- The key to rolling out new R&D is to have producer engagement/consultation throughout the research phase, which will be developed in the adoption plan for each project.
- Co-innovation or producer research sites, (similar to producer demonstration sites within pillar one), is one effective method of narrowing the time between adoption and R&D along with a platform to demonstrating value.
- Similarly, it is important to leverage the early adopters from the research and demonstrate value and return on investment to generate wider adoption.
- Engaging commercial organisations who market new technologies.

The feedback gained from the first three sessions will assist in refining the adoption plans which will underpin the roll-out of this exciting research. The research and adoption teams will be working side by side to ensure the best chance of uptake and industry benefit from the R&D.

Data platform
Having a data platform will no doubt increase the adoption of genetics as a tool in the wider industry, though making sure this is in a usable format with the tools and in language that is common across the value chain is critical. It is important that platform is set by implementing the strategies outlined in the first three pillars of the adoption plan.

Multi-breed
Multi-breed will assist in increasing the adoption rate of genetics and the tools, though if the initial pillars of the outlined strategy are not implemented, then there will be similar issues relating to lack of value proposition and understanding the language that we face today.

Genomic and future tools
The opportunities that genomics may provide the industry are exciting. Along with increasing the accuracy of breeding values, particularly for hard to measure traits such as carcass, eating quality and fertility, there are potential opportunities for predicting animal performance for feedlot/finishing and carcass. Aligning with the first three pillars of the strategy, these tools used which will be used by producers and the value chain, need to be consistent in language, along with the value and return on investment clearly identified.

Attendees suggested ways for MLA and industry to accelerate genetics adoption. All suggestions, bar one, are a part of the livestock genetics adoption strategy:

- Deliver multi-breed EBVs for the beef industry (pillars 3 and 4)
- Cheaper, user friendly and timely genomic tools to be used across the value chain (pillar 1 and 3)
- Demonstrate the value of genetics to the wider industry (pillar 1)
- Simplify and use a common genetic/value chain language (pillar 3)
- Increase connectivity Australia wide (this is the focus on another MLA program which is currently underway)
- Focus on people willing to change/early adopters (pillar 1)
- Deliver an accessible data platform allowing for full value chain feedback and genetic data (pillar 3 and 4)
- Explore ways of compensation for genetic data contribution – stud and commercial (pillar 1)
- Align the genetic and value chain resources in message and understanding (pillars 1 and 3)
- Work closely with the value chain to value and compensate for good genetics (pillar 1)
- Co-innovate and involve stud and commercial producers in research (pillar 1 and 4)
- Drive cultural change by embedding adoption into research (pillar 4)
- Incentivise producers to purchase animals with breeding values (pillar 1)
- More support for technical systems for breeders in extensive northern Australia (pillars 2 and 3)

Figure 1: The livestock genetics adoption plan

Genetics Adoption Plan

NLGC Goal By 2022, >$400M of industry improvements across the value chain through doubling the rate of genetic gain

Barriers
- Lack of value proposition
- Trust of evaluations
- No incentive to improve

- Mixed messages
- Lack of resources
- Spectrum of knowledge

- Complex language, tools and platforms, particularly for commercial producers

- Difficulty/time recording
- No across breed evaluation
- Feedback on performance
- Hard to measure traits

Commercial producers driving a demand for genetics

Adoption strategic goals

Demonstrate **value** and grow demand

Develop a pathway to **learning**

Simplify the language and tools

Align adoption and R&D

Adoption tactics
- Commercial Case studies
- Genetics campaign
- Demonstration sites
- Connect genetics to consumer
- Grow value chain partnerships and demand

- Develop genetics network
- Platform for alignment, collaboration and education
- Resource for information
- Identify resource gaps
- Value chain approach to delivery and education

- Simplify EBVs/ASBVs
- Better clarification/use of $indexes
- Develop selection tools incl. economics/value
- Update evaluation platforms

- Confirm R&D leads to adoption – the right R&D
- Clear adoption plan at initiation of R&D
- Have clear monitoring and evaluation guidelines

Continually monitor, evaluate and adjust based the success of the strategy goals

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Validate the barriers and issues to adoption

Top rating issues:
1. No clear incentive to improve (both stud and commercial)/lack of market pull through
2. Lack of trust in the data in and out
3. Lack of education, alignment (conflicting messages), training and resources
4. Complex language – lack of understanding or using the system incorrectly
5. Hard to measure traits, particularly in extensive geographies and cost and labour involved

Other highlighted issues:
- Visual assessment used only for sire selection – needs to be in combination with breeding value data. This is leading to wrong trends in purchasing behaviour e.g. weight * price correlation
- No multi-breed evaluation
- Lack of feedback data/streamlined information/disconnect between parts of value chain
- Return on investment for genotyping
- Lack of animals with EBV data available
- Peer-group pressure
- Lack of commercial providers for genotyping
- Missing traits – Feed efficiency (cow)
- Lack of understanding of market/breeding objectives
- Unwillingness to invest in building data – if you are not measuring, why would you start?
- NLIS failing to collect and report accurate data
- Lack of decision making tools
- Lifetime capacity of Bull/Cow
- Lack of business skills to analyse key drivers of profit
- No benchmark tools for commercial sector/tracking of genetic performance

Success in the commercial industry

There was general agreement that the below goals for the commercial industry were an indicator of success, with an understanding that these will change between species and region.

1. Producers using value chain feedback to make genetic and whole of farm decisions (data platform)
2. Having clear breeding and business goals and good methods of recording to measure improvement
3. Commercial producers understanding and using the tools properly (including future tools such as genomics for selection and economic estimations of breeding decisions)
4. Paying for breeding animals in balanced manner i.e. on genetic merit in combination with visual assessment (not just visual/weight assessment)
5. Commercial producers buying/requesting/demanding animals with BVs regardless of breed (available multi-breed evaluation)
6. Producers being compensated for the genetic merit, predicted or actual performance of animals

Other indicators of success in the commercial industry:
- High percentage of animals sold with data
- Producers being compensated for performance/share of consumer needs and $
- Standard methods of genetically comparing farms/benchmarking/demonstrating value/monitor whole farm production (catering for seasons)
- Positive return on investment regardless of environment
- Commercial producers becoming partners with seed stock – possible contribution of recording – phenotypic/genotype
- Engagement across a greater proportion of the livestock industry – not just top 10-20%
- Language used in carcass/feedlot feedback is common with genetic evaluations
- Having eating quality BVs to influence breeding programs