Multibreed Beef Genetic Evaluation

The establishment of 'multibreed beef genetic evaluation and livestock credentials' is listed as one of five bold ambitions in the MLA Strategic Plan 2030. This fact sheet provides further information about the establishment of national, industry-wide, multibreed beef genetic evaluations.

Introducing Multibreed Genetic Evaluations

Two beef multibreed genetic evaluations are initially being established, with one evaluation incorporating tropical breeds (TROPBEEF), and one incorporating temperate breeds (TEMPBEEF).

The multibreed genetic evaluations will deliver new selection tools (Australian Cattle Breeding Values or ACBVs, Australian Cattle Genomic Values or ACgVs, and Australian Cattle Genetic Profiles) that will enable the beef industry to improve productivity, profitability and sustainability through faster genetic improvement.

The establishment of multibreed beef genetic evaluation is in a research and development phase. Once the research and development phase is complete, the TROPBEEF and TEMPBEEF evaluations will be made available for industry review and consultation, before progressing to commercialisation. At this stage, the TROPBEEF genetic evaluation is scheduled for commercial release in November 2027, followed by the TEMPBEEF genetic evaluation in November 2028.

Breeds Included

Breeds targeted for inclusion in each multibreed genetic evaluation include:

TROPBEEF	TEMPBEEF
Belmont Red, Braford, Brahman, Brangus, Charbray, Droughtmaster, Santa Gertrudis, Tropical Composites and Ultrablack.	Angus, Beef Shorthorn, Blonde d'Aquitaine, Charolais, Devon, Hereford, Limousin, Murray Grey, Red Angus, Shorthorn, Simmental, Speckle Park, Salers, South Devon and Wagyu.

Benefits of Multibreed Genetic Evaluation

BREEDPLAN has been the cornerstone of genetic improvement in the Australian beef industry for more than 40 years, with the resultant genetic improvement generating an estimated $11.6 billion in additional profitability on a net present value basis.

While one of the industry's most successful technology and innovation investments, BREEDPLAN Estimated Breeding Values (EBVs) have been limited to allowing the genetic merit of animals to be compared within a single breed.

The establishment of multibreed genetic evaluation is the next evolution in Australia's national beef genetic evaluation ecosystem and aims to address this limitation, maintaining the ability for breeders to select animals within a single breed, while introducing additional capability where the genetic merit of animals can also be directly compared across breeds.

Benefit 1 - Breeders are provided with better tools for genetic improvement

Multibreed beef genetic evaluations will deliver a suite of new selection tools that allow beef breeders to directly compare the genetics of animals both within and across breeds, presented as Australian Cattle Breeding Values, or ACBVs, Australian Cattle Genomic Values, or ACgVs, and Australian Cattle Genetic Profiles, or GenProfiles.

Together, these tools will provide beef producers with more informative measures of an animal's genetic merit, helping accelerate rates of genetic gain, and delivering additional improvements in productivity, profitability and sustainability throughout the beef supply chain.

Benefits for commercial beef producers
Multibreed beef genetic evaluations are particularly advantageous to commercial beef producers.

Using Australian Cattle Breeding Values, commercial producers will be able to directly compare the genetics of bulls from different breeds, enabling them to better utilise the genetic variation that exists both within and across breeds. This will be of particular value to commercial producers who are operating crossbreeding programs.

Multibreed beef genetic evaluation will also provide commercial producers with access to new genomic tools not previously available from single breed genetic evaluations.

Australian Cattle Genetic Profiles will provide commercial beef breeders with an across-breed, genetic benchmark of their herd, better informing bull purchasing decisions and enabling commercial herds to track genetic progress over time.

Similarly, the availability of Australian Cattle Genomic Values, or ACgVs, will provide commercial beef breeders with an across-breed genomic prediction of an animal's genetic merit based on an animal's genomic (or DNA) profile, facilitating precision selection of replacement heifers in a commercial breeding operation, along with precision sorting and/or marketing of steers into lines suitable for the different paths in the beef supply chain.

Benefits for seedstock beef producers
While commercial producers are expected to gain significant value, seedstock breeders will also benefit from a multibreed evaluation system, with the ability to market genetics more effectively to commercial operations running different breed types. For example, seedstock breeders will be able to objectively demonstrate the genetic merit of their bulls to producers with a different breed of females. This creates new opportunities for seedstock producers to access a broader customer base and clearly communicate the value of their genetics.

Multibreed genetic evaluations are also advantageous to seedstock breeders with composite and crossbred animals, which are often poorly represented or excluded from traditional single breed evaluations. Multibreed genetic evaluation provides a framework for analysing these animals alongside straightbred populations, ensuring that all seedstock animals can be incorporated in national genetic evaluations, irrespective of breed.

Benefit 2 - Consolidation of evaluations enables faster product innovation and improved service delivery

Over 20 single breed genetic evaluations are currently conducted in Australia using BREEDPLAN software. Multibreed genetic evaluation consolidates these single breed analyses into a small number of core genetic evaluations, reducing duplication, and greatly improving the efficiency of product and service delivery.

Consolidated, multibreed genetic evaluations enable resourcing to focus on maintaining and enhancing a limited number of genetic evaluations, supporting faster and more agile technology adoption, more frequent enhancements, and better integration of new tools.

Additionally, the availability of new, across breed genomic tools for commercial producers makes the national, industry wide genetic evaluation available to a larger number of beef producers, with the resultant economies of scale introducing potential to reduce the price of genetics products and services.

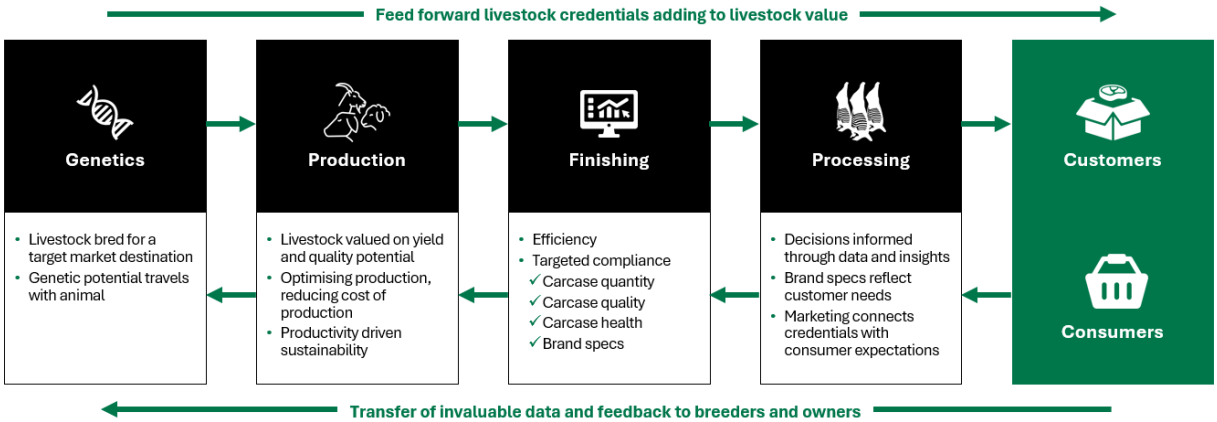
The outcome is a stronger and more sustainable national genetic evaluation ecosystem that provides greater value to breeders, commercial producers, service providers, and the broader beef industry.

Benefit 3 - A standard industry language for describing genetic credentials of commercial animals is established

Multibreed genetic evaluation creates a common language for describing the genetic credentials of commercial animals, independent of breed, establishing a framework for animals to be sold with an industry recognised description of their genetic merit.

With the genetic credentials of commercial animals better described, and feeding forward with animals as they move through the supply chain, the link between genetic merit and animal performance is strengthened, ensuring genetics are valued accordingly by the beef supply chain

This will better drive demand for superior genetics through the introduction of clearer price signals, transitioning the breeding industry from the current 'push' model, to an operating environment where the beef supply chain rewards genetics that are more closely aligned to market requirements, driving additional genetic improvement across the industry.



Benefit 4 - Past investment by MLA and industry partners is realised

Over many years, significant investments have been made by Meat & Livestock Australia (MLA), and industry partners to collect sufficient data to underpin the design and delivery of commercial, multibreed beef genetic evaluations. Since 2016 alone, approximately $40 million of R&D investments have been made, including the renowned Repronomics and Southern Multibreed Beef projects.

The establishment of multibreed genetic evaluations ensures the value of this industry-funded research is fully realised, turning research investments into tangible outcomes that deliver improved productivity, greater sustainability, and enhanced profitability across the beef supply chain.

Multibreed Selection Tools

	Australian Cattle Breeding Values (ACBVs)	Australian Cattle Genomic Values (ACgVs)	Australian Cattle Genetic Profiles (GenProfile)
Description	Australian Cattle Breeding Values, or ACBVs, predict genetic differences between animals, and can be used to compare the genetics of animals across breeds, herds and environments. Similar to BREEDPLAN EBVs, ACBVs are calculated from a range of sources including pedigree, performance and genomic information. ACBVs are the best estimate of an animal's genetic merit for particular traits and production systems.	Unlike ACBVs that rely on pedigree submission and performance recording, Australian Cattle Genomic Values, or ACgVs, provide commercial beef breeders with a genomic prediction of an animal's genetic merit based on an animal's genomic (or DNA) profile.	Australian Cattle Genetic Profiles provide commercial beef breeders with a genetic benchmark of their herd.
Used for	Bull breeders - selecting replacement sires and dams; semen sires; AI and ET dams that best suit your production system and breeding objective. Bull buyers - selecting high value sires that best suit your production system and breeding objective.	Precision selection of replacement heifers in a commercial breeding operation. Precision sorting and/or marketing of steers into lines suitable for the different paths in the beef supply chain	Benchmarking the genetic merit of a commercial herd to a) inform bull purchasing decisions and b) track genetic progress over time.
Level of precision	★★★	★★	★
What is required	Individual pedigree, performance measurements and genotypes.	Genotyping individual animals	Genotyping 30 animals, selected at random from the animals that you want to benchmark (e.g. last calf drop, replacement heifers, breeding females).

Next Generation Traits

Beef multibreed genetic evaluations provide a platform for the future delivery of breeding values for a range of new traits.

Methane Emissions
New breeding values for methane emissions, which will contribute to Australia's net zero ambitions

Female Reproduction
New breeding values for weaning rate, enabling improved selection for female fertility, an important driver of profitability in beef breeding enterprises.

Carcase Value
New breeding values for the overall economic value of a carcase, and its key drivers, carcase weight, yield, and eating quality, providing a more direct measure of animal's genetic capacity to generate value through the beef supply chain.

Structural Soundness
New breeding values for structural soundness, including locomotion and feet and leg conformation, using innovative computer vision based phenotyping technology, rather than subjective scores.

Male Fertility
New breeding values for male fertility, combining component BBSE traits such as percent normal sperm, mass, motility, and sperm abnormalities, along with measurements collected from the bull such as body weight, scrotal circumference, and sheath score.

Adaptation
New breeding values for adaptation, identifying animals with a better ability to maintain productivity, health and welfare when exposed to environmental and parasite challenges such as heat stress, buffalo flies and cattle ticks.

Mature Cow Resilience
New breeding values for mature cow resilience, reflecting the ability of females to maintain adequate body condition and reproductive performance under the ongoing demands of a commercial breeding herd.

Immune Competence
New breeding values for immune competence, enabling selection for healthier, more resilient cattle with reduced susceptibility to disease and lower reliance on animal health interventions.

Timelines

The establishment of multibreed beef genetic evaluation is in a research and development phase. Once the research and development phase is complete, the TROPBEEF and TEMPBEEF evaluations will be made available for industry review and consultation, before progressing to commercialisation. At this stage, the TROPBEEF genetic evaluation is scheduled for commercial release in November 2027, followed by the TEMPBEEF genetic evaluation in November 2028.

Figure 1 – Timeline for the establishment of the TROPBEEF genetic evaluation

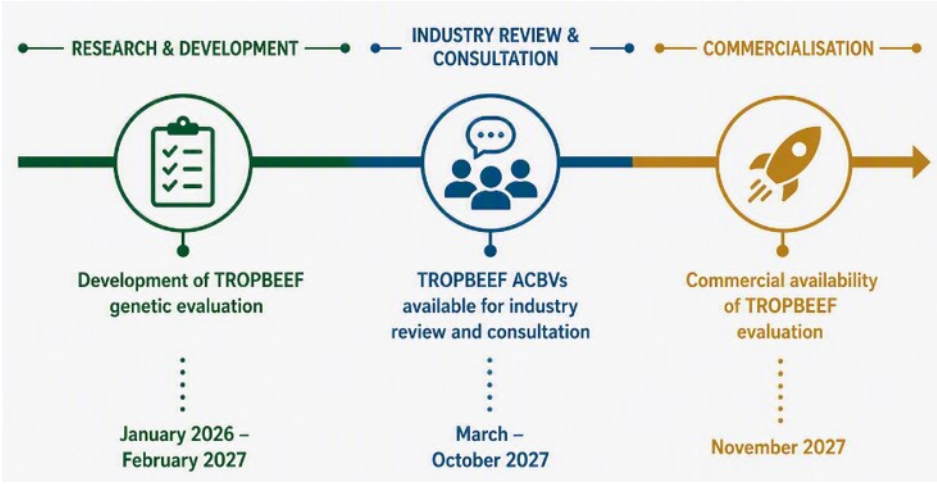
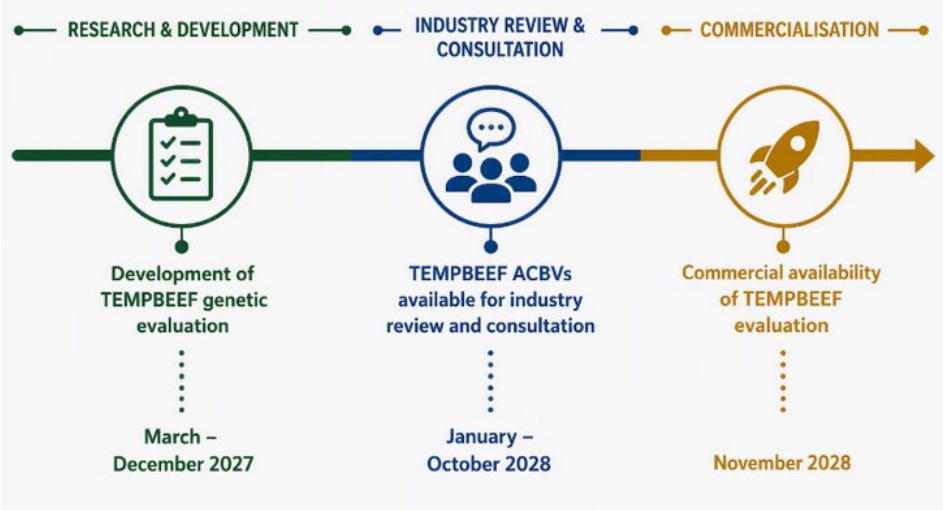


Figure 2 – Timeline for the establishment of the TEMPBEEF genetic evaluation



Industry Review & Consultation

The development of multibreed beef genetic evaluations will be subject to considerable industry and peer review to ensure that the genetic evaluations deliver the best possible tools to the beef industry.

Project Steering Committee	BREEDPLAN & Sheep Genetics Technical Committee	BREEDPLAN Advisory Committee	Stakeholder Information Sessions
The Project Steering Committee provides day-to-day guidance and management	The BREEDPLAN & Sheep Genetics Technical Committee provides scientific peer review and technical guidance	The BREEDPLAN Advisory Committee represent the views and requirements of users of the multibreed beef genetic evaluations	Bi-monthly information sessions communicate R&D outcomes to participating breed associations and key industry stakeholders

Implications for Single Breed Genetic Evaluations

Single breed BREEDPLAN evaluations continue to be available alongside multibreed genetic evaluation.

During the research and development phase, breed associations, as custodians of the data included in the single breed, BREEDPLAN genetic evaluation for their respective breed, are being invited to make this data available under a royalty free, non-exclusive license agreement to support the development of multibreed genetic evaluation. Under the terms of the license agreement, use of the data is restricted and all existing intellectual property ownership and rights in the data are maintained, with participating breed associations gaining the opportunity to participate in consultation, review activities and future commercial services once the multibreed genetic evaluations become available.

At the completion of the research and development phase, the multibreed breeding values will be published alongside the BREEDPLAN EBVs from single breed genetic evaluations for a review and consultation period to provide breed associations and beef breeders with the opportunity to review the selection tools being generated from the multibreed genetic evaluations.

During this review and consultation phase, breed associations will decide whether to maintain the current single breed BREEDPLAN genetic evaluation for their respective breed, and/or whether they would like to participate in multibreed genetic evaluation on an ongoing, routine basis.

Commercial Delivery of Multibreed Genetic Evaluation

The commercial delivery pathway for multibreed genetic evaluation is currently under development, with further announcements anticipated shortly.

Commercial arrangements, such as the commercial model and pricing, will be available during the review and consultation process. It is anticipated that access to multibreed genetic evaluation will be offered at a cost comparable to, or lower than, current single-breed BREEDPLAN evaluations.

Implications for Across Country Genetic Evaluation

Many single breed, BREEDPLAN evaluations include animals from overseas countries, such as New Zealand, South Africa and Namibia.

Multibreed genetic evaluation includes the same capability to include overseas animals, with breed associations from countries outside Australia also being invited to provide data to support the development of multibreed genetic evaluation, and participate in the routine, commercial multibreed evaluation once it is commercialised.

It is envisaged that multibreed breeding values will be presented in a form appropriate to each country. For example, multibreed breeding values in New Zealand may be presented as either New Zealand Cattle Breeding Values, or Estimated Breeding Values.

Investment in Multibreed Genetic Evaluation

Considerable new investments across four key pillars are planned over the next 10 years to make multibreed genetic evaluations a reality.

Grants & Funding Opportunities

A range of funding opportunities will become available to support adoption of the multibreed beef genetic evaluations, along with further innovation. Keep an eye out for funding application details on the MLA website.

Adoption of Multibreed Beef Selection Tools	Genomic Reference Populations	Breed Specific Priorities
Co-funding of education and extension staff to support adoption of multibreed beef selection tools	Co-funding of genomic reference populations	Co-funding to support breed specific research and development priorities

More information

Got questions? Contact an MLA staff member to find out more.

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Frequently Asked Questions – For Breeders

1. What is multibreed beef genetic evaluation?
Multibreed beef genetic evaluation involves the establishment of an industry wide, national genetic evaluation platform that enables the genetic merit of animals to be compared both within and across breeds. It will deliver new selection tools, including Australian Cattle Breeding Values (ACBVs), Australian Cattle Genomic Values (ACgVs) and Australian Cattle Genetic Profiles (GenProfiles).

2. Why is multibreed genetic evaluation being established?
Multibreed genetic evaluation is the next evolution in the beef genetic evaluation ecosystem and is being developed to enable the direct comparison of genetic merit across breeds, while maintaining the ability to compare animals within breeds. It provides improved selection tools for commercial and seedstock producers, supports faster rates of genetic gain, and establishes a common industry language for describing the genetic credentials of cattle.

3. Which breeds will be included?
Two beef multibreed genetic evaluations are initially being established, with one evaluation incorporating tropical breeds (TROPBEEF), and one incorporating temperate breeds (TEMPBEEF). Initial breeds targeted for inclusion in the TROPBEEF evaluation include Belmont Red, Braford, Brahman, Brangus, Charbray, Droughtmaster, Santa Gertrudis, Tropical Composites and Ultrablack. Initial breeds targeted for inclusion in the TEMPBEEF evaluation include Angus, Beef Shorthorn, Blonde d'Aquitaine, Charolais, Devon, Hereford, Limousin, Murray Grey, Red Angus, Shorthorn, Simmental, Speckle Park, Salers, South Devon and Wagyu.

4. Why are there separate genetic evaluations for the tropical and temperate breeds?
The establishment of the TROPBEEF and TEMPBEEF genetic evaluations reflects the data currently available from major research projects where the performance of different breeds have been compared head-on-head under the same environmental conditions. Most notably, these research projects have included the Repronomics projects, where major tropical breeds were compared head-on-head, and the Southern Multibreed Project, where major temperate breeds were compared head-on-head.

5. When will multibreed evaluations become available?
The establishment of multibreed beef genetic evaluation is in a research and development phase. Once the research and development phase is complete, the TROPBEEF and TEMPBEEF evaluations will be made available for industry review and consultation, before progressing to commercialisation. At this stage, the TROPBEEF genetic evaluation is scheduled for commercial release in November 2027, followed by the TEMPBEEF genetic evaluation in November 2028.

6. Will multibreed genetic evaluation replace BREEDPLAN?
No. The national, industry wide multibreed genetic evaluations will continue to utilise BREEDPLAN analytical software and are simply the next evolution in the beef genetic evaluation ecosystem. Single breed BREEDPLAN evaluations will continue to be available if breed associations wish to maintain a within breed genetic evaluation for their respective breed.

7. How are multibreed genetic evaluations different from BREEDPLAN?
BREEDPLAN primarily enables the genetic merit of animals to be compared within a breed, whereas multibreed evaluation enables direct comparison across breeds as well. Multibreed evaluations will complement existing BREEDPLAN services rather than replace them. They will also provide new genomic tools and commercial selection opportunities that are not currently available through traditional single-breed evaluations.

8. What new tools and traits will become available under multibreed beef evaluations?
Multibreed evaluations will deliver a suite of new selection tools, including Australian Cattle Breeding Values (ACBVs), Australian Cattle Genomic Values (ACgVs) and Australian Cattle Genetic Profiles (GenProfiles). Multibreed evaluations will also provide a platform for a range of new breeding values, for traits such as methane emissions, female reproduction, carcase value, structural soundness, fertility, adaptation, immune competence and mature cow resilience. Many of these traits have traditionally been difficult or expensive to measure on a large scale. Their inclusion will provide producers with new opportunities to make genetic progress in areas that directly influence productivity, profitability and sustainability.

9. Will multibreed genetic evaluation reduce the accuracy or usefulness of breeding values?
Initial research involving the Brahman, Santa Gertrudis and Droughtmaster breeds showed that the accuracy of breeding values increased when the data from each breed was consolidated into a multibreed genetic evaluation. The increase in accuracy was highest for traits with less data, and when breeds are more closely related genetically. Further research will now be undertaken during the research and development phase to assess the impact on the accuracy of breeding values in other breeds. Multibreed genetic evaluation aims to enhance, rather than reduce, the usefulness of breeding values.

10. What industry consultation was undertaken when deciding to establish multibreed genetic evaluation?
Multibreed genetic evaluation is the result of long-standing industry demand that has been identified through genetics reviews, industry consultation processes and strategic planning activities since the 1990s, and it has been consistently supported as a priority by the National Livestock Genetics Consortium. Approximately $40 million of R&D investment since 2016 in projects such as Repronomics and the Southern Multibreed Project has removed technical barriers and made the establishment of multibreed genetic evaluation possible.

Frequently Asked Questions – For Breed Associations

1. Will participation in multibreed genetic evaluation be mandatory?
No. Participation in multibreed genetic evaluation will remain a choice for breed associations. Single-breed BREEDPLAN evaluations will continue to be available for breed associations that wish to maintain them.

2. Why are breed societies being asked to provide data?
Breed associations, as custodians of the data included in the single breed, BREEDPLAN genetic evaluation for their respective breed, are being invited to make this data available to support the development and validation of robust multibreed genetic evaluations. Inclusion of data from their single breed, BREEDPLAN genetic evaluation will best position breed associations to review the selection tools being generated from the multibreed genetic evaluations, and decide whether to maintain the current single breed BREEDPLAN genetic evaluation for their respective breed, and/or whether they would like to participate in multibreed genetic evaluation on an ongoing, routine basis.

3. Does multibreed present a risk to the future of breed associations and their business model?
No. Breed societies who elect to participate in the national, industry wide multibreed genetic evaluations will continue to play an important role in the delivery of genetic evaluation services to their members. Multibreed genetic evaluation is intended to enhance the services available to breeders, not disrupt the role or business model of breed associations.

4. Will multibreed genetic evaluation mean there will be no breeds, or prevent individual breeds from being recognised and rewarded within the supply chain?
No. Breeds will continue to be recognised and valued within the beef industry. Multibreed genetic evaluation simply provides an additional framework for comparing genetic merit across breeds, while maintaining the existing ability for breeders to select animals within a single breed.

5. Will multibreed genetic evaluation replace current single breed genetic evaluations?
No. While it is envisaged that multibreed genetic evaluation will remove the need to also conduct single breed genetic evaluation, single breed BREEDPLAN genetic evaluation will still be available to breed associations who would like to maintain an evaluation for their breed. Following the research and development phase, multibreed breeding values will be published alongside existing single breed BREEDPLAN EBVs during a review and consultation period, allowing breed associations and their members to decide whether to maintain the current single breed BREEDPLAN genetic evaluation for their respective breed, and/or whether they would like to participate in multibreed genetic evaluation on an ongoing, routine basis

6. What happens if a breed association elects not to make the data available from the single breed, BREEDPLAN genetic evaluation for their respective breed to the development of multibreed genetic evaluation?
Where a breed association chooses not to participate, interested breeders will have the opportunity to participate directly in the development of multibreed genetic evaluation, and once commercialised, access multibreed genetic evaluation services.

7. Will data provided to multibreed genetic evaluation be provided to third parties, such as genomic companies or multi-nationals to support genomic tools for commercial or composite cattle?
No. During the research and development phase, licence agreements restrict the use of contributed data to the development of the multibreed genetic evaluation. Existing intellectual property ownership and rights remain unchanged, and data cannot be used for purposes outside the agreed terms in the license agreement. While arrangements for the commercial delivery of the multibreed genetic evaluations are still under development, it is envisaged similar terms will apply to participation in multibreed genetic evaluation as to the terms that apply to the existing single breed BREEDPLAN genetic evaluations.

8. How will multibreed genetic evaluations be governed?
The governance arrangements for industry wide, national multibreed genetic evaluation are currently under development. It is envisaged that multibreed genetic evaluations will be supported by a governance framework that includes industry representation, scientific peer review and stakeholder consultation. The BREEDPLAN & Sheep Genetics Technical Committee and BREEDPLAN Advisory Committee are likely to play key roles in the governance framework, along with regular stakeholder engagement activities.

9. How will multibreed genetic evaluations be commercialised?
The commercial delivery pathway for multibreed genetic evaluation is currently under development, with further announcements anticipated shortly. Details relating to service delivery, pricing and participation arrangements will be available as part of the review and consultation process prior to commercial release.

10. Who will own and manage the resulting intellectual property?
Existing intellectual property rights in data contributed to the multibreed evaluation remain with the original data owners. Arrangements relating to the ownership and management of any new intellectual property generated through the multibreed evaluation program are currently being developed and will be communicated as part of the commercialisation process.