



SHEEP GENETICS AUSTRALIA



THE MISSION:

Genetic improvement for a sustainable and profitable Australian sheep industry facilitated by the world's best sheep genetic evaluation system.

Sheep Genetics Australia is the new genetic evaluation and information service for the Australian sheep industry. Sheep Genetics Australia is a joint initiative of the Australian sheep industry, Meat & Livestock Australia and Australian Wool Innovation Limited.



FOREWORD

Genetic improvement is one of the fundamental tools that will enable Australian sheep producers to increase the productivity of their wool, lamb and sheepmeat enterprises.

Both the meat sheep and Merino industries have made significant advances in developing and adopting objective measurement and genetic evaluation. However our progress can be improved.

Together with the Australian sheep industry, Meat & Livestock Australia and Australian Wool Innovation Limited have developed a world's best practice genetic evaluation service to deliver credible, accurate breeding values in a single language that are accessible to all stakeholders in the sheep industry.

This national standard enables sheep breeders to compare the genetic merit of rams and ewes within designated groups, breeds or where appropriate between breeds. This has not been possible in all cases to date due to differences in various databases and languages used to describe genetic information.

Sheep Genetics Australia has been developed to utilise the world's most comprehensive sheep genetic database and evaluation service for the Australian sheep industry underpinned by a best practice quality assurance system.

Sheep Genetics Australia provides commercially relevant information to help sheep producers more effectively select breeding animals for their particular enterprise.

The genetic information held in Sheep Genetics Australia is owned by the industry and its delivery is supported by a comprehensive website available 24 hours a day.

Relevant to all sheep breeds, Sheep Genetics Australia is a significant initiative that will undoubtedly become one of the sheep industry's most important tools to increase productivity through genetic improvement and as a result contribute to the prosperity of Australia's sheep enterprises.



David Crombie

David Crombie
Chairman
Meat & Livestock Australia



The Hon Ian McLachlan AO

The Hon Ian McLachlan AO
Chairman
Australian Wool Innovation Limited

SGA KEY FEATURES – WHAT YOU NEED TO KNOW

A common national language for genetic evaluation – Australian Sheep Breeding Values (ASBVs)
Across-flock, and where appropriate, across-breed genetic evaluation
Breeders retain direct ownership of their data
Frequently updated genetic information and an efficient delivery system of relevant benchmarks
Commercially relevant traits for all sectors of the sheep industry
High levels of accuracy and quality assurance



THE FOUNDATIONS

Sheep Genetics Australia (SGA) is the national genetic information and evaluation service for the meat and wool sectors of the sheep industry.

SGA will host records on initially around one million individual Merino sheep, and a similar number from the terminal and maternal sire breeds – reflecting the data from more than 1000 flocks around Australia.

The data has been drawn from the Merino Benchmark, LAMBPLAN, CSIRO Select Breeding Services, Merino Genetic Services, Australian Merino Sire Evaluation Association (AMSEA) Central Test Sire Evaluation databases and other independent providers. It is anticipated that the database will grow as more breeders participate.

SGA's main purpose is to improve the quality, scope and utilisation of across-flock, and where appropriate across breed genetic information for the Australian sheep industry.

SGA acts as a resource for sheep genetic information and improvement through which commercial producers, ram breeders and service providers can interact.

It will supplement the skills of ram breeders and sheep classers by evaluating current measurements and providing further information, often on traits that cannot be assessed visually e.g. reproduction, carcase and internal parasite characteristics.

SGA will interact with federal and state agencies, breed societies, livestock agents, sheep classers, agricultural advisors and veterinary consultants, fleece testing businesses and genetic service providers. It will function as Australia's sheep genetic information database for all stakeholders to use.

SGA will be an evolving genetic evaluation system, that is able to be upgraded to accommodate new, proven technologies as they arrive, including DNA parentage, gene markers, new traits, and electronic identification.

SGA SERVICES

The core SGA product is the provision and maintenance of a national database for the calculation of breeding values using a single standard for genetic information. These breeding values will be released in the form of trademarked Australian Sheep Breeding Values (ASBVs).

ASBVs are designed to be used by ram breeders and commercial producers to compare the genetic potential of rams and ewes for a range of industry agreed traits, across flocks, independent of the environment and location.

ASBVs will be delivered via MERINOSELECT and LAMBPLAN, which have been designated for the wool and prime lamb sectors respectively.

MERINOSELECT is for Merino ram breeders and commercial wool producers. It is the new brand name for Merino genetic information combining data from the current Merino schemes into a national, consistent and quality assured service.

LAMBPLAN continues as the brand name under which genetic information is delivered to terminal, maternal

and dual purpose ram breeders and commercial lamb and sheep producers.

Brands for other breeds will be developed as they elect to use SGA.

Terminal, maternal, dual purpose and Merino breed information will be stored, managed, utilised and reported as separate databases as will the information for specific breed groups.

Information evaluated by SGA describes the genetic performance of sheep within their breed or industry group, for example, Merino or terminal sire breeds. The majority of producers will have a minimum standard of pedigree links to other flocks within their breed or industry group to allow their sheep's genetic performance to be compared to other flocks and to their appropriate benchmarks.

Breeding values are typically expressed as the difference between an individual's merit and the average merit base of the year of the genetic pool to which the animal is compared. SGA has developed new terminology to express this estimated breeding value.



NEW TERMINOLOGY FOR BREEDING VALUES

ASBVs will become the primary sheep genetic evaluation language in both MERINOSELECT and LAMBPLAN.

ASBVs will be derived from measured or visually scored traits using agreed standard procedures. In many respects, ASBVs are similar to genetic evaluation estimates that are used in other sectors of the livestock industry.

There will be a wide range of ASBVs. They will be available for the following core traits:

- wool
- growth
- carcase
- reproduction
- internal parasite resistance
- temperament

To ensure integrity, genetic data will only earn ASBV status if it meets accuracy, quality assurance and across

flock linkage standards, determined after review by a technical committee of SGA.

Producers will be able to use ASBVs in selection programs to focus on specific traits such as fibre diameter, growth rate, reproductive rate or a combination of traits that suit their flocks' breeding objective.

In the future, other traits may be considered and included. These include structural soundness, bare breech, style, crimp definition, face cover, body wrinkle, wool colour and lambing ease.

Those animals with the most favourable ASBVs for different traits will be identified in trait leader and elite animal summaries.

Flock Breeding Values (FBVs) will be a secondary term to allow breeders whose data do not meet ASBV standards at a particular point in time to receive breeding values that are comparable within their flock only.

THE CORE DIFFERENCES BETWEEN ASBV_s AND FBV_s ARE SHOWN IN THE TABLE BELOW:

ASBV	FBV
Minimum standard for across-flock linkage	Where across flock linkage is inadequate
Minimum standards for quality assurance	Flocks where quality assurance is below minimum
Minimum standards for trait accuracy	Trait accuracy levels below a standard threshold
ASBV _s accuracy information released	FBV _s will not have accuracy values released
Pedigree information provided	No or limited pedigree information provided
Direct measurement of traits	Traits where there is no appropriate direct measurement

CURRENT APPROVED PRODUCTS TO BE MADE AVAILABLE THROUGH SGA ARE:

Trait	Age of Assessment					
	Birth	Weaning	Post-weaning	Yearling	Hogget	Adult
Body weight	✓	✓	✓	✓	✓	✓
Carcase traits (GR Fat and EMD)			✓	✓	✓	
Fleece weight – greasy and clean				✓	✓	✓
Fibre diameter				✓	✓	✓
CV of diameter				✓	✓	✓
Curvature				✓	✓	✓
Staple length				✓	✓	✓
Staple strength				✓	✓	✓
Faecal egg count		✓	✓	✓	✓	✓
Number of lambs born						✓
Number of lambs weaned						✓
Scrotal circumference			✓	✓	✓	

SGA ALSO PROVIDES A RANGE OF OTHER SERVICES THAT SHEEP PRODUCERS AND BREEDERS CAN USE AS TOOLS IN THEIR BREEDING PROGRAMS.

Product or Service	Description	Level of Release
ASBV accuracy	Accuracies are based on the number of effective records for each trait. Accuracies should be reported with all ASBV _s that are made public	Client
Inbreeding measures	Every animal that enters the SGA database will have an inbreeding coefficient calculated	Client
Trend reports	A genetic trend report that benchmarks the average breeding values of a year drop of a flock against a specific group, breed or industry average	Client
Standard indexes	Standard multi-trait indexes will be determined and made available for each sector of the industry. Custom indexes can also be developed	Client and Industry
Trait leader summary	Details of sheep in the top 10% band for each ASBV will be accessible	Client and Industry
Percentile reports	Reports will be produced that list ASBV ranges within each percentile for all traits of the current drop of animals	Client and Industry

THE FEATURES OF USING SGA ONLINE

For ram breeders:

To participate in SGA, ram breeders must submit data on their sheep to the SGA database. They can do this directly themselves through on-farm software or through an accredited service provider.

The website **www.sheepgenetics.org.au** will have three main functions for ram breeders:

- providing access for ram breeders' data to be submitted to the SGA database.
- providing access to the measurements collected and breeding values calculated. Breeders will have a set of query, reporting and diagnostic tools provided to them on the web site for managing their data within the SGA database. SGA will also provide breeders with a searchable database of animals for potential use in breeding programs.
- providing news, information, and examples of using ASBVs within a breeding program.

Ram breeders will be provided with a secure user name and password to access their measurements and breeding values. Breeders will also be able to nominate

service providers who will have access to their data and be able to assist or manage it on the breeder's behalf.

Breeders retain ownership of their data contributed to the SGA database and can remove data on a whole flock basis from the database under certain conditions. SGA will not publish breeding values on animals without the permission of the owner.

The rapid processing of data is a main feature of the SGA database. Data will be screened and processed for ASBVs and FBVs fortnightly, and be available as a percentile band table or report. A detailed timetable of analysis dates for various breeds is available from the website.

For commercial producers:

The SGA website (www.sheepgenetics.org.au) will provide access to the breeding values, standard indexes, trait leader summaries and other relevant information summaries from flocks which choose to make this information available on the SGA website.

Commercial producers will be able to perform customised searches for sheep with traits of commercial relevance to their business.

QUALITY ASSURANCE

To ensure that the quality of the information provided to industry is of the highest order, set procedures and minimum standards apply to the entry of data before it can be accepted for analysis and reporting.

Information sessions, and the SGA Breeders Quality Assurance Manual will provide additional information to assist industry.

There will be a period of two years from November 2005 to allow breeders time to obtain training and where required to comply with the quality assurance (QA) procedures.

The quality assurance system consists of four key elements:

- **Data collection and supply**
A QA Check List is required to be submitted with each dataset to verify that the relevant QA procedures have been met. Scanners, fleece testers, service and data handling providers must be accredited. Laboratories undertaking faecal egg counts (FEC) must use NEMESIS protocols. Breeders are required to have QA procedures training, and any breeder reporting data directly to the database needs to meet QA standards.
- **Data integrity checking**
The integrity of each dataset submitted is subject to checking before it enters the master database.

Any concerns identified will be raised with the user who submitted the data. Data cannot proceed into the master database unless all relevant QA procedures have been met.

- **Data processing**
Evaluation of genetic performance utilises sophisticated software – OVIS – developed at the University of New England by the Animal Genetics and Breeding Unit. OVIS has recently been further developed to accommodate the wide diversity of genetic types, and enhancement of analytical procedures will be ongoing.
- **Reporting**
Groups of progeny that can be compared on an across-flock basis will have trait performance reported as an ASBV with a percentage accuracy figure.
Groups of progeny that cannot be compared to other across-flock groups will have trait performance described as an FBV and will be distinguishable as they will be reported without a trait accuracy.
The SGA logo that will accompany reports will verify the quality assurance of ASBVs and FBVs. Only sheep that have satisfactory linkage can be reported under the MERINOSELECT or LAMBPLAN brand name logos and trademarks.

SGA OBJECTIVES

SGA has a clear set of objectives for achievement by June 2010:

- SGA will be an efficient and effective genetic evaluation program that will be recognised by industry as a key resource for ongoing genetic and business improvement
- At least 80% of Australian meat sheep rams will be evaluated through SGA
- At least 50% of Australian Merino rams will be evaluated through SGA
- More than 50% of rams sold in the Australian market will be sold with SGA breeding information
- Where applicable, the research and development outcomes from Australian Wool Innovation Limited and Meat & Livestock Australia's investment in genetic technologies will be delivered as products of SGA
- Genetic trends in commercially relevant traits agreed by industry will be reported annually to measure and report the rate of improvement



THE ECONOMICS

SGA is a not for profit service operating for the benefit of Australian sheep producers.

However, SGA budgets have been prepared using the principle that the delivery of genetic information that benefits individual producers should be paid for in full by the users.

Industry has settled upon an annual subscription per flock plus a fee per animal entered into the database.

An animal achieves a billable status when it has data entered into the database at a post-weaning record. Sheep that have records for birth weight and/or weaning weight alone do not attract the per animal charge. This means that once an animal is entered into the database, the owner can continue to add data on that animal throughout its life at no additional cost.

The fees outlined below cover the SGA analysis and reporting of data. The cost of measurement and collection of data is additional.

Service	Annual Fee	Per animal fee				
		2005-06	2006-07	2007-08	2008-09	2009-10
MERINOSELECT™	\$300	\$1.25	\$1.50	\$1.50	\$1.50	\$1.50
LAMBPLAN™	\$300	\$2.00	\$1.50	\$1.50	\$1.50	\$1.50
Other breeds	\$300	\$1.25	\$1.50	\$1.50	\$1.50	\$1.50

*These prices do not include GST and are subject to variation pending annual review

For owners of large scale or multiple flocks there is a maximum fee of \$2500 per business and for flocks with small numbers of progeny that are evaluated annually (<25), there is a flat rate of \$7.50 per animal.

SUMMARY OF TERMS & CONDITIONS

Clear guidelines and definitions will apply when using SGA information. A fundamental principle of SGA is that breeders have clear rights about the disclosure of data.

Breeders own the data that they send to SGA. Breeders will be able to remove their data under certain conditions. SGA will advise other breeders whose linkage and breeding value information may be affected by this data removal.

The Australian Merino Sire Evaluation Association (AMSEA) has direct control of Central Test Sire Evaluation (CTSE) data and disclosure. AMSEA will be responsible for the disclosure of rams that have progeny only in the CTSE.

There are clear and documented rules regarding the publication and use of brands and ASBV logos.

For more information on how to contact service providers and the terms and conditions outlined above please refer to the SGA website.

www.sheepgenetics.org.au

For latest information on

- Service providers
- Breeders Quality Assurance Manual
- SGA Business Plan
- ASBV user guides
- Tips and Tools
- Case studies with SGA advocates
- News



SHEEP GENETICS AUSTRALIA



CONTACT DETAILS

MANAGER:

Dr Alex Ball, aball@sheepgenetics.org.au

PROJECT ADMINISTRATOR:

Emily Wright, ewright@sheepgenetics.org.au

POSTAL ADDRESS:

PO Box U254
University of New England
Armidale NSW 2351

PH: 02 6773 3191

FAX: 02 6773 2707