Sheep Genetics Business Plan 2016-21

PUBLIC VERSION, 16 August 2016

Contents

Plan at a glance

The core elements of the SG Business Plan 2016-21 are summarised in Figure 1.

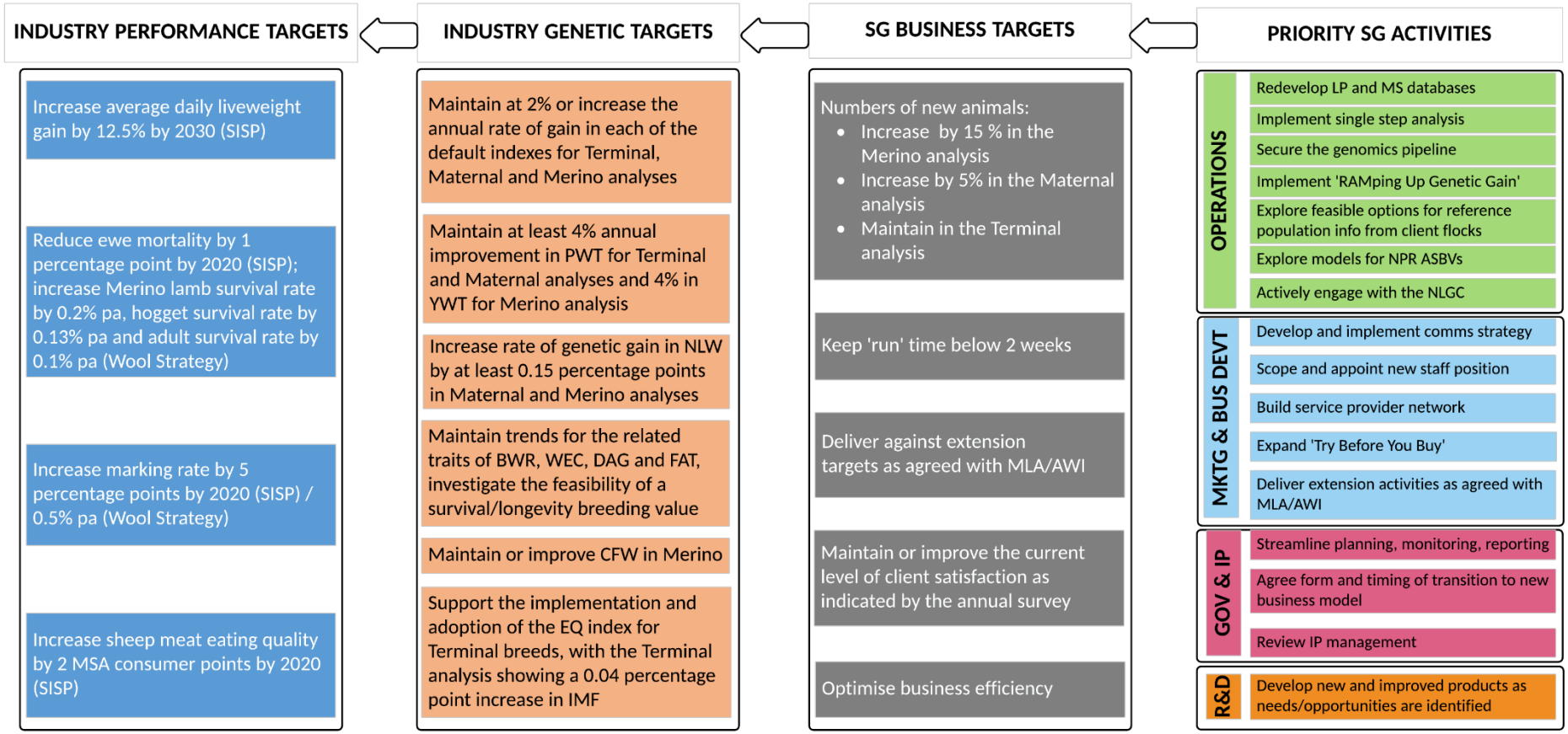

Figure 1. Logic framework for this plan.

Abbreviations

AGBU	Animal Genetics and Breeding Unit
ASBV	Australian Sheep Breeding Value
AWI	Australian Wool Innovation
BLUP	Best linear unbiased prediction
CRC	Cooperative Research Centre
FBV	Flock Breeding Value
FTE	Full-time equivalent
IP	Intellectual property
MLA	Meat & Livestock Australia
MSA	Meat Standards Australia
NLGC	National Livestock Genetics Consortium
NSIP	National Sheep Improvement Program
NPR	Non-performance-recorded
R&D(&E)	Research and development (and extension)
SG	Sheep Genetics
SISP	Sheepmeat Industry Strategic Plan

1. Introduction

Sheep Genetics (SG) has grown over the first decade of its life to become an essential service provider to the Australian sheep industry and to sheep producers elsewhere in the world, delivering world-class genetic evaluation services to grow industry profitability.

The five-year period of this Business Plan 2016-21 will see SG remain at the forefront of livestock genetics, the capabilities of which continue to expand. SG will continue to increase its market penetration and will broaden its service offer, potentially taking up the genomic tools, decision support software, R&D and training currently delivered by the CRC for Sheep Industry Innovation. SG will also play a core role in genetics R&D and adoption by the seedstock and commercial sectors.

Internally, the coming five-year period will see the upgrading of hardware and software systems. This is critical to ensure SG is able to manage the ever-increasing quantities of data that clients require to be analysed.

This Business Plan 2016-21 draws on a comprehensive review of the SG business conducted in 2016[1]. This review has provided detailed analyses of the potential SG market and SG's penetration of that market, as well as pricing and cost structures.

2. Purpose of Sheep Genetics

2.1. Overview

SG is the genetic evaluation service of the Australian sheep industry. The purpose of SG is to assist sheep breeders and commercial producers to increase the rate of genetic gain, across a broad range of traits, in their sheep.

[1] Australian Venture Consultants 2016

SG was established in 2005 by Meat & Livestock Australia Ltd (MLA) and Australian Wool Innovation Ltd (AWI). It was created by the consolidation of several existing genetic databases and services that had been built over several decades. SG has two major divisions: LAMBPLAN, the genetic evaluation service for the prime lamb industry; and MERINOSELECT, servicing the wool industry. SG also delivers the genetic evaluation for the Dohne Merino breed and KIDPLAN, a goat industry service.

From its establishment in 2005, SG was a joint project between MLA and AWI. LAMBPLAN was 100% owned and funded by MLA. Ownership of MERINOSELECT was split 50/50 between the two organisations. From July 2016, both LAMBPLAN and MERINOSELECT will be owned and funded by MLA.

The genetic evaluation services provided by SG (described more fully in Appendix 1) underpin the breeding decisions that drive genetic gain in 'seedstock' flocks (producers of elite genetics) which then flows through to commercial flocks. Genetics is a key profit determinant for livestock industries and for individual producers. Unlike many other farm inputs, genetic superiority is permanent and cumulative.

SG's services have been built upon the outcomes of many years of research, much of it funded by sheep producers. Industry-funded research continues to improve SG's services. The quantitative genetics base upon which SG is built is gradually being supplemented by more recent advances from molecular genetics or genomics, which increase the accuracy of genetic evaluations and allow more rapid progress to be made.

SG is a not for profit entity, reflecting the mandates of the joint project partners to advance industry good through research, development and extension (R,D&E). The pricing of its services is formulated to recognise the balance between industry good, which accrues to the levy payers of MLA and AWI through genetic gain and broadly to consumers, and the private good realised by seedstock clients of SG, who can realise some of the additional value of their superior genetics through the pricing of their rams.

2.2. Corporate statements

2.2.1. Vision

To be recognised as the global leader in the provision of genetic information that enables the production of fibre and meat.

2.2.2. Mission

To assist the sheep industries to achieve their strategic goals for genetic improvement, as set out in the Sheepmeat Industry Strategic Plan (SISP) and the AWI and Wool Industry National Research, Development and Extension Strategies, and to assist individual sheep breeding businesses to optimise profitability.

2.2.3. Core principles

SG's unique position in the sheep industry is summarised in the following core principles:

- Profit focus – genetic information underpins profit and sustainability for Australian livestock producers
- Leadership – underpinned by continuous innovation
- Value-adding – providing accurate, trusted and relevant information, as efficiently as possible
- Independence – working for the benefit of the Australian sheep industry

3. Objectives 2016-21

The overarching objective of SG during the life of this plan is to support the sheep meat and wool industries to achieve respective strategic performance targets which involve a genetic component[2]. These targets and their genetic equivalents are shown in Table 1.

Table 1. Industry targets with a genetic component and the equivalent genetic targets.

	Performance target	**Genetic target**
Whole sheep industry	Maintain at 2% or increase the annual rate of genetic gain across the national flock	Maintain at 2% or increase the annual rate of gain in each of the default indexes for Terminal, Maternal and Merino analyses
Sheepmeat Industry Strategic Plan 2015-20 (SISP 2020)	Increase average liveweight gain per day by 12.5% across the national flock by 2020	Maintain or increase a genetic trend of 4% improvement across the three major analyses, measured as a 4% improvement in PWT (post weaning weight) for the Terminal and Maternal analyses and 4% improvement in YWT (yearling weight) in the Merino analysis
	Increase marking rates by 5 percentage points by 2020	Increase the rate of genetic improvement in number of lambs weaned (NLW) by at least 0.15 percentage points per annum in the Maternal analysis
	Decrease the ewe mortality rate by one percentage point by 2020	Maintain genetic trends for the related traits of: • Breech wrinkle (BWR); • Worm egg count (WEC); • Dag (DAG); and • Fat depth (FAT) and investigate the feasibility of a survival/ longevity breeding value
	Increase sheep meat eating quality by 2 Meat Standards Australia (MSA) consumer points by 2020	Support the implementation and adoption of the EQ index for Terminal sheep breeds, with Terminal breeds showing a 0.04 percentage point improvement in intra-muscular fat (IMF) trends
Wool Industry National RD&E Strategy 2016-20	Increase average marking rates by 0.5% per annum	Increase the rate of genetic improvement in number of lambs weaned (NLW) by at least 0.15 percentage points per annum in the Merino analysis while at least maintaining the average merit for clean fleece weight at its current level
	Increase the Merino: • Lamb survival rate by 0.2%; • Hogget survival rate by 0.13%; and • Adult survival rate by 0.1% per annum	Maintain genetic trends for the related traits of: • Breech wrinkle (BWR); • Worm egg count (WEC); • Dag (DAG); and • Fat depth (FAT) and investigate the feasibility of a survival/ longevity breeding value

[2] The majority of performance targets have genetic and non-genetic (e.g. management, nutrition) components

	Increase the proportion of Merino ewes first lambing at 12 months old by 0.5% per annum	Increase the number of Merino flocks with reproduction data in the MERINOSELECT analysis by 20% while maintaining the genetic trend for number of lambs weaned (NLW)
	Maintain average wool cut per head	Maintain the genetic trend for yearling clean fleece weight (YCFW)

To deliver its required contribution to these **industry** targets, SG will deliver against the following **organisational** targets:

1. Maintain or grow the annual number of new animals analysed in the three major analyses:
    a. At least maintain Terminal animal numbers at current levels
    b. Increase Maternal numbers by 5%
    c. Increase Merino numbers by 15% by 2021 from the 2016 base
2. Maintain or improve the current level of client satisfaction as indicated by the annual customer satisfaction survey
3. Keep 'run' time[3] at below 2 weeks
4. Deliver against extension targets as agreed with MLA
5. Optimise business efficiency.

Priority activities for 2016-21 to deliver against these targets are described in section 6.

4. Situation analysis

- **The Australian sheep industry has changed considerably in the last 25 years**. Traditional perspectives on breeds and breeding systems are breaking down and industry participants increasingly seek ways to maximise the value of each sheep from both meat and wool. SG plays a critical role in this evolution because it allows each sheep to be considered for its genetic merit for particular individual traits, not for the perceived breed average.
- **Genetics has a key role to play in enabling the sheepmeat and wool sectors to realise their strategic objectives.** The national sheep flock has experienced significant genetic gain over the last decade and these gains are forecast to continue especially for key traits (Figure 2). An example over the next five years will be the drive by MLA and AWI to increase the net reproductive and survival rates of sheep nationally. Genetics could also play a role in addressing animal welfare concerns, another central issue for the sheep industry.

[3] SG analyses are conducted twice each month. Updated breeding values and other genetic information are supplied back to the breeder (and genetic advisor if identified) within 15 days of the analysis cut-off date, and are available for download at the same time.

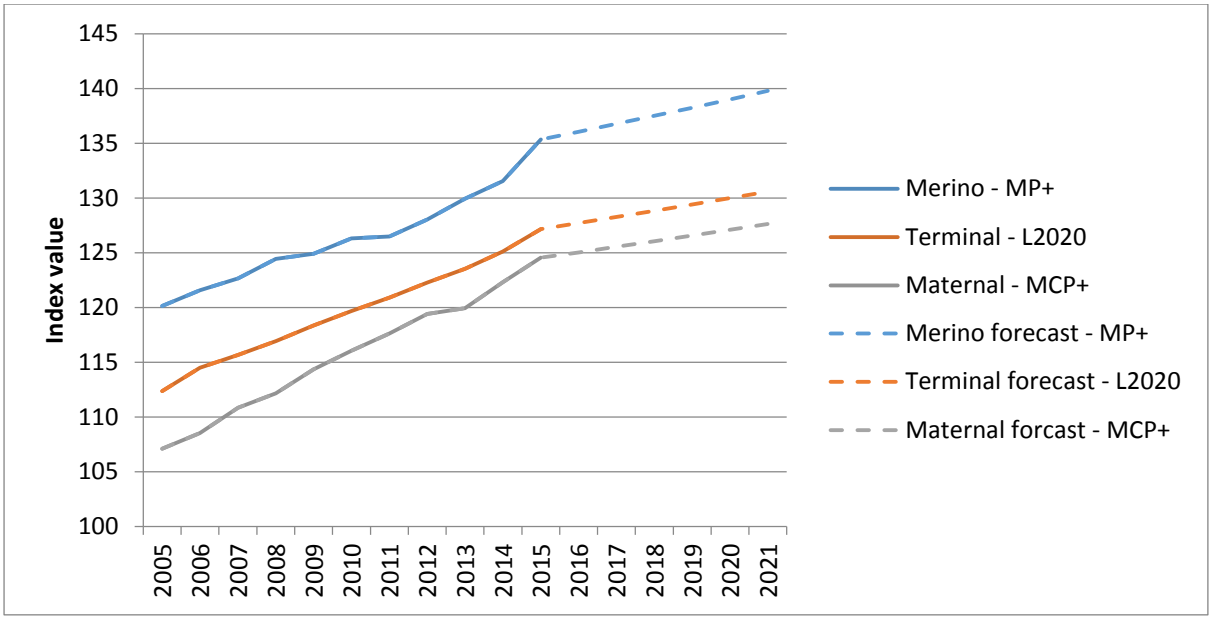

Figure 2. Historic and forecast gain in Merino, Terminal and Maternal indexes (Note: MP+, L2020 and MCP+ are indexes calculated using a range of traits, and therefore provide a broad picture of genetic gain across the breed group)

- **SG provides an integrating delivery vehicle for past and future sheep genetics RD&E.** This ensures that the innovation cycle in genetics (idea-research-extension-idea) is as short as possible.
- **Data are becoming ever more important in sheep value chains**. Technology to identify animals, measure traits of interest and facilitate exchange of data is advancing rapidly. Both MLA and AWI are heavily involved in initiatives to increase the utilisation of data in all parts of the value chain from seedstock to final consumer and back, with a focus on meeting consumer requirements. SG is a vital element of this data revolution for the sheep industry. Opportunities are opening up for SG to collaborate with other organisations and private companies and to develop new product streams.
- **The science and techniques employed by SG are world-leading and internationally recognised.** This is assisted by its physical location among the (informal) livestock genetics cluster in Armidale which includes the Animal Genetics and Breeding Unit (AGBU), an important partner to the SG business. SG and AGBU do (and must) continuously innovate in product and process because they are pushing the boundaries of sheep genetic evaluation.
- **SG is well-grounded in the sheep industry**, being located in Armidale, one of the centres of the seedstock and commercial sheep industries in Australia. SG also has a well-established Advisory Committee of users of its services. However, the SG client base is dispersed thinly over all sheep producing regions and reaching these clients is difficult with a small team and limited resources. Private service providers must be an important part of the 'route to market' but there is an opportunity to better harness their services.
- **SG has a committed user base that has grown over the decade or so that SG has been in existence.** SG is industry owned and understood by most participants to operate independently in the best interests of the sheep industry.
- **However, a central challenge for SG is to move towards operating in a commercial manner**, when it is the joint project of two research funding organisations that do not sell products or provides services to other businesses in the usual sense.
- **Transparency of SG's operations to its owners, to meat and wool levy payers and to clients is imperative to maintain.** This is particularly true when considering 'who pays for what?'

given that SG is funded by a mixture of user charges and industry levy/taxpayer ('public good') funds. SG must also position itself for a possible 'post-RDC' future given the ever-changing political and commercial environment in which it operates.

- **A further challenge is to maintain and grow the staff resources needed by SG to deliver services to industry.** SG requires staff members with specific technical and personal skills and, in the case of the Manager and Development Officers, a willingness to travel extensively. Lack of ready succession is a key risk for SG.

5. Market analysis

SG's market is principally sheep seedstock flocks in Australia but with some demand from other sheep-producing countries. A detailed analysis of Australian and international sheep industries has been undertaken separately[4] and a summary presented below.

5.1. Domestic market

There are currently approximately 70m sheep in Australia, the largest populations being in NSW (27%), Victoria (15%), South Australia (15%) and Western Australia (15%). This compares with total numbers of nearly 180m in 1990. Over this period, wool production has declined from around 1m tonnes to 400,000t, although this level has stabilised since 2009. The number of lambs slaughtered has meanwhile increased from an average around 15m per annum in the early 1990s to around 23m per annum currently.

Six breeds of sheep account for 90% of the Australian sheep seedstock sector: Merino, Poll Merino, Poll Dorset, White Suffolk, Suffolk and Border Leicester.

There are currently 838 Australian sheep seedstock sector flocks registered with SG, accounting for 96% of all flocks directly[5] registered with SG. The distribution of the Australian sheep seedstock sector flocks registered with SG is summarised in Figure 3.

[4] Australian Venture Consultants 2016

[5] The remainder are from New Zealand and South America. The total number does not include flocks in the National Sheep Improvement Program (US).

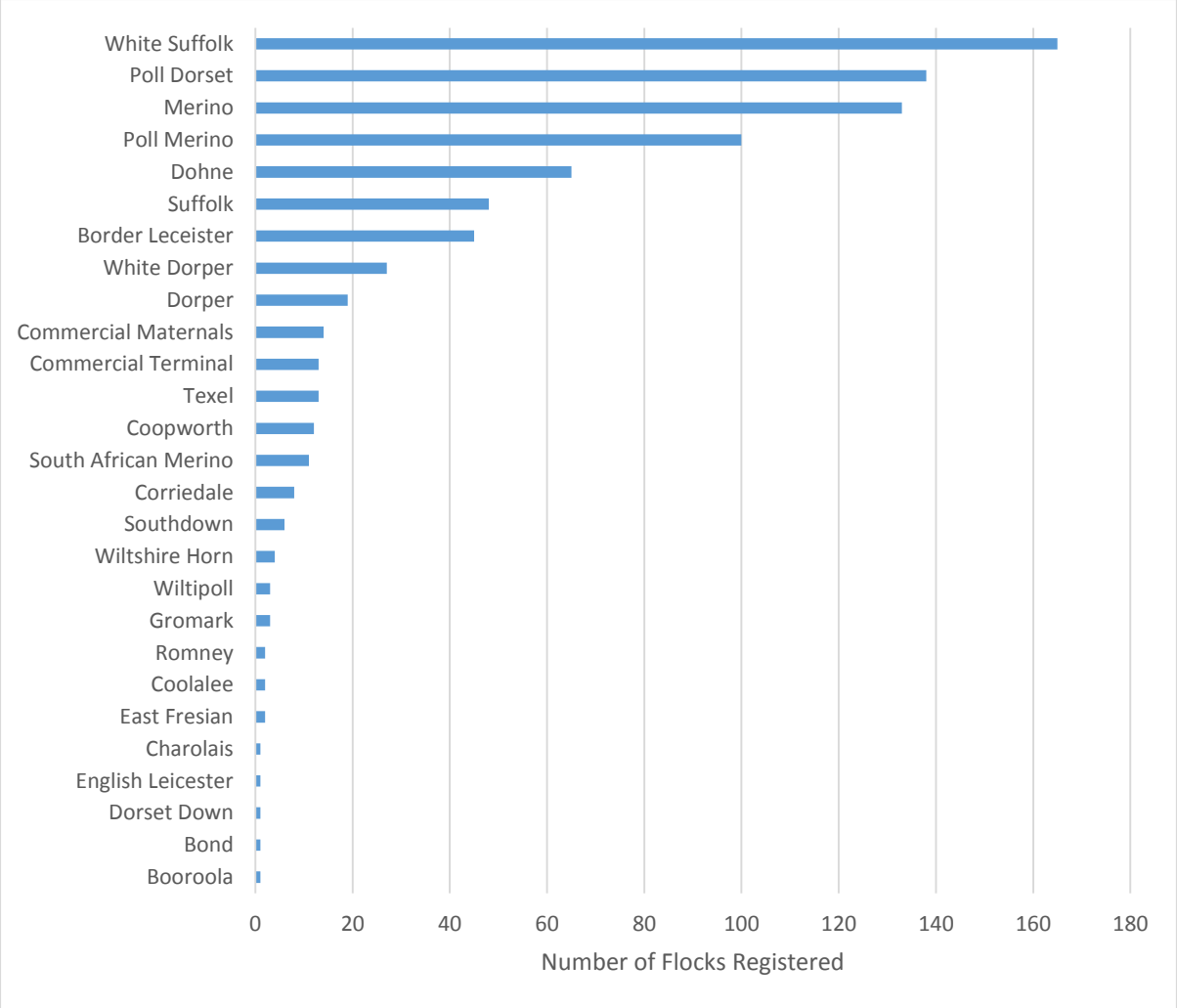

Figure 3. Flocks registered with SG by breed, Australian seedstock sector.

The market penetration across the various breeds is difficult to estimate, for two reasons. First, there is no comprehensive estimate of the total number of flocks producing rams. The number of registered studs is known but there are ram producers whose flocks are not registered. Second, seedstock flocks vary greatly in their size and the number of rams they sell. SG believes that it has disproportionately higher penetration of larger than smaller flocks.

For example, Corriedale breeders using SG account for 11% of the total Corriedale flock but 42% of the rams sold.

One study[6] estimated that, in 2012, LAMBPLAN flocks were supplying about 68% of terminal sires and 41% of maternal sires, while MERINOSELECT flocks were supplying about 18% of Merino sires in use[7]. This study used a bottom-up approach in which the total number of rams required by the national flock was estimated from the number of ewes and an assumed 'lifetime coverage' rate (females joined per male lifetime).

[6] Fennessy P et al 2014, 'Evaluating the Impact of Animal Genetics and Genomics RD&E Investment', final draft report for MLA

[7] Including rams are sold with ASBVs and those sold with Rampower estimates

In the opinion of the SG Executive and Advisory Committees, SG should be able to achieve 5% growth in the number of new animals analysed in the Maternal analysis and 15% growth in the number of new Merinos analysed by 2021 compared with 2016. SG is considered to be at or close to maximum feasible penetration for the Terminal analysis and maintenance of the number of new animals analysed is forecast.

International

Global sheep numbers have recovered from a decline during the 1990s to plateau at a level slightly below that of 1990. However, this recovery has been driven largely by China – sheep populations in Australia, the UK, New Zealand and South Africa are significantly below 1990 levels.

In the opinion of the SG Executive and Advisory Committees, SG's penetration of overseas markets is unlikely to grow significantly. Specific business development activity to increase SG exports is neither economically justifiable nor consistent with SG's purpose.

6. Priority activities 2016-2021

6.1. Operations

SG's data analysis, reporting and quality assurance have progressively improved over time and are of high standard. However, the SG databases are now quite old and the growing number and complexity of analyses require that operational improvement processes be accelerated over the next five years to ensure accurate and prompt turnaround of information to clients is maintained.

An additional consideration during the upcoming period is the potential addition to SG's business of a number of products and services currently provided by the Cooperative Research Centre for Sheep Industry Innovation (Sheep CRC). The Sheep CRC will wind up in 2019. At the time of preparing this plan, succession arrangements for the Sheep CRC's intellectual property have not been resolved. SG would appear to be a logical choice to deliver the suite of sheep genetic products from the CRC but alternative options are also under consideration.

The Sheep CRC genetic products and services potentially needing to be delivered are:

- Molecular genetic (genomic) tests (for parentage and specific traits;
- Software (e.g. RamSelect);
- Service provider training; and
- R&D.

With these considerations in mind, the priorities for operational improvement within SG over the life of this plan are:

1. Redevelopment of the LAMBPLAN and MERINOSELECT databases, bringing them together onto one platform and allowing for seamless integration with AGBU, Information Nucleus Flock, Resource Flock and the Genomics databases.
2. Development and implementation of full single step analysis for LAMBPLAN and MERINOSELECT.
3. Securing the genomics pipeline to allow genomic information to contribute to SG analyses even in the absence of the Sheep CRC or an alternative provider of genomic tests.
4. Full implementation of 'RAMping Up Genetic Gain' reports and their accessibility via the dashboard on the SG website to both breeders and service providers.
5. Exploration of feasible options for collecting reference population information from breeder clients' flocks in collaboration with MLA's Resource Flock management.

6. Exploration of business models to allow delivery of ASBVs for non-performance-recorded (NPR) animals through the use of genomics.
7. Active engagement with the development of the National Livestock Genetics Consortium (NLGC).

These improvements will be resourced through normal operational expenditure except for the redevelopment of the databases. This will be capital expenditure for which funding will be sought from MLA on completion of a scoping study to be completed by December 2016.

6.2. Marketing and business development

'Marketing and business development' is generally referred to as 'extension' by SG and includes product training and skills development for potential users of SG products. These activities must be understood in the context that SG seeks to maximise benefits for its owners (sheepmeat levy payers and the Australian Government) through industry adoption of genetics, rather than its own financial surplus.

Industry development, genetic extension information and the provision of skilled service providers who advise the sheep industry on the use of genetic information are essential to the success of SG. To ensure that the industry has access to appropriate genetic extension information, and to an appropriate number of high quality service and data providers, SG:

1. Provides training directly or via service providers to breeders and producers through the development of ram breeder workshops, producer workshops and where appropriate direct support for breeder groups;
2. Builds the skills of current and future service providers; and
3. Identifies future service providers and appropriate training and development mechanisms.

Marketing and business development activities for 2016-21 will be based on industry engagement activities, improved communications to stakeholders and reducing barriers to adoption.

Priorities for operational improvement within SG over the life of this plan are:

1. Development and implementation of a communications strategy during calendar year 2016.
2. Scoping and appointment of a new staff position with a focus on enhancing the service provider network (refer to Section 7 for further detail).
3. Building the service provider network.
4. Expansion of the 'Try Before You Buy' scheme.
5. Delivery of genetics-related extension activities such as Bred Well Fed Well workshops as agreed with MLA.

6.3. Governance and intellectual property management

Current governance arrangements ensure that there is close oversight of SG by the investors and that both industry (clients) and technical experts provide input to the operation of SG. However, previous independent reviews of SG and the SG Advisory Committee have recommended that MLA (and previously AWI) consider alternative legal and business models, principally to mitigate the risks associated with investors being unwilling or unable[8] to continue to support SG in its current form.

[8] For example, if livestock transaction levies were to be discontinued

Planning, monitoring and reporting of SG activities and finances are also excessive, resulting in undue transaction costs to the business and to the investors separate to SG and these functions need to be streamlined.

With these considerations in mind, the priorities for governance and intellectual property (IP) management within SG over the life of this plan are:

1. Review and streamlining of SG's planning, monitoring and reporting systems and structures to reduce overhead.
2. Agreement on the form and timing of a transition, if any, to a more independent business model.
3. Review of IP management, seeking both to maximise benefit for the industry and minimise risk (for example, from the use of SG data in third-party products).

6.4. Product development and R&D

SG's products and services have continually evolved, resulting in:

- An increase in the range of traits able to be evaluated;
- Increased accuracy of genetic evaluation;
- Improved implementation of SG tools by users;
- Reduced turnaround time and cost of service delivery; and
- Reduced risk of technology obsolescence.

Product development and R&D are industry-good activities and will continue to be funded through project contracts between MLA and/or AWI and relevant service providers.

Priorities for product development and R&D over the life of this plan are:

- Continuous development of new ASBVs, particularly in the areas of reproduction, welfare and survival, and feed conversion efficiency.
- Ongoing review of existing indexes and development of new indexes to assist in meeting industry targets and changing breeding objectives in an evolving production environment.
- Further development of tools that enable more effective breeding programs, leading to higher rates of genetic gain.

Other product development and R&D priorities will be progressively determined by the Executive Committee in consultation with the Technical and Advisory Committees.

7. Management team

The SG management team currently comprises:

- **SG Manager** (1 fulltime equivalent (FTE)), responsible for the day-to-day management and financial performance of the SG, including human resources, equipment, training, service quality assurance and delivery of results.
- **Two Project Coordinators** (2 FTE), responsible for administration of business accounts, reporting of financial outcomes, supporting Executive, Advisory and Technical Committees, supporting client and other stakeholder needs, coordination and maintenance of communications.
- **LAMBPLAN and MERINOSELECT Development Officers** (2 FTE), responsible for client interactions, service delivery and extension activities that increase the adoption and

awareness of SG services, development of marketing and communications materials, data diagnostics.

- **LAMBPLAN and MERINOSELECT Database Managers** (2 FTE), responsible for management of the SG databases, data transfer to and from OVIS, maintenance and development of reporting and diagnostic software, maintenance and development of the SG web site and Pedigree Master software.

Staff are employed by MLA and their salaries are determined in accordance with MLA policy and procedures for staff remuneration.

The SG Executive and Advisory Committees have placed a high priority on appointing an additional staff member early in the five-year period. The role is yet to be fully scoped but is likely to be focused on business development, with specific responsibility for developing SG's capability in capturing, analysing and utilising business metric data, and building the service provider network to expand the reach and improve the service offer of SG in the long term.

The additional staff member is needed to achieve the growth and improvement targets described in this plan, both directly and through improving the service provider network. The additional position will also enhance career pathways and mitigate succession risks within SG.

8. Financials

8.1. Principles

Revenue is from two sources:

1. Users of Sheep Genetics services, Australian and international; and
2. MLA.

MLA will seek cost recovery of SG's operating, marketing and business development costs from users as far as possible but not to the extent that service pricing will reduce adoption. The governance, IP, product development and R&D costs associated with SG are considered to be industry-good costs and will be met by MLA.

Each specific activity undertaken by SG has been allocated to one of the four activity/cost areas, and each staff member's time on specific activities has been estimated. This allows modelling of staff costs that are recoverable from users and those that are paid for by MLA. Non-staff costs have been similarly allocated.

These principles are important to understanding the SG pricing model.

8.2. Revenue

8.2.1. Sales volume

Sales volume is determined by a number of factors including the number of first flock subscribers, number of additional flocks, number of small flocks, number of sheep over the billing cap, the number of lambs produced and the proportion of annual lamb production that is recorded with SG. This makes predicting sales volume challenging.

A model has been developed[9] to assist SG to forecast its sales. At the individual breed level actual data pertaining to the current number of flocks, additional flocks, small flocks and number of

[9] Australian Venture Consultants 2016

animals over the billing cap have been used to set a base case. The total number of lambs produced by SG clients in each sector has been used to determine the trend and base case for billable animals, with an assumption that 85 percent of terminal and maternal new animals are submitted and billed and 70 percent of Merino, Poll Merino and Dohne new animals are submitted and billed.

For the purposes of this plan, a 'most likely case' scenario was developed by consensus among the SG Executive and Advisory Committees and the parameters used in the model to estimate sales over the next five years. These parameters are shown in Table 2.

Table 2. Assumptions for sales volume forecasts 2016/17-2020/21.

LAMBPLAN	
Growth in new flocks – assumption	Based on linear trend since July 2008
Growth in new flocks – model input	-0.6%
Growth in billable animals – assumption	Maintained at current level
Growth in billable animal – model input	0.0%
MERINOSELECT	
Growth in new flocks – assumption	Based on linear trend since July 2012
Growth in new flocks – model input	+6.6%
Growth in billable animals – assumption	Maintained at current level
Growth in billable animal – model input	0.0%

8.2.2. Pricing

The fee schedule for SG services will be reviewed annually and adjusted in line with costs over the period of the business plan.

Within the first six months of this plan, SG intends to model the effect on revenue of increasing the cap on the number of animals within a flock beyond which no additional charges are incurred. Currently, the cap is 1250 animals. The intention (approved by the Advisory Committee) is to double this number to 2500. The application of a sliding scale based on reducing marginal cost to analyse additional animals will also be modelled.

SG will also consider other modifications to the pricing schedule as required, for example charging for additional levels of customer support. Any changes made will be introduced in different years as far as possible, (a) to minimise the impost on clients and (b) so that the effects of any changes can be observed.

8.2.3. Revenue summary

Based on modelling of expected growth in SG's penetration of the market and the pricing structure shown in Table 3, revenue from each of SG's main market segments over the period of the business plan is forecast as shown in Table 3.

Table 3. Forecast SG revenue 2016/17-2020/21.

	2016-17	**2017-18**	**2018-19**	**2019-20**	**2020-21**
LAMPLAN Australia	$397,228	$401,992	$406,817	$411,704	$416,649
LAMBPLAN International	$11,148	$10,665	$10,848	$11,033	$11,222
MERINOSELECT Australia	$324,609	$338,924	$354,228	$370,598	$387,724

	2016-17	2017-18	2018-19	2019-20	2020-21
MERINOSELECT International	$38,032	$39,740	$41,688	$42,315	$42,951
KIDPLAN Australia	$8,182	$8,254	$8,420	$8,858	$8,753
KIDPLAN International	$1,619	$1,644	$1,670	$1,696	$1,722
TOTAL REVENUE	**$780,818**	**$801,221**	**$823,671**	**$845,930**	**$869,022**

The forecast contribution of MLA is shown in Section 8.4.

8.3. Costs

SG's forecast costs over the period of the plan are shown in Table 4.

Table 4. Forecast SG costs 2016/17-2020/21.

	2016-17	2017-18	2018-19	2019-20	2020-21	% of total (16/17)
Operations						
Salaries and wages	$293,905	$298,313	$302,788	$307,330	$311,940	
AGBU routine	$121,266	$127,438	$136,721	$142,032	$147,549	
Other costs	$134,959	$136,984	$139,039	$ 141,124	$143,241	
Sub-total	*$550,130*	*$562,735*	*$578,547*	*$590,486*	*$602,730*	***26%***
Marketing and Business Development						
Salaries and wages	$228,236	$231,660	$235,135	$238,662	$242,242	
Other costs	$108,174	$109,796	$111,443	$113,115	$114,812	
Sub-total	*$336,410*	*$341,456*	*$346,578*	*$351,777*	*$357,053*	***16%***
Governance and IP Management						
Salaries and wages	$51,623	$52,397	$53,183	$53,981	$54,791	
Other costs	$48,966	$49,700	$50,446	$51,203	$51,971	
Sub-total	*$100,589*	*$102,097*	*$103,629*	*$105,184*	*$106,762*	***5%***
Product Development						
Salaries and wages	$177,754	$180,420	$183,127	$185,873	$188,662	
Other costs	-	-	-	-	-	
Sub-total	*$177,754*	*$180,420*	*$183,127*	*$185,873*	*$188,662*	***8%***
Research and Development						
Salaries and wages	$28,066	$28,487	$28,915	$29,348	$29,789	
Contracted projects	$151,859	$154,137	$156,449	$158,796	$161,178	
AGBU research	$636,647	$669,049	$717,785	$745,665	$733,011	
Other costs	$147,868	$191,422	$236,249	$282,378	$337,513	
Sub-total	*$964,441*	*$1,043,095*	*$1,139,398*	*$1,216,187*	*$1,303,108*	***45%***
TOTAL COSTS	**$2,129,324**	**$2,229,804**	**$2,351,279**	**$2,449,507**	**$2,558,314**	**100%**

Notes on the forecast costs:

1. The salaries component assumes the appointment of a new staff member, as described in Section 11.1, at the start of 2016/17. The allocation of this staff member's time across activity areas has been assumed to be the same as that of the Manager.
2. Annual Consumer Price Index (CPI) rises of 1.5% have been assumed across all costs.
3. The expense budget does not include the planned upgrade of software during 2016/17 and 2017/18. The cost of this upgrade is unknown at this stage and will be determined from a scoping study early in 2016/17. It is expected that specific funding for the upgrade will be sought from MLA as a specific project.

8.4. Summary

Table 6 shows the forecast for revenues, costs and surpluses/deficits over the period of the plan. It has been constructed to highlight the extent to which full cost recovery is achieved, given the principles established in Section 8.1, the pricing structure and other assumptions detailed in this plan.

Table 5. Summary of forecast SG financials 2016/17-2020/21.

	2016/17	2017/18	2018/19	2019/20	2020/21
Operational Revenue					
LAMBPLAN	$408,376	$412,658	$417,665	$422,737	$427,871
MERINOSELECT	$362,641	$378,665	$395,916	$412,913	$430,675
KIDPLAN	$9,801	$9,898	$10,089	$10,280	$10,475
TOTAL OPERATIONAL REVENUE	$780,818	$801,221	$823,671	$845,930	$869,021
Costs					
Operations	$550,130	$562,735	$578,547	$590,486	$602,730
Marketing and Business Development	$336,410	$341,456	$346,578	$351,777	$357,053
Governance and IP Management	$100,589	$102,097	$103,629	$105,184	$106,762
Product Development and R&D	$1,142,195	$1,223,515	$1,322,525	$1,402,060	$1,491,770
TOTAL COSTS	$2,129,324	$2,229,803	$2,351,279	$2,449,506	$2,558,315
MLA overhead charge (@ 8.0%)	$170,346	$178,384	$188,102	$195,961	$204,665
TOTAL COSTS INCL. MLA OVERHEAD	$2,299,670	$2,408,187	$2,539,382	$2,645,467	$2,762,980
DEFICIT AFTER CLIENT REVENUE	$1,518,852	$1,606,967	$1,715,711	$1,799,537	$1,893,959
MLA Contribution					
Contribution to Operations and MBD shortfall	$105,722	$102,970	$101,455	$96,332	$90,762
Contribution to Governance and IP Management	$100,589	$102,097	$103,629	$105,184	$106,762
Contribution to PD and R&D[10]	$1,142,195	$1,223,515	$1,322,525	$1,402,060	$1,491,770
Contribution to MLA overhead charge	$170,346	$178,384	$188,102	$195,961	$204,665
TOTAL MLA CONTRIBUTION	$1,518,852	$1,606,967	$1,715,711	$1,799,537	$1,893,959
DEFICIT AFTER MLA CONTRIBUTION	$0	$0	$0	$0	$0

Notes on the financial summary:

1. The table includes the MLA overhead charge of 8% of total expenses. MLA has not previously sought reimbursement of this amount from SG, but it is included in this table because it is a real cost that will need to be factored in to SG's accounts within the next few years. The

[10] There is an opportunity for AWI to contribute to PD and R&D costs on a project-by-project basis. The figures shown here assume no contribution by AWI

overhead charge is included in the total surplus/deficit calculation. Note too that 8% may not be considered an adequate overhead charge by MLA and will be subject to review by the MLA board.

2. As indicated in Section 8.2, the forecast does not include the impact of the proposed increase in the flock 'cap' from 1250 to 2500.

9. Risk management

The major risks to this business plan and steps to be taken to mitigate these risks are:

Risk	Likelihood	Impact	Mitigation
Discontinuation of or substantial decrease in livestock levy	Low	High	• Ensure the business is as efficient as possible • Examine alternative business models
Discontinuation of AGBU	Low	High	• Have provisions in the AGBU contract for access to OVIS in the case of contract termination
Loss of data	Low	High	• Ensure rigorous backup procedures are in place
Loss of key staff (especially SG Manager, Database Managers)	Med	Med	• Within bounds acceptable to MLA, make remuneration packages attractive • Avoid excessive workloads • Ensure all business processes and systems are well documented to allow rapid transition to new staff when required
Arrival of a competitor	Low	Low	• Unlikely, especially in Australia

Appendix 1: SG products and services

SG exists to provide accurate, credible information on the breeding value of sheep as well as tools to make optimum use of this information at individual animal, flock and industry levels. Industry benchmarks such as flock summaries, trait leader lists and percentile bands have been developed that enable both seedstock and commercial clients to assess the relevance of the information provided for their breeding program development and implementation.

The core role of SG is to facilitate the conversion of raw phenotypic data (observations or measurements of characteristics of an organism) on sheep to Australian Sheep Breeding Values (ASBVs). A number of related services arise from this core function.

ASBVs were developed to ensure that the Australian sheep industry uses a uniform common language to describe the genetic merit of an animal. ASBVs are calculated through the use of an analytical method called 'best linear unbiased prediction' (BLUP). BLUP is a quantitative genetic platform that estimates an individual's genetic merit for a particular trait and relies on phenotypic data from the animal of interest and also from its relatives (especially offspring). These pieces of information are combined using appropriate weightings and knowledge of the individual's relationship to other measured individuals (pedigree).

ASBVs are calculated for the following groups of traits:

- Wool quality and quantity;
- Growth;
- Carcase and eating quality;
- Reproduction;
- Health and welfare; and
- Visual traits.

ASBVs can be combined in 'indexes', in which a series of ASBVs is combined to provide a weighted estimate of the overall genetic merit of an animal. Indexes can be customised to a particular breeder's objectives and there are industry-standard indexes – for example, the 'Carcase Plus' index which promotes animals with high growth and muscle, while maintaining carcase leanness.

Within the life of the business plan, certain ASBVs will incorporate genomic or molecular genetic information. This is derived not from observed or measured expression of traits but from the direct analysis of an individual's DNA.

ASBV and index information is presented in a number of ways to enable seedstock and commercial breeders to make use of it, and also to assist industry-level decision making. These products and services are summarised in Table 6.

Table 6. ASBV-related products and services.

Product/service	Description
ASBV (Australian Sheep Breeding Value)	Trademarked breeding value, calculated by using minimum standards for across-flock linkage, quality assurance and accuracies along with appropriate pedigree information.
FBV (Flock Breeding Value)	Breeding values that do not meet the minimum standards to acquire an ASBV. This is when linkage is below the appropriate levels, quality assurance standards have not been met, accuracy levels for traits have not been met or there is a lack of pedigree information.
Genetic trend reports	A genetic trend report will be available with each SG analysis that a breeder

	receives. The genetic trend report shows the average breeding value for each drop of animals that the breeder has entered against an average (which can be defined within group, breed or industry sector).
Industry standard indexes	For each sector of the industry, standard indexes will be determined and made available to breeders. These indexes will be developed through the Technical Committee.
Web search interface	An interface has been developed with features defined in consultation with the SG Advisory Committee and service providers.
Percentile reports	For each analysis within each sector, a percentile report will be calculated that lists the ranges for ASBVs produced for the current drop of sheep within each percentile for all traits.
Sale catalogues	These will be available to all breeders who choose to list their flocks with the web-based service. Catalogues can be used for private auction, multi-vendor auction or private treaty offerings.
Semen catalogues	These will be available to all breeders who choose to list their flocks with the web-based service.
Trait leader summaries	Sheep in the most desirable ten percentile band for each ASBV (based on the current drop) are identified in a website that is in a searchable and downloadable.
MateSel	MateSel is a program designed to assist breeding programs by making selection and mating recommendations that optimise the balance rate of genetic progress and changes in inbreeding.
Rampower	Rampower is a tool that allows phenotypic indexes to be derived using similar weightings to the standard SG indexes on a self-service basis.