Welcome to the Autumn edition of the Breeder’s Bulletin

It has been a busy couple of months for the Sheep Genetics team, April has seen us welcome Clara Collison to the team. Clara has replaced Will Chaffey as the LAMBPLAN Development Officer, Clara has literally had to hit the ground running, with one day in the office before venturing out to start meeting clients.

As I write this the 2016 Regional Forums are well underway with good attendance across all venues, it has been pleasing to see the interaction with a wide range of clients both old and new. We had to reschedule the Launceston forum due to flooding, new date is 7th July.

May has also seen the introduction of changes to the analysis, you can read more about this later in the bulletin. The implementation was timely with the regional forums allowing breeders to interact with Sheep Genetics staff and garner a better understanding of how the changes have impacted their flock.

Sheep Genetics recently held their Genetics Service Provider workshop for 2016 on the 10th and 11th of May in Melbourne. Fifteen service providers from around the country attended the two day workshop to learn more about the genetic evaluation, factors that drive genetic progress and draw from the knowledge and experience of other participants.

The RAMping up genetic gain project strives to develop tools to better serve our Sheep Genetics clients, identifying potential ways to increase their rates of gains, which shaped the focus of the two days. The workshop ran under a different format to previous years with sessions being interactive, discussion based and jointly presented by Daniel Brown from AGBU, Sam Clark from UNE, Tom Granleese from Sheep CRC, Luke Stephen from the NSW DPI and Sheep Genetics staff.

The sessions discussed different factors that impact rates of gain within a flock as well as drawing on different experiences from people around the room. Reports that have been developed as part of the RAMping up genetic gain project were successfully launched at the end of the workshop. Feedback from Service Providers about the reports has been positive and the participants in the workshop came away with a greater understanding of the key areas that impact genetic gain and potential recommendations to improve these areas.

Sheep Genetics would like to thank all of those who participated in the workshop, especially the presenters for their time.

LambEx 2016 registrations are now open, please go to the following website to register www.lambex.com.au this is an important event for the sheep industry and we encourage all breeders and their clients to get involved.

Regional Forums 2016 Dates

- 7th July - LAUNCESTON Tasmania (rescheduled from June)
- 26th July - WILLIAMS Western Australia

Regional forums are a great way to stay up to date with what is happening with LAMBPLAN and MERINOSELECT, they are at a cost of $33 per ram breeding business and include morning tea, afternoon tea and lunch.

Email now to book your place info@sheepgenetics.org.au

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Logging in and Website Tools

The Sheep Genetics website has the capacity for all clients to login. Once logged in breeders have access to more tools including the dashboard (where you can build genetic trends for different traits and animals), download latest analysis reports, as well as updating details such linking your website to your animals or nominating a service provider.

To ensure that breeders can stay up to date and manage their preferences from one easy place we will continue to add in further functionality to the Sheep Genetics website when logged in. Moving forward this will also be the only place you will be able to download results from Sheep Genetics.

To access the tools you need to be on either the LAMBPLAN, MERINOSELECT or KIDPLAN animal search pages, and then login on the right hand side. Your log in will be your 6 digit breed and flock code eg.509999. Your password can be found in the subject line of the report emails.

Once logged in, you can click on the Tools link that is above the Members Login. This will take you to where you will find various tools to assist with your breeding program.

Revise your details

Clients are now able to easily give access to their service provider and link their animals to their flock’s website through the Revise your details button on the tools page.

Service Provider’s that have signed up to Sheep Genetics can be chosen by selecting their name from the drop down box. This will give the service provider access to your tools page, they will then have access to your results, downloads, and also be able to use tools they have access to such as MateSel.

If you have your own website, setting your flock home page will trigger for all of your animals to have a ‘www’ logo next to their ID when people run searches. This logo will give them a link to be directed to the individual flock’s website. To set your flock home page you will need to click on the Revise my details and complete the information.

When adding a website you will need to enter the full address including the http:// for example

http://www.sheepgenetics.org.au
Analysis Changes

Annual Upgrades to the Genetic Evaluations
The LAMBPLAN and MERINOSELECT analyses are continually being developed to improve the genetic evaluation and supply the best tools possible to producers aiming to help improve genetic gain across the sheep industry. Major updates to the Sheep Genetics analyses are implemented once a year to minimise any disruption that may result from the changes. This year there are a number of significant updates to both LAMBPLAN and MERINOSELECT. It is important to understand the enhancements made to the analysis and why you may have seen changes to the ASBVs of your animals. All updates detailed below were added to MERINOSELECT on the 7th of May and LAMBPLAN on the 14th of May.

Additional Traits
Post Weaning Fleece Traits
In 2015 Post Weaning wool measurements were included in the MERINOSELECT analysis and ASBVS were calculated for PGFW, PCFW, PFD, PFDCV and PCURVE for the first time. Further data submissions have meant enough information to introduce Post Weaning ASBVs for staple strength (PSS) and staple length (PSL). Along with PSS and PSL, all post weaning fleece ASBVs will be reported in MERINOSELECT and implemented into the DOHNE analysis from the 7th of May.

Visual Traits
Visual traits can be submitted to Sheep Genetics when they are measured using the visual score guide created by AWI and MLA. Recently the number of measurements in the database for each trait was reviewed to see if they could be included in the analysis and reported to breeders. Wool Colour (COL), Wool character (CHAR), Fleece rot (FLROT) and Weathering (WEATH) have enough records from both research and industry flocks to produce ASBVs. All four traits will be reported as ASBVS when the analyses are updated. To find out more on how to visually score the three traits refer to the Visual Sheep Scores Guide.

Analysis Upgrades
Single Step Carcase Analysis
Until now all genomic information has been incorporated into ASBVs using a blended approach. The blended approach combines the pedigree based estimated breeding value with the genomic breed value to create a blended ASBV. To improve the application of genomics in the genetic evaluation carcase traits will now be calculated in a single step approach. The single step analysis will look at both the genomics information and the performance records in a single model and calculate the one reportable ASBV for each trait.

The single model for carcase traits will be implemented into the TERMINAL, MATERNAL and MERINO analysis. Updating to the Single Step process for carcase traits will allow genetic correlations with related traits to be used more effectively in the analysis. This will result in a larger number of animals having eating quality breeding values estimated. It is important to note that this is a significant change in the analysis and will impact the eating quality breeding values of animals between the two runs.

Mating Module
The reproduction analysis will start to use the data sent into Sheep Genetics through the mating module. This includes information on joining dates, pregnancy scans and ewe management. Pregnancy scans will highlight both fertility and litter size outcomes more clearly than has been done in the past and allow these records to be utilised in the calculation of number of lambs born (NLB). The ewe management groups, from joining to lambing, will help identify differences in management that will impact fertility, litter size and lamb survival. Which will be the basis of a more accurate estimation for number of lambs weaned (NLW).

Visual Age Stages
To allow more information to be included in the analysis exclusion rules made at OVIS due to age have been reviewed. This will allow all wool, carcase and visual traits to be consistent in regards to the exclusions made by the analysis. The addition of visual traits previously excluded will have a slight impact on the ASBVs of visual traits; however the improvement will not have a significant impact on other traits.

Additional Adult Records (A5 and A6)
The OVIS analysis was upgraded in 2015 to accept three repeated observations in the analysis instead of accepting just the first record found between two and six years. The three age brackets allowed measurements up to 4.5 years of age. The analysis will now have an additional two age brackets bringing the age of measurements for wool and liveweight up to 6.5 years of age. The addition of repeated adult observations up to 6.5 increases the amount of data that is in the OVIS analysis and information that can be used in the calculation of adult traits.
Index upgrades
Eating Quality Traits in Terminal Sire Indexes
The introduction of the Single Step analysis for carcase traits will increase the number of animals that will have eating quality ASBVs. With more animals having eating quality breeding values available, there is now the opportunity to add eating quality into indexes. Terminals will have two new indexes available with the analysis upgrades, to address the antagonistic relationship between Lean Meat Yield and Eating Quality.

Maternal Index Review
The maternal index review commenced in 2015 with breeders asked to complete a survey to identify their breeding objectives and profit drivers. The information from the survey helped Sheep Genetics to evaluate the current breeding objectives and create three new indexes. The three new indexes are the Border Leicester Cross (BLX), Maternal Carcase Production (MCP) and the Maternal Carcase Production + (MCP+). Before presenting the new indexes consultation and feedback was requested through a webinar held on the 20th of May and a survey which closed on the 29th of April. For more information please see visit the Sheep Genetics website.

Targets for 2017
LAMBPLAN and MERINOSELECT improvements are continuous and there are a number of goals already set for next year. Including additional traits such as maternal behaviour, horn type and wool colour, as well as implementing the single step analysis for reproduction traits and reviewing the maternal index. Before these enhancements can be made, more research and data is needed to ensure the quality of the genetic evaluation is maintained. It is important to note, data in relation to new traits needs to come not only from research flocks but also flocks that are a part of Sheep Genetics. Please consider the additional traits proposed for the coming year and support Sheep Genetics by submitting data where possible.

Additional Traits – More data needed
Maternal Behaviour Scores
Maternal behaviour refers to the ewe’s behaviour towards their lamb and is an important factor in lamb survival. Genetic correlations between maternal behaviour with growth and reproduction are also known. To improve lamb survival through selection and utilise these relationships in the LAMBPLAN and MERINOSELECT analyses a maternal behaviour ASBV is needed. Maternal behaviour can be measured, while tagging lambs at birth through a scoring system. To produce an ASBV for maternal behaviour in the future, Sheep Genetics needs more data. Please refer to the Sheep Genetics website to find the scoring chart for Maternal Behaviour.

Horn Type
Sheep Genetics currently report a predictive breeding value for pol-horn status. This predictive breeding value, which is reported as PP, PH or HH, is based off of a single SNP from the animal’s 12K genomics test. It is important to note that this single SNP is not a direct marker or actual gene causing polled status. However the SNP is closely linked to the poll and horned phenotypes and will help understand the proportion of offspring that will have a poll and horn status.

To improve the estimation for horn type, Sheep Genetics are looking at including phenotypic measurements and genomic results in a single step analysis. Phenotypic measurements can be measured through a visual horn score. It is important that all scoring systems used are consistent and permits the data from individual flocks to be combined. For a more accurate Poll-Horn breeding value to be implemented more phenotypic data is needed over the next year. Sheep Genetics are working with research flocks and breeders to set guidelines for system of visually scoring horn type. The visual score guide will be reported as soon as possible.

Analysis Upgrades
Single Step Reproduction traits
Although carcase traits have been updated to incorporate genomics and phenotypic data through a single step process, other traits such as reproduction and fleece traits are still calculated using a blended approach. More information and research is needed to guarantee the quality of the genetic evaluation that is offered to LAMBPLAN, MERINOSELECT and DOHNE clients. Sheep Genetics aims to move the reproduction analysis and traits to a single step analysis in 2017.
Understanding MERINOSELECT
Visual Trait ASBVs

Sheep Genetics report ASBVs for a number of visual traits that can be recorded using the *Visual Sheep Scoring Guide*. Visual assessment is an important part of any breeding objective and the guide was developed to create a standardised scoring system.

<table>
<thead>
<tr>
<th>Trait</th>
<th>BWR</th>
<th>BCOV</th>
<th>DAG</th>
<th>COL</th>
<th>CHAR</th>
<th>FROT</th>
<th>WEATH</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASBV</td>
<td>-0.3</td>
<td>-0.1</td>
<td>-0.1</td>
<td>-0.5</td>
<td>-1.0</td>
<td>-0.1</td>
<td>-2.0</td>
</tr>
<tr>
<td>Acc</td>
<td>45</td>
<td>55</td>
<td>50</td>
<td>45</td>
<td>30</td>
<td>40</td>
<td>35</td>
</tr>
</tbody>
</table>

- **Breech Wrinkle**
  Rams with a lower breech wrinkle (BWR) will produce progeny that have a lower degree of wrinkle in the breech area. A ram with an ASBV of -0.3 score will produce progeny that are -0.15 scores lower than the progeny of a ram with an ASBV of 0.

- **DAG**
  Animals with a lower dag ASBV will genetically have a lower amount of faecal material adhere to the breech area. A higher dag score is often associated with increased flystrike risk.

- **Wool Character**
  Wool character describes the definition of crimp in the wool. A ram with a lower ASBV for character will have a better defined crimp than a ram with a higher ASBV.

- **Staple Weathering**
  A ram with a lower ASBV for staple weathering (WEATH) produce lambs that have a lower degree of deterioration down the staple due to penetration of dust and water.

- **Breech Cover**
  Breech cover refers to the amount of natural bare skin around the perineum and breech area. Animals with a more positive ASBV for BCOV will produce lambs that have more breech cover.

- **Wool Colour**
  Wool colour describes the intensity of whiteness and yellowness of greasy wool. A ram with an ASBV of -0.5 will, on average, produce progeny that have -0.25 scores whiter greasy wool than progeny of a ram with an ASBV of 0.

- **Fleece Rot**
  Rams with a lower fleece rot ASBV will produce progeny that are genetically less susceptible to fleece rot. This ram will sire progeny that on average show -0.05 scores less stain in the staple than progeny of a ram with a 0 ASBV for FROT.

- **Note**: A useful rule of thumb for converting ram ASBVs into production differences is to simply halve the ASBV (as rams contribute half the genetics of the lamb).

- **Accuracy** – published as a percentage, is a reflection of the amount of effective information that is available to calculate the ASBV. All ASBVs are now published with accuracies. The higher the percentage, the closer the ASBV is to the true breeding value of the animal. Breeding values without accuracies are Flock Breeding Values (FBVs) and can only be compared within the flock.
Sheep Genetics regularly reviews indexes to ensure that they reflect current breeding programs and markets signals. At the end of 2015 Sheep Genetics started its review into the Maternal indexes and as a result released updated indexes in May 2016.

The index review process started with an invitation for all Maternal breeders to respond to the survey opened on the 27th of January 2016. The survey covered questions about the breeder’s flock structure, production levels and clients’ breeding programs. This allowed Dr Andrew Swan from the Australian Genetics and Breeding Unit (AGBU) to model a typical flock for the various types of breeding program using the Sheep Object software and develop new indexes specific to those breeding programs.

Sheep Genetics held a webinar on the 20th of April 2016 to present the proposed indexes and variants that had been developed. The webinar also requested feedback on areas where more information was needed as well as preferred variants to be used. Sheep Genetics requested that all feedback was to be given in writing through the ‘Maternal Index Webinar - Feedback’ survey or via email by Monday the 2nd of May. The collated feedback was then used to finalise the indexes that were implemented with the 2016 Analysis Upgrades. More information on the three new Maternal indexes can be found on the next page.

The Maternal Index webinar can be found on Sheep Genetics’ YouTube channel:

https://www.youtube.com/watch?v=JQX0N2RxFWNQ
Border Leicester Cross (BLX)
The Border Leicester Cross Index is modelled on a production system using sires crossed to Merino dams producing first cross progeny. The index identifies high early growth animals with a significant response in post weaning weight and maternal ability. It also aims for an improvement in carcase eye muscle depth and number of lambs weaned. There is a small improvement in fleece weights. The index also recognises the importance of maintaining adult weight over time. The contribution of each trait to economic gain is expressed in the graph along with predicted genetic gain over 10 years.

Maternal Carcase Production (MCP)
The Maternal Carcase Production (MCP) index ranks animals on their suitability for a self-replacing system with a carcase production focus. This index balances the main economic traits relevant to Maternal breeders who consider that fleece traits or worm egg count are not economically important. This allows higher gains to be made for growth and carcase traits. The index also assumes no mating to terminal sires. The index aims to maintain adult weight at current levels. The contribution of each trait to economic gain is expressed in the graph along with the predicted genetic gain over 10 years.

Maternal Carcase Production + (MCP+)
The Maternal Carcase Production + (MCP+) index is similar to the Maternal Carcase Production (MCP) index, with the addition of both wool and worm egg count. This index targets self-replacing production systems where maintaining adult weight and fleece weights are seen as important at the same time as improving carcase traits. A slight increase in clean fleece weight is expected. This index aims to reduce WEC as it is assumed in the index most enterprises are located in high rainfall areas and/or high input management systems. The contribution of each trait to economic gain is expressed in the graph along with the predicted genetic gain over 10 years.
LAMBPLAN Maternal Indexes

These indexes are designed to meet different breeding objectives. They are simply a guide to assist animal selection, however when doing so commercial and seedstock producers should first consider their own breeding objective. This will involve considering your current ewe base, the environment they are run in and the target market for their progeny.

BLX

The BLX index identifies animals suitable for a first cross breeding production system promoting high early growth and maternal ability, improving reproduction and maintaining fleece weight.

MCP

The MCP index identifies animals suitable for self-replacing production systems with a carcase production focus. This index balances the main economic traits relevant to Maternal breeders where fleece traits or worm egg count are not considered important.

MCP+

The MCP+ Index identifies animals suitable for self-replacing production systems with a carcase production focus where fleece weights and WEC are important.

The following table illustrates the predicted genetic gain over 10 years for all recognised traits in the three indexes.

<table>
<thead>
<tr>
<th>Trait</th>
<th>BLX</th>
<th>MCP</th>
<th>MCP+</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gain over 10 years</td>
<td>Gain over 10 years</td>
<td>Gain over 10 years</td>
</tr>
<tr>
<td>BWT (kg)</td>
<td>0.1</td>
<td>0.14</td>
<td>0.14</td>
</tr>
<tr>
<td>WWT (kg)</td>
<td>1.62</td>
<td>2.04</td>
<td>1.9</td>
</tr>
<tr>
<td>PWT (kg)</td>
<td>2.76</td>
<td>3.37</td>
<td>3.11</td>
</tr>
<tr>
<td>MWWT (kg)</td>
<td>1.71</td>
<td>1</td>
<td>0.98</td>
</tr>
<tr>
<td>AWT (kg)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PFAT (mm)</td>
<td>0.06</td>
<td>0.14</td>
<td>0.27</td>
</tr>
<tr>
<td>PEMD (mm)</td>
<td>0.57</td>
<td>0.73</td>
<td>0.75</td>
</tr>
<tr>
<td>CEMD (mm)</td>
<td>0.67</td>
<td>0.85</td>
<td>0.87</td>
</tr>
<tr>
<td>YNLW (%)</td>
<td>0.04</td>
<td>0.03</td>
<td>0.03</td>
</tr>
<tr>
<td>NLW (%)</td>
<td>0.03</td>
<td>0.02</td>
<td>0.03</td>
</tr>
<tr>
<td>PWEC (%)</td>
<td>4.64</td>
<td>3.43</td>
<td>-25.82</td>
</tr>
<tr>
<td>YGFW (%)</td>
<td>1.48</td>
<td>1.21</td>
<td>0.09</td>
</tr>
<tr>
<td>YCFW (%)</td>
<td>2.17</td>
<td>-1.61</td>
<td></td>
</tr>
<tr>
<td>ACFW (%)</td>
<td>-0.3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

It is important to note that by maintaining adult weight there is a large impact on the genetic gain made by other traits. The emphasis on adult weight is due to the expression of many breeders in the concern to maintain adult. The level of emphasis on adult weight indicates a need to ensure adult weight is being measured and data is collected and entered.
Sheep Genetics first released the carcase and eating quality traits as Research Breeding Values (RBVs) in 2012. Upgrading the carcase analysis to a single step process has meant that the eating quality traits that were reported as RBVs are now being reported as ASBVs. Traits that are now being reported as ASBVs include Intramuscular Fat (IMF), Shear Force (SF5) and Lean Meat Yield (LMY). The single step analysis utilises pedigree and correlated traits, such as fat and muscle depth scan data, as well as genotype information as part of the same analysis instead of the blended approach that combines the outputs of two separate analyses that has been used since 2012. The benefit of this single step approach is that it allows breeding values to be calculated for a much wider range of animals. This in turn allows eating quality traits to be included in index calculations.

In order to include eating quality in the Terminal indexes, the value of eating quality has been derived through the combination of consumer taste test panel data and willingness to pay information collected as part of the Information Nucleus Flock program. This combined with the economic value of production traits, was used to develop additional indexes in the Terminal analysis. Sheep Genetics presented the proposed additional index through a webinar held on the 21st of April 2016. Feedback on the index could be submitted to Sheep Genetics through the ‘Eating Quality Webinar - Feedback’ survey launched on the 04th of May 2016. The results from the survey highlighted the need for two eating quality indexes, one based around Carcase + and the other on Lamb 2020, these indexes have been released as EQ and LEQ. Information on the two additional indexes can be found in the article below.

The Eating Quality Index webinar can be found on Sheep Genetics YouTube channel https://www.youtube.com/watch?v=0P7_c14VAkg.

**Eating Quality (EQ)**
The eating quality index is targeted at terminal producers interested in improving the meat eating quality of their prime lambs while continuing to improve production traits in a balanced way. The EQ index is based on the same production targets as Carcase + with the added emphasis on eating quality traits including Intramuscular fat (IMF) and Shear force (SF5). The graph below represents the predicted economic gains for each trait of interest in the index and also expresses the expected 10 year gains for the individual traits.
Lamb 2020 + EQ (LEQ)
The Lamb 2020 Eating Quality index is targeted at terminal producers interested in improving the meat eating quality of their prime lambs while continuing to improve production traits in a balanced way. The LEQ index is similar to the EQ index however is based on the same production targets as Lamb 2020 where birthweight (BWT) and worm egg count (WEC) are important in the breeding objective. The greater emphasis on WEC is the main difference between LEQ and EQ. The graph below represents the predicted economic gains for each trait of interest in the index and also expresses the expected 10 year gains for the individual traits.

The following table illustrates the predicted genetic gain over 10 years for all recognised traits in the new eating quality indexes alongside Carcase + and Lamb 2020.

<table>
<thead>
<tr>
<th>Trait</th>
<th>Carcase +</th>
<th>EQ</th>
<th>Lamb 2020</th>
<th>LEQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>BWT (kg)</td>
<td>0.15</td>
<td>0.06</td>
<td>0.07</td>
<td>0.07</td>
</tr>
<tr>
<td>WWT (kg)</td>
<td>2.85</td>
<td>1.55</td>
<td>1.85</td>
<td>1.28</td>
</tr>
<tr>
<td>PWT (kg)</td>
<td>4.4</td>
<td>3.15</td>
<td>2.8</td>
<td>2.6</td>
</tr>
<tr>
<td>PEMD (mm)</td>
<td>1.46</td>
<td>1.07</td>
<td>1.44</td>
<td>1.17</td>
</tr>
<tr>
<td>PFAT (mm)</td>
<td>0.14</td>
<td>0.04</td>
<td>0.59</td>
<td>0.33</td>
</tr>
<tr>
<td>PWEBC (%)</td>
<td>0.06</td>
<td>0.16</td>
<td>-52.24</td>
<td>-35.83</td>
</tr>
<tr>
<td>CEMD (mm)</td>
<td>1.5</td>
<td>1.15</td>
<td>1.42</td>
<td>1.25</td>
</tr>
<tr>
<td>CCFAT (mm)</td>
<td>-0.5</td>
<td>-0.4</td>
<td>0.07</td>
<td>-0.12</td>
</tr>
<tr>
<td>DRESS (%)</td>
<td>1.31</td>
<td>1.09</td>
<td>1.1</td>
<td>1.03</td>
</tr>
<tr>
<td>LMY (%)</td>
<td>1.66</td>
<td>0.91</td>
<td>1.14</td>
<td>0.87</td>
</tr>
<tr>
<td>SF5 (nM)</td>
<td>0.77</td>
<td>-2.41</td>
<td>0.62</td>
<td>-2.06</td>
</tr>
<tr>
<td>IMF (%)</td>
<td>-0.27</td>
<td>0.09</td>
<td>-0.14</td>
<td>0.1</td>
</tr>
</tbody>
</table>

It is expected that the gain made over 10 years for LMY is reduced in the eating quality indexes compared to Carcase + and Lamb 2020 due to the antagonistic relationship between IMF/SF5 and LMY. Although this is the case, LMY is still improves over 10 years while the response in eating quality traits is significantly improved. These indexes are targeting a balanced production system where LMY, IMF and SF5 are all improved at the same time.

The eating quality indexes have been developed to give producers the opportunity to make balanced selection decisions reflecting animals with superior meat eating quality in their flock. Eating quality is becoming increasingly important to consumers and the indexes allow proactive selection decisions to be made.
2015 Annual Survey Overview

This report is a compilation of the responses for the 2015 Annual Subscriber Satisfaction Survey. The survey was distributed electronically on the 21st December 2015 and closed on the 15th January 2016, with 100 flocks responding, a rise from 84 last year.

As you can see by the breakdown of breeder types and flock sizes, there is a good representation, reflecting client numbers.

Staff
As can be seen from the table below, when we collate the results into a scoring system, the Staff have maintained a consistent and sound score. This is pleasing to see, in spite of a heavy travel load and two new project officers requiring support.

Please note if there are gaps in the numbers, this indicates that the question was not asked in that year.

<table>
<thead>
<tr>
<th>Type of breeder</th>
<th>48% Terminal</th>
<th>13% Maternal</th>
<th>3% Goat</th>
<th>34% Merino</th>
<th>2% Dohne</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flock size</td>
<td>% of flocks by size</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-50 animals</td>
<td>2%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50-100 animals</td>
<td>8%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100-300 animals</td>
<td>27%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>300-600 animals</td>
<td>25%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>600+ animals</td>
<td>38%</td>
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<tbody>
<tr>
<td>Requests are dealt with in a timely manner</td>
<td>3.6</td>
<td>3.0</td>
<td>3.7</td>
<td>3.5</td>
<td>3.3</td>
<td>4.0</td>
<td>3.8</td>
<td>3.6</td>
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<tr>
<td>Sheep Genetics reports can be easily interpreted</td>
<td>4.0</td>
<td>4.1</td>
<td>3.8</td>
<td>3.9</td>
<td>4.0</td>
<td>4.0</td>
<td>4.0</td>
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<tr>
<td>Sheep Genetics staff are approachable and friendly</td>
<td>4.3</td>
<td>4.2</td>
<td>4.3</td>
<td>4.2</td>
<td>4.2</td>
<td>4.2</td>
<td>4.3</td>
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</tr>
<tr>
<td>Sheep Genetics Staff are helpful and patient with requests</td>
<td>4.0</td>
<td>4.1</td>
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<td>4.1</td>
<td>4.1</td>
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<tr>
<td>Staff members can be contacted easily</td>
<td>3.8</td>
<td>3.8</td>
<td>3.8</td>
<td>3.8</td>
<td>3.6</td>
<td>4.0</td>
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</tr>
<tr>
<td>Average</td>
<td>3.8</td>
<td>3.6</td>
<td>3.9</td>
<td>3.9</td>
<td>3.9</td>
<td>4.0</td>
<td>4.0</td>
<td>3.9</td>
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</tr>
<tr>
<td>Sheep Genetics staff are approachable and friendly</td>
<td>4.2</td>
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<td>3.9</td>
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<td>4.2</td>
<td>4.0</td>
<td>4.2</td>
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</tr>
</tbody>
</table>
Survey Cont’d

Australian Sheep Breeding Values

From responses shown below it can be seen that across LAMBPLAN and MERINOSELECT there are similar responses, a pleasing trend is that around 80-90% of respondents felt that ASBVs assist with selection, achieving their breeding objective and making higher rates of genetic gain.

**ASBVs play a significant role in the selection decisions that I make.**

<table>
<thead>
<tr>
<th></th>
<th>LAMBPLAN %</th>
<th>MERINOSELECT %</th>
<th>TOTAL FLOCK RESPONSE %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>66%</td>
<td>66%</td>
<td>66%</td>
</tr>
<tr>
<td>Agree</td>
<td>26%</td>
<td>20%</td>
<td>24%</td>
</tr>
<tr>
<td>Disagree</td>
<td>7%</td>
<td>11%</td>
<td>8%</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>2%</td>
<td>3%</td>
<td>2%</td>
</tr>
</tbody>
</table>

**ASBVs assist in achieving breeding objectives**

<table>
<thead>
<tr>
<th></th>
<th>LAMBPLAN %</th>
<th>MERINOSELECT %</th>
<th>TOTAL FLOCK RESPONSE %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>62%</td>
<td>63%</td>
<td>63%</td>
</tr>
<tr>
<td>Agree</td>
<td>26%</td>
<td>31%</td>
<td>28%</td>
</tr>
<tr>
<td>Disagree</td>
<td>10%</td>
<td>6%</td>
<td>8%</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>2%</td>
<td>0%</td>
<td>1%</td>
</tr>
</tbody>
</table>

**Using ASBVs has meant that I am able to achieve a higher rate of genetic gain**

<table>
<thead>
<tr>
<th></th>
<th>LAMBPLAN %</th>
<th>MERINOSELECT %</th>
<th>TOTAL FLOCK RESPONSE %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>51%</td>
<td>54%</td>
<td>52%</td>
</tr>
<tr>
<td>Agree</td>
<td>41%</td>
<td>34%</td>
<td>39%</td>
</tr>
<tr>
<td>Disagree</td>
<td>7%</td>
<td>9%</td>
<td>7%</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>2%</td>
<td>3%</td>
<td>2%</td>
</tr>
</tbody>
</table>

A full collation of answers from the survey can be found on our website.

**Barbervax and WEC Data**

Barbervax has been on the Australian market since October 2014. The vaccine has had a positive impact on Barbers Pole worm egg counts and drench resistance, especially in the New England region.

The effect Barbervax has on an animal’s worm egg count after the protection period is over is not well known. Until more is known any worm egg counts measured after exposure to Barbervax cannot be used in the analysis. Sheep Genetics recommend taking any worm egg counts for the calculation of ASBVs before Barbervax is used on the animal to avoid the measurements being excluded.

To learn more about the impacts of Barbervax on worm egg counts at later age stages AGBU need more information. If you have collected or submitted worm egg counts from animals that have been exposed to Barbervax prior to measurement, please contact Clara Collison or Caris Jones to discuss how this can help AGBU’s research.
Parentage Testing - Sheep CRC

Sheep breeders are embracing the SNP-based Parentage Test available from the Sheep CRC with over 29,000 tests undertaken so far this financial year. SNP (pronounced “snip”) stands for single nucleotide polymorphisms. SNPs are single nucleotide substitutions in the DNA sequence and are now the DNA marker of choice in genomic selection studies.

Features of the SNP-based parentage test include:

- The test is compatible with other SNP-based tests. Animals tested using the Sheep Genomics Test will not need to be re-sampled by the breeder for parentage as the genotyping has already been recorded.
- A poll/horn result is returned for animals tested if applicable (a poll/horn result is also returned with a Sheep Genomic test).

There are two sampling methods currently available to breeders – blood cards and the Allflex Tissue Sampling Unit (TSU). In both cases DNA is extracted and processed by Geneseek. Blood cards are currently stored indefinitely and can be re-punched for the Sheep Genomics Test if required at any time. TSUs are stored for 12 months and can be re-tested within a 6 month period. Over 83,000 parentage tests using blood cards have been undertaken by the Sheep CRC with a failure rate of 2.1%. Following the blood card collection protocol provided helps to minimise test failures. With TSUs only recently being offered for parentage and Sheep Genomic testing, no significant numbers of TSUs have been processed by the Sheep CRC to provide a comparable failure rate.

With multiple generations of sheep now in the database it is important breeders provide as much information as possible about each order to minimise delays. To ensure the best possible results breeders need to be aware of the following:

- It is important to collect samples from all of the animals that need to be matched up if possible. For example, failing to sample one or two sires may make it difficult to assign all of the lambs to their sires. The same applies to sampling all ewes if full pedigrees are requested.
- When matching to previously genotyped animals it is important to provide full 16 digit IDs and the ID that was originally submitted for the animal. If visual IDs/EIDs were submitted for the animal ID originally, a file with corresponding 16 digit IDs can be sent to the Genomics Office to alter the animal ID in the database.
- An EID field has been added to the database, however it is preferable to submit corresponding 16 digit IDs with EIDs.
- A sire verification against the Sheep Genetics database, is now automatically provided for all animals tested with the Sheep Genomics test.
- Breeders need to provide a complete list of all previously tested and possible sires/ewes for the parentage order to ensure the best results. Running against all sires/ewes in the database can cause issues if there are multiple close relationships (eg sires, grand sires and great grand sires).
- Where the sires submitted are closely related it is recommended that dams are also included.

The technology in this area is advancing rapidly so watch this space for future developments in parentage testing!

Breeders can order parentage tests for blood cards and TSUs by placing an online order via the Sheep CRC webpage at www.sheepcrc.org.au

To discuss parentage test requirements please contact the Sheep Genotyping Office on 02 6773 3466.
We have all seen the range in ewe behaviour towards their lambs in the paddock at one time or another. The maternal behaviour of a ewe is an important factor in lamb survival, especially in the early stages of the lamb’s life. Information from both research flocks and industry has shown that maternal behaviour is moderately heritable in Maternal, Merino and Terminal breeds. Revealing lamb survival improvements can be made through measuring and selecting for maternal behaviour. A breeding value for maternal behaviour can be estimated as long as the trait is measured in a consistent manner across flocks. Repeated measurements of the ewe over her life will increase the accuracy of the breeding value estimated.

The behaviour of the ewe can be measured through a scoring system that is constructed around the distance the ewe moves from the lamb during the tagging process. The maternal behaviour score (MBS) is correlated to both reproduction and growth. Indicating that improving maternal behaviour will not only improve lamb survival but also growth and reproduction in your ewes.

The MBS method is the planned process to record and submit maternal behaviour to Sheep Genetics going forward. The scoring system ranges from a score one of excellent maternal behaviour where the ewe stays near their lamb to a score five of poor maternal behaviour where the ewe runs away and is difficult to direct back to their lamb. The scoring of maternal behaviour within 24 hours of parturition can be done easily and at a low cost, especially for flocks that are already tagging lambs at birth.

To produce a maternal behaviour ASBV and utilise the correlations between it and other traits in the LAMBPLAN and MERINOSELECT analyses more data is needed. If you are already taking note of the maternal behaviour of your ewes or can easily add it to the records taken at lambing please read the below guidelines and submit the data to Sheep Genetics through the mating module. Without more information we will not be able to make the most of the information we have and estimate a breeding value for maternal behaviour in 2017.

**Maternal Behaviour Score**

**Summary:** Maternal behaviour refers to the ewe’s behaviour towards its lamb(s). It can be scored through assessing the distance a ewe travels from the lamb when handled by operators. Maternal behaviour can vary from the ewe staying close by to running away and not coming back.

**Age:** Over 11 months of age

**When:** Within 24 hours of parturition/birth

**How to score:** A single score of 1, 2, 3, 4 or 5.

**Rule of Thumb:** A ewe with Score 1 shows excellent maternal behaviour and stays close to the lamb. A ewe with Score 5 show poor maternal behaviour and show little interest in the lamb.

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ewe stays close to the lamb and operator</td>
</tr>
<tr>
<td>2</td>
<td>Ewe stays within 10 metres of the lamb and operator</td>
</tr>
<tr>
<td>3</td>
<td>Ewe stays within 30 metres of the lamb and operator</td>
</tr>
<tr>
<td>4</td>
<td>Ewe ran away but readily returned when operators moved away</td>
</tr>
<tr>
<td>5</td>
<td>Ewe ran away and was difficult to get to return to the lamb</td>
</tr>
</tbody>
</table>

**Tips to minimise delays in parentage orders**
- Place an online order at www.sheepcrc.org.au
- Follow the blood card protocol carefully
- Return the cards/TSUs via express post
- Return the correct order form with the cards/TSUs
- Provide an electronic file with TSUs including sample ID, SGID and group details
- Provide all necessary information about the order with the cards/TSUs
- Provide payment details when cards/TSUs are returned
- Provide a complete sire/dam list to match to progeny
- Provide 16 digit IDs for all animals tested
Sheep Genetics Organisational Setup

MLA/AWI

Executive Committee
Dr Jane Weatherley (MLA)
Richard Apps (MLA)
Dr Paul Swann (AWI)
Neil Judd (AWI)

Advisory Committee
Ron Cullen (Chair)
Murray Long - 230324
Pendarra White Suffolks, NSW
Mark Mortimer - 601250
Centre Plus Merinos, NSW
Mark Murphy - 601365
Karbullah Merinos, QLD
Dale Price - 161886
Majardah Poll Dorsets, SA
Warren Russell - 501704
Melrose Merinos, VIC
Sara Wilson - 470169
Jilakin Downs Dorpers WA

Sheep Genetics Manager
Hamish Chandler
Fiona McLoughlin
Nicole Williams

LAMBPLAN Clara Collison
Stephen Field

MERINOSELECT Caris Jones
David Rubie

Technical Committee
Dr Rob Woolaston (Chair)
Dr Rob Banks - AGBU
Dr Daniel Brown - AGBU
Dr Andrew Swan - AGBU
Dr Kim Bunter - AGBU
Mr Neil Judd - AWI
Mr Richard Apps - MLA
Dr Julius Van Der Werf - UNE
Dr Sam Clark - UNE
Mr Sam Gill - MLA
Dr Ben Hayes - UQ
Dr Sue Mortimer - NSW DPI
Mr Mark Mortimer - Industry
Mr Hamish Chandler - Sheep Genetics

Sheep Genetics staff should always be the initial contact point for all communication

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