final report

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Southern Beef Technology Services

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Executive Summary

The Southern Beef Technology Services (SBTS) project was a joint initiative between 15 breed associations represented mainly in southern Australia, the Agricultural Business Research Institute (ABRI) and Meat & Livestock Australia (MLA). SBTS provided the southern beef industry with hands-on technical support to improve the understanding and adoption of BREEDPLAN and related genetic improvement technologies. The project was initially funded from 1 September 2010 until 30 August 2014, but was subsequently extended to 30 June 2016.

The project achieved its objective to increase genetic gain in the southern beef industry through a range of innovative extension, technology transfer and technical support activities including one-on-one technical support to seedstock herds (both remotely and on-property), technical support to Breed Association Technical Committees or Boards and facilitation of cattle breeding and genetics workshops and field days. The extension activities involved both seedstock and commercial producers.

Members from all stakeholder breeds undertaking genetic evaluation through GROUP BREEDPLAN in Australia were provided with structured and consistent education and technical support via the SBTS project.

Genetic improvement in the Australian beef industry is driven by genetic improvement in the seedstock industry which provides most of the bulls used by commercial breeders. The major objective to increase the weighted average selection index by **$21.00** per cow mated from the base year of 2008 to 2015 was exceeded by a total of **$3.75** or **$0.62** per year.

The weighted average selection index ($) for the 2015 calving year is **$83.27** compared to the 2008 calving year (base year) of **$58.02** This represents an **increase of $25.25** between the 2008 and 2015 calving years or an **average increase of $3.61 per year.**

With an estimated 4 million beef breeding females in southern Australia, the overall potential benefit of the genetic improvement achieved in dollar terms can be estimated at $72 million. However, acknowledging that only 80% of sires being used in the commercial industry in southern Australia are sourced from the seedstock industry, the actual benefit that is likely to be realised can be estimated to be $57.6 million.

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1 Background

The Southern Beef Technology Services (SBTS) project was a joint initiative between 15 breed associations represented mainly in southern Australia, the Agricultural Business Research Institute (ABRI) and Meat & Livestock Australia (MLA). SBTS provided the southern beef industry with hands-on technical support to improve the understanding and adoption of BREEDPLAN and related genetic improvement technologies. The project was initially funded from 1 September 2010 until 30 August 2014 but was subsequently extended to 30 June 2016. It aimed to build on two previous successful SBTS projects.

Genetic improvement in the Australian beef industry is driven by genetic improvement in the seedstock industry which provides most of the bulls used by commercial breeders. This benefit to industry is not instantaneous due to the lag time between the genetic improvement in the seedstock and commercial sector but it is cumulative, on-going and permanent.

The improvement in profitability via genetics can be estimated by using the BreedObject Selection Index trends for the stakeholder breeds. BreedObject Selection Indexes indicate differences in net profit per cow mated, with Indexes developed and published for the Angus, Hereford, Shorthorn, Charolais, Limousin, Murray Grey, Simmental,. Wagyu, Red Angus and South Devon breeds. In 2015 these breeds accounted for 98.5% of the cattle registered with stakeholder Breed Societies in the SBTS project.

The major objective of the project was to increase the weighted average selection index by **$15.00** per cow mated from the base year of 2008 to 2013. With the extension of the project the major objective was to increase the weighted average selection index by **$21.00** per cow mated from the base year of 2008 to 2015

The project aimed to achieve its objective to increase genetic gain in the southern beef industry through a range of extension, technology transfer and technical support activities including one-on-one technical support to seedstock herds (both remotely and on-property), technical support to Breed Association Technical Committees or Boards and facilitation of cattle breeding and genetics workshops and field days. The extension activities involved both seedstock and commercial producers.

Members from all breeds undertaking genetic evaluation through GROUP BREEDPLAN in Australia were provided with structured and consistent education and technical support via either the SBTS project or the TBTS project.

2 Project Objectives

The project objectives were to:

1. Undertake extension activities and provide technical support to implement both new and existing BREEDPLAN related technologies in southern Australian seedstock herds e.g. BREEDPLAN EBVs, Internet Solutions, BreedObject Selection Indexes, TakeStock®, Data Quality Herd Audit, Marker Assisted EBVs and Mate Selection tools.

2. Undertake regular extension initiatives to inform the seedstock and beef breeding industry in general of the relevance and application of DNA technology for accelerating genetic progress in economically important production traits.
3. Maintain and support the Selection Indexes published by stakeholder breed associations to ensure they remain relevant to current and future markets and production systems. Where possible, also develop and publish Selection Indexes for stakeholder breed associations not currently doing so.
4. Define key statistics (KS) for genetic progress in beef stock herds and develop an automated process of reporting the KSs. The KSs will provide benchmarking values across breeds and assist in identifying herds to target for individual consultation in order to achieve objective 5.
5. Facilitate an increase in the rate of genetic progress of the stakeholder breed associations by increasing the weighted average BreedObject selection index value of animals by $15.00 per cow mated between 2008 drop (base year) and 2013 drop calves (extended to $21.00 per cow mated between the 2008 base year and 2015 drop calves).
6. Maintain and expand the extension material relating to BREEDPLAN related technologies, particularly the new tools. This involves maintenance of the BREEDPLAN and SBTS websites, BREEDPLAN Tip Sheets and Booklets, and the development of electronic media including regular webinars and podcasts.
7. Recommend a strategy for continuation and funding of the services provided by SBTS as a key component of a national extension program into genetic improvement of the beef industry.

3 Methodology

3.1 Undertake extension activities and provide technical support to implement both new and existing BREEDPLAN related technologies in southern Australian seedstock herds e.g. BREEDPLAN EBVs, Internet Solutions, BreedObject selection, TakeStock®, Data Quality Herd Audit, Marker Assisted EBVs and Mate Selection tools.

A range of extension activities and technical support initiatives to implement both new and existing BREEDPLAN related technologies in southern Australian seedstock herds were undertaken

3.2. Undertake regular extension initiatives to inform the seedstock and beef breeding industry in general on the relevance and application of DNA technology for accelerating genetic progress in economically important production traits.

SBTS has actively updated the seedstock and beef breeding sector on the relevance and application of DNA technology.

3.3. Maintain and support the selection indexes published by Stakeholder Breed Associations to ensure they remain relevant to current and future markets and production systems. Where possible, also develop and publish selection indexes for stakeholder Breed Associations not currently doing so.

A total of 10 SBTS breed societies have selection indexes published totalling 32 selection indexes For each of the selection indexes, SBTS maintains a detailed set of technical documentation that provide details on the key profit drivers, EBV weightings and response to selection that can be expected when selecting animals using the selection index.

3.4. Define Key Statistics (KS) for genetic progress in beef seedstock herds and develop an automated process of reporting KS. The KS will provide benchmarking values across breeds and assist in identifying herds to target for individual consultation in order to achieve objective 5

Phase 1 - The first phase of this objective has been completed with the development of the "Completeness of Performance" product. The key statistics generated by this system are based around the levels (and trends over time) of pedigree and performance recording relevant to the BREEDPLAN analyses. The statistics and associated reports can be produced on either an individual herd or breed level.

Phase 2 - The second phase of this objective has been finalised with the development of the Phase II Genetic Improvement Benchmarking report. This comprehensive herd level report includes numerous benchmarking statistics in relation to genetic improvement and progress.

3.5. Facilitate an increase in the rate of genetic progress of the stakeholder Breed Associations by increasing the weighted average BreedObject selection index value of animals by $21.00 per cow mated between the 2008 drop (base year) and 2015 drop calves

The weighted average selection index value for the stakeholder Breed Associations was calculated based on the latest BREEDPLAN genetic evaluation results available on June 30th 2016 for each Breed Society with selection indexes published.

3.6. Maintain and expand the extension material relating to BREEDPLAN related technologies, particularly the new tools. This involves maintenance of the BREEDPLAN and SBTS websites, BREEDPLAN Tip Sheets and Booklets, and the development of electronic media including regular webinars and podcasts.

SBTS maintained the SBTS (http://sbts.une.edu.au) and BREEDPLAN (http://breedplan.une.edu.au) websites.

The SBTS team maintained the comprehensive set of BREEDPLAN Tip Sheets and Booklets. Electronic video media developed and posted to the SBTS and TBTS YouTube Channel.

3.7 Recommend a strategy for continuation and funding of the services provided by SBTS as a key component of a national extension program into genetic improvement of the beef industry.

A number of strategies were considered for the continuation and funding of the services provided by SBTS. It was concluded that matching of funds provided by breed societies and ABRI by the MLA Donor Company was the preferred model.

4 Results

4.1 Undertake extension activities and provide technical support to implement both new and existing BREEDPLAN related technologies in Southern Australia seedstock herds e.g. BREEDPLAN EBVs, Internet Solutions, BreedObject selection, TakeStock®, Data Quality Herd Audit, Marker Assisted EBVs and Mate Selection tools.

A range of extension activities and technical support initiatives to implement both new and existing BREEDPLAN related technologies in Southern Australian seedstock herds were undertaken as follows:

- Closer to Your Client Workshops; A total of 44 "Closer to your Client" workshops were conducted during the project. These workshops were run on seedstock properties but specifically targeted commercial bull buyers.

- Webinars; During the project four webinar series were conducted, each consisting of five or six one hour webinars with a general theme. The 22 webinars were then posted on YouTube and can be viewed at *http://sbts.une.edu.au/Webinars/webinars.html* The webinar series and average attendance for each series are shown in Table 1.

  Table 1; Attendance of webinars

Webinar Series	Number of webinars	Average Attendance	Downloads in next 6 months
Know Your Genes	6	84	243
Recording in Small Herds	1	100	55
The Cutting Edge	6	87	293
Staying Ahead of the Curve	4	43	135
BREEDPLAN Basics	5	39	180

- General Workshop Delivery: In addition to the workshops and webinars facilitated by SBTS, extension staff were also involved in presenting sessions at 146 beef industry field days and seminars.

- SBTS & TBTS Updates: Summer and Winter Update publications were produced each year as a joint initiative with TBTS and can be viewed under Technical Documents at the website http://sbts.une.edu.au/ The SBTS & TBTS Update was an effective extension avenue for keeping seedstock producers informed on current developments in the genetic progress technology area and upcoming related extension initiatives.

  With regard to distribution, the SBTS and TBTS Update was:

  - Mailed to all BREEDPLAN members of the SBTS and TBTS stakeholder Breed Societies (approximately 2100 businesses).

- Electronically distributed via email or e-news mail list to BREEDPLAN and non-BREEDPLAN members of the SBTS & TBTS stakeholder Breed Societies (approximately 5,500 businesses),
- Electronically distributed via email or e-news mail list to a list of personnel working in the beef industry (eg. Ultrasound scanners, staff from AGBU, MLA, SGA, DPI, Pfizer, UQ, private consultants).
- In addition, a copy is provided in electronic form to each Breed Society stakeholder for wider distribution.

TechTalk: TechTalk articles which discuss a topic of interest regarding the application of genetic technologies and their utilisation within a breeding program were commenced in May 2013.

TechTalk was circulated via the SBTS website and social media network. The articles were also provided to participating Breed Societies for distribution throughout their networks. They can be viewed in Technical Documents on the website http://sbts.une.edu.au/

Social Media: In May 2013, SBTS in conjunction with TBTS, implemented a strategy to utilise social media as an additional communication stream for genetic technology updates. This involves two social media platforms being Twitter and Facebook. This is additional to the SBTS and TBTS YouTube channel which has been utilised to upload recorded webinars and other related videos. The Social Media links are:

www.facebook.com/SBTSTBTS

www.twitter.com/SBTSTBTS

www.youtube.com/sbtstbts

Additionally:

- Facebook –The average post reached 45 people. The number of "page likes" at 30 June 2016 was 428, compared to 162 at the same time in 2015.
- Twitter –At 30 June 2016 the twitter account had 192 "followers", compared to 128 at the same time in 2015.
- YouTube – The SBTS & TBTS YouTube channel includes 53 videos. This includes both recorded webinars and specifically developed videos. Since the YouTube channel was established in 2013 there have been a total of 8,740 views of individual presentations. The most viewed webinar "DNA Technology; Understanding the basics had been viewed 922 times to the 30th June 2016.

- **Technical support was provided on a day to day basis to staff, boards and technical committees**/representatives from participating Breed Societies. Examples of technical support provided to Breed Societies include:

- Representation of participating Breed Societies at BREEDPLAN Technical Liaison Group (BTLG) meetings (four per year)
- Review of preliminary results from GROUP BREEDPLAN analyses for participating breed societies and provision of associated permission to release the results on behalf of the breed society.
- General liaison and advice with members from participating breed societies' staff, technical committees and boards.
- Compilation of technical articles for Breed Society publications.

More specific technical support provided during the project included:

- Support in the transition to ABRI's new generation of breed registry software known as ILR2. The new software includes several new features such as the running of monthly GROUP BREEDPLAN analyses, production of enhanced BREEDPLAN reports and access to the mating optimisation tool MateSel..
- Implementation of new EBVs and Indexes analysis and publication for a number of breeds.
- Assistance with the Beef Information Nucleus (BIN) programs for Hereford and Charolais, including a Least Square Means analysis.
- In conjunction with AGBU, the development of the Genomic Policy Roadmaps for seveal breeds.

❑ Technical Support to Breed Society Members: Members of all participating Breed Societies had access to ongoing assistance in the use and understanding of the different genetic tools that are available. Technical support provided to Breed Society members included:

- Provision of day to day phone and email consultation. This ranged from general provision of advice regarding the use and application of genetic technologies, to more complex EBV diagnostics. As noted in annual reports, this activity took up a significant amount of time in each SBTS Technical Officer's profile.
- SBTS services included a structured on-property consultation program with influential seedstock herds. In the first three years Phase 1 visits to 201 herds were completed. A more advanced Phase 2 package was developed and, the target list was reviewed and revised accordingly to ensure the list contains the relevant "influential" breeders. In the final three years 43 on-property Phase 2 consultations were conducted.

4.2. Undertake regular extension initiatives to inform the seedstock and beef breeding industry in general on the relevance and application of DNA technology for accelerating genetic progress in economically important production traits.

SBTS has actively updated the seedstock and beef breeding sector on the relevance and application of DNA technology. This included:

- The SBTS Technical Officers actively updated Breed Society Technical Committees and/or Boards on the relevance and application of DNA technology specifics on a breed by breed basis. This was either communicated directly through presentations to the Boards and/or Technical Committees, or via the quarterly BTLG summary report.

- The SBTS Technical Officers regularly provided support and advice (phone and email) directly to Breed Society members regarding the application of DNA technology in their herds.

4.3. Maintain and support the selection indexes published by Stakeholder Breed Associations to ensure they remain relevant to current and future markets and production systems. Where possible, also develop and publish selection indexes for stakeholder Breed Associations not currently doing so.

A total of 10 SBTS breed societies have selection indexes published totalling 32 selection indexes as shown in Table 2. For each of the selection indexes, SBTS maintains a detailed set of technical documentation that provide details on the key profit drivers, EBV weightings and response to selection that can be expected when selecting animals using the selection index.

Table 2; Selection Indexes maintained for each breed

Breed	No.	Selection Indexes
Angus	4	Angus Breeding, Domestic, Heavy Grain, Heavy Grass
Charolais	3	Domestic, Export, Northern Terminal
Hereford	4	Supermarket, Grass Fed Steer, Grain Fed Steer, EU
Limousin	4	Domestic Terminal, Self Replacing, Heavy Steer Terminal, Vealer Terminal
Murray Grey	3	Vealer Terminal, Supermarket and EU Heavy Steer
Red Angus	3	Supermarket, Vealer, Northern Steer
Simmental	4	Domestic Maternal, Export Maternal, Vealer Terminal, Northern Terminal
Shorthorn	3	Heavy Domestic, Export Maternal, Northern Maternal
South Devon	3	Vealer, Supermarket, Export Maternal
Wagyu	1	Fullblood Terminal

4.4. Define Key Statistics (KS) for genetic progress in beef seedstock herds and develop an automated process of reporting KS. The KS will provide benchmarking values across breeds and assist in identifying herds to target for individual consultation in order to achieve objective 5

Phase 1 - The first phase of this objective has been completed with the development of the "Completeness of Performance" product. The key statistics generated by this system are based around the levels (and trends over time) of pedigree and performance recording

relevant to the BREEDPLAN analyses. The statistics and associated reports can be produced on either an individual herd or breed level.

On a breed level, the “Completeness of Performance” statistics were compiled into a benchmarking report which is presented to the SBTS Stakeholder Breed Societies on an annual basis. This provides valuable information to each Breed Society regarding how the pedigree and performance recording levels in their breed compares to other breeds (and breed groups) involved in genetic evaluation through BREEDPLAN. The breed level statistics and report can also be generated at any point of time for presenting and discussing with individual breed societies.

On a herd level, “Completeness of Performance” reports were provided to all BREEDPLAN herds on an annual basis. Additionally, for breed societies on an ILR2 database platform, and therefore monthly BREEDPLAN analyses, the Completeness of Performance reports and associated star ratings were updated on a more regular basis (i.e. if the herd had submitted data to BREEDPLAN is the previous month their report was automatically updated).

A valuable addition to the “Completeness of Performance” product was the trait diagnostic report. This reporting process allows the data recording of individual breeders to be quickly and efficiently interrogated to identify individual animals with gaps in their performance trait profile.

Phase 2 - The second phase of this objective was finalised with the development of the Phase II Genetic Improvement Benchmarking report. This comprehensive herd level report includes numerous benchmarking statistics in relation to genetic improvement and progress. The statistics are displayed in several sections being:

- Current Genetic Position
- Genetic Trends
- Genetic Improvement Key Drivers
    - Selection Intensity
    - Genetic Variation
    - Generation Length
- Phenotypic Trends

The Genetic Improvement Benchmarking report formed the basis of the Phase II on-property consultations with influential seedstock herds. For these, the Genetic Improvement Consultation kit included:

- Genetic Improvement Benchmarking Report
- Completeness of Performance Report
- MateSel Sire Scoping Report
- And reference documents:
    - “Maximising Genetic Improvement” TechNote
    - “Understanding Selection Indexes” Tip Sheet
    - “A Guide to Performance Recording” Booklet

Herd Target Lists - The above developments provided invaluable information for identifying herds to target for individual consultation. For the Phase 1 on-property consultation program, the SBTS team developed a target list based primarily on herd size and general knowledge of their "influence" on the breed at a seedstock and/or commercial level. The target list includes 119 "primary" herds and 129 "secondary" seedstock herds with the primary herds given precedent over the secondary herds. For the Phase 2 consultations, the target list was reviewed and revised accordingly to ensure the list contains the relevant "influential" breeders.

4.5. Facilitate an increase in the rate of genetic progress of the stakeholder Breed Associations by increasing the weighted average BreedObject selection index value of animals by $21.00 per cow mated between the 2008 drop (base year) and 2015 drop calves

The weighted average selection index value for the stakeholder Breed Associations was calculated based on the latest BREEDPLAN genetic evaluation results available on June 30th 2016 for each Breed Society with selection indexes published.

The weighted average selection index ($) for the 2015 calving year is **$83.27** compared to the 2008 calving year (base year) of **$58.02** (see Table 3). This represents an **increase of $25.25** between the 2008 and 2015 calving years or an **average increase of $3.61 per year.**

Table 3; Weighted Average Selection Index 2008 to 2015

Calving Year	# Animals	Weighted Av Selection index ($)	Weighted Av ΔG ($)
2008 (Base)	136,562	58.02	0.73
2009	131,282	60.53	2.52
2010	129,132	63.18	2.65
2011	140,846	66.59	3.41
2012	140,517	70.73	4.14
2013	136,213	75.31	4.58
2014	120,928	78.94	3.63
2015	93.534	83.27	4.32

The objective to increase the weighted average selection index by $21.00 per cow mated from the base year of 2008 to 2015 was exceeded by a total of $4.27 or $0.61 per year.

Importantly, the weighted average selection index trends show an increasing rate of genetic progress being achieved. For the three year period to 2010 the average increase in the weighted average index was $1.97 per year and in the three years to 2015 the average increase in the weighted average index was $4.18 per year.

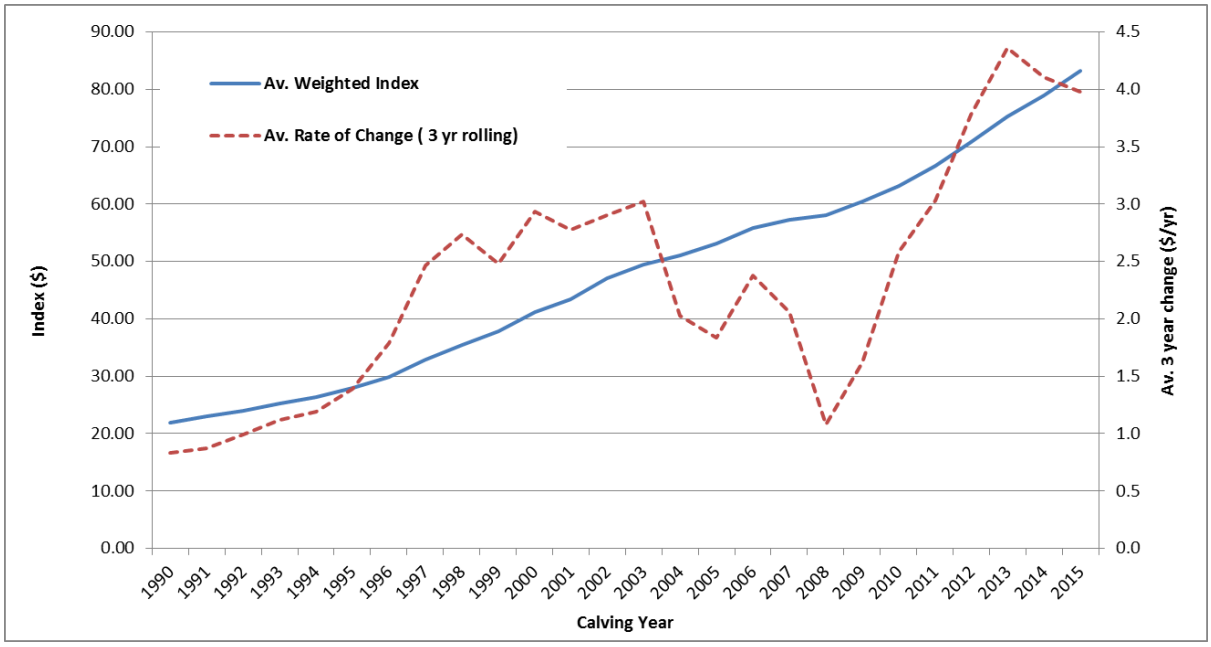

Fig 1. Weighted Average selection index ($) and Average Rate of Change (3 year rolling) for Southern Beef Technology Services stakeholder breeds.

5 Discussion

5.1 Achievement of Project Objectives

The project objectives were achieved as follows:

1. Undertake extension activities and provide technical support to implement both new and existing BREEDPLAN related technologies in Southern Australia seedstock herds e.g. BREEDPLAN EBVs, Internet Solutions, BreedObject Selection Indexes, TakeStock®, Data Quality Herd Audit, Marker Assisted EBVs and Mate Selection tools.
   A range of extension activities and technical support initiatives to implement both new and existing BREEDPLAN related technologies in Southern Australian seedstock herds have been undertaken (see Methodology section for more detail).

2. Undertake regular extension initiatives to inform the seedstock and beef breeding industry in general of the relevance and application of DNA technology for accelerating genetic progress in economically important production traits.

SBTS has actively updated the seedstock and beef breeding sector on the relevance and application of DNA technology (see Methodology section for more detail).

3. Maintain and support the Selection Indexes published by stakeholder breed associations to ensure they remain relevant to current and future markets and production systems. Where possible, also develop and publish Selection Indexes for stakeholder breed associations not currently doing so.

   A total of 10 SBTS breed societies have selection indexes published totalling 32 selection indexes. Indexes were implemented for three breeds which did not previously have Indexes. For each of the selection indexes, SBTS maintains a detailed set of technical documentation that provide details on the key profit drivers, EBV weightings and response to selection that can be expected when selecting animals using the selection index (see Methodology section for more detail).

4. Define key statistics (KS) for genetic progress in beef stock herds and develop an automated process of reporting the KSs. The KSs will provide benchmarking values across breeds and assist in identifying herds to target for individual consultation in order to achieve objective 5.

   Phase 1 - The first phase of this objective has been completed with the development of the "Completeness of Performance" product. The key statistics generated by this system are based around the levels (and trends over time) of pedigree and performance recording relevant to the BREEDPLAN analyses. The statistics and associated reports can be produced on either an individual herd or breed level.
   Phase 2 - The second phase of this objective has been finalised with the development of the Phase II Genetic Improvement Benchmarking report. This comprehensive herd level report includes numerous benchmarking statistics in relation to genetic improvement and progress (see Methodology section for more detail).

5. Facilitate an increase in the rate of genetic progress of the stakeholder breed associations by increasing the weighted average BreedObject selection index value of animals by $15.00 per cow mated between 2008 drop (base year) and 2013 drop calves (extended to $21.00 per cow mated between the 2008 base year and 2015 drop calves).
   *The weighted average selection index ($) for the 2014 calving year was **$83.27** compared to the 2008 calving year (base year) of **$58.02** (see table below). This represents an **increase of $25.25** between the 2008 and 2015 calving years or an **average increase of $3.61 per year.***

6. Maintain and expand the extension material relating to BREEDPLAN related technologies, particularly the new tools. This involves maintenance of the BREEDPLAN and SBTS websites, BREEDPLAN Tip Sheets and Booklets, and the development of electronic media including regular webinars and podcasts.

   The BREEDPLAN and SBTS websites were maintained and regularly updated during the project. Currently 92 Tip Sheets and four booklet relating to BREEDPLAN are available, many of which have been developed or revised during this project. Additionally, a range of electronic video media has been developed and posted to the SBTS and TBTS YouTube Channel. This site currently includes 53 videos related to genetic technologies for the beef industry.

7. Recommend a strategy for continuation and funding of the services provided by SBTS as a key component of a national extension program into genetic improvement of the beef industry.

   A number of strategies were considered for the continuation and funding of the services provided by SBTS. It was concluded that matching of funds provided by breed societies and ABRI by the MLA Donor Company was the preferred model.

5.2 General Discussion

This project performed well against its Project Objectives. The weighted average selection index ($) for the 2015 calving year is **$83.27** compared to the 2008 calving year (base year) of **$58.02**. This represents an **increase of $25.25** between the 2008 and 2015 calving years or an **average increase of $3.61 per year.**

The major objective to increase the average weighted selection index by **$21.00** per cow mated from the base year of 2008 to 2015 was exceeded by a total of **$4.25** or **$0.61** per year.

With an estimated 4 million beef breeding females in southern Australia, the overall potential benefit of the genetic improvement achieved in dollar terms can be estimated at $72 million. However, acknowledging that only 80% or sires being used in the commercial industry in southern Australia are sourced from the seedstock industry, the actual benefit that is likely to be realised can be estimated to be $57.6 million.

There is a lag time between the genetic improvement in the seedstock and commercial sector but it is cumulative, on-going and permanent. Genetic gains in the commercial beef industry during this project would have benefitted from genetic gains in the previous SBTS project and the gains in the seedstock sector in this project will benefit the commercial sector in future years.

An issue which arose during the project was the loss of the two key staff who had been involved in all phases of the SBTS project who moved to Angus Australia which accounts for about half the seedstock industry in southern Australia. This highlighted the difficulty of a succession process for a very small group of staff. Several younger staff members have been involved in the three phases of SBTS but each has moved on. This issue needs to be addressed during the next phase of the project.

6 Conclusions/Recommendations

Genetic gain in the Australian beef industry has been achieved by the use of Estimated Breeding Values for a wide range of traits and $Indexes calculated using the BREEDPLAN genetic analysis system. It is imperative that there is an ongoing education program for both seedstock breeders to ensure that they understand the importance of data quality and completeness, how to utilise the tools that are available to them to optimise the genetic information which is available for their herd and breed. Commercial breeders also need to understand how to best utilise the genetic information which is available to them to maximise the profitability of their purebred or cross bred herds.

The genetic gains made by southern seedstock herds since 2010 have been made using almost exclusively traditional genetic technologies of calculating Estimated Breeding Values from pedigrees and phenotypic measurements for a wide range of traits. The industry is now moving to a new level whereby the information from genomic tests will be incorporated into EBVs or used to calculate EBVs for which there are no direct measurements. This will require a new phase of education of seedstock and commercial breeders.

7 Key Messages

Seedstock breeders have made good genetic progress during this project using the available genetic technologies and commercial breeders will have made similar gains albeit with a lag time. Feedlots will have benefitted from the increased growth rate and therefore gross feed efficiency. Processors will have gained from increased marbling particularly for the Angus and Wagyu breeds which increases the end value of the beef they sell particularly into export markets.