



Final report

MLA Genetics Insights

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Abstract

One of the key drivers in productivity and profitability for beef, sheep and lamb producers is genetics. The detailed baselines for genetic tool adoption and drivers and barriers were established six years ago. The more recent study in 2020 provided further insight into changes since the baseline, however, information is now required on new genetic topics that were not addressed in either the 2016 or 2020 studies. An online and telephone survey of 639 cattle producers and 696 sheep producers was therefore conducted in November 2022 to February 2023. The producers surveyed were representative of the industry in terms of breed type (temperate and tropical beef breeds), production system (wool and meat sheep), herd/flock size and location. The research identified that cattle and sheep producers have adopted, to different degrees, many of the genetics practices that will drive the profitability and productivity of their operation. For example, the majority of commercial cattle producers and sheep producers use BREEDPLAN EBVs (59%), TACE EBVs (12%), and Sheep Genetics ASBVs (57%). Recommendations have been made on addressing barriers to genetic tool adoption including improving the attitudes of non-users, encouraging participation in formal training, driving website traffic, building on producer relationships with other producers, developing training activities from sources of genetics advice (stock agents, advisors and vets) and repeating the survey to track progress. Understanding the uptake and barriers in the use of genetic tools will also allow MLA to understand how progress is tracking to achieve the goal set by the NLGC to double the rate of genetic gain by 2025.

Executive summary

Background

Genetics is one of the key drivers in productivity and profitability for beef, sheep and lamb producers. Estimated Breeding Values (EBVs), Australian Sheep Breeding Values (ASBVs) and systems driven by programs such as BREEDPLAN and Sheep genetics demonstrate to producers a quantification approach to evaluating an animal's genetic potential for a range of traits that directly impact profitability such as growth, weight, carcass quality, fertility / reproductive performance, worm resistance and wool quality. Understanding the increased uptake in the use of breeding values will also allow Meat and Livestock Australia (MLA) to understand how progress is tracking to achieve the goal set by the NLGC to double the rate of genetic gain by 2025.

Despite the proven benefits of breeding values some producers in the industry have chosen not to adopt them in their enterprises. Previous research conducted by MLA in 2016 identified a number of barriers to adoption including a lack of value proposition, lack of education resources around genetics and language that is too complex to understand. Subsequent research by MLA in 2020 identified that MLA's Genetics marketing campaign was successful in informing many producers of the benefits of breeding values, encouraged them to seek information and advice on genetics to help their sire purchase decision and to use, or consider using, breeding values in their operation. The barriers to adoption identified in that research included lack of understanding of benefits, small operation, lack of need, not enough information and a reliance on breeders and other selection methods.

The detailed baselines for genetic tool adoption and drivers and barriers were established six years ago and while the more recent study in 2020 provided further insight into changes since the baseline, the 2020 study was more focused on assessing the Genetics marketing campaign. It was also largely focused on commercial breeding operations, the main target of the campaign, rather than seedstock / stud operations. In addition, information is now required on new genetic topics that were not addressed in either the 2016 or 2020 studies.

It was therefore timely to revisit the topic of breeding values with producers in 2022 to quantify current levels of genetic tool adoption and the perceptions, needs and communication preferences of producers in relation to genetics. New research could then be used to evaluate the current uptake levels and issues surrounding genetic tool adoption and identify if any barriers to uptake exist. This will allow MLA to further refine genetics education material and communication and extension strategy to ensure a continuing return on investment from the industry's dollars.

This project provides up to date insights into the use of EBVs and ASBVs in the Australian Beef and Sheep industry and offers an understanding of barriers to use of these and other genetic materials. This information has been broken down across species and production regions in the country.

Objectives

The objective of this project is to track the uptake of, and drivers and barriers to, genetic technology by beef and sheep producers so that MLA can better understand producers' needs, perceptions and communication preferences and drive generic adoption in the industry.

Methodology

The methodology for this project involved a survey of 639 beef producers and 696 sheep producers in November 2022 through to February 2023. A mixed methodology was employed involving a 33-minute Online survey with 935 producers and a 25-minute survey with 400 producers via Computer Assisted Telephone Interviews (CATI). Producers were incentivised to participate in the survey through a prize draw. Producer contact details were sourced from MLA's member database.

The sample was stratified, and results weighted by state and herd and flock size categories based on 2021 data from the Australian Bureau of Statistics (ABS) for representativeness. As the results are based on a survey, they are subject to margins of error and should be viewed as the midpoint of the likely range, rather than a single value. For example, based on the national sample of 696 sheep producers, 74% of producers have a defined breeding objective for genetic improvement in their animals. This result has a margin of error of +/- 2% at a 90% confidence level so the national result of 74% has a range of between 72% and 76%.

Results

Cattle

This research project represents cattle producers from New South Wales (35%), Victoria (20%), Queensland (27%), South Australia (6%), Western Australia (8%), Tasmania (3%) and the Northern Territory (1%).

Almost half of all interviewed cattle producers (46%) ran between 50 and 199 breeding cows.

Cattle producers were well educated, with half (50%) having a tertiary graduate or post graduate qualification. Producers were also very experienced with 50% having been making breeding decisions for 31 years or more. The largest age segment of interviewed producers was those 65 and over (42%), and almost all producers were 35 and over.

Nationally, producers earned 91% of their income from beef cattle.

The majority (82%) of cattle producers were commercial with the remainder seedstock cattle producers (18%). Nationally, almost half of all producers ran between 50 and 199 breeding cows (46%), followed by 200 - 399 cows (23%), 400 – 799 cows (16%), 800 – 1,599 cows (7%), 1,600 and 5,399 cows (6%) and 5,400 or more (1%). The average number of breeding cows was 573 per farm. Temperate breeds were more common nationally (83% compared to 31% tropical breeds) although tropical breeds dominated in Queensland (83%) and the Northern Territory (79%).

Almost all cattle producers had a defined breeding objective (85%). Split by seedstock and commercial producers, significantly more seedstock producers have a defined breeding objective (98%), while 82% of commercial producers have a breeding objective.

Cattle producers tracked many measurements of genetic gains with the top three being fertility, temperament and calving ease, regardless of seedstock or commercial system.

Almost all seedstock cattle producers were a member of a breed society (94%), with the majority (76%) also users of genetic evaluation services. BREEDPLAN was used by over half (56%) of seedstock cattle producers who used a genetic evaluation service, with TACE accounting for over one fifth (21%). Among seedstock producers, 56% of temperate only, 62% of tropical only and 62% who have both breed types used BREEDPLAN. For commercial cattle producers, only one third (33%) were members of a breed society, although the majority (59%) used BREEDPLAN EBVs. Overall, among commercial producers, 60% of temperate producers used BREEDPLAN EBVs as did 51% of tropical producers and 60% of producers with both temperate and tropical breeds.

Where commercial cattle producers did not use BREEDPLAN / TACE when buying bulls, one third (33%) stated that it was because they rely on information being given to them by another party, e.g., the breeder. Among commercial cattle producers who do not use BREEDPLAN / TACE, most (89%) have never used either system with 11% being past / lapsed users. The top reason given for never using BREEDPLAN / TACE was that it was “Not necessary / trust own process” (23%). Slightly fewer non-users reported that they have used BREEDPLAN in the past than when the previous study was reported in 2016 (11% in 2023 compared to 19% in 2016).

Satisfaction with genetic gains was high, with almost half (47%) of interviewed cattle producers very satisfied with the gains they have achieved over the last ten years and a further third (37%) fairly satisfied. Where cattle producers were less than fully satisfied with their genetic gains, almost two thirds (57%) said this was due to there always being room for improvement with one third (33%) citing environment factors.

Regardless of whether they were seedstock or commercial, cattle producers were bullish about the financial health of their business, with 75% of seedstock producers and 70% of commercial producers saying it is improving.

Around a quarter of cattle producers (23%) used genomic products. Among these users, the most popular products were DNA tests for parentage (69%) and DNA tests for performance (65%). When split by production type, seedstock producers were significantly more likely to use genomic products than commercial producers (70% compared to 13% respectively) and were more likely to use

multiple genomic products, e.g., 89% of seedstock producers DNA test for parentage and 85% DNA test for performance. Commercial producers were significantly less likely to DNA test for parentage (45%) and DNA test for performance (42%) but more likely to use Heifer select (18%).

The key factor that cattle producers understand about BREEDPLAN is that it is data regarding genetics, with over a third citing this. Around one quarter of producers also listed each that BREEDPLAN assisted in decision making, is a database that can be used as a guide and that it provides benchmarking. When split by seedstock / commercial, a higher proportion (44%) stated that BREEDPLAN is data regarding genetics, while only a third of commercial producers shared this understanding.

Regardless of production type, cattle producers said the best thing about BREEDPLAN is that it aids selection / decision making (35%), with seedstock producers significantly more likely to cite the ability to assess traits (21%), benchmark (20%) and aid in marketing (13%) compared to commercial producers who were more likely to say they did not know the best things about BREEDPLAN.

The biggest factor driving negative perceptions of BREEDPLAN among all cattle producers was issues with accuracy (20%). Seedstock producers were also concerned by problems with data capture (26%) and methodology while commercial cattle producers were most likely to have nothing negative to say (22%) or be unsure (19%).

Overall, for cattle producers, the three key traits considered for breeding bull selection were temperament (91%), calving ease (80%) and birth weight (72%). There were innumerable, significant differences among seedstock and commercial breeding bull selection.

Over the next ten years, both seedstock (87%) and commercial producers (83%) consider reproduction / fertility to be the most important factor for their business, followed by cost of production / efficiency (81% and 84%, respectively).

When asked how they choose a stud, commercial cattle producers most frequently cited the genetics and performance of the stud (62%), followed by their relationship with the breeder (57%). Once they have selected a stud, almost all commercial producers choose a bull based on its looks and breeding values (94%).

As a group, cattle producers' attitudes towards BREEDPLAN were generally positive with high respect, reliance, expectation, commitment, understanding and ease of use, although there is still room to improve knowledge and understanding overall. When results were segmented into users and non-users of cattle genomic services however, significant barriers to adoption of genomic services were identified among non-users regarding knowledge and understanding of BREEDPLAN / BREEDPLAN EBVs, the financial and decision-making benefits of BREEDPLAN / BREEDPLAN EBVs and the ease of use BREEDPLAN / BREEDPLAN EBVs.

On average, producers considered EBVs moderately important for breeding bull selection, with seedstock producers ascribing slightly more importance to EBVs (rating at 5.5/7) than commercial producers (5.2/7). Dollar Index / Selection Index was relatively less important for selection (4.3/7).

Overall, for cattle producers, other farmers were the largest source of information, with more than one third relying on their peers (36%). Commercial producers also favoured other farmers (35%) while seedstock producers were far more likely to refer to a breed society (52%).

Regarding their use of BREEDPLAN and BREEDPLAN EBVs, a little over one third of cattle producers said they had received formal training or guidance. Seedstock producers were significantly more likely to have formal training (56%) compared to commercial producers (32%).

Of those producers who had received formal training or guidance, breed societies were the single biggest source (35%) and were used at a significantly higher rate by seedstock producers (52%). Commercial cattle producers were split between breed societies (28%), the Department of Primary Industries (DPI) (31%) and MLA (29%).

Where producers had not received formal training or guidance, cattle producers as a whole said they had never gotten around to it (27%) or did not know where to go (23%). 27% of commercial producers also had not gotten around to it, while seedstock producers were more likely to say that training was too far away (25%).

Producers were also asked where they would go to get further training or guidance, with MLA the top pick overall at 29%. Seedstock producers were significantly more likely (44%) to seek guidance from a stock agent while commercial producers were significantly more likely to say they 'don't know' where to get further training (22%).

Around half (51%) of cattle producers interviewed have visited the BREEDPLAN website, with the database search (70%) and percentile bands tables (61%) most frequently used. Seedstock producers are more likely to visit the BREEDPLAN website (78%) than commercial producers (45%).

The vast majority of seedstock cattle producers (90%) did not use MateSel.

Producers were asked to consider which organisations were involved in the overall BREEDPLAN system, including research, training, promotion, funding, people and delivery. Top of mind for both seedstock and commercial producers were breed societies (74% and 56%, respectively) and BREEDPLAN people (72% and 53% respectively). MLA was mentioned by 63% of seedstock and 52% of commercial producers.

On average, producers said they were 'just a little' familiar with BREEDPLAN (3.3/5), with seedstock producers significantly more familiar (3.9/5) than commercial producers (3.2/5). Conversely, commercial producers (4.2/5) had a mainly favourable opinion of BREEDPLAN while seedstock producers were slightly more neutral (3.8/5).

Overall trust of BREEDPLAN was high with an average across cattle producers of 4.3/5, although seedstock cattle producer trust was slightly lower than commercial at 3.9/5 and 4.3/5 respectively.

Where producers had a critical opinion of BREEDPLAN, it was largely due to concerns about the integrity of the data (53% total cattle) and issues with the methodology (41% total cattle). Positive opinions were driven by a sentiment of trust and scientific validity (40% total cattle).

Sheep

The research project represents sheep producers from New South Wales (37%), Victoria (27%), Queensland (4%), South Australia (15%), Western Australia (13%), and Tasmania (3%).

Sheep producers were well educated, with two thirds (42%) having a tertiary graduate or post graduate qualification. Producers were also very experienced, with 53% having been making breeding decisions for 31 years or more. The largest age segment of interviewed producers was those 65 and over (36%), and almost all producers were 35 and over.

Nationally, producers earned 28% of their income from sheep for wool and mutton, 24% from lambs for meat and 14% from sheep for wool and first cross lamb production. The average flock size was 1,892 head with 26% of producers having a flock size of between 500 – 999 head.

The majority of sheep producers (74%) said that they have a defined breeding objective, with reproductive traits fertility (56%) and number of lambs weaned (51%) the top tracked measurements for genetic gain. When split by seedstock and commercial producers, almost all (99%) seedstock producers had a defined objective, with commercial producers less likely to have one. In terms of measurements tracked, seedstock producers most often tracked weight gain and fertility, with fertility being the top metric for commercial producers.

Around half (56%) of sheep seedstock producers were a member of Sheep Genetics. Split by production type, 53% of wool specialists, 58% of meat specialists and 57% wool and meat producers were members of Sheep Genetics. More than a third (37%) of Sheep Genetics users used LAMBPLAN, 15% use MERINOSELECT and a small number use both. Similarly, 57% of commercial producers used ASBVs, representing 57% of wool specialists, 44% of meat specialists and 66% wool and meat producers. Among commercial ASBV users, 14% report they used (from Sheep Genetics) MERINOSELECT only, with 11% using LAMBPLAN only and 11% using both. The remaining portion of ASBV users did not associate their ASBVs with LAMBPLAN or MERINOSELECT from Sheep Genetics illustrating some brand confusion in the industry.

The majority of producers were satisfied with the genetic gains achieved in their sheep over the last ten years with 38% very satisfied and 42% fairly satisfied. Where producers were not satisfied, the top two reasons they gave were that there is always room for improvement (45%) and climatic/ environmental factors (24%).

Seedstock sheep producers were very positive about the financial health of their operations, with most (73%) saying that it is improving. Commercial sheep producers were also positive with 52% saying the financial health of their operation was improving. Commercial ASBV users however were more positive in the financial health of their operation than Commercial ASBV non-users (61% versus 41%).

Most sheep producers (75%) said they do not use genomics products with only 16% utilising products, primarily DNA test for performance or parentage. When split by seedstock and commercial, a higher proportion of seedstock sheep producers (43%) use genomic products, with DNA test for performance (43%) and parentage (42%) being most used. In contrast only 10% of commercial producers used genomic products and favour flock profile (49%).

Sheep producers had a broad understanding of LAMBPLAN / MERINOSELECT with sheep producers overall saying it is a database they can use (27%), provides data to assist in decision making (22%) and data regarding genetics (20%). This was mirrored among commercial sheep producers (24%, 22% and 19%, respectively), while seedstock sheep producers were significantly more likely to say that LAMBPLAN / MERINOSELECT is a database that can be used (40%) and that they can be used to record and measure genetic traits (19%).

Overall, the number one factor driving a positive perception of LAMBPLAN / MERINOSELECT among sheep producers was that it aids in selection / decision making (21%).

One quarter (25%) of sheep producers were not able to name any drawbacks to LAMBPLAN / MERINOSELECT and a further fifth (22%) said there was nothing negative about LAMBPLAN / MERINOSELECT. This was driven by a high number of commercial sheep producers who cannot name a negative (29%) or have no negative comments (24%). Seedstock sheep producers cited issues with data capture as the primary negative factor (26%).

Sheep producers considered an array of traits when selecting sires, with fertility most important (49%) followed by fibre diameter (46%) and fleece weight (43%). When split by production type, seedstock producers were most concerned with postweaning weight target (61%) and fertility (56%), while commercial sheep producers were most concerned with fibre diameter (49%) and fertility (48%).

Sheep producers were asked the nominate important factors for their business over the next ten years. For both seedstock and commercial producers, most farmers were concerned about several factors with carbon neutrality mentioned most infrequently. Seedstock producers were most likely to nominate animal welfare / health as a key concern (81%), while commercial producers slightly favoured cost of production / efficiency (82%).

Overall, seedstock producers were significantly more likely to record performance data compared to commercial producers, with weaning weight (86% vs 28%) and post weaning weight (75% vs 24%) most likely to be recorded by seedstock producers. There was a small drop off when it came to submitting this data to LAMPLAN or MERINOSELECT, with weaning weight (82%) and post weaning weight (69%) submitted by a majority of seedstock producers.

While commercial sheep producers considered several factors when selecting a stud, the biggest driver was their relationship with the ram breeder (55%). When selecting a sire, both the sire's looks and breeding values (44%) and the sire's looks and raw measurements (44%) were important to selection.

Regarding attitudes towards Sheep Genetics, both seedstock and commercial sheep producers have high respect, reliance, expectation, commitment, understanding and ease of use ratings, but, as with cattle, there is still more to learn. Analysing data by users and non-users of sheep genomic services identified numerous barriers to adoption of genomic services among non-users. This included knowledge and understanding of Sheep Genetics, the financial and decision making benefits of the service and its ease of use.

On average, sheep producers thought ASBVs are of neutral to moderate importance (rating at 4.8/7), with seedstock producers placing more emphasis on ASBVs than commercial producers (5.1/7 and 4.8, respectively). Similarly, Selection Indexes were neutral to moderately important (4.3/7 for total, seedstock and commercial producers).

For sheep producers overall, there was a reliance on stock agents (42%) and other farmers (28%) as sources of genetics advice. Seedstock sheep producers were likely to prefer to seek advice from Sheep Genetics (36%) or other farmers (35%) while commercial producers relied more heavily on stock agents (47%).

The majority of all sheep producers (27%) have not received proper training in the use of LAMBPLAN, MERINOSELECT or ASBVs, with seedstock producers significantly more likely to have training than commercial producers (39% compared to 25%).

When sheep producers had formal training, Sheep Genetics was the most popular source overall, (31%), followed by MLA (23%), a consultant (21%) and DPI (20%). Seedstock sheep producers were

significantly more likely to have received training from Sheep Genetics 69% compared to 18% of commercial sheep producers. Commercial sheep producers utilised MLA (23%), consultants (23%) and DPI (24%) relatively equitably.

Where sheep producers had not had proper training or guidance, the biggest reasons given were that they saw no need for it (21%) and that they never got around to it (20%). Both seedstock and commercial sheep producers gave 'no need' as a primary reason for not having had proper training (24% and 20%, respectively).

Sheep producers were also asked about where they would seek further training or guidance, with a third (29%) saying they would go to MLA and around a quarter (23%) unsure where they could obtain training. Seedstock producers were significantly more likely to contact Sheep Genetics (46%), while the top source of further training for commercial sheep producers was MLA (33%).

A little under half of sheep producers (46%) had visited the LAMBPLAN or MERINOSELECT websites, with ASBVs and indexes explained the most commonly used feature (76%) and the MLA Genetics Hub the least used (9%) and lowest awareness feature (46%).

MLA was strongly associated with LAMBPLAN and MERINOSELECT by both seedstock (79%) and commercial sheep producers (59%). Sheep Genetics was also strongly associated by seedstock producers (55%) but less so by commercial sheep producers (27%).

On average, sheep producers were 'just a little' (3.1/5) familiar with Sheep Genetics, with seedstock producers having higher familiarity (3.7/5) than commercial producers (3.0/5). Despite this, overall impressions of the Sheep Genetics systems were 'mainly favourable' (3.9/5 for total sheep and commercial and 3.8 for seedstock producers).

Overall, sheep producers trusted the Sheep Genetics system 'a little' (4.2/5), with slightly more distrust among seedstock (3.9/5) compared to commercial producers (4.2/5). Seedstock sheep producers also had a lower opinion of the Sheep Genetics system overall, with an average rating of 3.8/5 compared to commercial producers, who said they would speak highly of Sheep Genetics if asked (4.2/5).

Among sheep producers with a critical opinion of Sheep Genetics, the top reason given was issues with methodology (32%) followed by data integrity (23%). Commercial sheep producers were more likely to cite methodology (41%) and data integrity (34%) than seedstock producers (22% and 11%, respectively). Half of all producers who had a positive opinion of Sheep Genetics (50%) had trust in the science and purpose of the system. There were few differences in the drivers of positive opinions between seedstock and commercial producers.

Benefits to industry

This research is beneficial to industry as it quantifies current levels of genetic tool adoption and the perceptions, needs and communication preferences of producers in relation to genetics. This report compares and contrasts the current uptake levels and issues surrounding genetic tool adoption and identifies barriers to uptake. This will allow MLA to further refine genetics education material and communication and extension strategy to ensure a continuing return on investment from the industry's dollars.

This project provides up to date insights into the use of EBVs and ASBVs in the Australian Beef and Sheep industries and forms an understanding of barriers to use of these and other genetic materials. This information will be broken down across species and production type (seedstock or commercial).

Future research and recommendations

Eight recommendations have been made from this research:

1. Develop strategies to address the main barriers to adoption of genetic tools
2. Raise the profile of Sheep Genetics
3. Improve producer opinions of BREEDPLAN
4. Encourage producers to participate in formal training
5. Increase accessibility of formal training
6. Drive traffic to the BREEDPLAN, LAMBPLAN and MERINOSELECT websites
7. Increase activities that build producer relationships with peers, and develop training activities for those they seek genetics advice from (stock agents, livestock advisors and vets)
8. Repeat the full survey every two years to track industry progress

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1. Background

Genetics is one of the key drivers in productivity and profitability for beef, sheep and lamb producers. Estimated Breeding Values (EBVs), Australian Sheep Breeding Values (ASBVs) and systems driven by programs such as BREEDPLAN and Sheep genetics demonstrate to producers a quantification approach to evaluating an animal's genetic potential for a range of traits that directly impact profitability such as growth, weight, carcass quality, fertility / reproductive performance, worm resistance and wool quality. Understanding the increased uptake in the use of breeding values will also allow Meat and Livestock Australia (MLA) to understand how progress is tracking to achieve the goal set by the NLGC to double the rate of genetic gain by 2025.

Despite the proven benefits of breeding values some producers in the industry have chosen not to adopt them in their enterprises. Previous research conducted by MLA in 2016 identified a number of barriers to adoption including a lack of value proposition, lack of education resources around genetics and language that is too complex to understand. Subsequent research by MLA in 2020 identified that MLA's Genetics marketing campaign was successful in informing many producers of the benefits of breeding values, encouraged them to seek information and advice on genetics to help their sire purchase decision and to use, or consider using, breeding values in their operation. The barriers to adoption identified in that research included lack of understanding of benefits, small operation, lack of need, not enough information and a reliance on breeders and other selection methods.

The detailed baselines for genetic tool adoption and drivers and barriers were established six years ago and while the more recent study in 2020 provided further insight into changes since the baseline, the 2020 study was more focused on assessing the Genetics marketing campaign. It was also largely focused on commercial breeding operations, the main target of the campaign, rather than seedstock / stud operations. In addition, information is now required on new genetic topics that were not addressed in either the 2016 or 2020 studies.

It was therefore timely to revisit the topic of breeding values with producers in 2022 to quantify current levels of genetic tool adoption and the perceptions, needs and communication preferences of producers in relation to genetics. New research could then be used to evaluate the current uptake levels and issues surrounding genetic tool adoption and identify if any barriers to uptake exist. This will allow MLA to further refine genetics education material and communication and extension strategy to ensure a continuing return on investment from the industry's dollars.

This project provides up to date insights into the use of EBVs and ASBVs in the Australian Beef and Sheep industry and offers an understanding of barriers to use of these and other genetic materials. This information has been broken down across species and production regions in the country.

2. Objectives

The objective of this project is to track the uptake of, and drivers and barriers to, genetic technology by beef and sheep producers so that MLA can better understand producers' needs, perceptions and communication preferences and drive generic adoption in the industry.

3. Methodology

3.1 Questionnaire

A fully structured questionnaire to address the research objectives and issues was developed in conjunction with MLA.

Most questions for analysis were closed format with a list of pre-populated responses for respondents to select during online completion or interviewers to select during telephone completion. An option for 'other specify' responses was also provided with these open responses provided to MLA for future internal reference. A number of open-ended questions were also included so respondents could enter their full comments. These responses were then thematically coded to calculate frequencies.

The online questionnaire was piloted with 52 beef and sheep producers from 25 – 29 November. The average survey online length was 33:05 minutes, and the average CATI survey length was 25:36. The programmed survey captured all required data, and the survey was fully launched on 13 December 2022.

A copy of the questionnaire is available on request.

3.2 Sample design

A sample of 1,000 cattle and 1,000 sheep producers was chosen for this study. This was designed to achieve national results with a 90% confidence level and +/- 2% margin of error. This confidence level was consistent with MLA's 2016 Understanding the Usage & Perceptions of Genetics & Genomics in the Australian Beef & Sheep Sectors, although the 2016 sample was larger, with 1,031 cattle and 794 sheep producers interviewed in 2016.

The cattle sample was stratified into 7 state / territory and 3 herd size quotas (50 – 399, 400 – 1,599 and 1,600 head +) based on the latest ABS producer population data. The samples achieved for each quota is provided in Table 6 in the Appendix. The sheep sample was stratified into 6 state 3 flock size quotas (100 – 499, 500 – 1,999 and 2,000 head +) based on the latest ABS producer population data. The samples achieved for each quota is provided in Table 2 in the Appendix. Both samples included seedstock and commercial producers.

The final sample achieved was 1,335 composed of 639 cattle producers and 696 sheep producers. Despite the lower-than-expected response rate, it was decided to end the survey on the planned closing date to ensure that the report would be delivered in a timely manner.

3.3 Sample selection

MLA provided Kynetec with a database of 41,883 beef producer members of who 40,598 had a phone number and 28,572 had an email address. In addition, MLA provided Kynetec with a database of 33,702 sheep producers, of who 24,026 had a phone number and 26,447 had an email address. These records were used for the soft launch, full launch and reminders for the online survey, and for telephone interviewing.

At the beginning of the survey, all respondents were screened to ensure that they qualified for the survey based on the following requirements:

1. Be the primary / joint decision maker regarding breeding practices on their property.
2. Have farm income from cattle, sheep or lamb in the previous three financial years.
3. Must have a minimum average herd size of 50 breeding females for cattle over the last three years.
or
4. Must have a minimum flock size of 100 ewes joined for sheep over the last three years.

The sample was stratified (divided) into state and herd / flock size groups based on the population of breeding cattle / sheep producers in each state and herd /flock size group from the ABS. Quotas were then set for interviewing. The sample results were then weighted to the ABS producer population to adjust for any over or under-sampling of different strata to ensure that the final results were representative of the cattle and sheep industries.

3.4 Data collection

Data was collected via a mixed methodology approach using both Online and Computer Assisted Telephone Interview (CATI) methodologies. The methodological split was proposed to be 800 Online and 200 CATI for each species. The Online methodology allowed the large scale, extended length survey to be conducted very cost effectively with the CATI component being an alternative method of following up non-respondents to the email survey or contacting producers who did not have an email address. A number of factors point towards the increasing adoption of online surveys to collect data in the future. These include the high prevalence of producers with email addresses, an increasing familiarity with digital technologies such as smart phones and online surveys, the increasing labour costs of CATI and an anecdotal trend in more producers screening incoming calls on their mobiles due to inconvenience, unknown callers and concerns around scams.

A pilot (soft launch) for the Online survey was conducted from 25 – 28 November and following the successful pilot, the Online survey was fully launched to approximately 38,000 producers from MLA's Member database by providing each a unique link to the Online survey. Five reminder emails were sent to non-respondents throughout December to January.

The survey closed on 10 February with 935 online completes, the CATI component of 400 surveys was completed by contacting non-respondents to the Online survey and also MLA members who were only contactable by phone, not email.

Average survey length was 33:05 minutes for Online and 25:36 minutes for CATI.

The breakdown of the sample by methodology is shown in Table 1.

Table 1. Sample methodology

| Methodology | Total |
|--------------------|--------------|
| Online | 935 |
| CATI | 400 |
| Total | 1,335 |

For the Online survey, of the 38,000 producers sent a unique link by email, 528 screened out because they did not meet the minimum requirements to qualify, and 935 were completed.

For the CATI survey, a total of 606 conversations were held with individual in-scope producers. Of these, there were 400 completes, and 220 were screened out.

3.5 Statistical analysis

It should be noted that the results presented in this study are derived from a survey (as opposed to a census when all members of a population are captured). Survey results are used to make inferences about the total population.

As all surveys are subject to errors, a survey result should not be treated as a single value but rather as the midpoint of the likely range that the true population result would lie within. The range around the survey result is the “margin of error”. For example, a survey result of 50% may have a margin of error of plus or minus 5 percentage points i.e., 45% - 55%. The margin of error depends on the sample size (smaller sample sizes have larger errors), the actual sample result (a result closer to 50% has a larger percentage error) and the confidence level required. Due to a high margin of error associated with a small sample, results based on a small sample in the report should be treated with caution. Care should be taken with any results from a sample of less than 30.

A summary of the expected margins of error based on different sample sizes (from 25 – 700) and different survey results (from 5% to 95%) assuming a 90% confidence level is contained in Table 10 in the Appendix. For example, based on the national sample of 696 sheep producers, a survey result of 30% of producers would have a margin of error of +/- 3% at a 90% confidence level so the national result of 30% has a range of between 27% and 33%.

The main statistically significant differences in results between production types are also highlighted throughout this report.

4. Cattle results and discussion

4.1 Background to the analysis

This section presents the results and discussion summarising the current practices of Australian cattle producers. Results are presented at the national level and by production type (commercial or seedstock producers).

4.2 Respondent demographics

Producer demographics such as region, production type, age, gender, years of breeding decision making, education and percentage of gross farm income are presented below. These charts illustrate the diverse demographic range of the cattle producers in Australia.

The sample comprised producers from New South Wales (35%), Victoria (20%), Queensland (27%), South Australia (6%), Western Australia (8%), Tasmania (3%) and the Northern Territory (1%).

There are two sets of numbers for respondents in Table 2, and this is because the higher number (735) refers to all cattle producers initially interviewed, including those who use EBVs but not BREEDPLAN / TACE and therefore exited the survey after question 2.12 and the lower number (639) refers to the remaining respondents who continued with the survey.

The largest age segment of producers was those 65 and over (42%) with almost all producers being thirty-five and over, and 2% 25 – 34. One percent of producers declined to state their age.

The majority (70%) of producers identified as male. Slightly under one third (29%) identified themselves as female with 1% preferring not to identify themselves. No producers indicated that they prefer to identify as another gender.

Nationally, cattle producers have extensive experience in making breeding decision. 31% of cattle producers have 41 or more years' experience, and the vast majority (91%) have 11 years' experience or more (Figure 1).

Around half of producers have a tertiary or post graduate qualification (Figure 2).

Nationally, interviewed producers derive the majority (91%) of their income from beef cattle (Figure 3).

Table 2. Cattle producer demographic sample

| Beef Producer Sample | | | | | | | | |
|------------------------|-------|--------|-----|-----|-----|-----|-----|-----|
| (Base) | TOTAL | Region | | | | | | |
| | | NSW | VIC | QLD | SA | WA | TAS | NT |
| Total | 735 | 243 | 143 | 234 | 30 | 55 | 17 | 13 |
| Seedstock | 18% | 21% | 15% | 17% | 4% | 24% | 23% | 10% |
| Commercial | 82% | 79% | 85% | 83% | 96% | 76% | 77% | 90% |
| Total | 639 | 208 | 132 | 209 | 25 | 39 | 15 | 11 |
| Age | | | | | | | | |
| 18 - 24 years old | - | - | - | 1% | - | - | - | - |
| 25 - 34 years old | 2% | 2% | 1% | 4% | 3% | 2% | - | 10% |
| 35 - 44 years old | 10% | 7% | 6% | 15% | 15% | 7% | 18% | 10% |
| 45 – 54 years old | 16% | 17% | 15% | 15% | 13% | 25% | - | 20% |
| 55 – 64 years old | 29% | 28% | 27% | 30% | 44% | 27% | 33% | 34% |
| 65 years old and over | 42% | 45% | 51% | 34% | 25% | 39% | 49% | 26% |
| Refused | 1% | 1% | - | 1% | - | - | - | - |
| Gender | | | | | | | | |
| Male | 70% | 66% | 75% | 67% | 79% | 77% | 86% | 59% |
| Female | 29% | 33% | 24% | 31% | 21% | 21% | 14% | 41% |
| Other | - | - | - | - | - | - | - | - |
| Prefer not to identify | 1% | 1% | 1% | 2% | - | 2% | - | - |

Figure 1. Years cattle producers have been involved in breeding decision making (n=639)

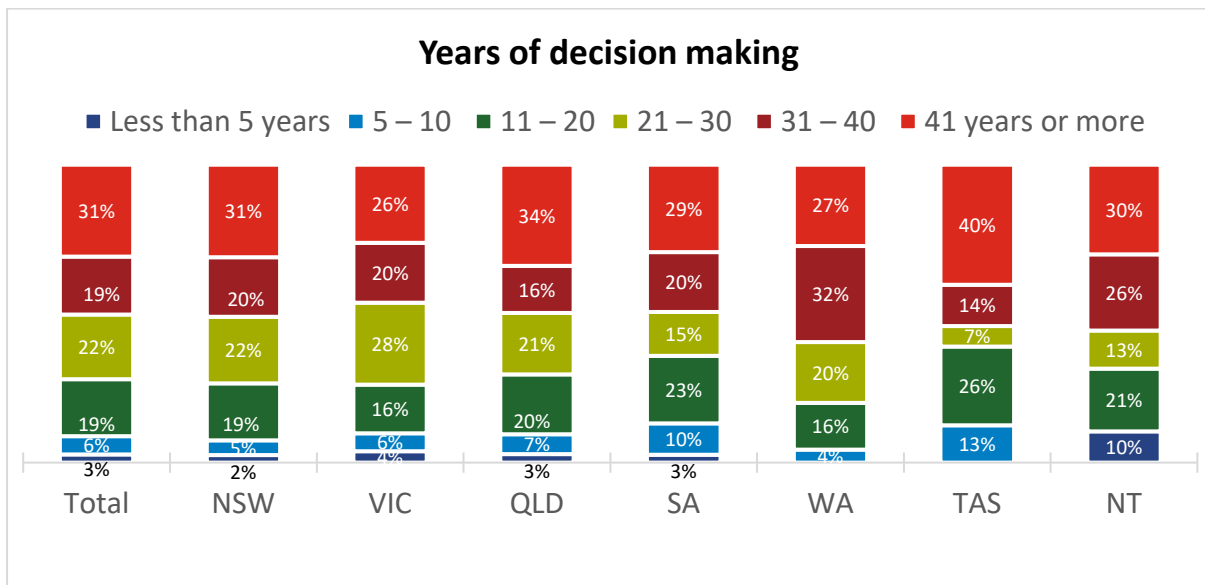


Figure 2. Highest level of education achieved by cattle producers (n=639)

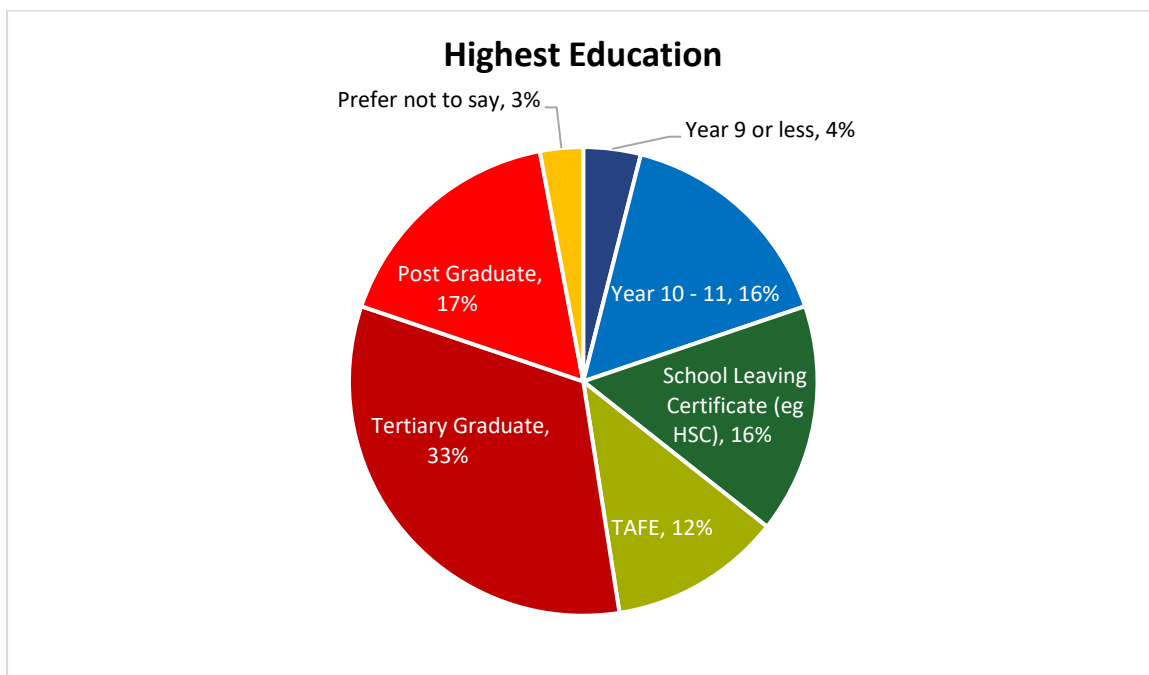
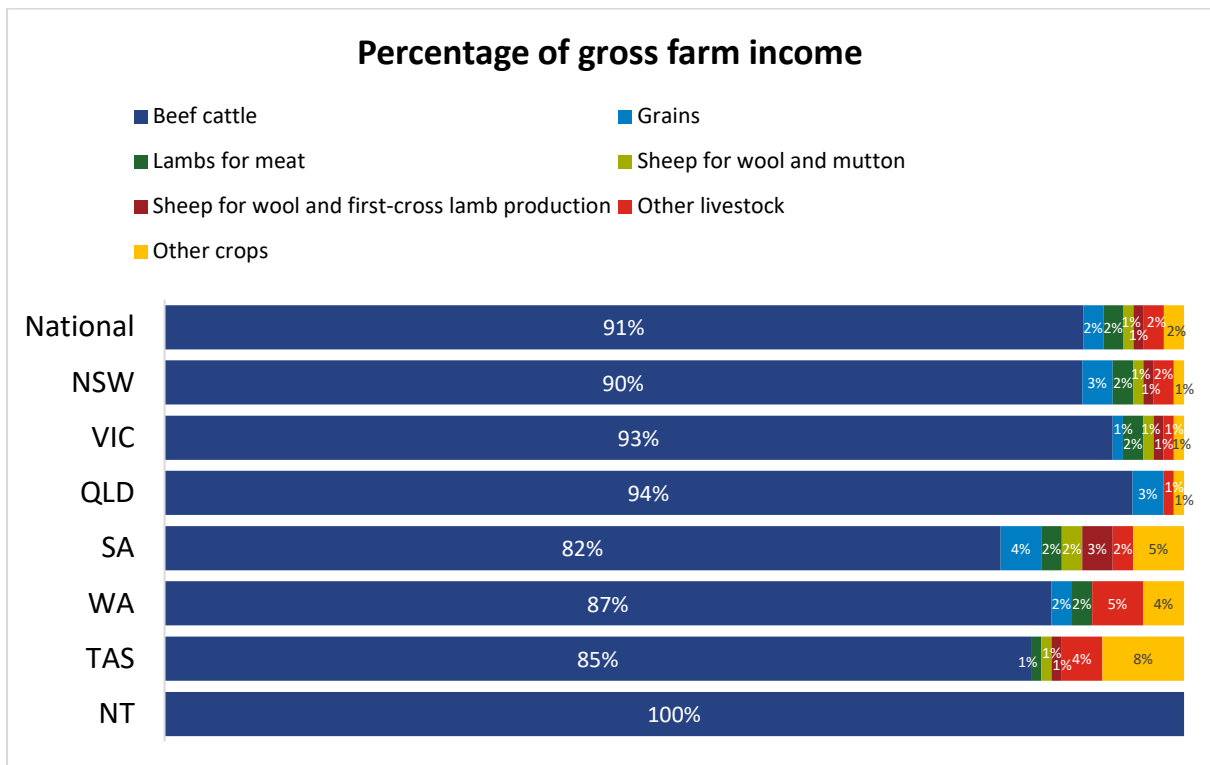


Figure 3. Percentage of gross farm income by activity and state for cattle producers (n=735)



4.3 Herd structure

The majority (82%) of cattle producers were commercial with the remainder seedstock cattle producers (18%). Where producers said that they produce both commercial and seedstock cattle, they were allocated to the seedstock group, as this had fewer respondents. Nationally, almost half of all producers (46%) ran between 50 and 199 breeding cows while 1% ran 5,400 or more. 23% ran 200 - 399 cows, and 16% between 400 – 799 cows. 7% of producers ran between 800 – 1,599 cows, 6% ran between 1,600 and 5,399 cows (Table 3). The average number of breeding cows was 573 per farm.

Temperate breeds were more common nationally (83% compared to 31% tropical breeds), although tropical breeds dominated in Queensland (83%) and the Northern Territory (79%). Queensland and Northern Territory cattle producers were also over-sampled to ensure that these important tropical cattle production states were not under-represented in the study.

Table 3. Cattle sample distribution summary

| Cattle Producer Sample | | | | | | | | |
|-----------------------------------|-------|-------|-----|-----|------|-----|------|-----|
| | | State | | | | | | |
| (Base) | TOTAL | NSW | VIC | QLD | SA | WA | TAS | NT |
| Cattle Sample Distribution | 735 | 243 | 143 | 234 | 30 | 55 | 17 | 13 |
| Seedstock | 18% | 21% | 15% | 17% | 4% | 24% | 23% | 10% |
| Commercial | 82% | 79% | 85% | 83% | 96% | 76% | 77% | 90% |
| Breeding females joined | | | | | | | | |
| 50 - 199 | 46% | 52% | 62% | 31% | 18% | 52% | 43% | 10% |
| 200 - 399 | 24% | 27% | 24% | 25% | 9% | 10% | 43% | 10% |
| 400 - 799 | 16% | 14% | 9% | 20% | 31% | 22% | 5% | 4% |
| 800 – 1,599 | 7% | 5% | 3% | 10% | 16% | 11% | 10% | 7% |
| 1,600 – 5,399 | 6% | 2% | 1% | 11% | 26% | 5% | 0% | 34% |
| 5,400+ | 1% | 0% | 0% | 3% | 0% | 0% | 0% | 34% |
| Breed Type | | | | | | | | |
| Temperate | 83% | 93% | 94% | 55% | 100% | 91% | 100% | 29% |
| Tropical | 31% | 19% | 0% | 83% | 4% | 13% | 0% | 83% |

4.4 Breeding Objectives

Across commercial and seedstock producers, almost all (85%) producers have a defined breeding. Split by seedstock and commercial producers, significantly more seedstock producers have a defined breeding objective (98%), while 82% of commercial producers have a breeding objective (Figure 4). There were no significant differences by state (Figure 5).

Producers track many measurements of genetic gains, with the top three being fertility, temperament and calving ease (Figure 6), regardless of seedstock or commercial system (Figure 7). The remaining 17 tracked measurements can be found in the full Excel results tables.

Figure 4. Cattle producers with a defined breeding objective split by seedstock and commercial producers

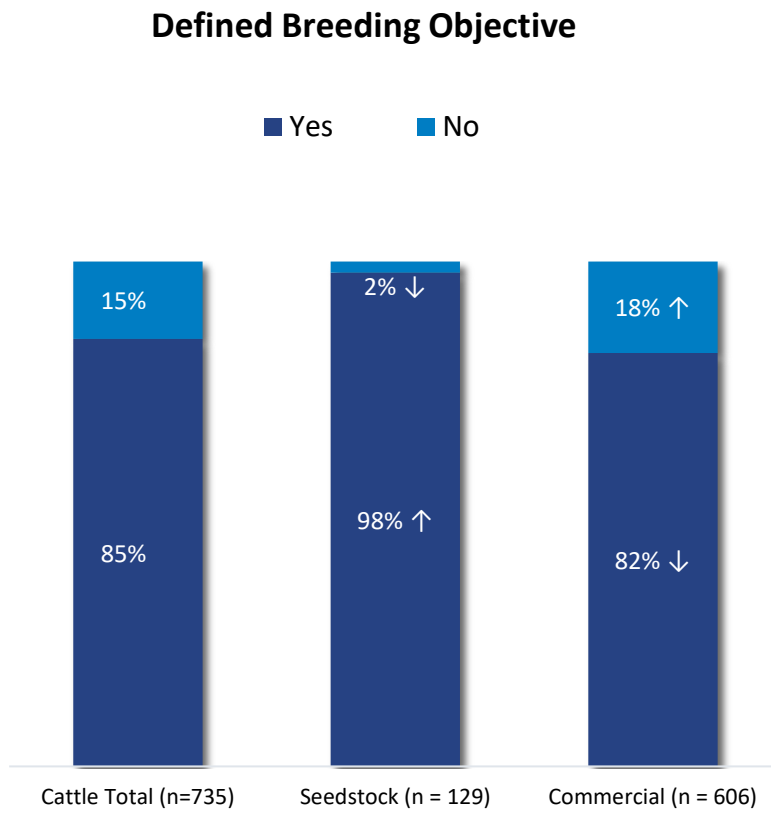


Figure 5. Cattle producers with a defined breeding objective split by state

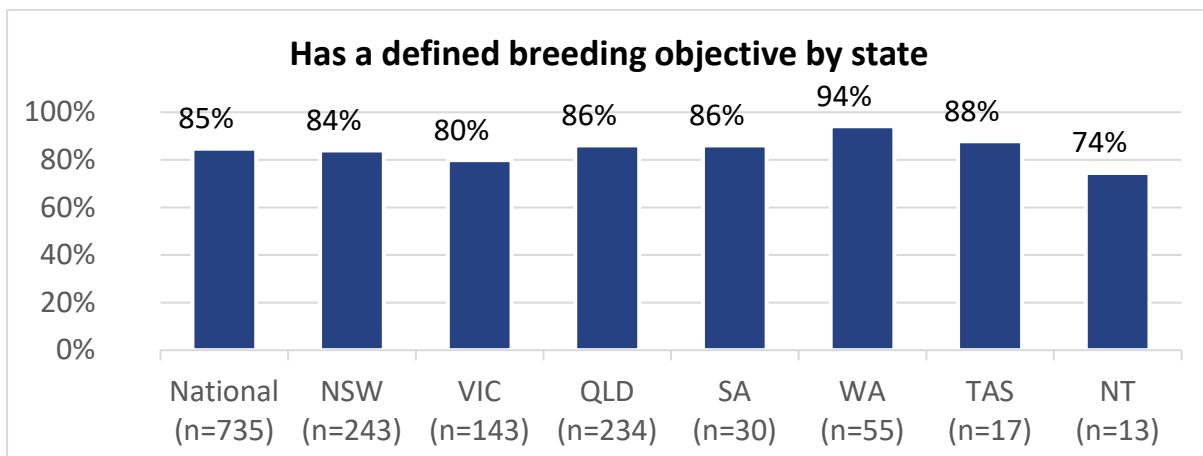


Figure 6. The top 10 tracked measurements for genetic gains for cattle producers (n=735)

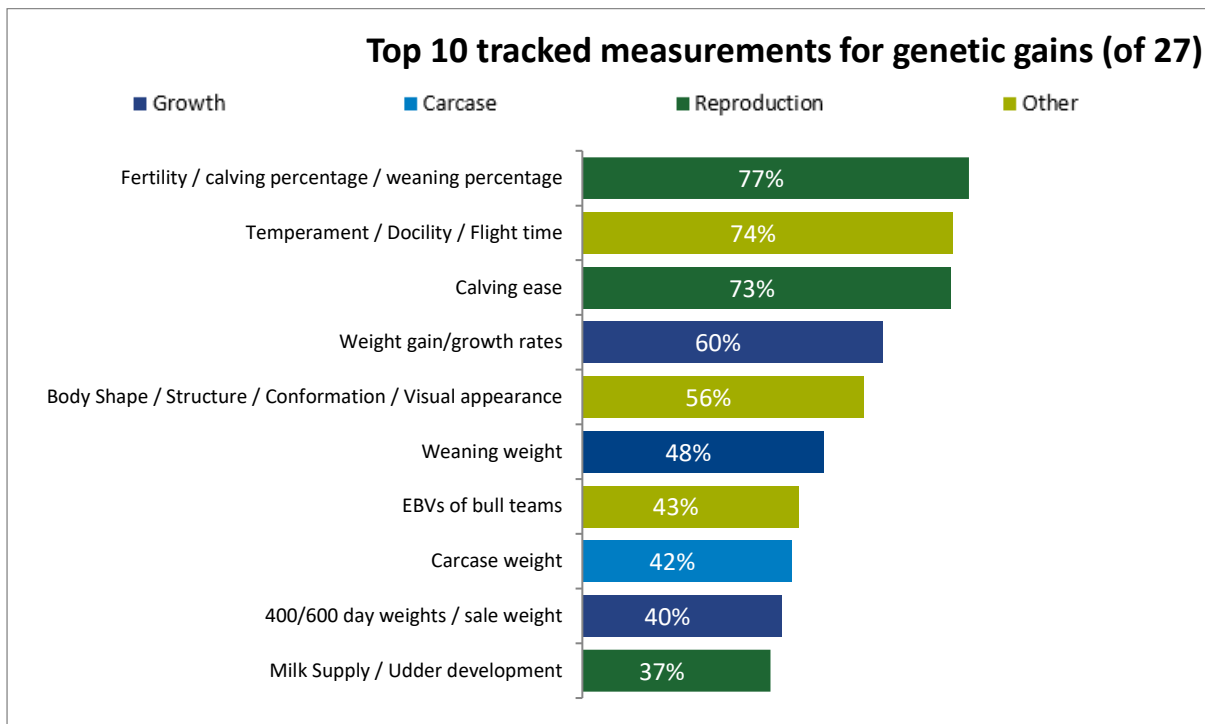
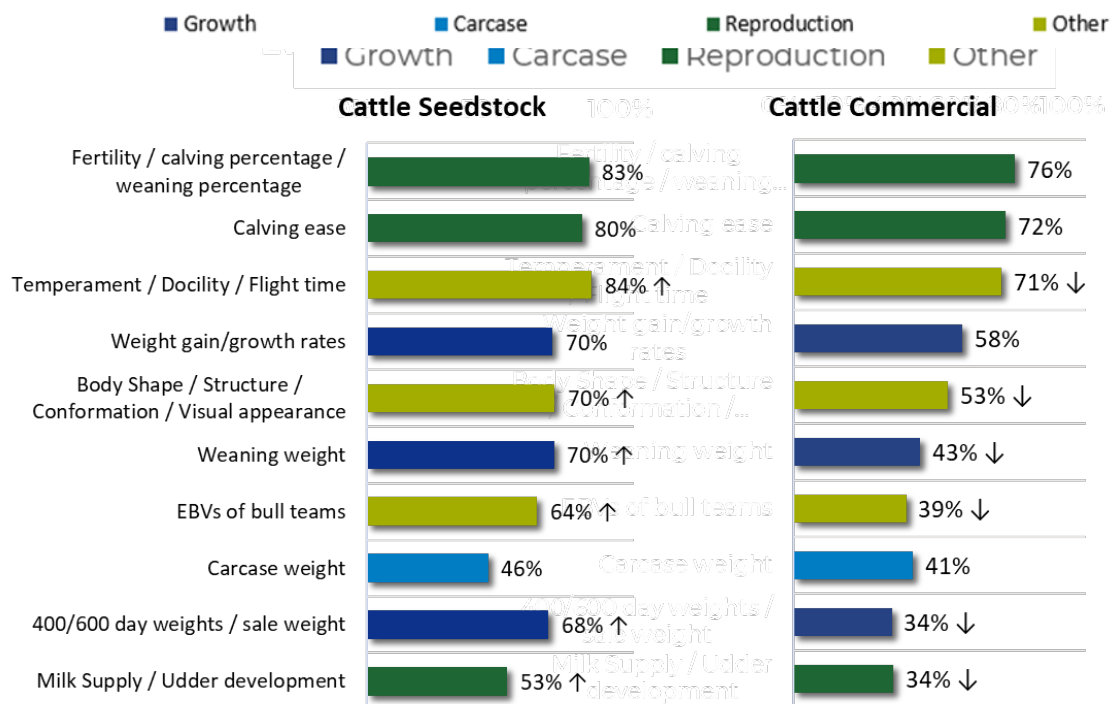


Figure 7. Top 10 tracked measurements split by seedstock and commercial cattle producers



4.5 Genetics Management

Around one third (36%) of seedstock producers used Excel or Microsoft data management software for animal management (Figure 8). Stockbook (20%) and Herdmaster (15%) were also popular. Fewer commercial producers used data management software, with more than half (55%) using none, although Excel or Microsoft was relatively popular among commercial producers (29%).

Mating techniques for breeding females varied by seedstock or commercial production (Figure 9). Almost all (92%) commercial breeding females were mated naturally, while 63% of seedstock breeding females were mated naturally and 30% mated using artificial insemination.

Almost all seedstock cattle producers were a member of a breed society (94%) (Figure 10), with the majority (76%) also users of genetic evaluation services (Figure 11). BREEDPLAN was used by over half (56%) of seedstock cattle producers who used a genetic evaluation service, with TACE accounting for over one fifth (21%) (Figure 12). Split by temperate and tropical cattle breeds (Figure 13), 55% of temperate producers used BREEDPLAN, with 56% of tropical and 62% of both temperate and tropical breed producers also using BREEDPLAN. On average, seedstock users of BREEDPLAN or TACE have used that genetic technology for 19 years (Figure 14).

Figure 8. Data management software used by beef producers

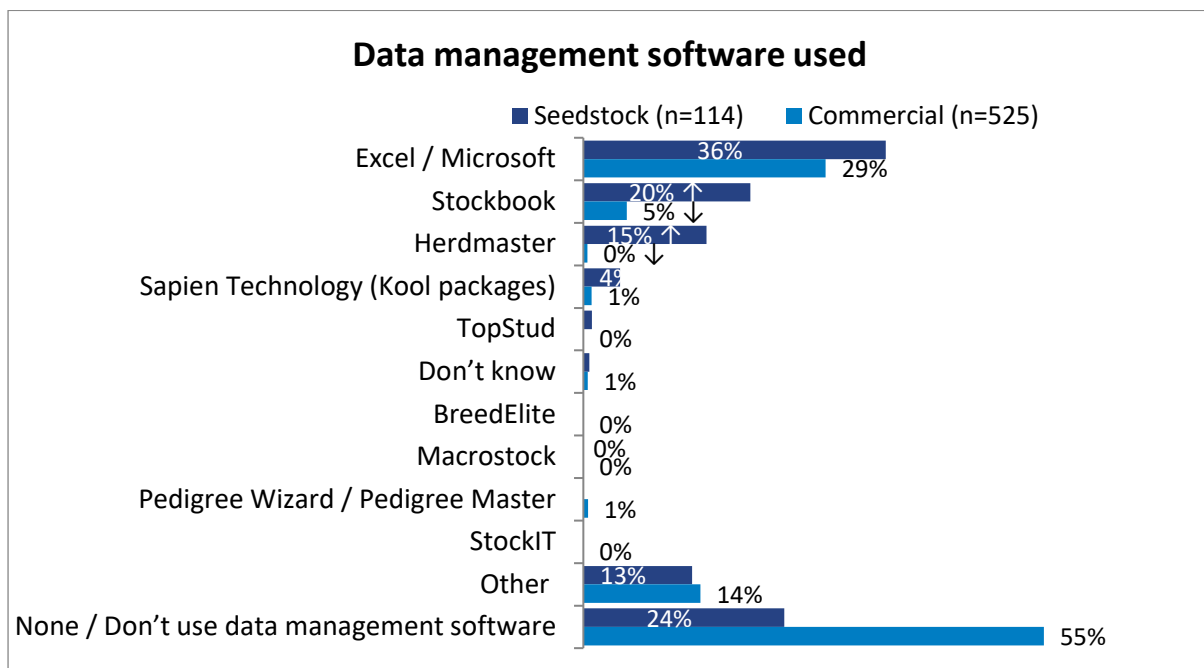


Figure 9. Percentage of breeding females mated using each of the following breeding techniques

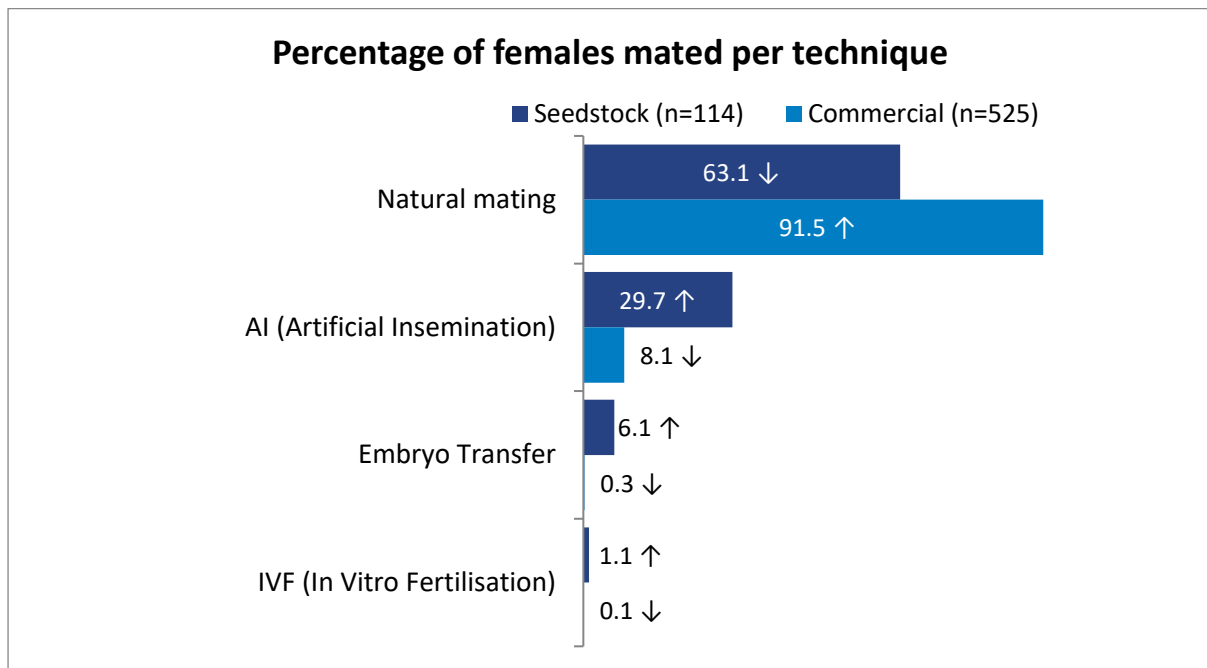


Figure 10. Members of a breed stock society (seedstock cattle producers n=129)

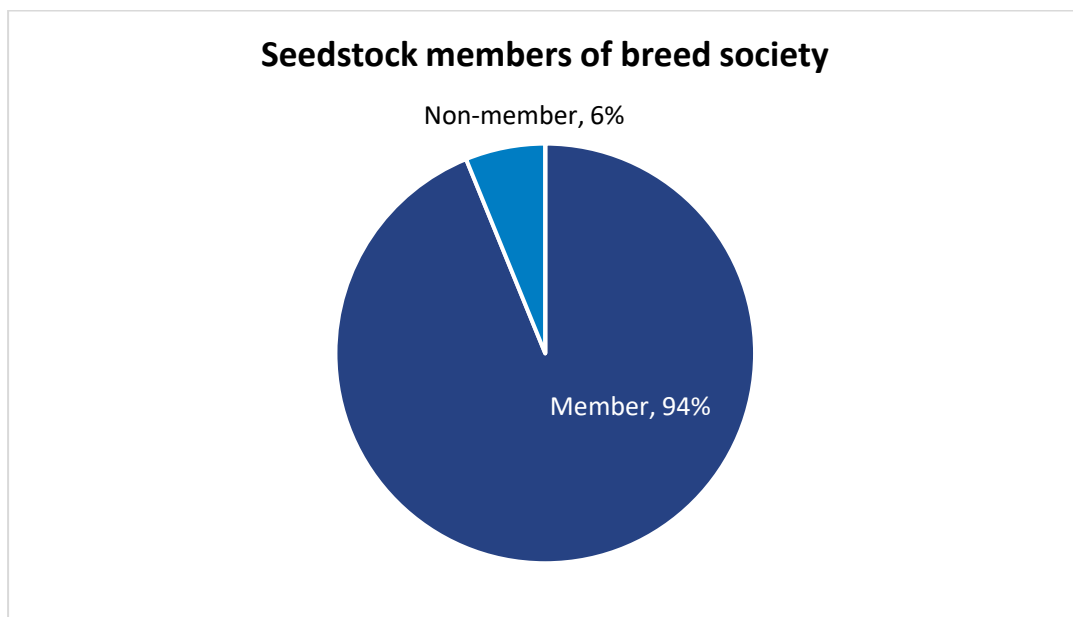


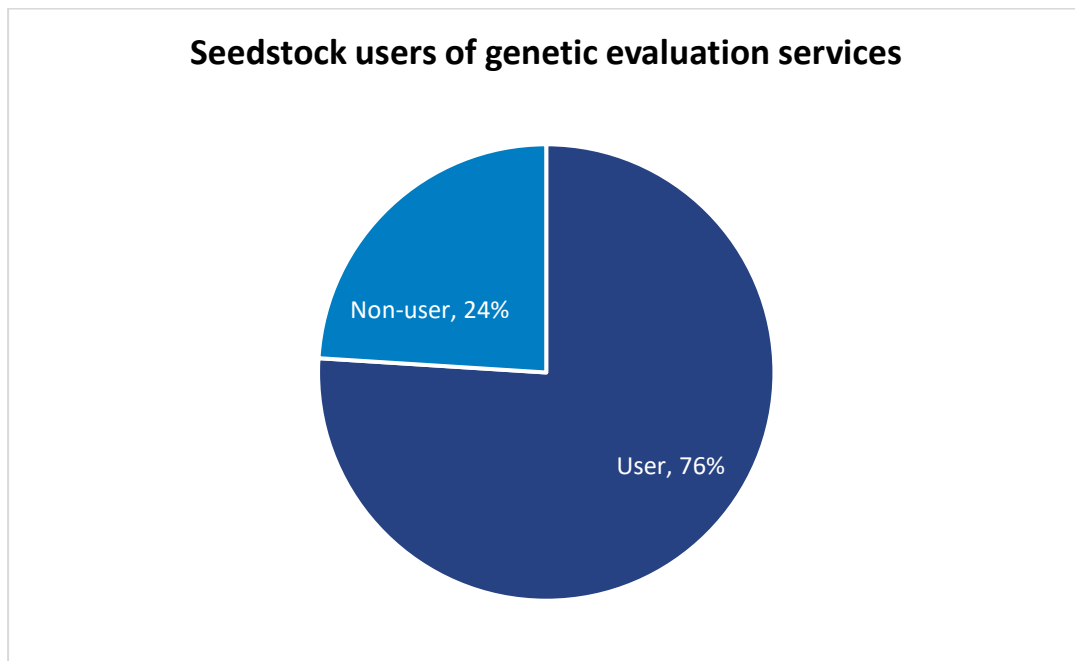
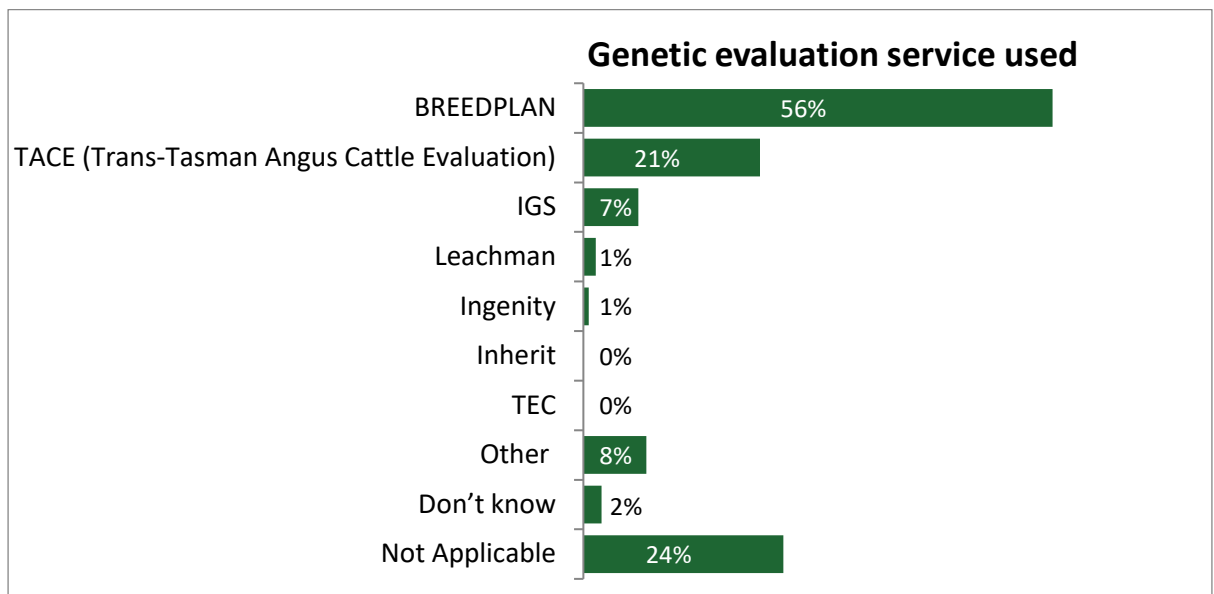
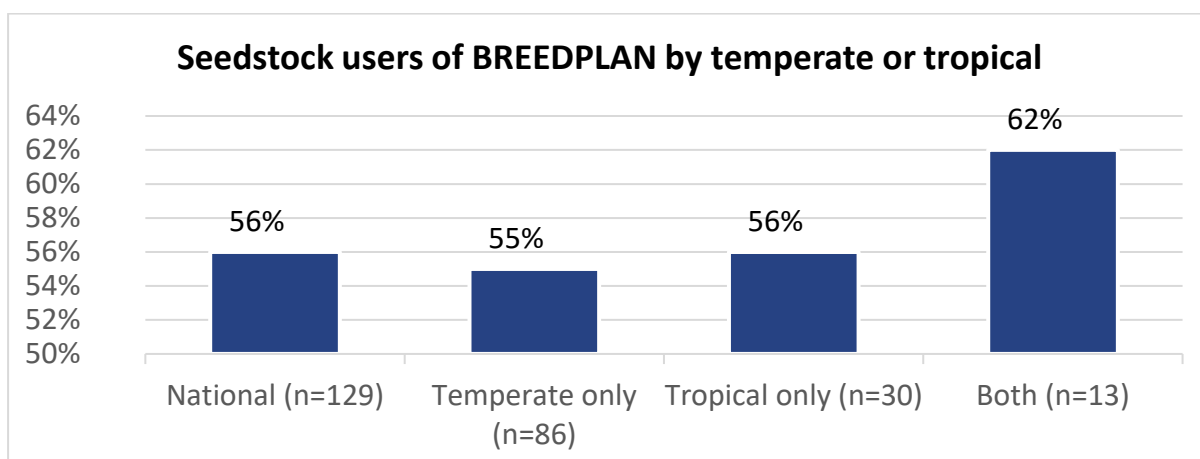
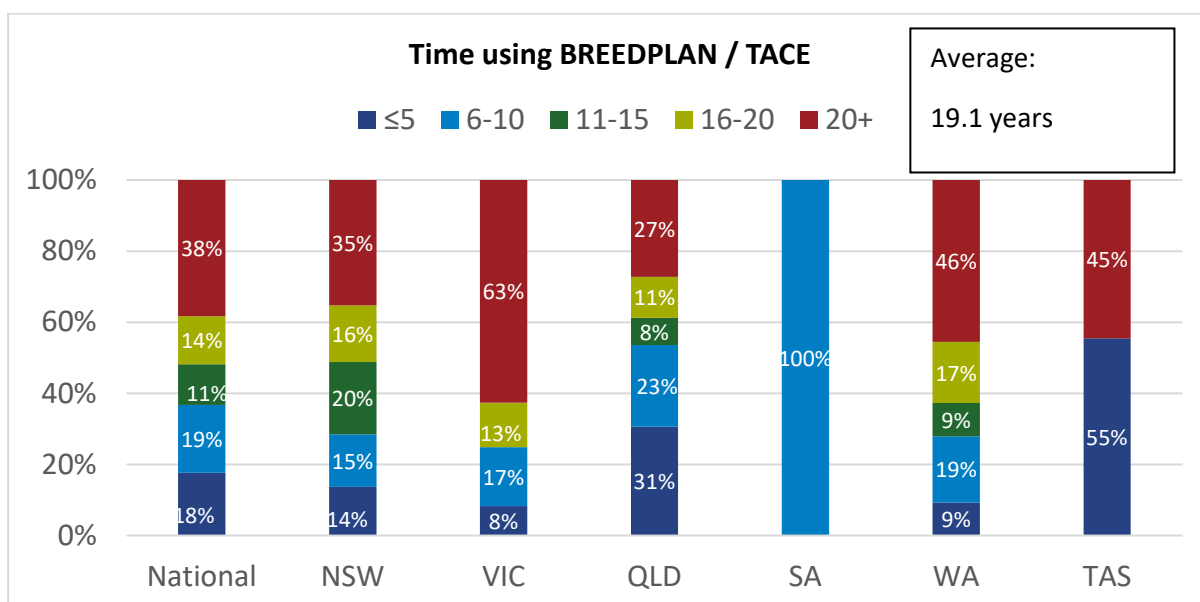
Figure 11. Users of genetic evaluation (seedstock cattle producers) (n=129)**Figure 12. Genetic evaluation service used by seedstock cattle producers (n=129)**

Figure 13. Users of BREEDPLAN (seedstock cattle producers by temperate or tropical) (n=129)**Figure 14. Length of time using BREEDPLAN or TACE among cattle seedstock producers (n=84)**

For commercial cattle producers, only one third (33%) were members of a breed society (Figure 15), although the majority (78%) used EBVs (Figure 16). When viewed by state (Figure 17), Queensland producers were significantly less likely to use EBVs (70%). Almost two thirds (59%) of commercial producers sourced their EBVs from BREEDPLAN with 12% using TACE (Figure 18). When split by EBV service used (Figure 19), 60% of temperate producers used BREEDPLAN EBVs as did 51% of tropical producers, and 60% of producers with both temperate and tropical breeds.

Where commercial cattle producers did not use BREEDPLAN / TACE when buying bulls (Figure 20), one third (33%) stated that it was because they rely on information being given to them by another party, e.g., the breeder.

Among commercial cattle producers who do not use BREEDPLAN / TACE, most (89%) have never used either system (Figure 21) with 11% being past / lapsed users. The top reason given for never using BREEDPLAN / TACE was that it was “Not necessary / trust own process” (23%) (Figure 22).

Slightly fewer non-users reported that they have used BREEDPLAN in the past than when the previous study was reported in 2016 (11% in 2023 compared to 19% in 2016).

Figure 15. Commercial cattle producers who are members of a breed society (n=606)

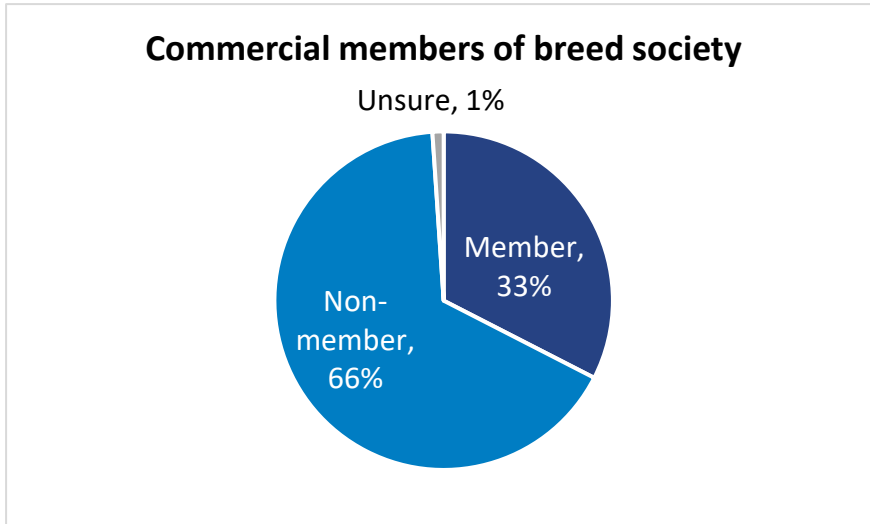


Figure 16. Commercial cattle producers who use EBVs (n=606)

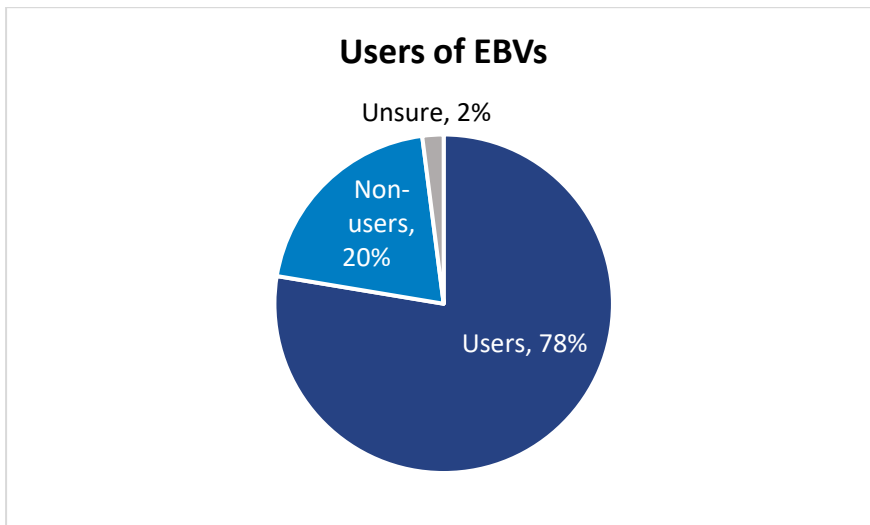


Figure 17. Commercial cattle producers who use EBVs by state

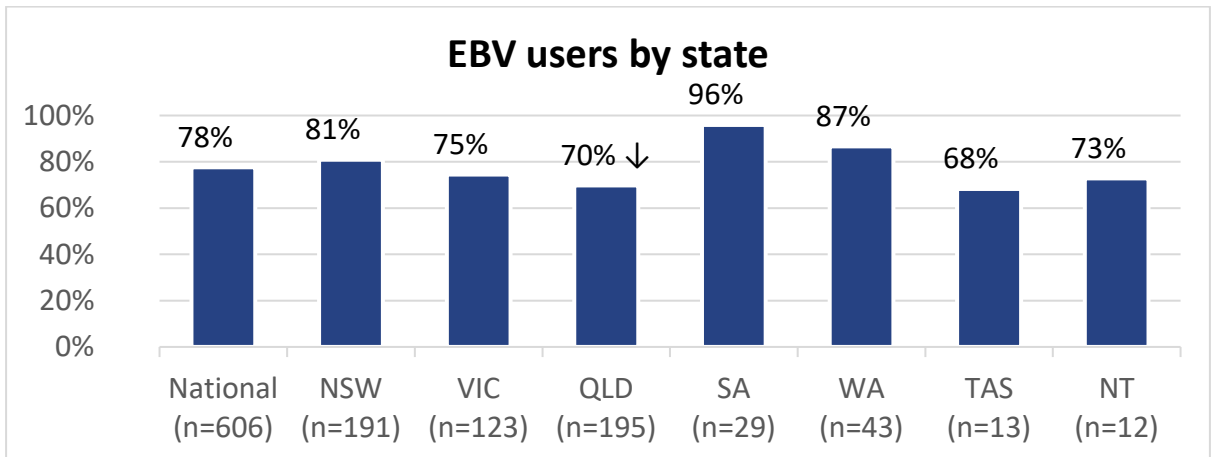


Figure 18. Genetic evaluation service used by commercial cattle producers for EBVs (n=606)

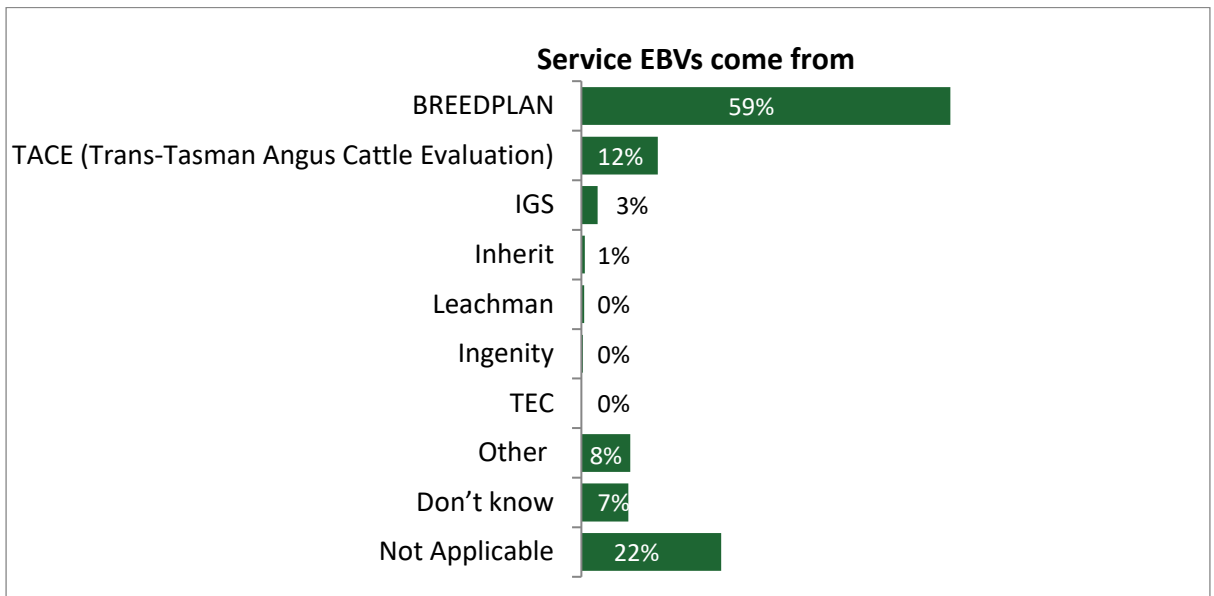


Figure 19. BREEDPLAN users by temperate or tropical breeds

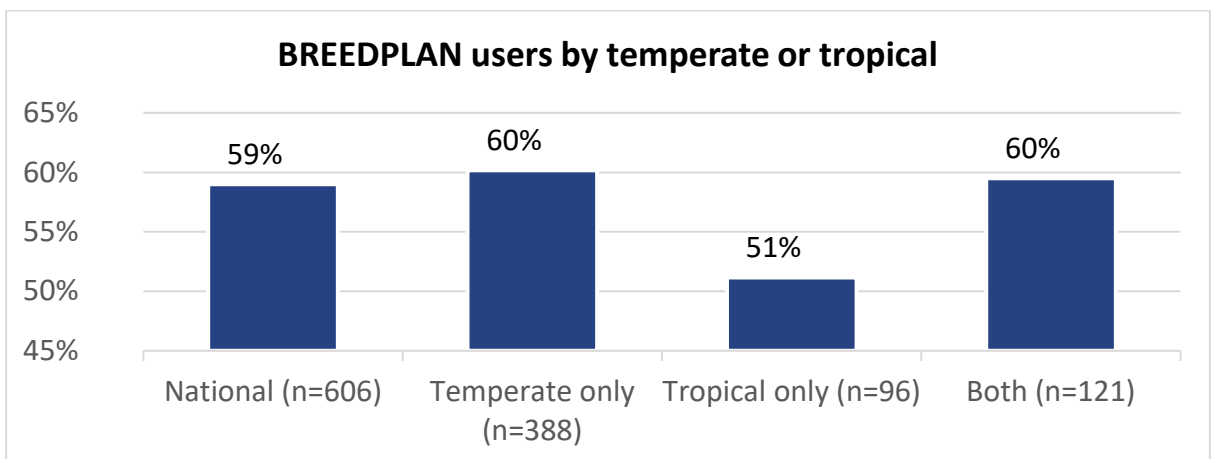


Figure 20. Reasons commercial cattle producers do not use BREEDPLAN / TACE when buying bulls (n=81)

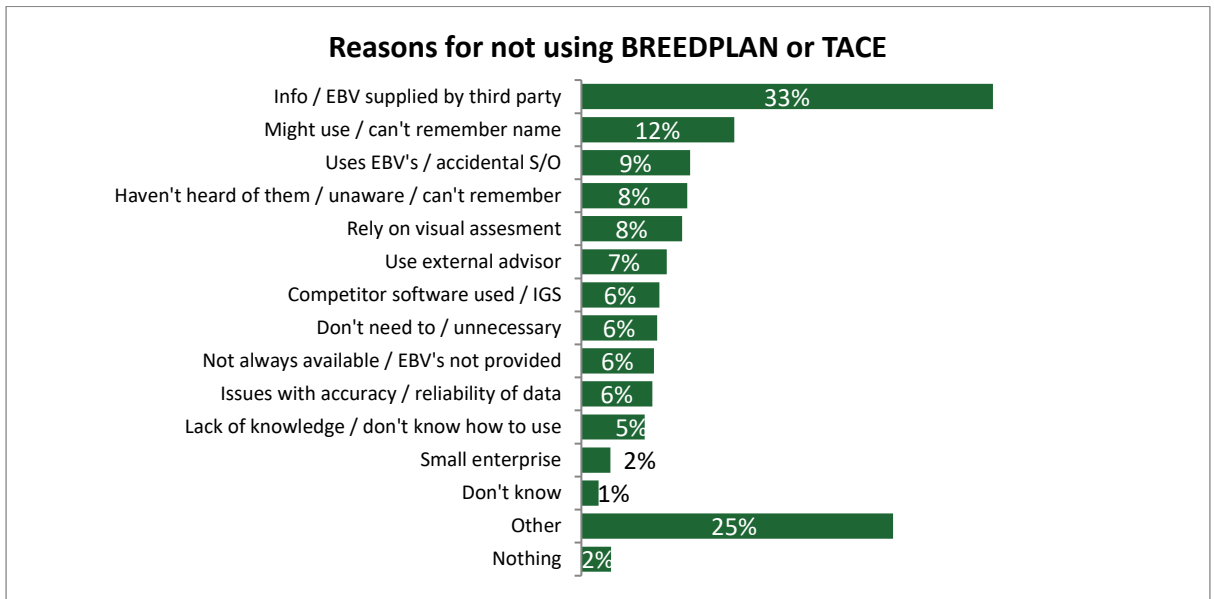


Figure 21. Commercial cattle producers who have never used BREEDPLAN / TACE (n=129)

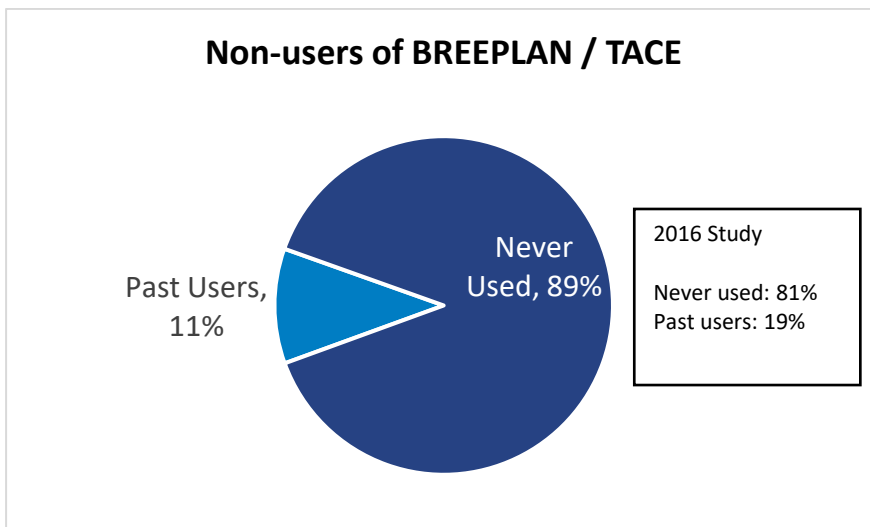
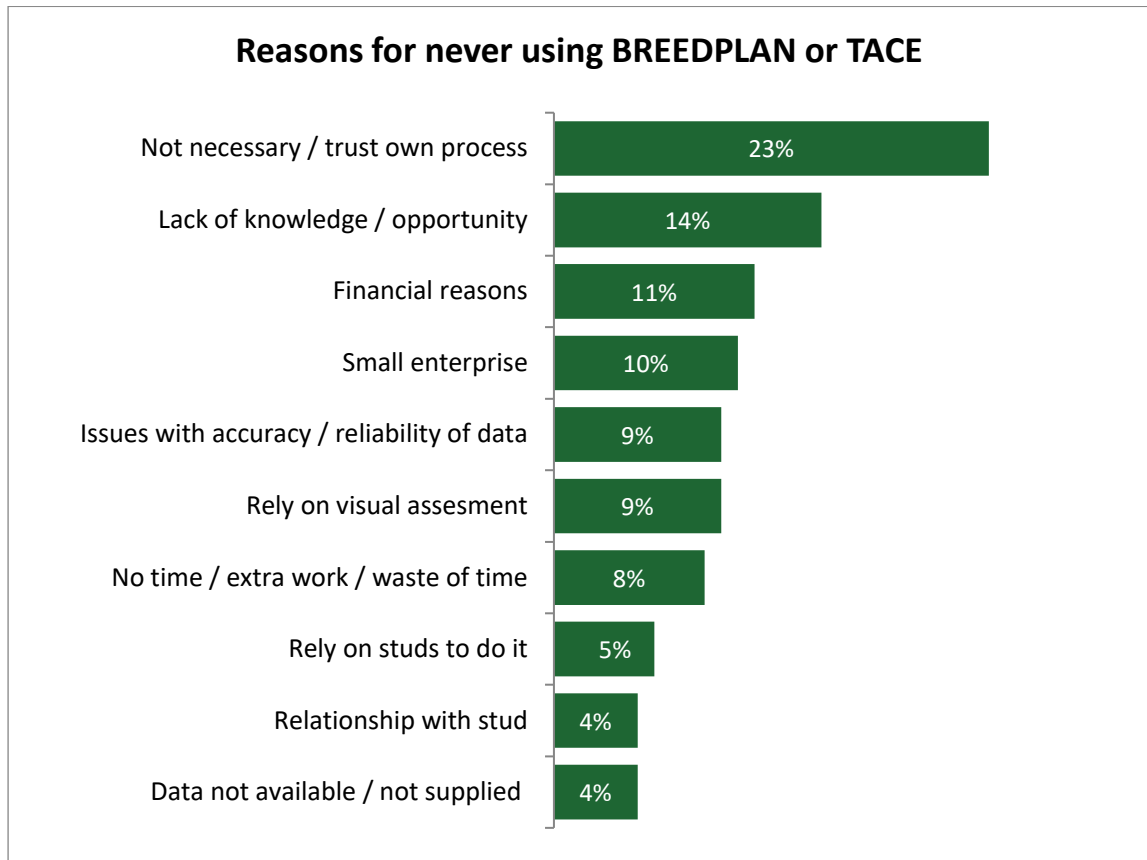


Figure 22. Top 10 reasons that commercial cattle producers have never used BREEDPLAN / TACE (n=114)



Satisfaction with genetic gains was high with almost half of cattle producers (47%) very satisfied with the gains they have achieved over the last ten years and a further third (37%) fairly satisfied (Figure 23). Where cattle producers were less than fully satisfied with their genetic gains (Figure 24), almost two thirds (57%) said this was due to there always being room for improvement with one third (33%) citing environment factors.

Regardless of whether they were seedstock (Figure 25) or commercial (Figure 26), cattle producers were bullish about the financial health of their business with 75% of seedstock producers and 70% of commercial producers saying it is improving.

Figure 23. Satisfaction with genetic gains amongst cattle producers (n=639)

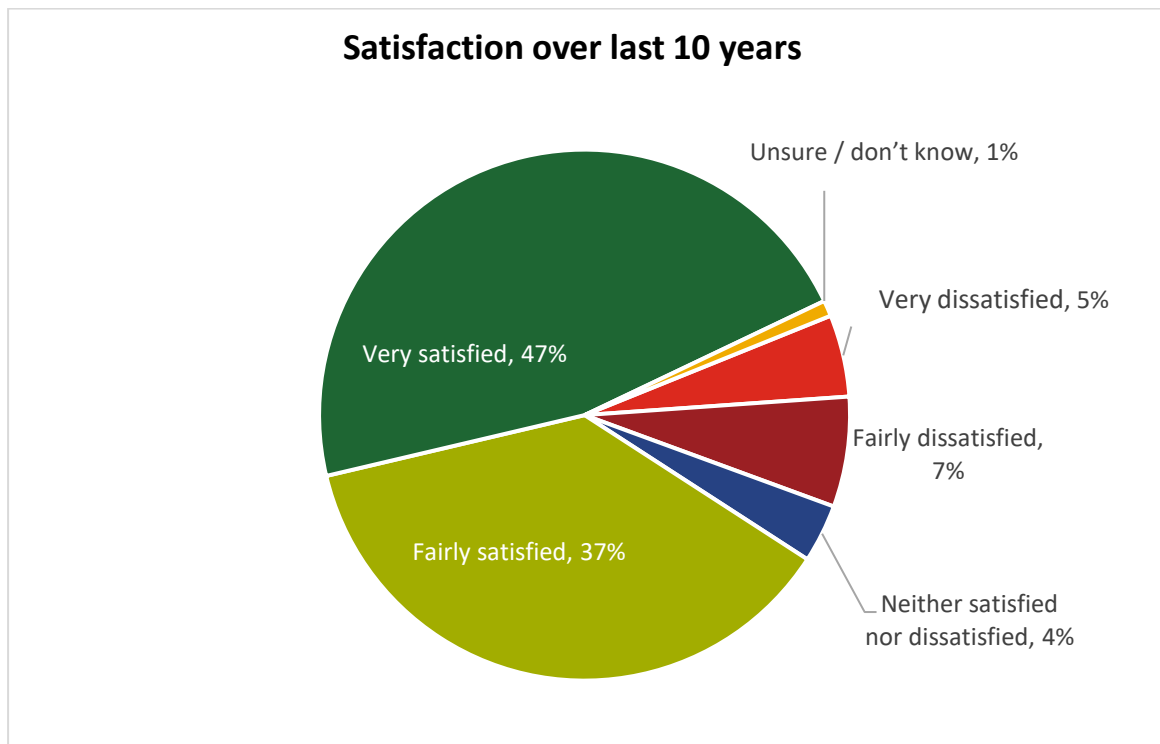


Figure 24. Reasons for cattle producers being less than satisfied with genetic gains (n=99)

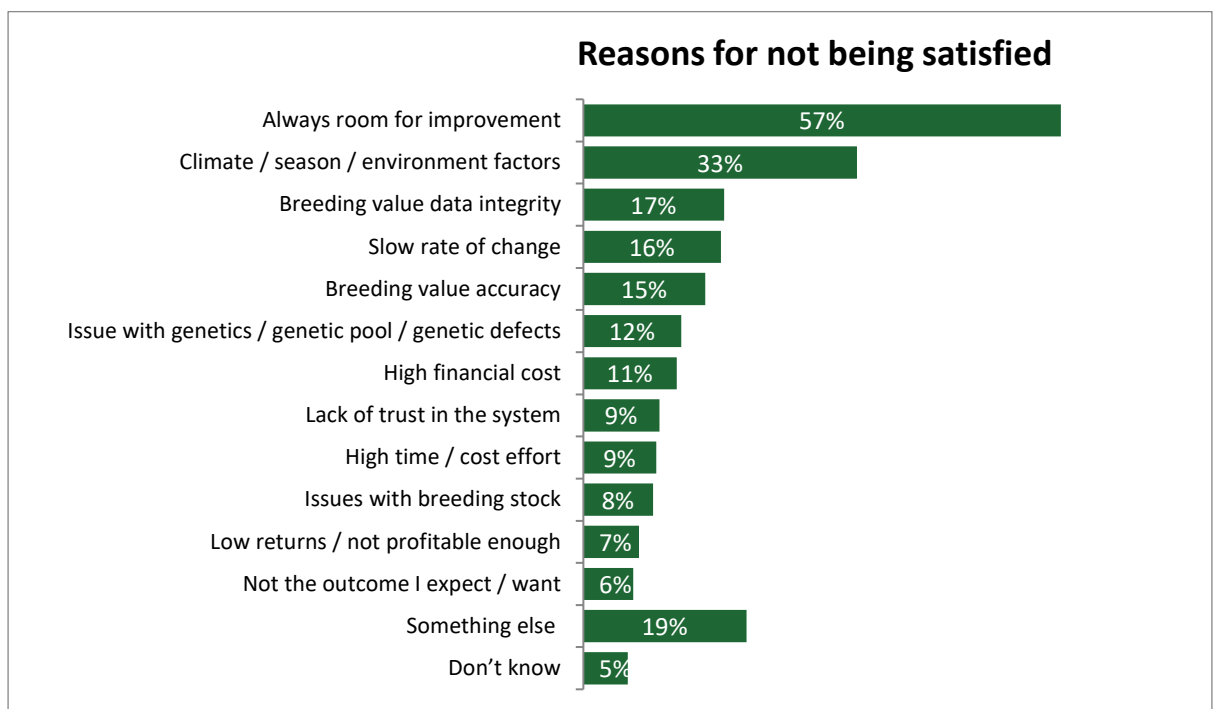


Figure 25. Trend in financial health for seedstock cattle producers (n=114)

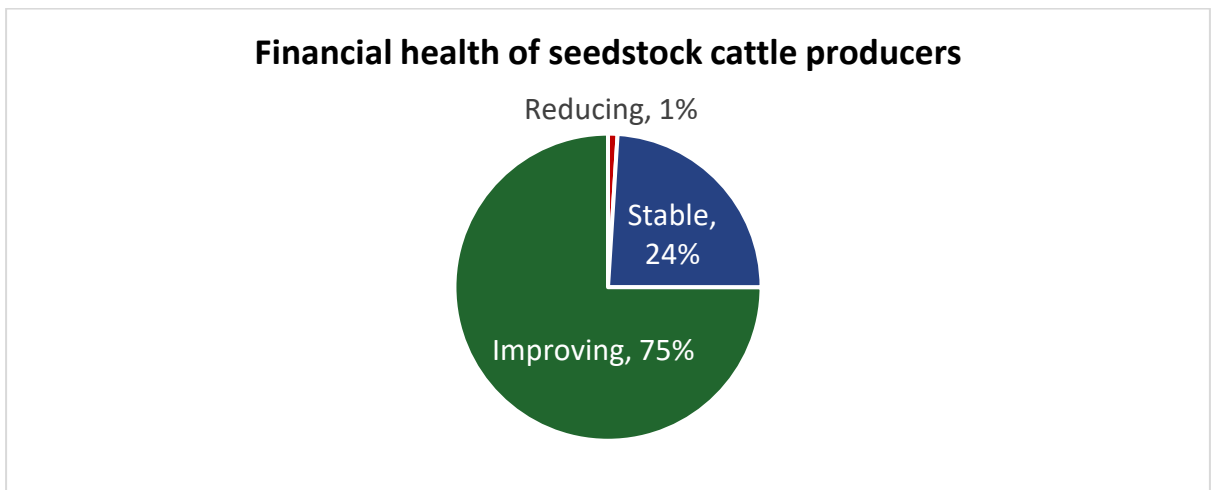
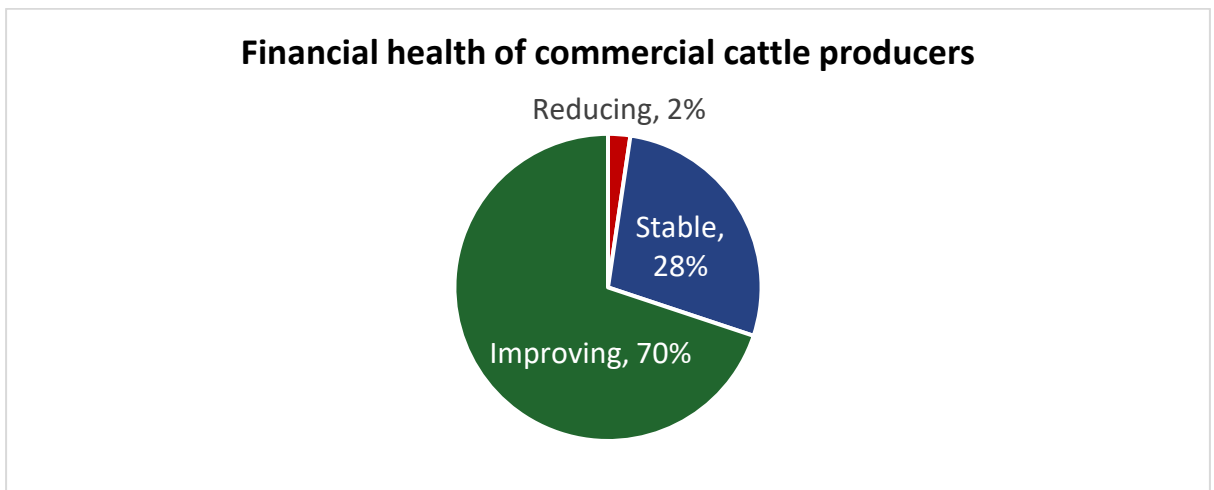


Figure 26. Trend in financial health for commercial cattle producers (n=525)



Around a quarter of cattle producers (23%) used genomic products (Figure 27). Among these users, the most popular products were DNA tests for parentage (69%) and DNA tests for performance (65%) (Figure 28). When split by production type (Figure 29), seedstock producers were significantly more likely to use genomic products than commercial producers (70% compared to 13% respectively) and were more likely to use multiple genomic products, e.g., 89% of seedstock producers DNA test for parentage and 85% DNA test for performance (Figure 30). Commercial producers were significantly less likely to DNA test for parentage (45%) and DNA test for performance (42%) but more likely to use Heifer select (18%) (Figure 31).

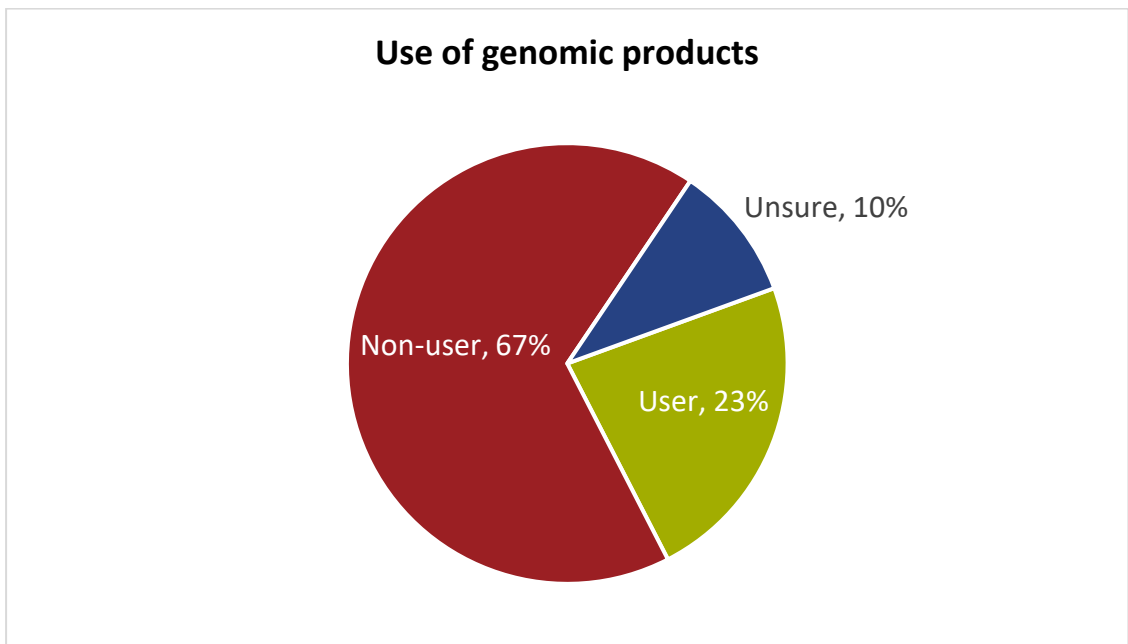
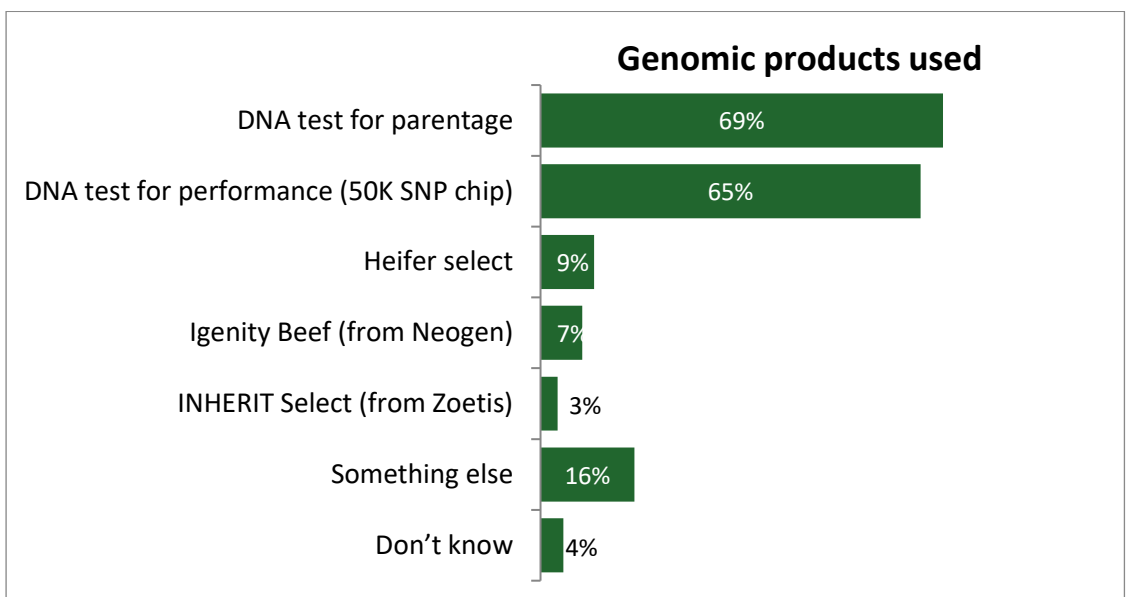
Figure 27. Use of genomic products amongst cattle producers (n=639)**Figure 28. Genomic products used by cattle producers (n=149)**

Figure 29. Use of genomic products for cattle producers split by production type

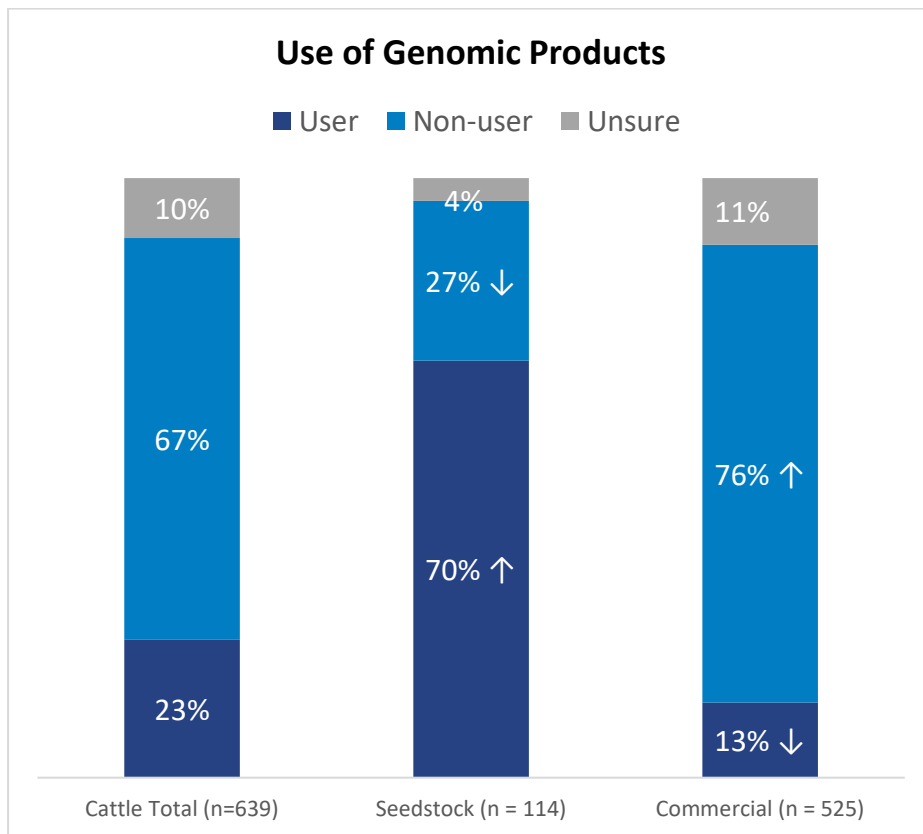


Figure 30. Genomic products used by cattle seedstock producers (n=78)

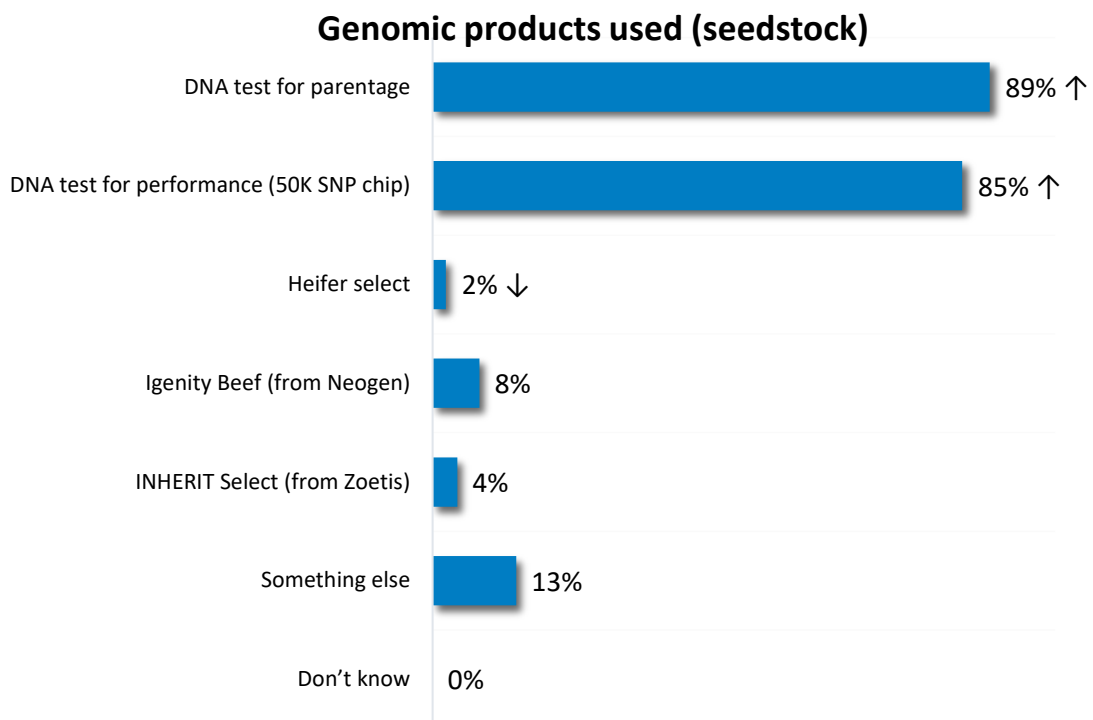
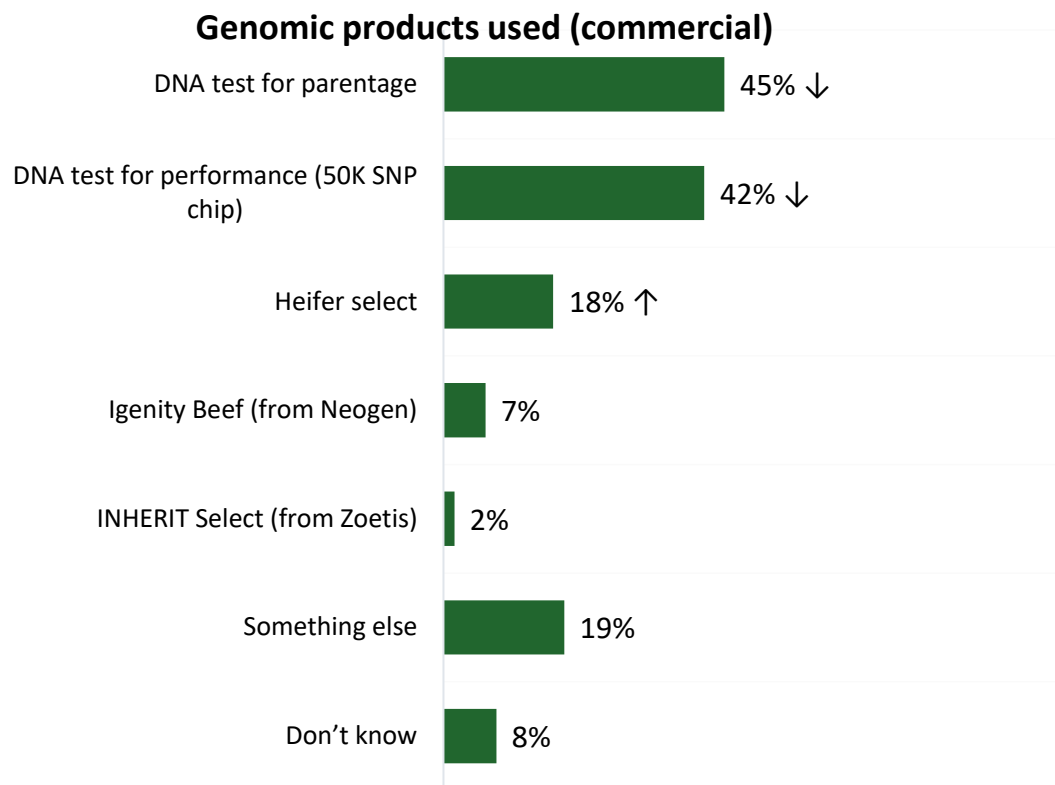


Figure 31. Genomic products used by commercial cattle producers (n=71)

4.6 BREEDPLAN

Cattle producers' primary understanding of BREEDPLAN is that it is data regarding genetics / parentage / pedigree with over a third citing this (Figure 32). Around one quarter of producers also noted that BREEDPLAN assisted in decision making, is a database that can be used as a guide and that it provides benchmarking. When split by seedstock / commercial, a higher proportion of seedstock producers (44%) stated that BREEDPLAN is data regarding genetics (Figure 33), while only 33% of commercial producers shared this understanding (Figure 34).

Figure 32. Understanding of BREEDPLAN amongst all cattle producers (n=639)

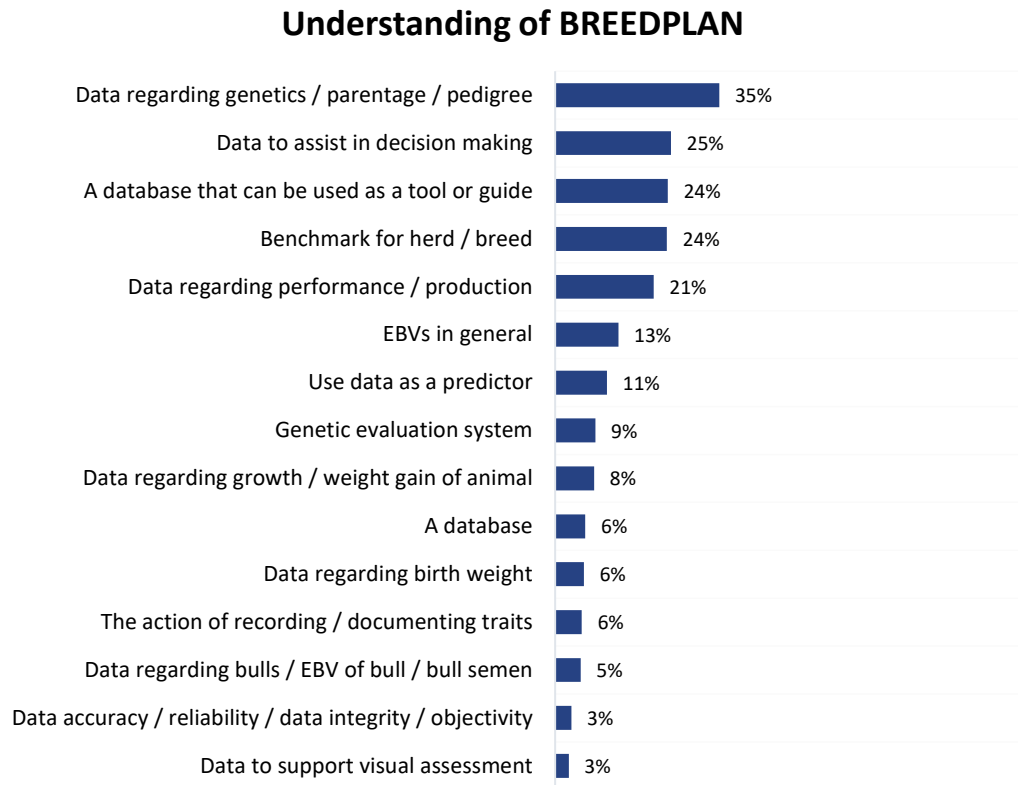


Figure 33. Cattle Seedstock producers' understanding of BREEDPLAN (n=114)

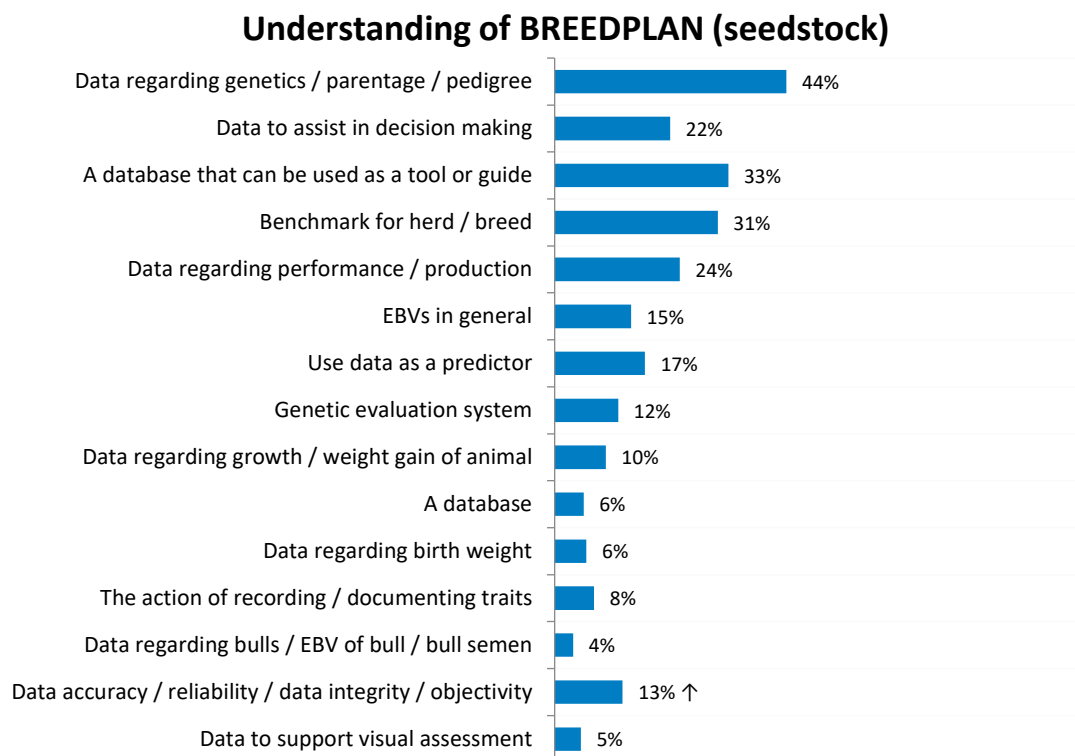
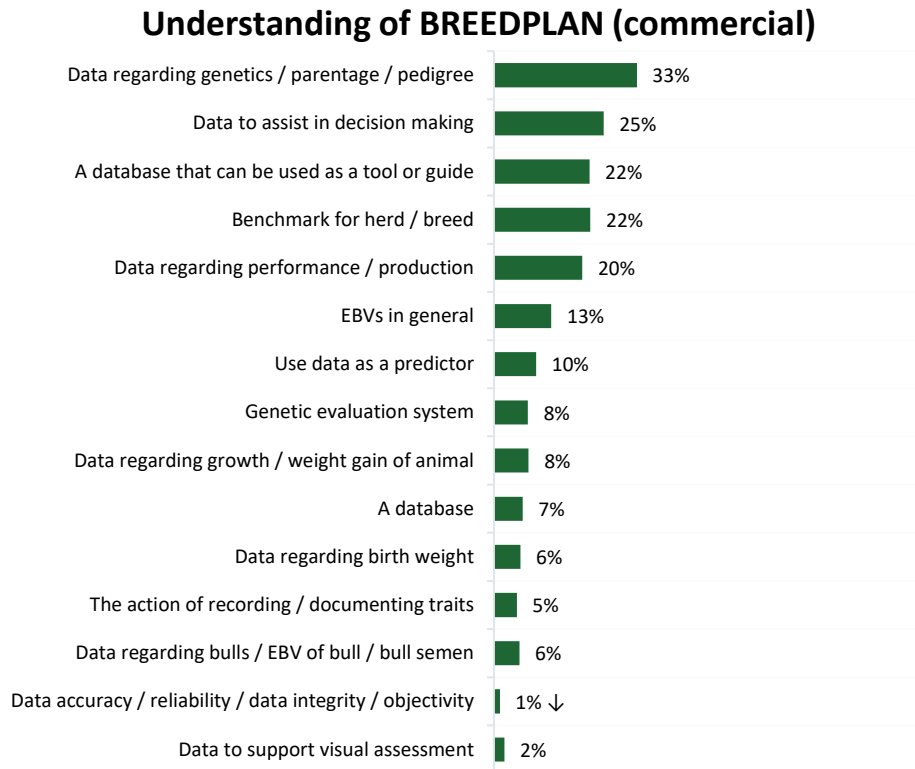


Figure 34. Understanding of BREEDPLAN from commercial cattle producers (n=525)

Regardless of production type, cattle producers said the best thing about BREEDPLAN is that it aids selection / decision making (35%) (Figure 35), followed by provides information (21%) and acts as a guide (14%). Seedstock producers (Figure 36) were significantly more likely to cite the ability to assess traits (21%), benchmark (20%) and aid in marketing (13%) compared to commercial producers who were most likely to say it aids selection (35%), provides information (22%) and acts as a guide (14%) (Figure 37).

Figure 35. Positive perceptions of BREEDPLAN among all cattle producers (n=639)

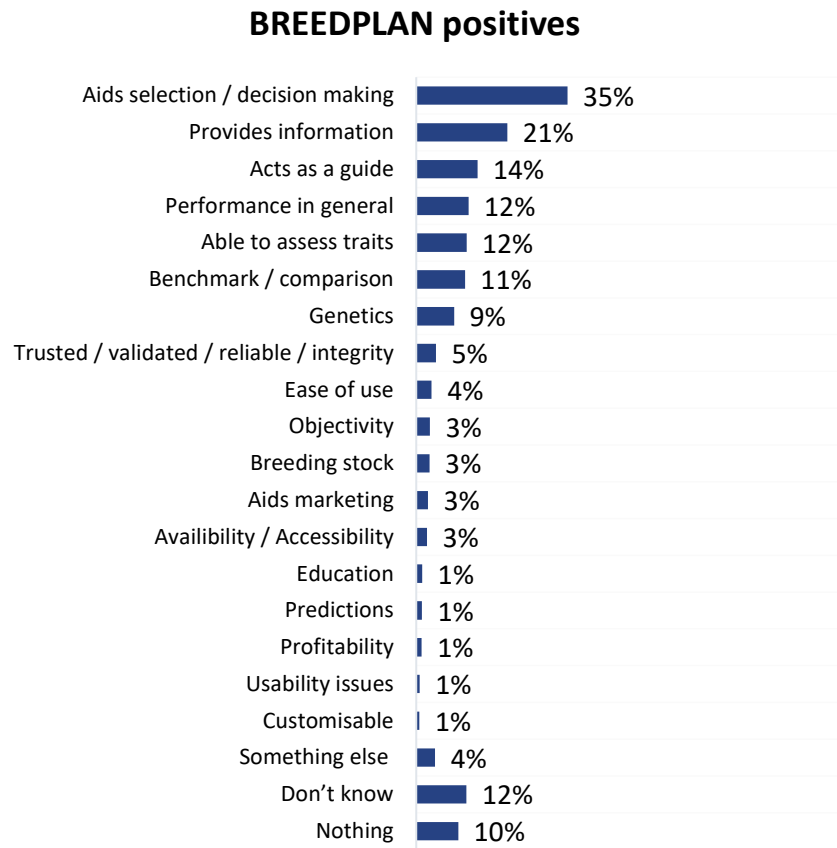


Figure 36. Positive perceptions of BREEDPLAN among seedstock cattle producers (n=114)

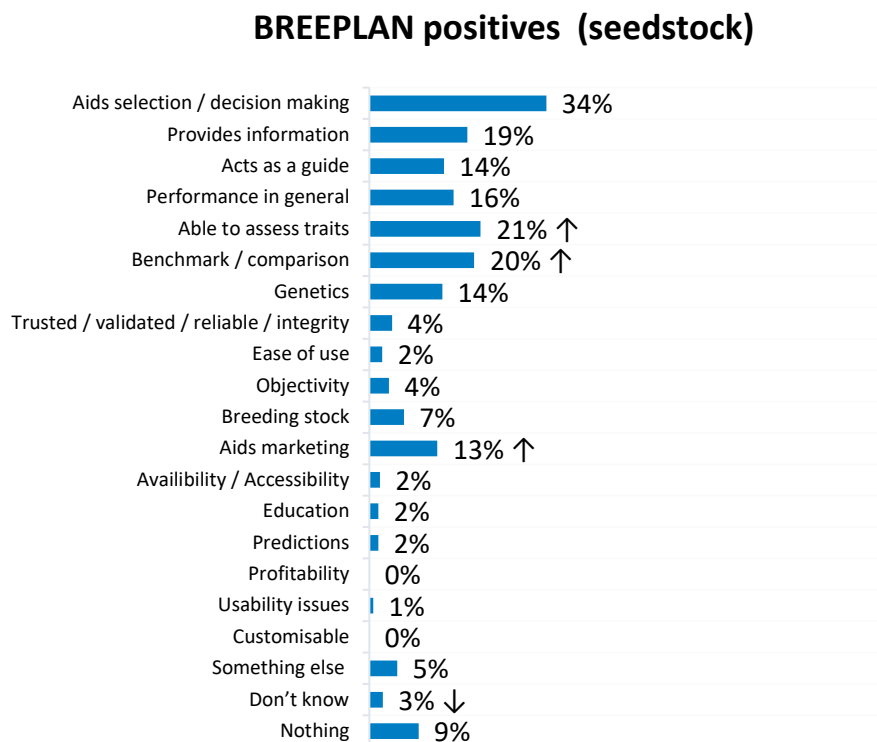
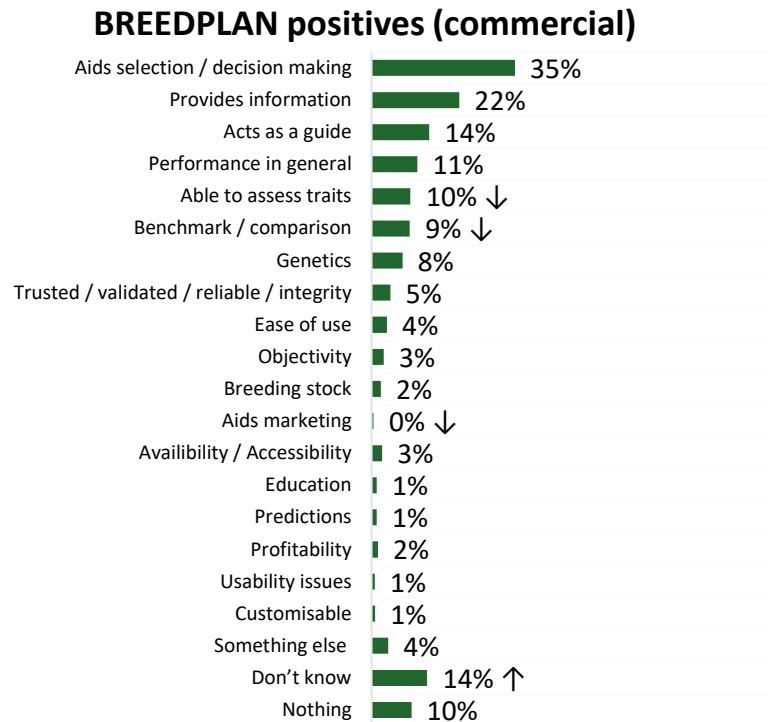


Figure 37. Positive perceptions of BREEDPLAN amongst commercial cattle producers (n=525)



The biggest factor driving negative perceptions of BREEDPLAN among all cattle producers (Figure 38) was issues with accuracy (20%). Seedstock producers (Figure 39) were also concerned by problems with data capture (26%) and methodology (29%) while commercial cattle producers were most likely to have nothing negative to say (22%) or be unsure (19%) (Figure 40).

Figure 38. Negative perceptions of BREEDPLAN among all cattle producers (n=639)

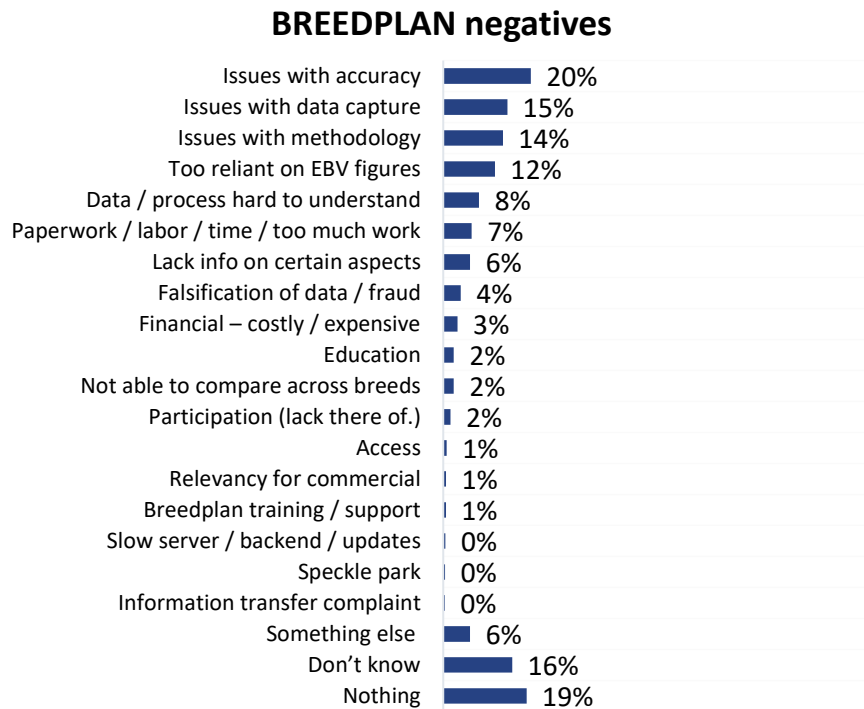


Figure 39. Negative perceptions of BREEDPLAN among seedstock cattle producers (n=114)

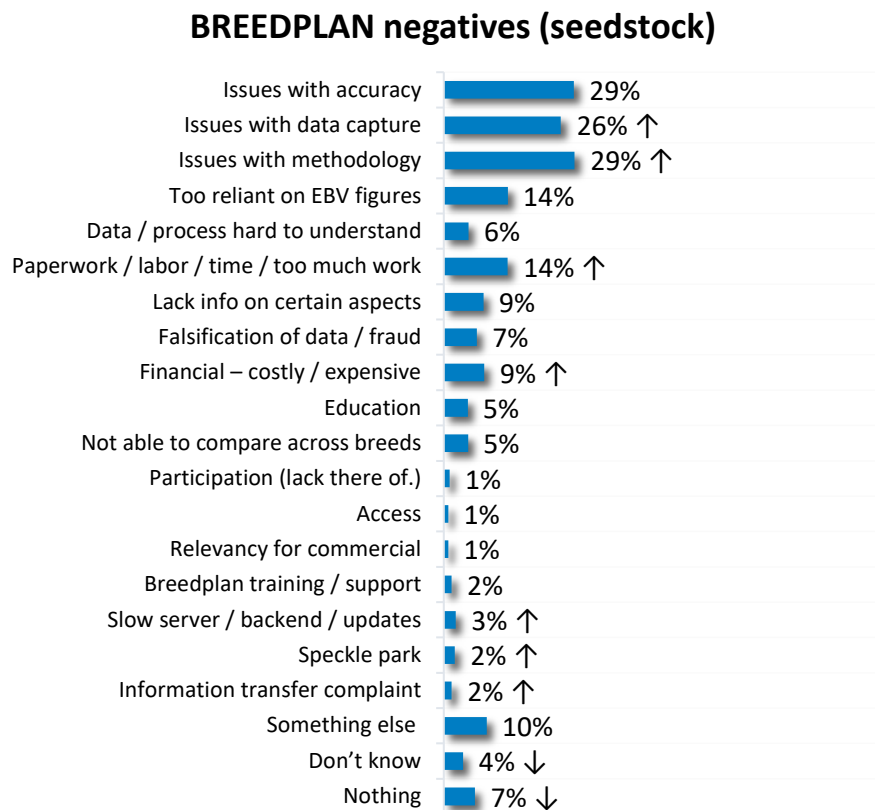
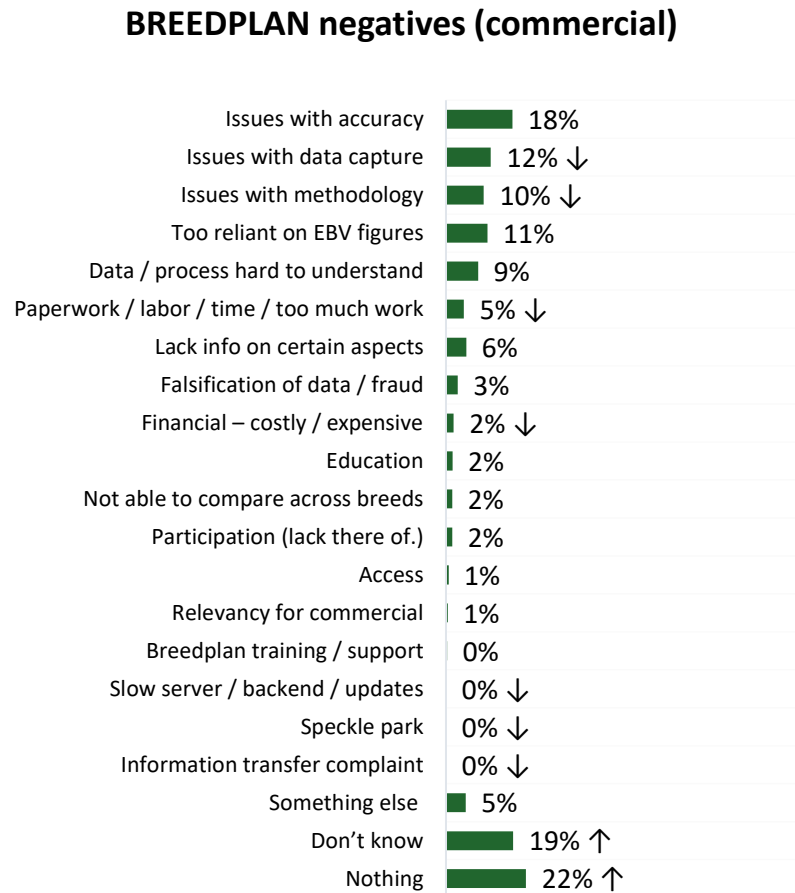


Figure 40. Negative perceptions of BREEDPLAN among commercial cattle producers (n=525)



Overall, for cattle producers, the three key traits considered for breeding bull selection were temperament (91%), calving ease (80%) and birth weight (72%) (Figure 41). There were innumerable, significant differences among seedstock (Figure 42) and commercial breeding bull selection (Figure 43).

Figure 41. Most important traits for selecting breeding bulls for all cattle producers (n=639)

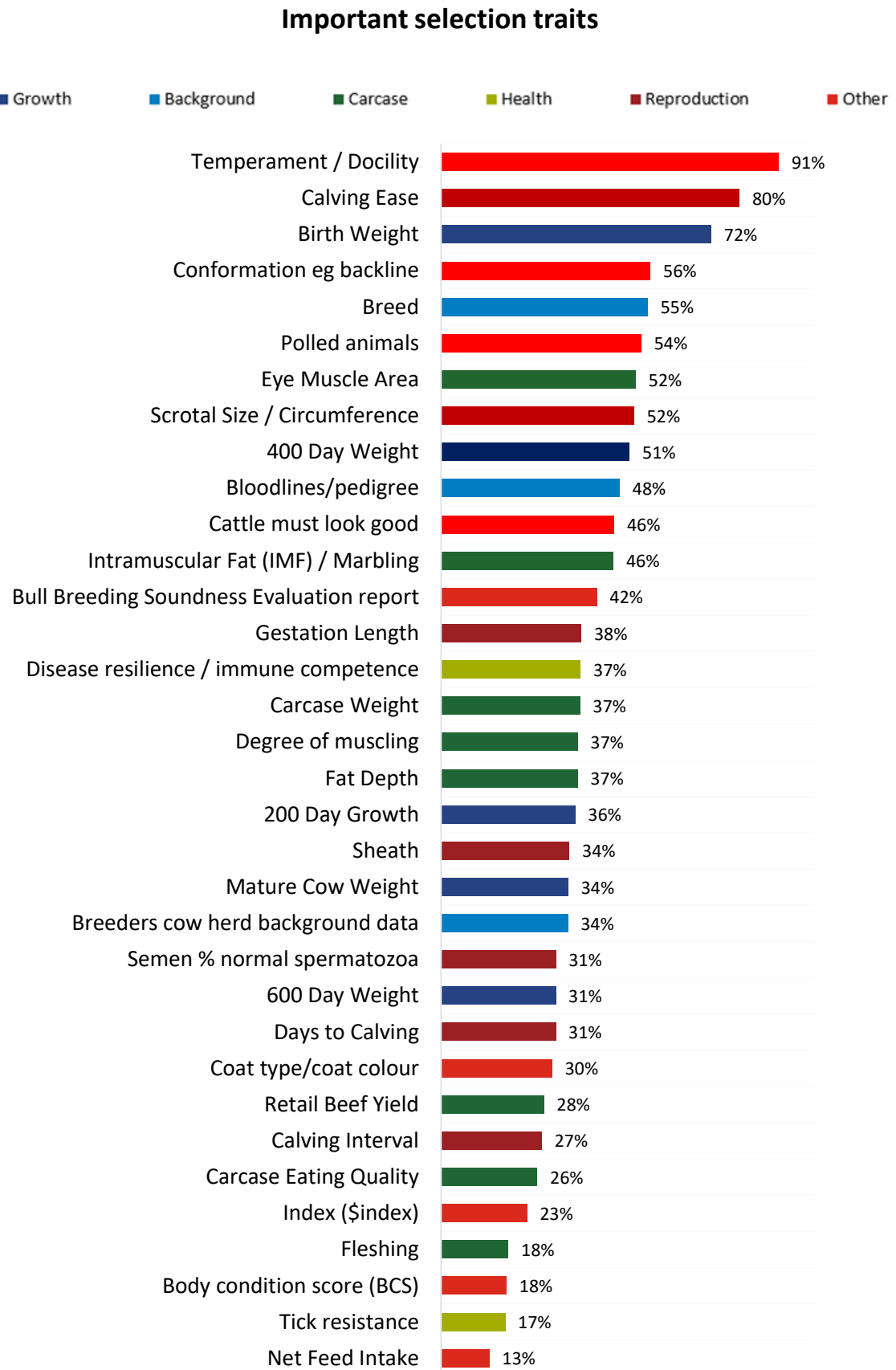


Figure 42. Most important traits for breeding bull selection among seedstock cattle producers (n=114)

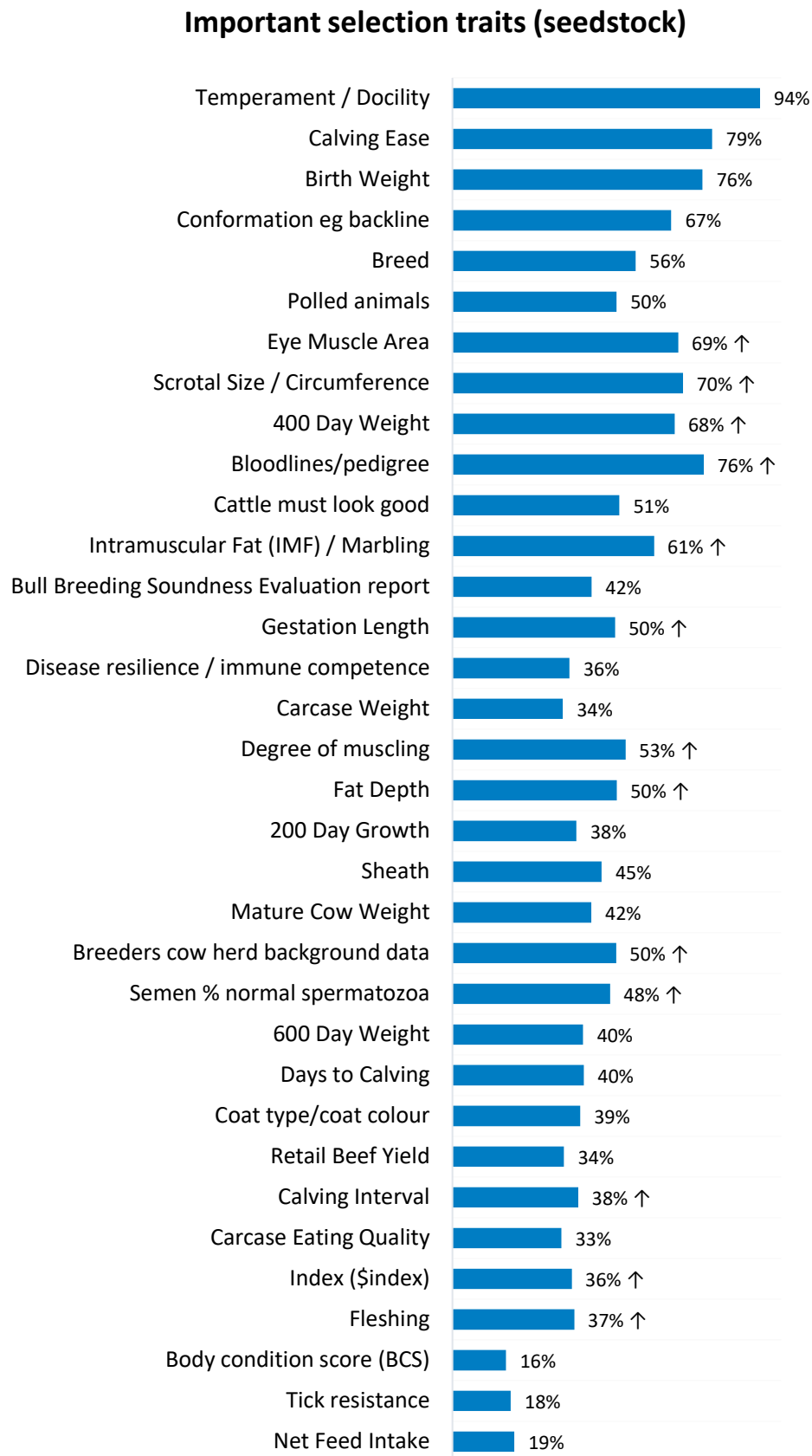
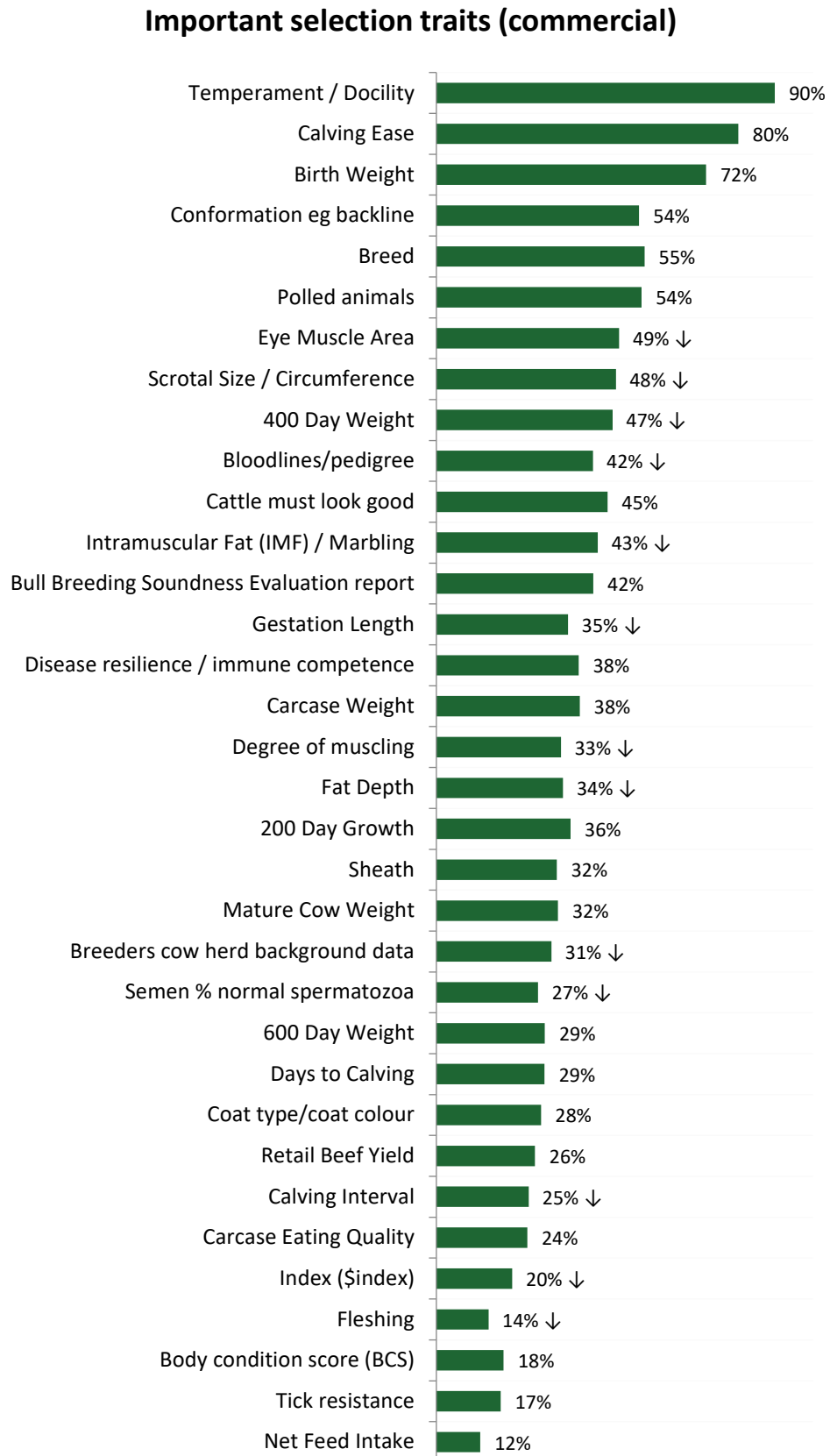


Figure 43. Important traits for selecting breeding bulls for commercial cattle producers (n=525)



Over the next ten years, both seedstock (87%) (Figure 44) and commercial producers (83%) (Figure 45) consider reproduction / fertility to be the most important factor for their business, followed by cost of production / efficiency (81% and 84%, respectively).

When asked how they choose a stud (Figure 46), commercial cattle producers most frequently cite the genetics and performance of the stud (62%), followed by their relationship with the breeder (57%). Once they have selected a stud, almost all commercial producers choose a bull based on its looks and breeding values (94%) (Figure 47).

Figure 44. Important factors for seedstock cattle businesses over the next ten years (n=114)

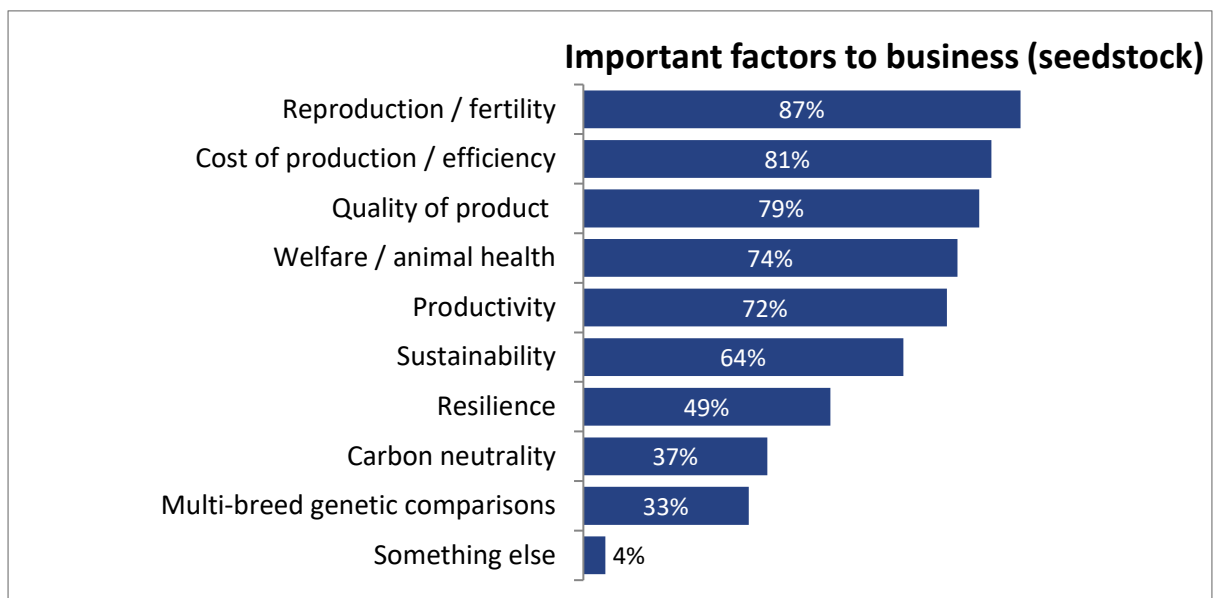


Figure 45. Important factors for commercial cattle businesses over the next ten years (n=525)

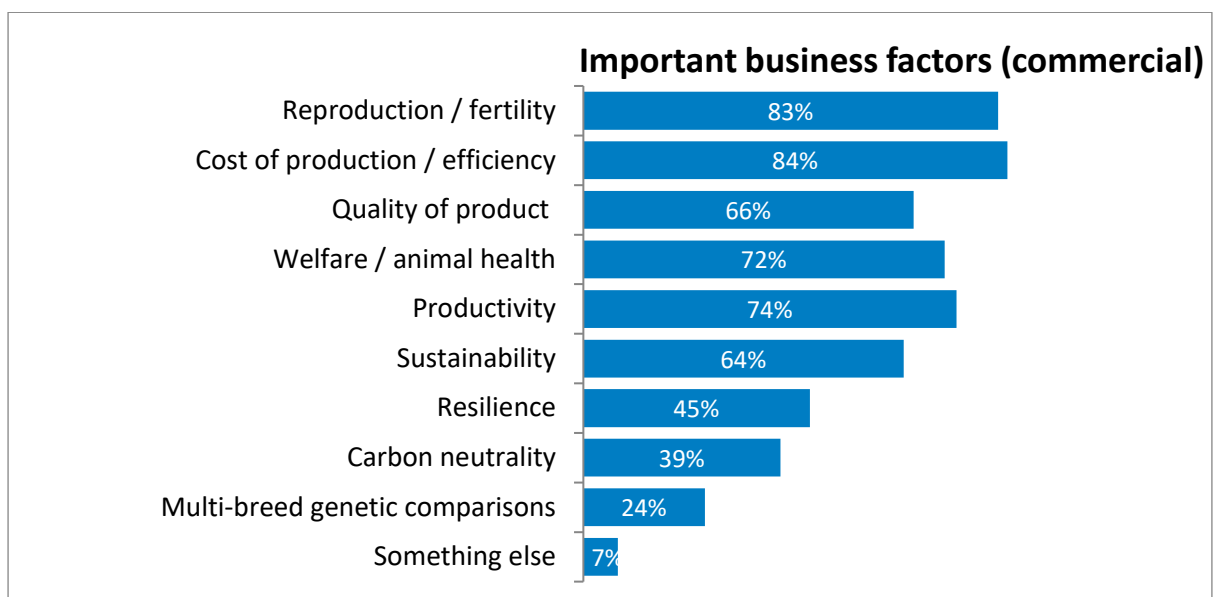
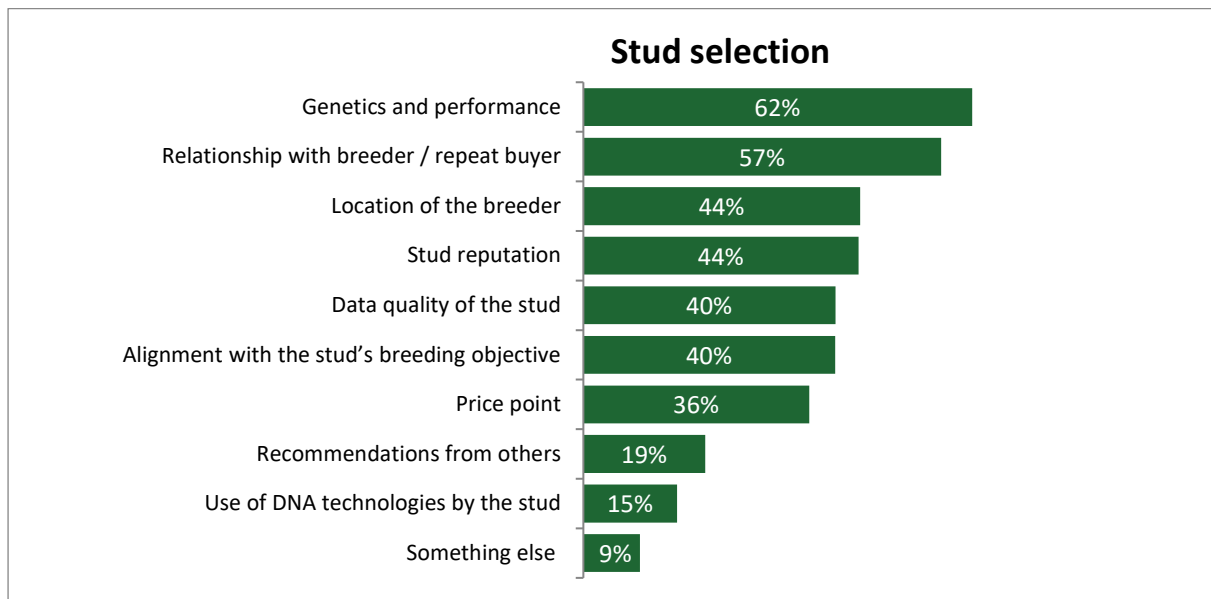
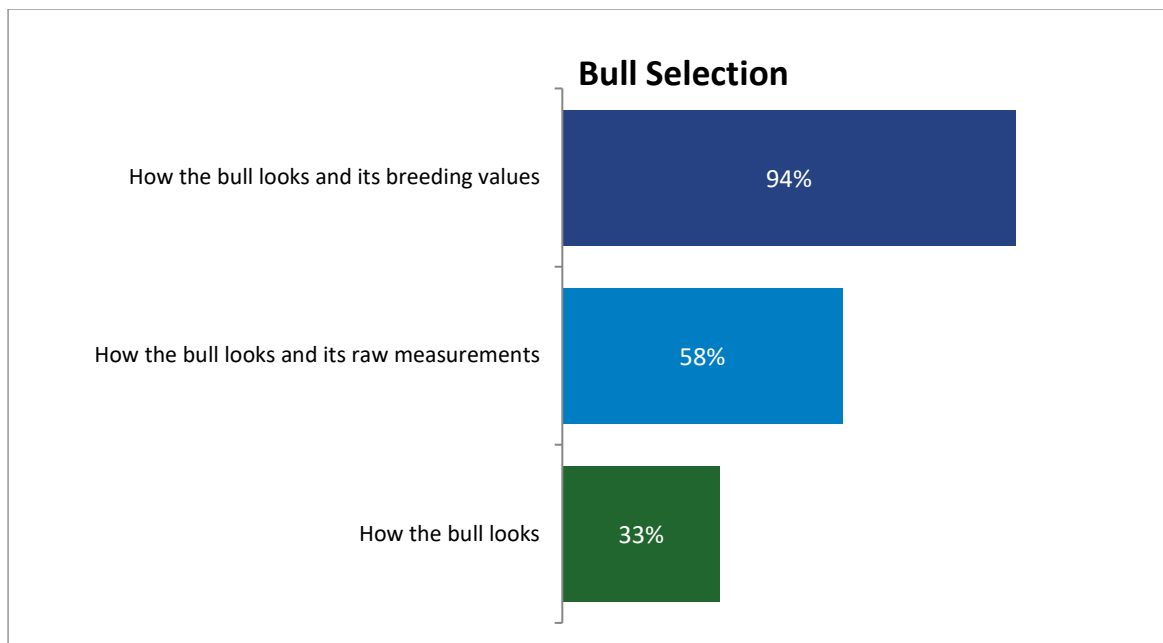


Figure 46. Factors which influence stud selection for commercial cattle producers (n=525)**Figure 47. Bull selection factors for commercial cattle producers (n=525)**

4.7 Attitudes

Cattle producers attitudes towards BREEDPLAN (Table 4) were generally positive with high respect, reliance, expectation, commitment, understanding and ease of use, although there is still more to learn, as reflected in the lower percentage of cattle producers who feel like they know everything they need to know about BREEDPLAN and EBVs and the low confidence that the data provides all they need to know to make breeding decisions. These percentages were calculated from the rating that producers gave for each statement, from 1 (completely disagree) to 7 (describes you perfectly). The numbers in the table show the percentage of producers who rate the statement as either 5, 6 or

7 i.e. high agreement. Statements are listed in order from highest to lowest based on results for all cattle producers.

Table 4. Attitudinal statements towards BREEDPLAN and BREEDPLAN EBVs

| | Seedstock Cattle (n=114) | Commercial Cattle (n=525) |
|--|-----------------------------|------------------------------|
| I respect and rely upon the people behind ___ *to be constantly improving it | 73% | 80% |
| My customers expect me / I expect my stud suppliers to use ___ to improve the quality of my / their breeding animals | 65% | 82% |
| I definitely intend to keep using ___ for the foreseeable future | 74% | 79% |
| When I use ___ my confidence in getting the genetic traits I want and avoiding the ones I don't want is increased | 68% | 75% |
| I understand how genomics fits in my business | 73% | 53% |
| I am easily able to use internet-based services like ___ to help make better business decisions. | 73% | 63% |
| Using ___ is something I easily do as a routine part of my breeding decisions / work | 68% | 64% |
| I find indexes simple to use | 59% | 62% |
| It is easy to see the genetic payback from using ___ | 57% | 61% |
| There is plenty of training and guidance available to help people like me use ___ better | 60% | 56% |
| I always use ___ because it helps improve profits | 55% | 59% |
| Indexes reflect my breeding objective | 51% | 62% |
| I always use ___ to keep track of our animals' genetic progress | 61% | 42% |
| I know everything I need to know about ___ to use it effectively | 59% | 43% |
| The ___ data provides me with all I need to know when making breeding decisions | 39% | 45% |

*BREEDPLAN or BREEDPLAN EVBs as applicable

On average, producers considered EBVs moderately important for breeding bull selection (Figure 48), with seedstock producers ascribing slightly more importance to EBVs (5.5/7) than commercial producers (5.2/7). Dollar Index / Selection Index (Figure 49) was relatively less important for selection (4.3/7 for all cattle producers, seedstock producers and commercial producers).

A more in-depth breakdown of attitudes is included as an appendix.

Figure 48. The importance of EBVs for breeding bull selection by all cattle (n=639), seedstock (n=114) and commercial producers (n=525)

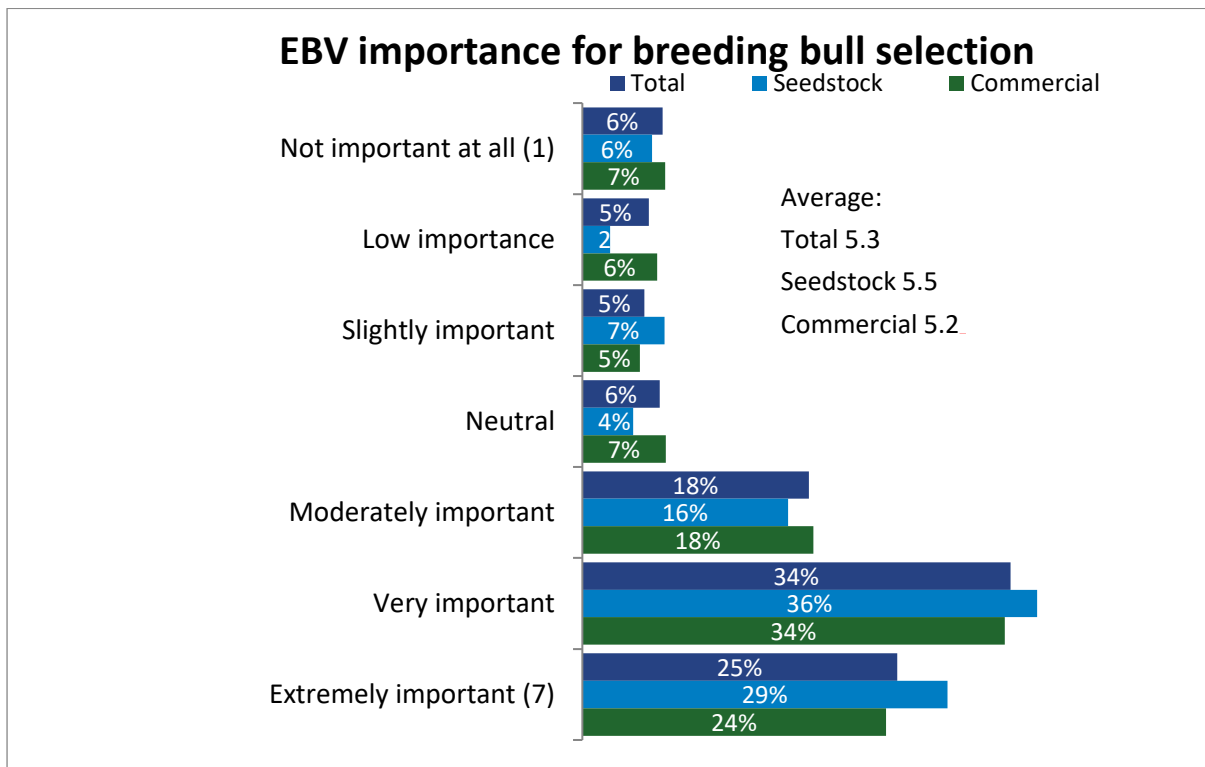
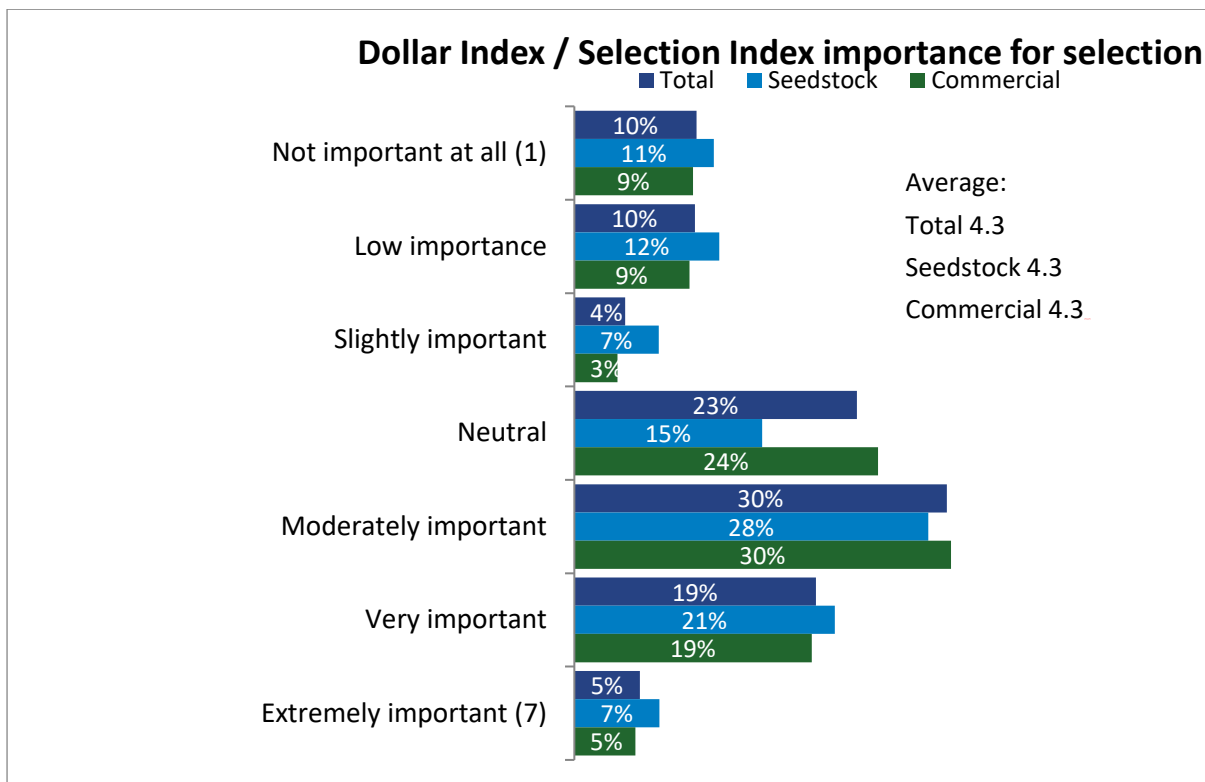


Figure 49. Importance of the Dollar Index / Selection Index for selection for all cattle producers (n=639), seedstock (n=114) and commercial (n=525)



By segmenting the cattle seedstock and commercial producers into users and non-users of genetic services, a number of attitudes have been identified that limit non-users in their uptake of genetic services.

Seedstock Genetic Evaluation Service non-users and Commercial EBV non-users share the following attitudinal barriers to adoption:

- A lack of confidence that by using BREEDPLAN / BREEDPLAN EBVs they will get the genetic traits they want and avoid the ones they do not want
- Less able to use internet-based services like BREEDPLAN / BREEDPLAN EBVs to help them make better business decisions
- Lack of ease is using BREEDPLAN / BREEDPLAN EBVs as a routine part of their breeding decisions / work
- Less likely to find indexes easy to use
- Fewer see a genetic payback from using BREEDPLAN / BREEDPLAN EBVs
- Little linkage between BREEDPLAN / BREEDPLAN EBVs and improving profits
- Indexes are less likely to reflect their breeding objective
- Lack knowledge about how to use BREEDPLAN / BREEDPLAN EBVs effectively
- BREEDPLAN / BREEDPLAN EBVs data does not provide all they need to know when making breeding decisions

In addition, more Commercial EBV non-users lack an understanding of how genomics fits in their business.

In contrast, Seedstock Genetic Evaluation Service users and Commercial EBV users largely agree that they have the knowledge and understanding of BREEDPLAN / BREEDPLAN EBVs, can see the financial and decision making benefits of BREEDPLAN / BREEDPLAN EBVs and they can easily use BREEDPLAN / BREEDPLAN EBVs.

Full details of the attitudinal differences between users and non-users of genetic services are summarised in Appendix 1.3.

4.8 Training and information

Overall, for cattle producers, producers are relying on multiple sources of information. Other farmers were the largest source of information, with more than one third (36%) relying on their peers (Figure 50). This is followed by Breed Society (32%), stock agents (24%) and MLA (21%). There is no significant difference in the top 5 sources of information by state (Figure 51). Commercial producers (Figure 53) also favoured other farmers (35%) while seedstock producers were far more likely to refer to a breed society (52%) (Figure 52).

Figure 50. Sources of genetic advice used by all cattle producers (n=639)

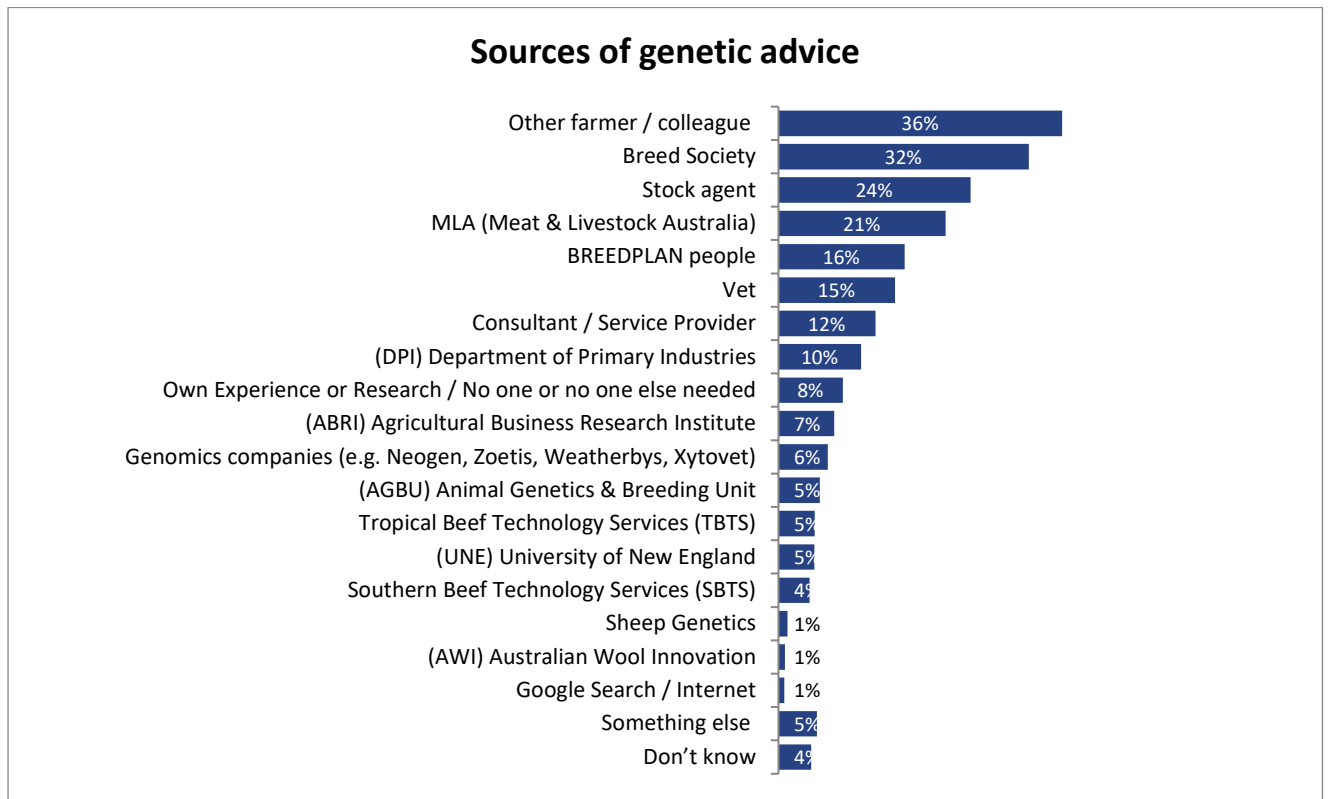


Figure 51. Sources of genetic advice used by cattle producers by state

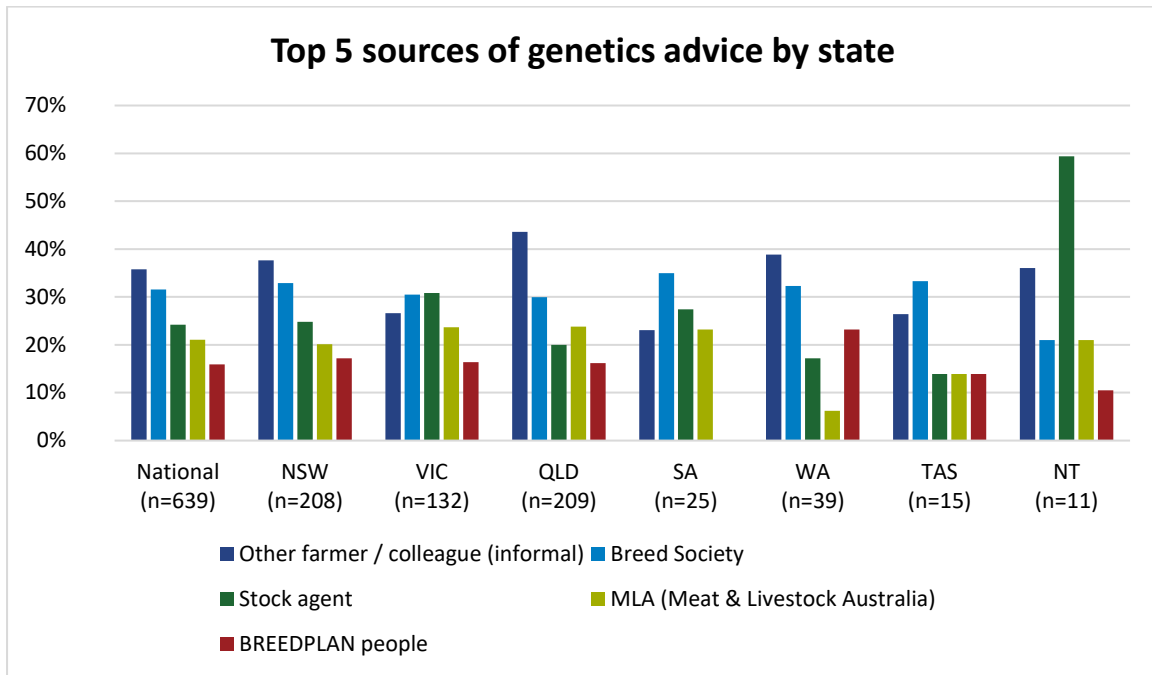


Figure 52. Sources of genetics advice for seedstock cattle producers (n=114)

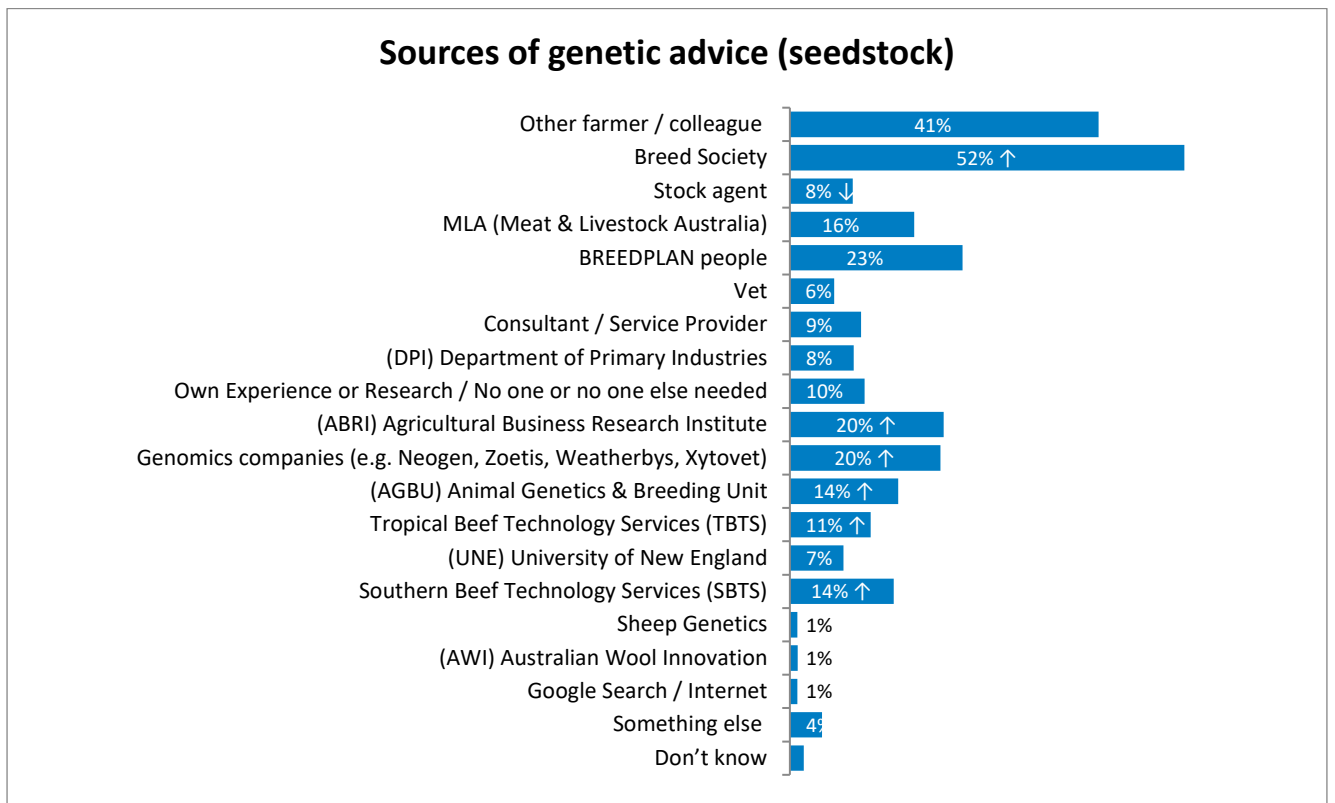
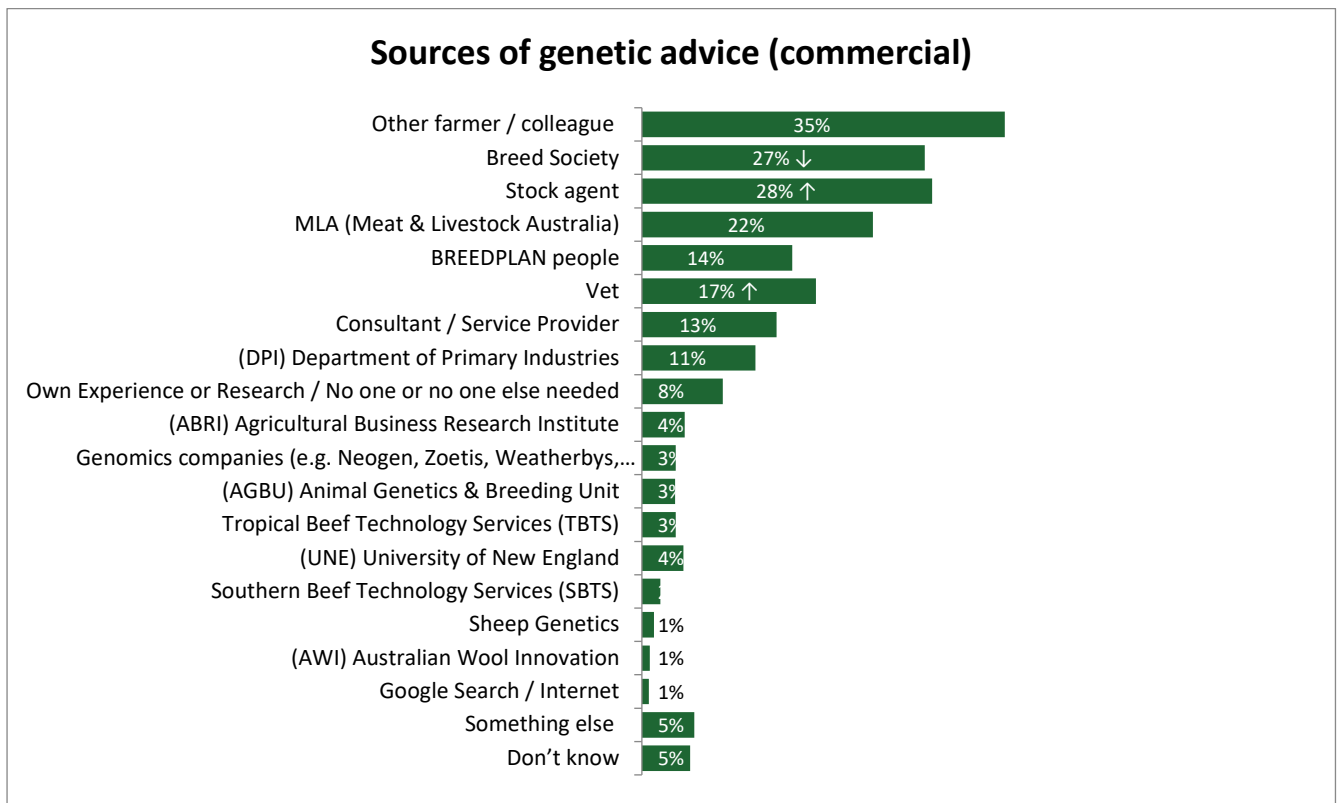


Figure 53. Sources of genetics advice for commercial cattle producers (n=525)

Regarding their use of BREEDPLAN and BREEDPLAN EBVs (Figure 54), only 36% of cattle producers said they had received formal training or guidance. Seedstock producers were significantly more likely to have formal training (56%) compared to commercial producers (32%).

Of those producers who had received formal training or guidance, breed societies were the single biggest source (35%) (Figure 55), and were used at a significantly higher rate by seedstock producers (52%) (Figure 56), while commercial cattle producers were split between breed societies (28%), DPI (31%) and MLA (29%) (Figure 57).

Figure 54. Participation in formal training or guidance for using BREEDPLAN or BREEDPLAN EBVs

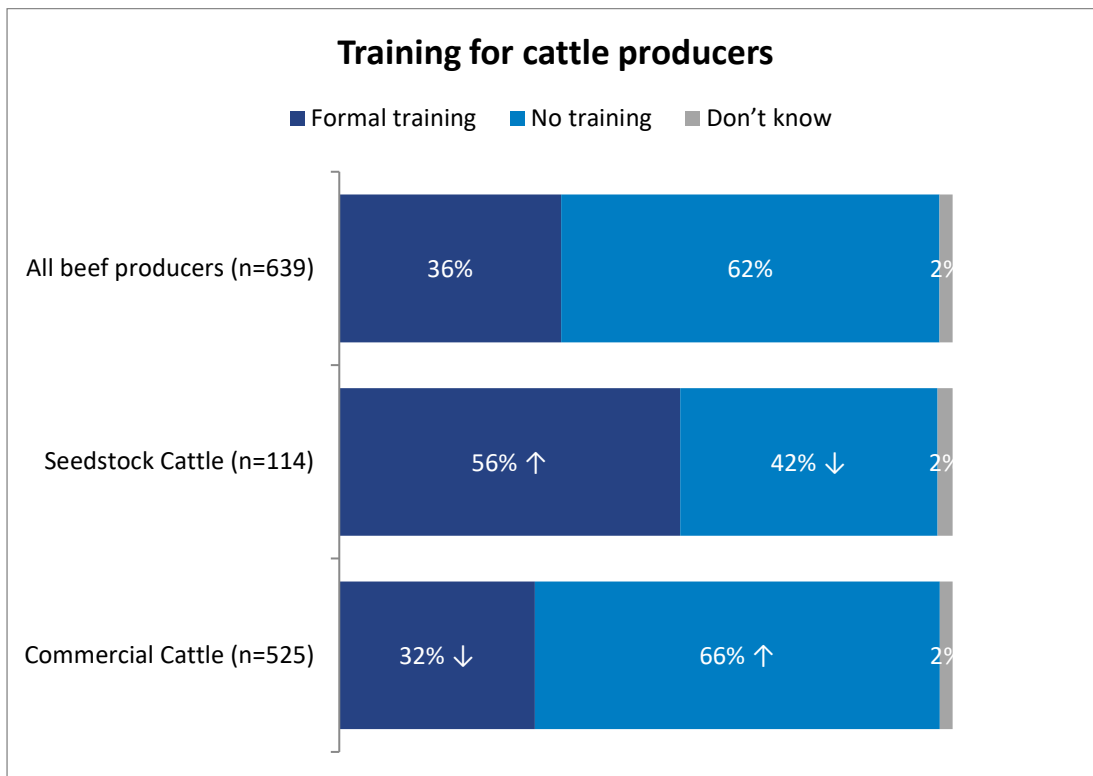


Figure 55. Training providers for total cattle producers (n=232)

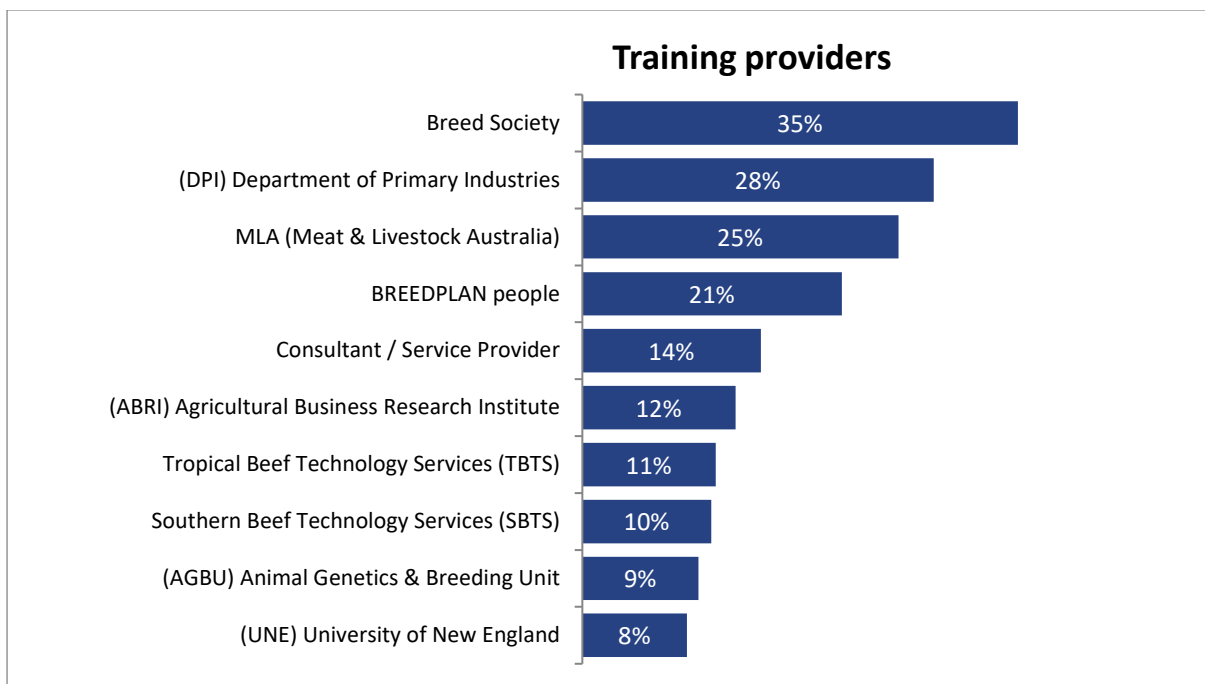
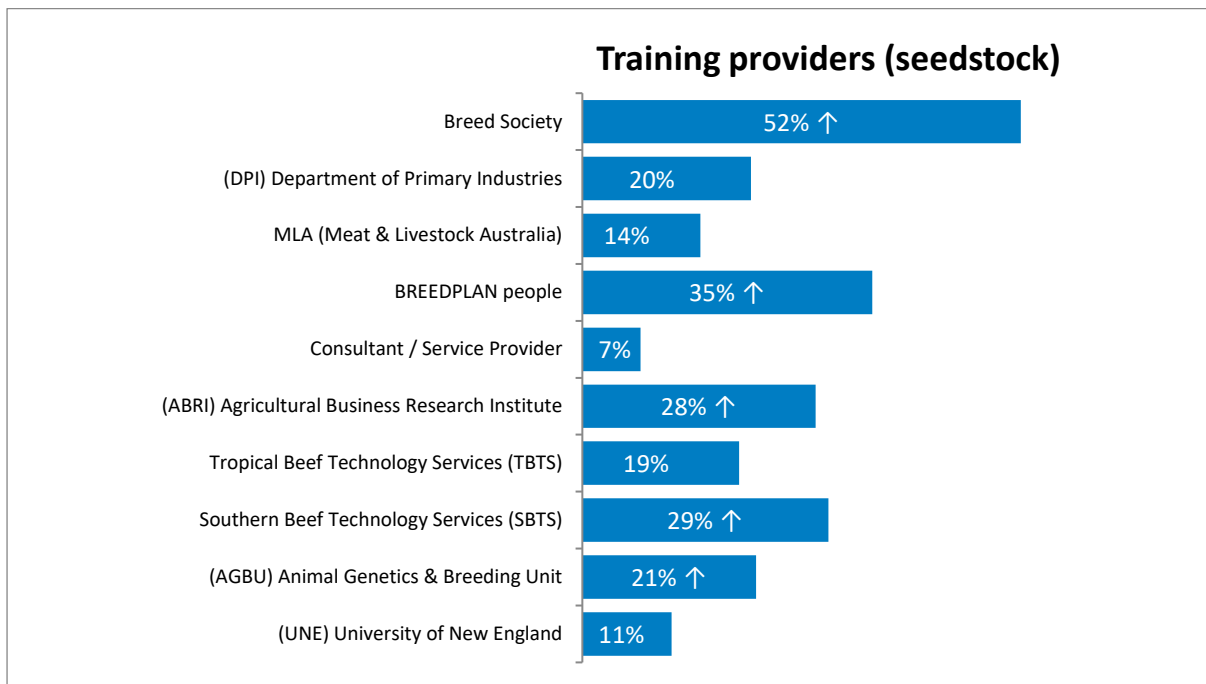
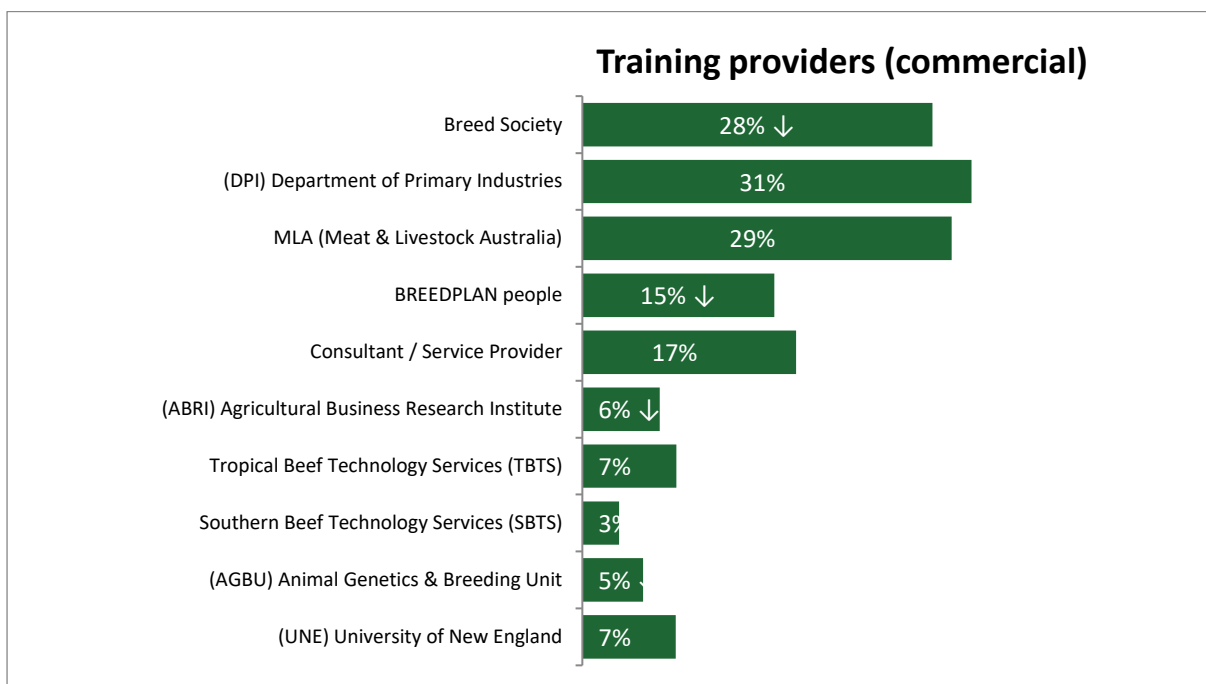


Figure 56. Training providers of seedstock cattle producers (n=65)**Figure 57. Training providers of commercial cattle producers (n=167)**

Where producers had not received formal training or guidance, cattle producers as a whole said they had never gotten around to it (27%) or did not know where to go (23%) (Figure 58). 27% of commercial producers (Figure 60) also had not gotten around to it, while seedstock producers were more likely to say that training was too far away (25%) (Figure 59).

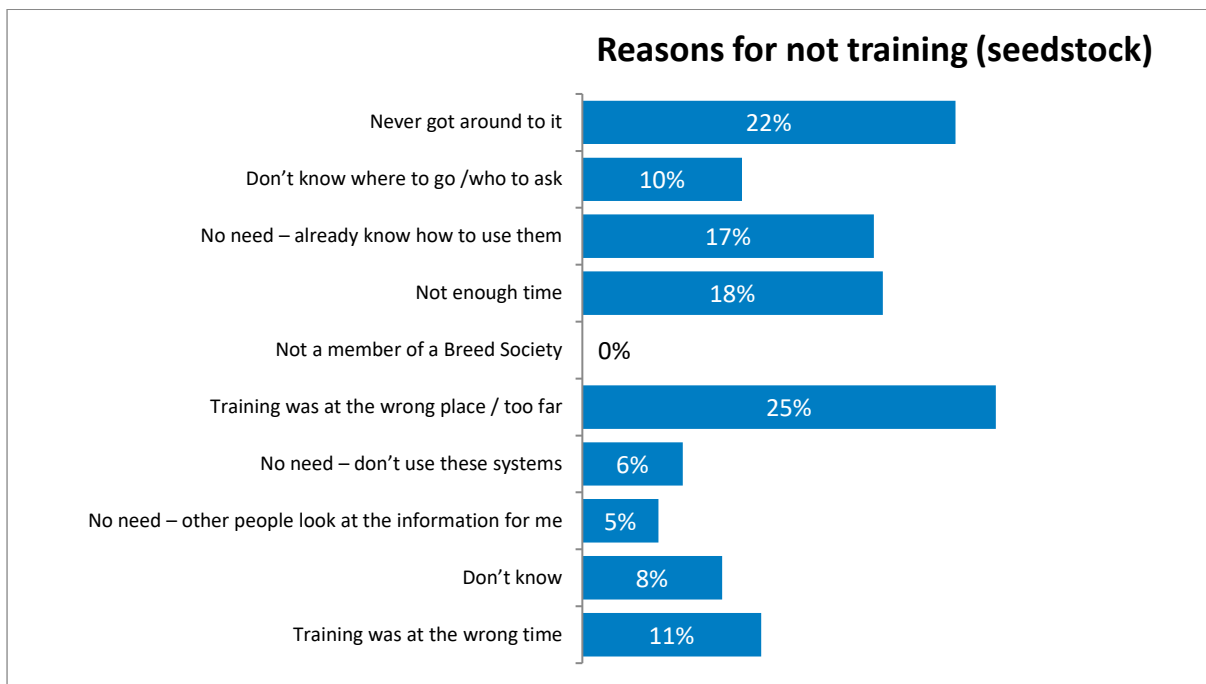
Figure 58. Reasons cattle producers have not had proper training or guidance (n=407)**Figure 59. Reasons given by seedstock cattle producers for not having had proper training or guidance (n=49)**

Figure 60. Reasons commercial cattle producers have not had formal training or guidance (n=358)

Producers were also asked where they would go to get further training or guidance, with MLA the top pick overall at 29% (Figure 61). Seedstock producers (Figure 62) were significantly more likely (44%) to seek guidance from a stock agent while commercial producers (Figure 63) were significantly more likely to say they 'don't know' where to get further training (22%).

Figure 61. Source for further training or guidance among all cattle producers (n=639)

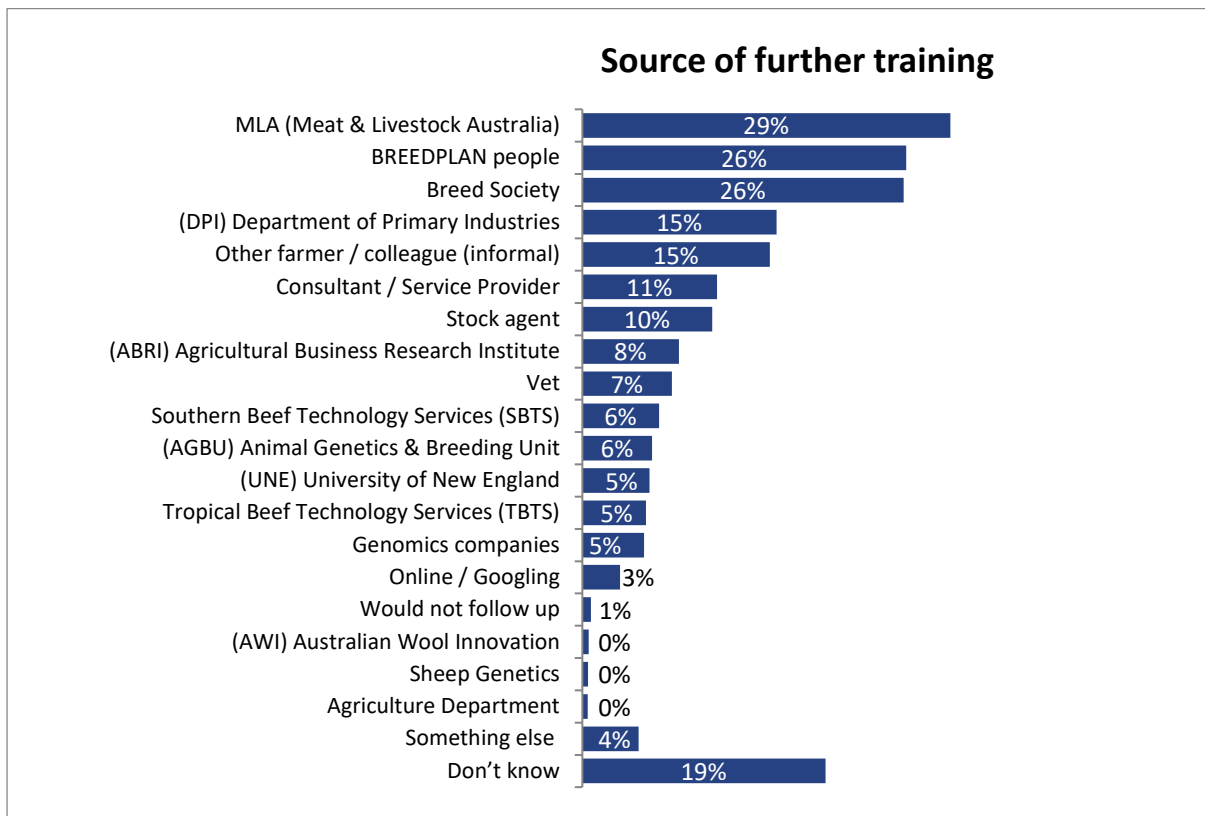


Figure 62. Source for further training or guidance for seedstock cattle producers (n=114)

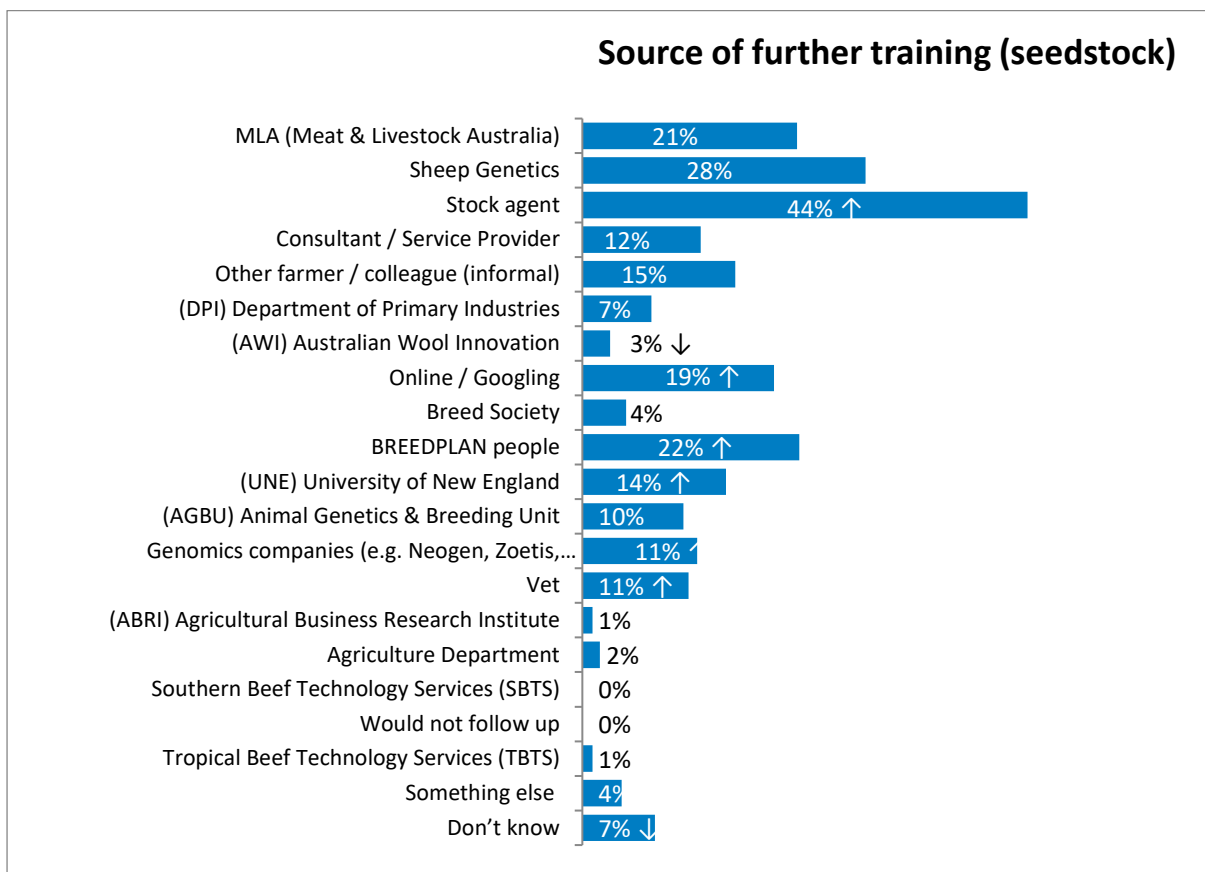
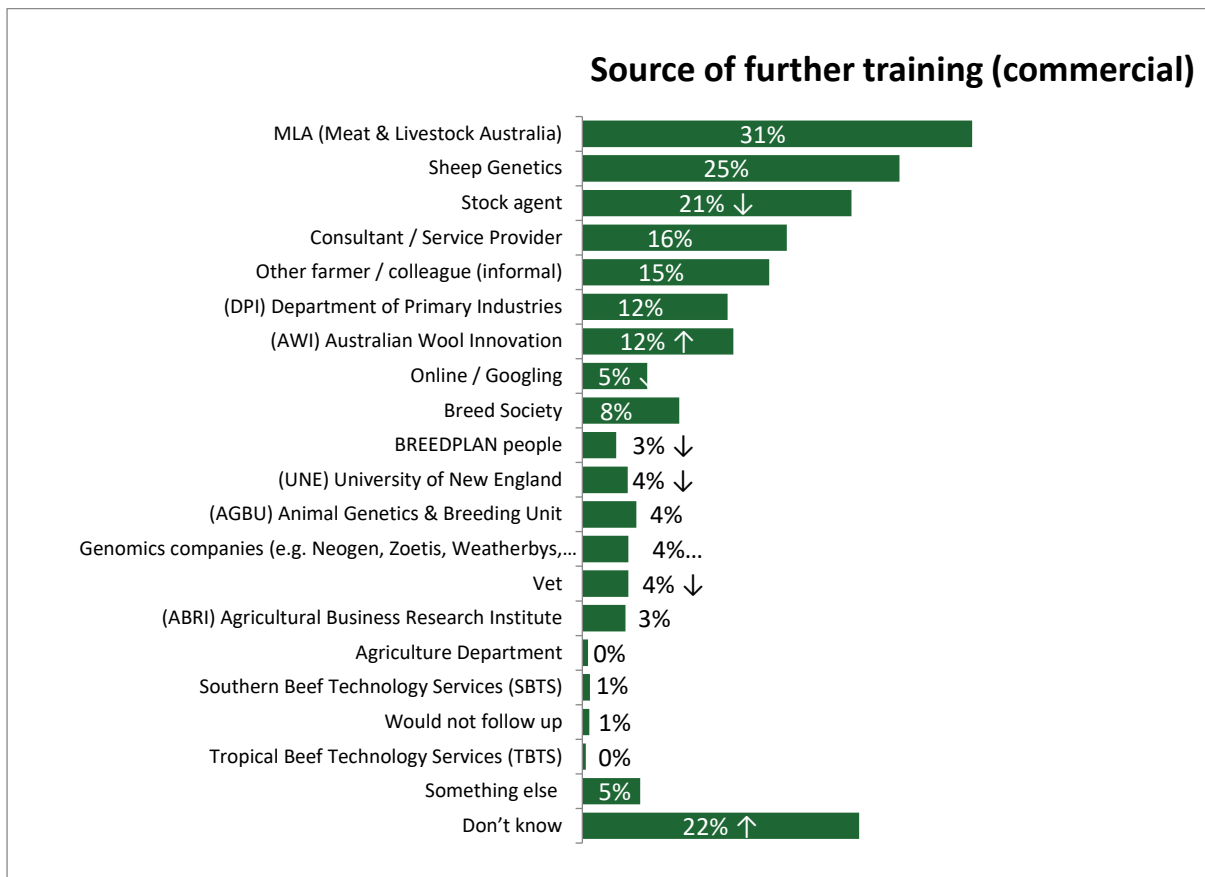


Figure 63. Source for further training or guidance for commercial cattle producers (n=525)



Around half (51%) of cattle producers interviewed have visited the BREEDPLAN website (Figure 64), with the database search (70%) and percentile bands tables (61%) most frequently used (Figure 65). Seedstock producers are more likely to visit the BREEDPLAN website (78%) than commercial producers (45%).

Most seedstock cattle producers (90%) do not use MateSel (Figure 66).

Figure 64. Visits of the BREEDPLAN website by cattle producers (n=629)

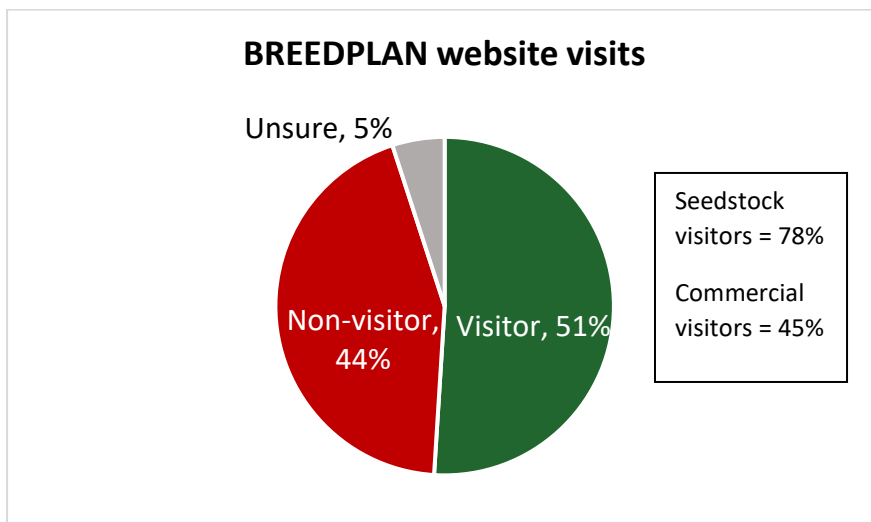


Figure 65. Cattle producers awareness and use of the BREEDPLAN website's features (n=330, * n=89 (seedstock only))

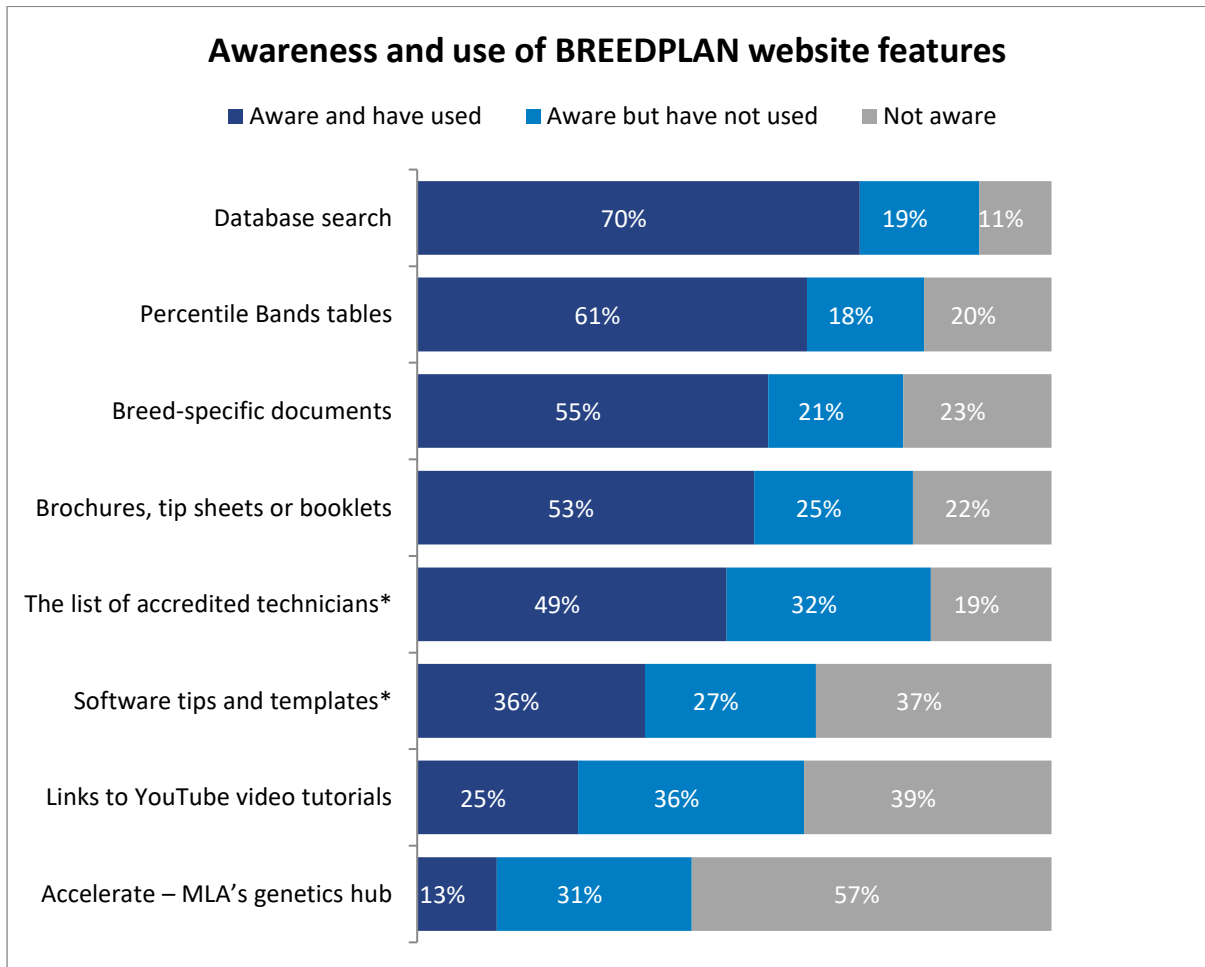
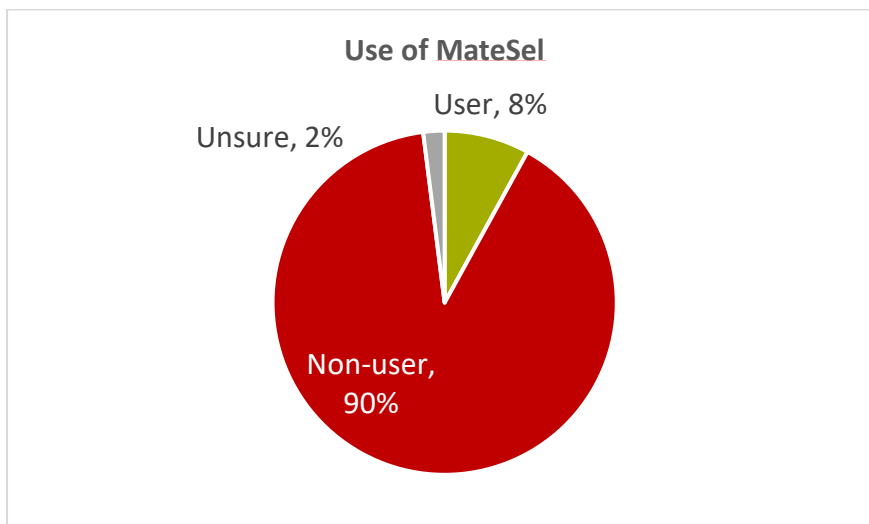


Figure 66. Seedstock cattle producers who use MateSel (n=114)



4.9 Reputation

Producers were asked to consider which organisations were involved in the overall BREEDPLAN system, including research, training, promotion, funding, people and delivery (Figure 67). Top of mind for both seedstock and commercial producers were breed societies at (74% and 56%, respectively) and BREEDPLAN people (72% and 53% respectively). MLA was mentioned by 63% of seedstock and 52% of commercial producers.

On average, producers said they were ‘just a little’ familiar with BREEDPLAN (3.3/5), with seedstock producers significantly more familiar (3.9/5) than commercial producers (3.2/5) (Figure 68). Conversely, commercial producers (4.2/5) had a mainly favourable opinion of BREEDPLAN (Figure 69) while seedstock producers were slightly more neutral (3.8/5).

Overall trust of BREEDPLAN was high with an average across cattle producers of 4.3/5 (Figure 70). Seedstock cattle producer trust was slightly lower than commercial at 3.9/5 and 4.3/5 respectively. Producers also said that they would speak highly of BREEDPLAN if asked (4.1/5), with commercial producers more favourable (4.3/5) than seedstock producers (3.6/5) (Figure 71).

Positive opinions (Figure 72) were driven by a sentiment of trust and scientific validity (40% total cattle), with positive historical (17%) performance important to producers.

Where producers had a critical opinion of BREEDPLAN (Figure 73), it was largely due to concerns about the integrity of the data (53% total cattle) and issues with the methodology (41% total cattle).

Figure 67. Organisations associated with BREEDPLAN (Seedstock cattle producers n=114, Commercial cattle producers n=525)

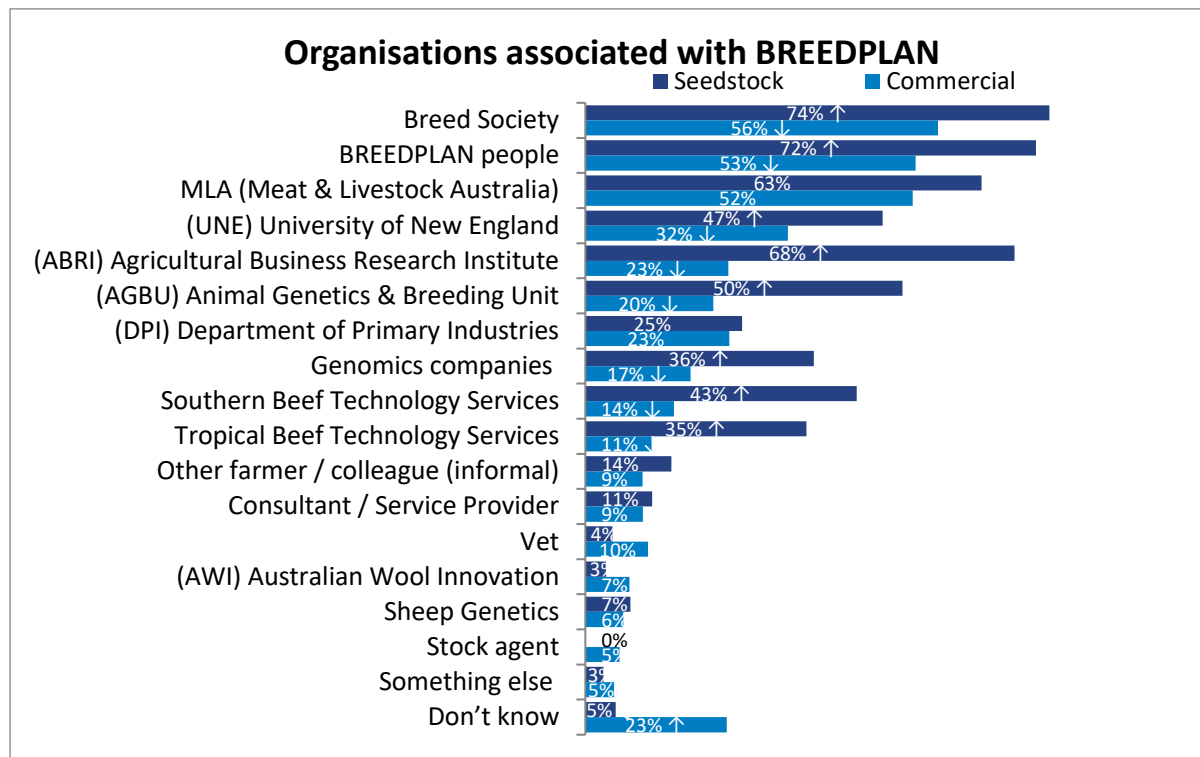


Figure 68. Familiarity with BREEDPLAN among total cattle (n=639) and seedstock (n=114) and commercial cattle producers (n=525)

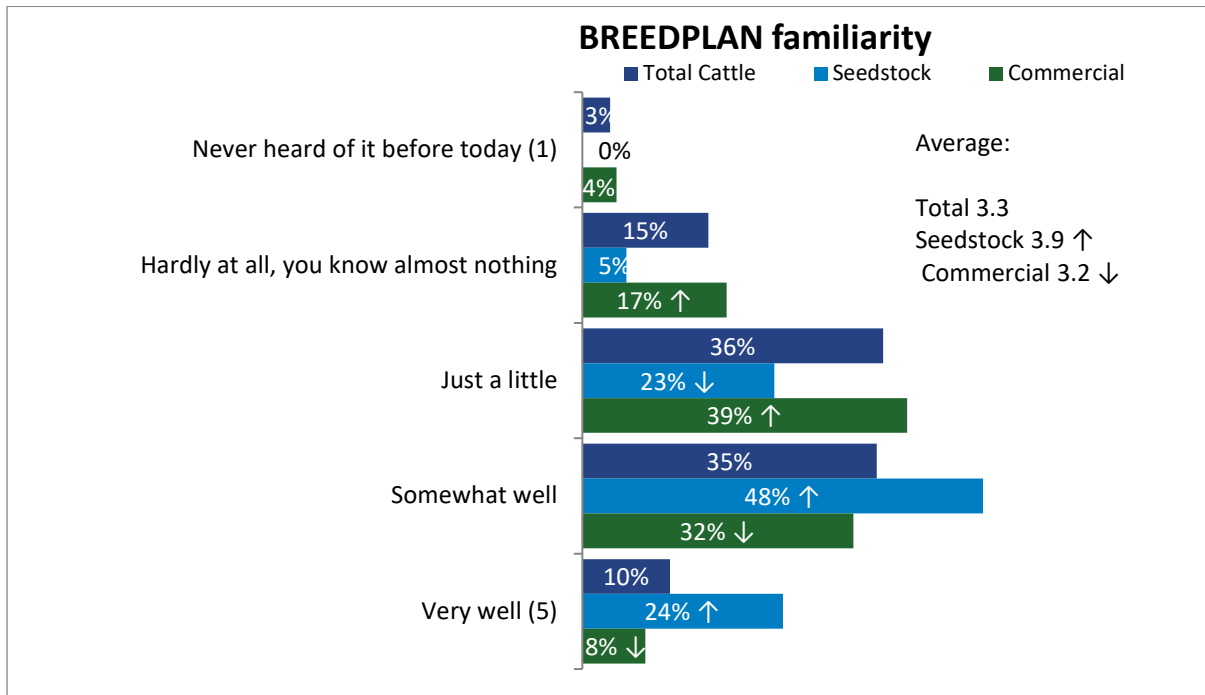


Figure 69. Overall impression of BREEDPLAN among total cattle (n=639) and seedstock (n=114) and commercial cattle producers (n=525)

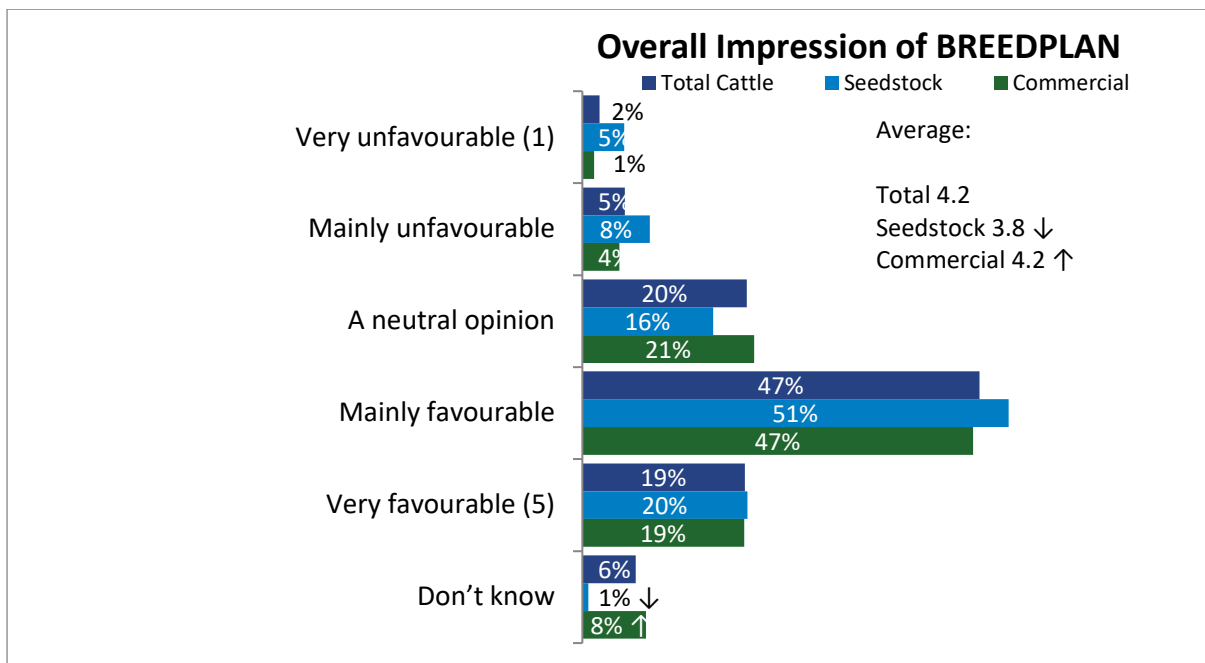


Figure 70. Trust of BREEDPLAN among total cattle (n=639) and seedstock (n=114) and commercial cattle producers (n=525)

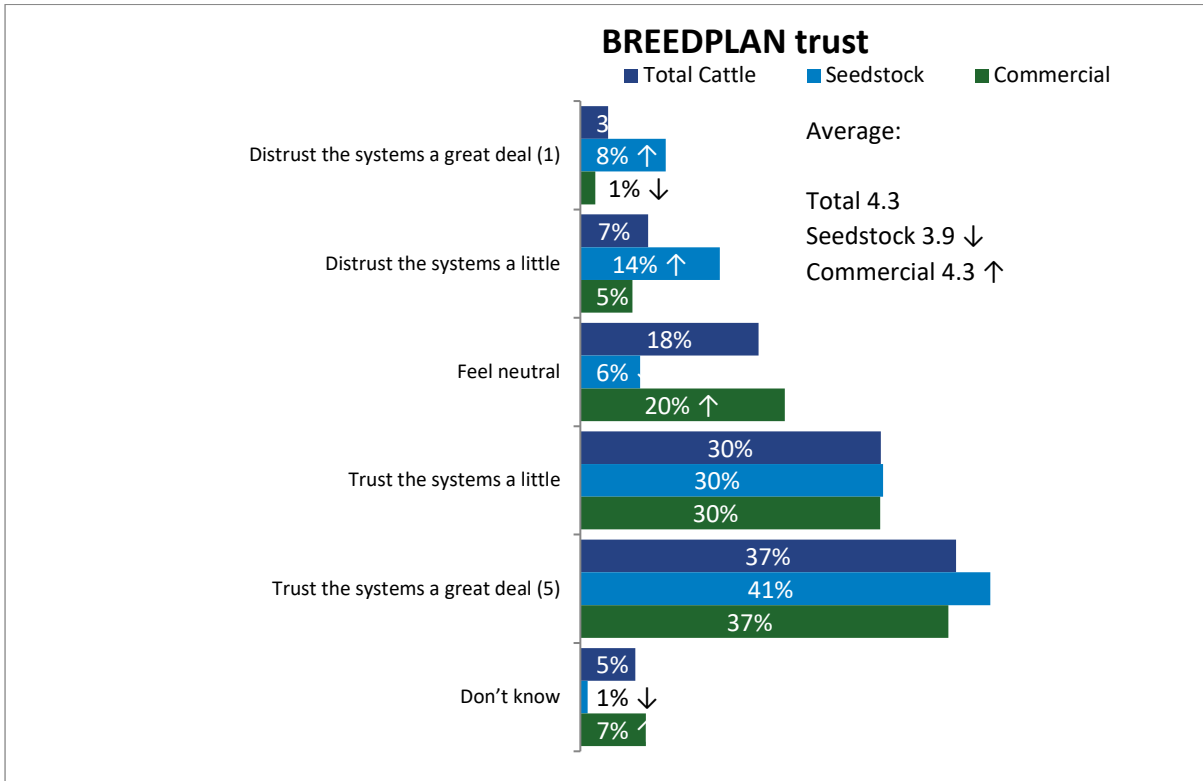


Figure 71. Opinion and perceptions of BREEDPLAN among total cattle (n=639) and seedstock (n=114) and commercial cattle producers (n=525)

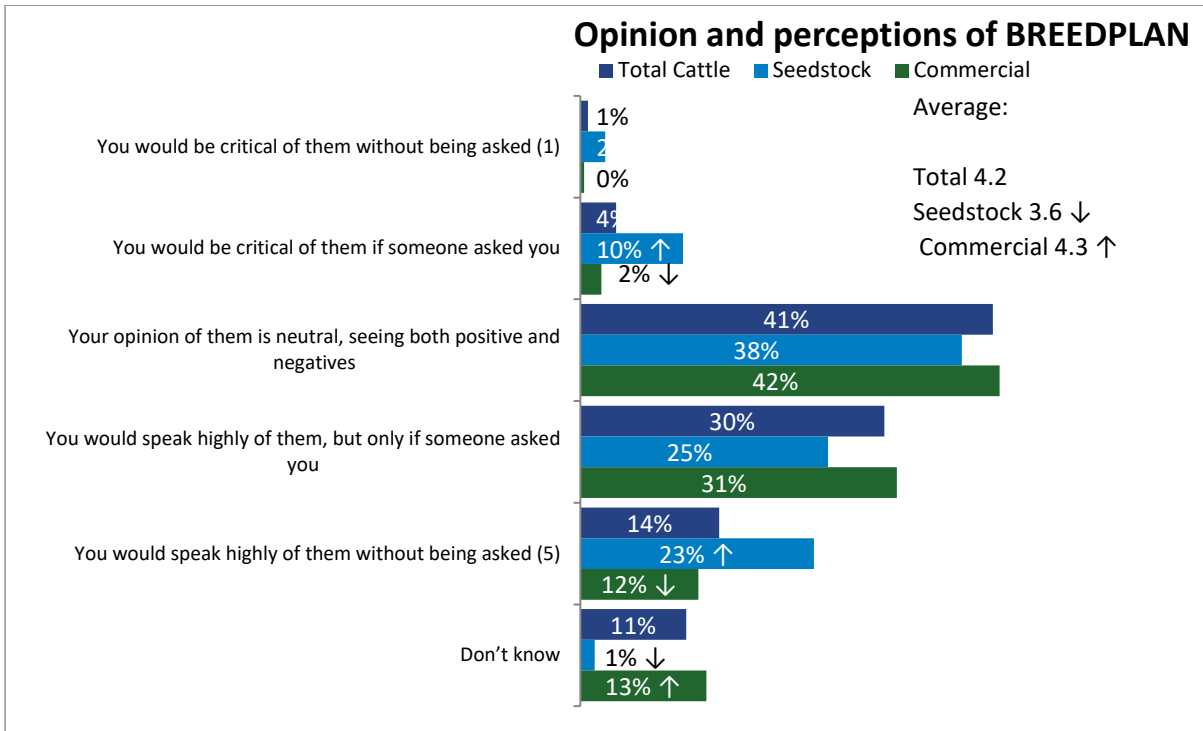


Figure 72. Reasons given by cattle producers for their positive opinion of BREEDPLAN (n =287, seedstock n=232 and commercial n=55)

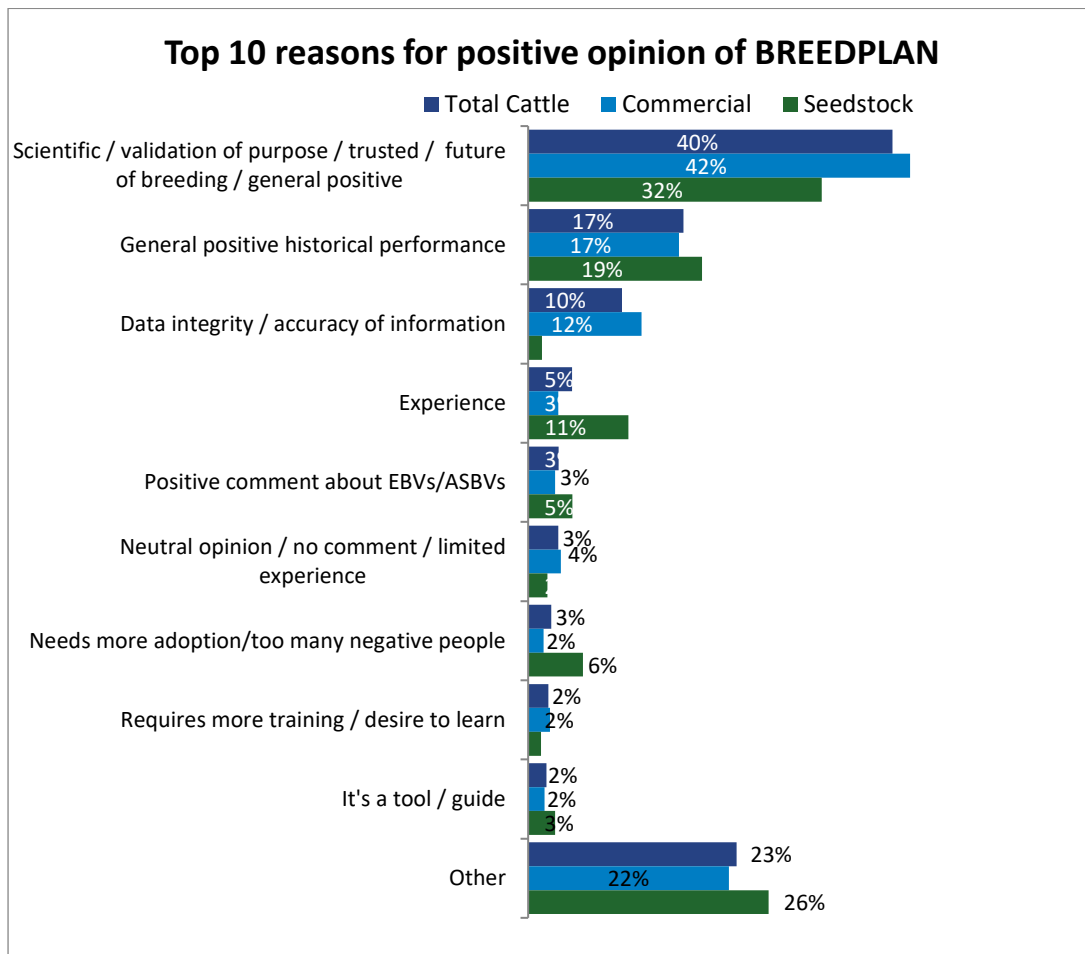
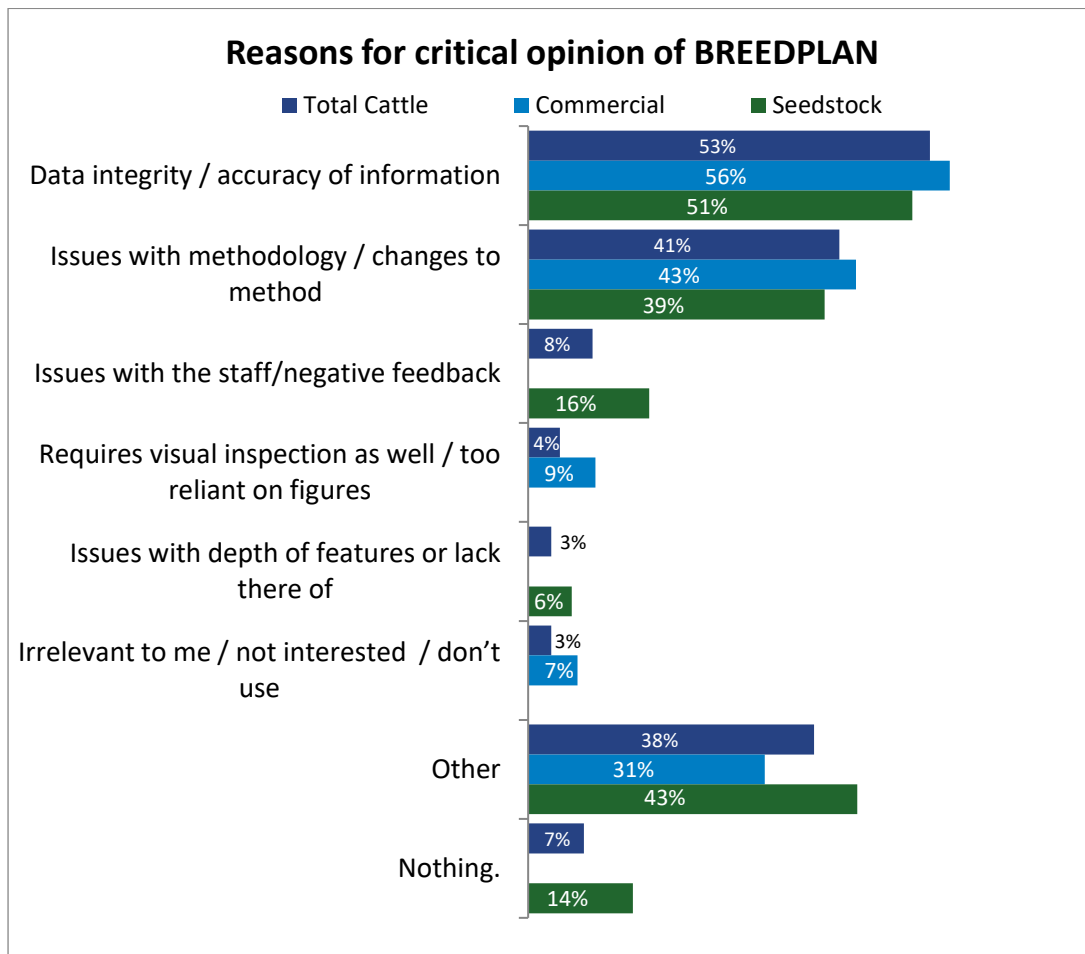


Figure 73. Reasons given by cattle producers for their critical opinion of BREEDPLAN (n =27, seedstock n=13 and commercial n=14)



5. Sheep results and discussion

5.1 Background to the analysis

This section presents the results and discussion summarising the current practices of Australian sheep producers. Results are presented at the national level and by production type (commercial or seedstock producers).

5.2 Respondent demographics

Producer demographics such as region, production type, age, gender, years of breeding decision making, education and percentage of gross farm income are presented below. These charts illustrate the diverse demographic range of the sheep meat and wool producers in Australia.

The sample comprises producers from New South Wales (37%), Victoria (27%), Queensland (4%), South Australia (15%), Western Australia (13%), and Tasmania (3%) (Table 5).

The largest age segment of producers was those 65 and over (36%) with almost all producers being thirty-five and over, and 3% 25 – 34. One percent of producers declined to state their age.

The majority (79%) of producers identified as male. Slightly under one fifth (19%) identified themselves as female with 1% preferring not to identify themselves. No producers indicated that they prefer to identify as another gender.

Nationally, sheep producers tend to be experienced, with 34% have 41 or more years of decision-making experience and the vast majority (90%) have 11 years' experience or more (Figure 74).

Around two fifths of producers have a tertiary or post graduate qualification (Figure 75).

Nationally, producers derive around two thirds of the income from sheep (Figure 76), with sheep for wool and mutton accounting for 28%, lambs for meat 24%, sheep for wool and first cross lamb production at 14% and grains accounting for 20%.

Table 5. Sheep respondent profile summary

| Sheep Producer Sample | | | | | | | |
|------------------------|------------|------------|------------|-----------|------------|------------|-----------|
| | | Region | | | | | |
| (Base) | TOTAL | NSW | VIC | QLD | SA | WA | TAS |
| Total | 696 | 238 | 184 | 15 | 138 | 107 | 14 |
| Seedstock | 17% | 19% | 14% | 23% | 17% | 12% | 33% |
| Commercial | 83% | 81% | 86% | 77% | 83% | 88% | 67% |
| Age | | | | | | | |
| 18 - 24 years old | - | - | - | - | - | - | - |
| 25 - 34 years old | 3% | 3% | 3% | 3% | 3% | 2% | 4% |
| 35 - 44 years old | 9% | 6% | 7% | - | 17% | 15% | - |
| 45 – 54 years old | 21% | 22% | 18% | 29% | 26% | 23% | 6% |
| 55 – 64 years old | 30% | 35% | 30% | 11% | 26% | 28% | 17% |
| 65 years old and over | 36% | 33% | 41% | 57% | 27% | 32% | 73% |
| Refused | 1% | 1% | - | - | 1% | - | - |
| Gender | | | | | | | |
| Male | 79% | 74% | 82% | 85% | 87% | 75% | 89% |
| Female | 19% | 23% | 18% | 15% | 12% | 23% | 11% |
| Other | - | - | - | - | - | - | - |
| Prefer not to identify | 1% | 2% | - | - | 1% | 1% | - |

Figure 74. Years involved in breeding decision making among sheep producers (n=696)

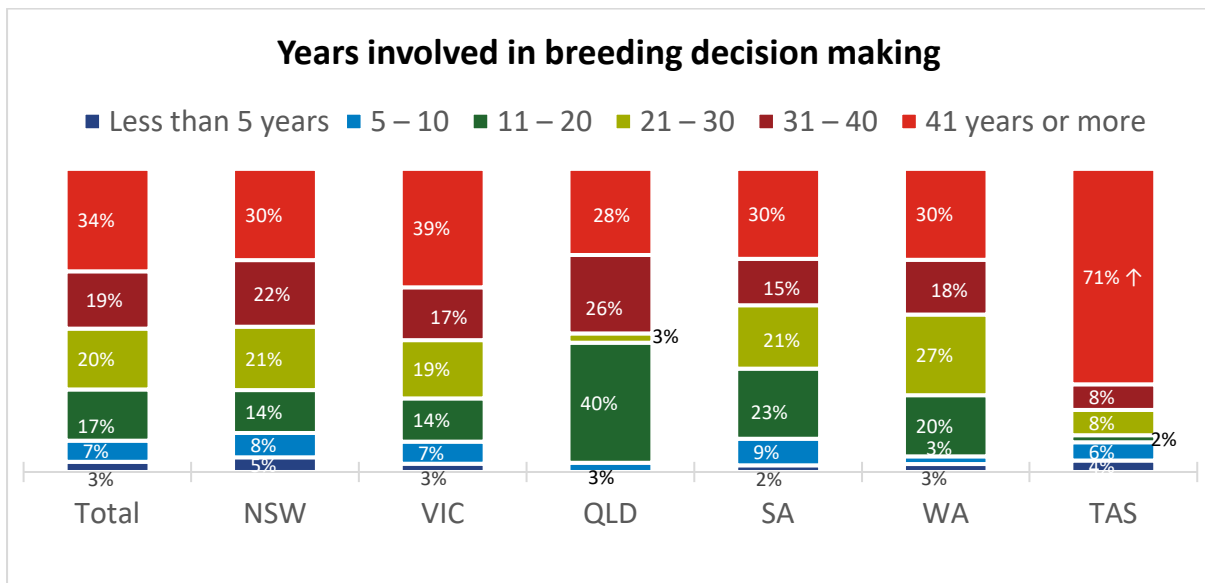


Figure 75. Highest level of education achieved among sheep producers (n=696)

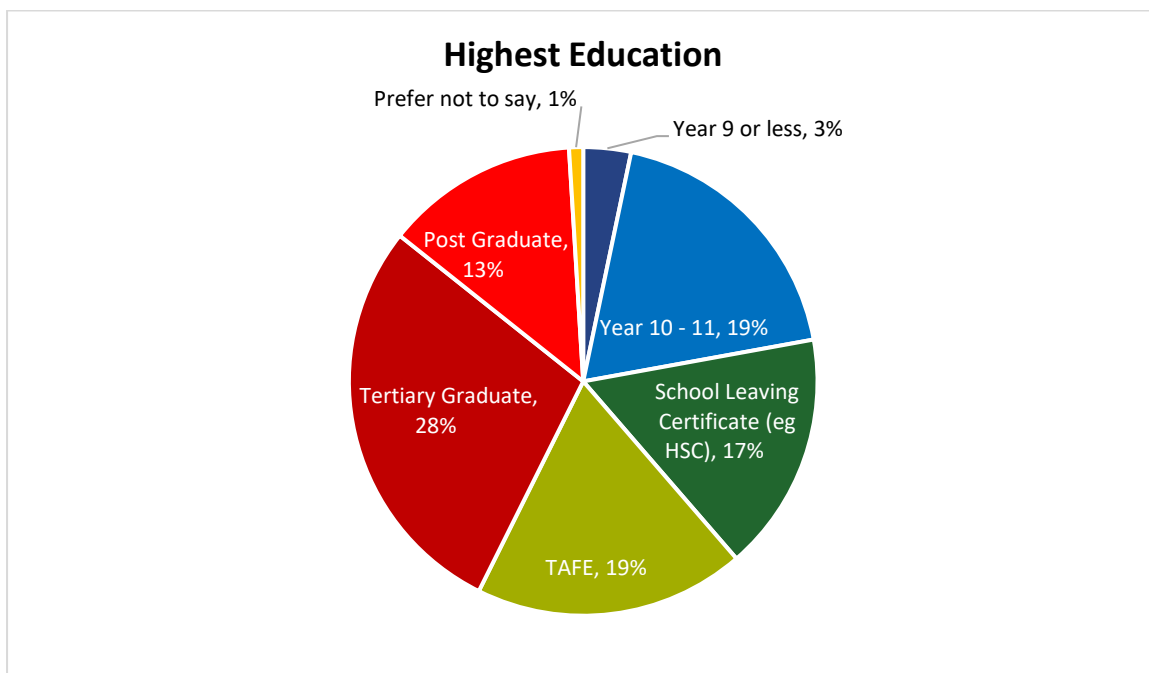
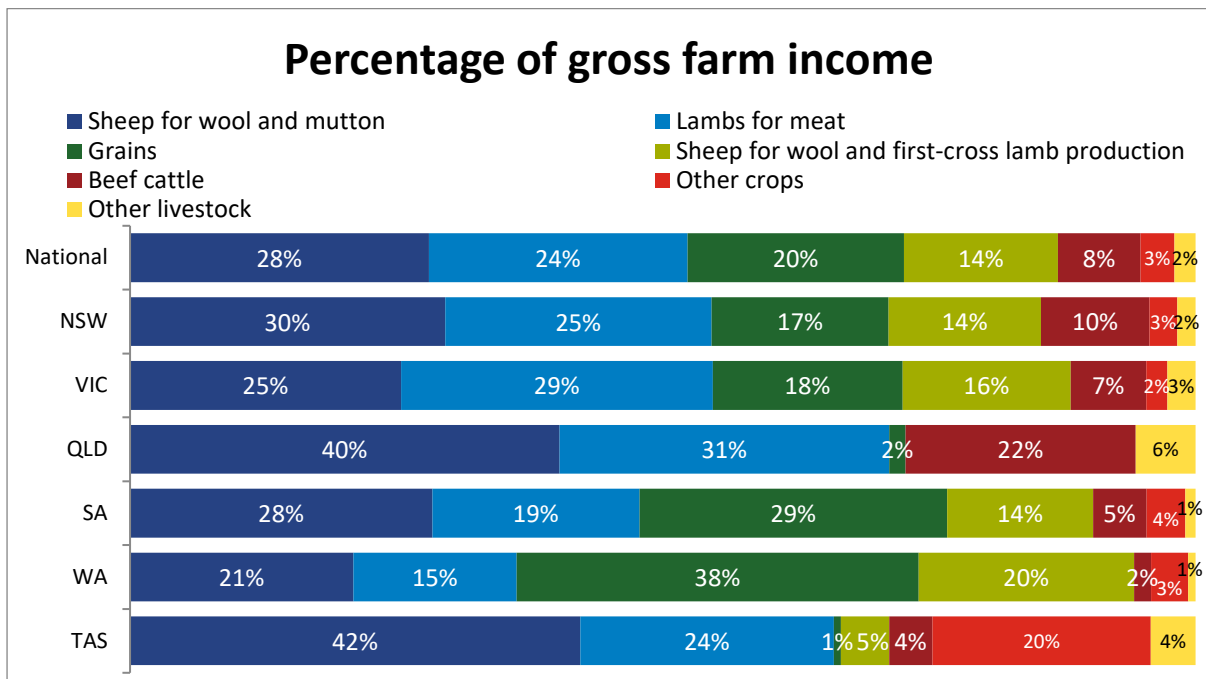


Figure 76. Percentage of gross farm income by activity and state among sheep producers (n=696)

5.3 Flock structure

The majority of sheep producers (83%) were commercial producers (Table 6). Respondents were split by production type with 28% wool specialists, 34% meat specialists and 37% both meat and wool producers.

On average, sheep producers joined 1,892 ewes over the last three years. 22% of producers joined 100-499 ewes, 26% joined 500-999, 21% joined 1,000-1,999, 12% joined 2,000-2,999 and 19% joined 3,000 or more ewes.

Table 6. Sheep sample distribution summary

| Sheep Producer Sample | | | | | | | |
|----------------------------------|------------|------------|------------|-----------|------------|------------|-----------|
| | | State | | | | | |
| (Base) | TOTAL | NSW | VIC | QLD | SA | WA | TAS |
| Sheep Sample Distribution | 696 | 238 | 184 | 15 | 138 | 107 | 14 |
| Seedstock | 17% | 19% | 14% | 23% | 17% | 12% | 33% |
| Commercial | 83% | 81% | 86% | 77% | 83% | 88% | 67% |
| Breeding females joined | | | | | | | |
| 100 - 499 | 22% | 25% | 25% | 17% | 12% | 15% | 33% |
| 500 - 999 | 26% | 22% | 27% | 51% | 28% | 22% | 33% |
| 1,000 – 1,999 | 21% | 22% | 22% | 11% | 25% | 15% | 15% |
| 2,000 – 2,999 | 12% | 11% | 12% | 6% | 19% | 13% | 4% |
| 3,000+ | 19% | 21% | 14% | 15% | 16% | 34% | 16% |
| Production type | | | | | | | |
| Wool Specialist | 28% | 27% | 23% | 51% | 35% | 32% | 7% |
| Meat Specialist | 34% | 35% | 42% | 40% | 22% | 19% | 77% |
| Both | 37% | 38% | 35% | 9% | 42% | 48% | 16% |

5.4 Breeding Objectives

The majority of sheep producers (74%) had a defined breeding objective (Figure 77), with significantly more (97%) Queensland producers having an objective (Figure 78). Reproductive traits fertility (56%) and number of lambs weaned (51%) the top tracked measurements for genetic gains (Figure 79). When split by seedstock and commercial producers, almost all (99%) of seedstock producers had a defined objective, with commercial producers less likely to have one (69%). In terms of measurements tracked (Figure 80), seedstock producers most often tracked weight gain (77%) and fertility (71%), with fertility being the top metric for commercial producers (53%). The remaining 24 tracked measurements can be found in the full Excel results tables.

Figure 77. Defined breeding objective for sheep in total and for seedstock and commercial producers

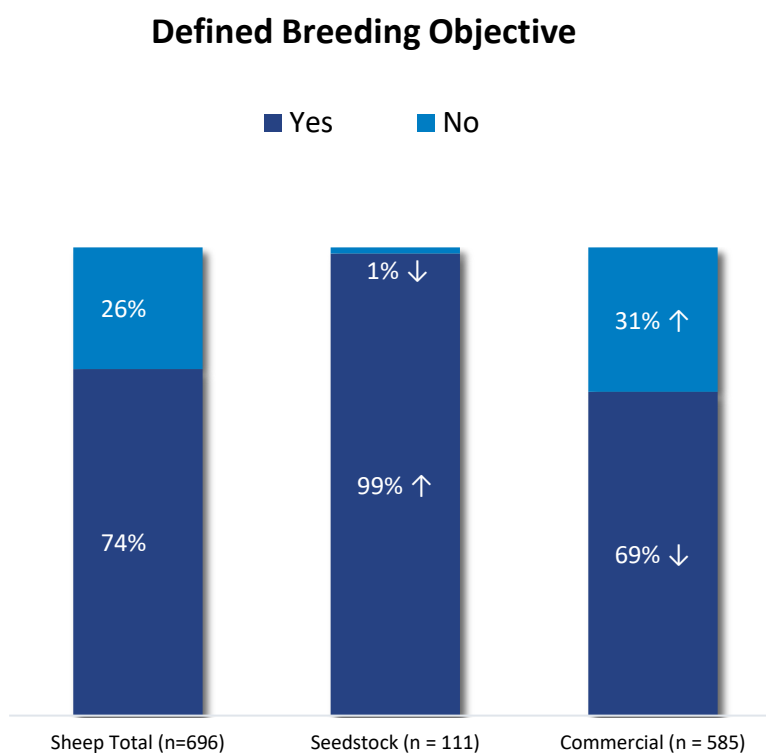


Figure 78. Defined breeding objective for sheep by state

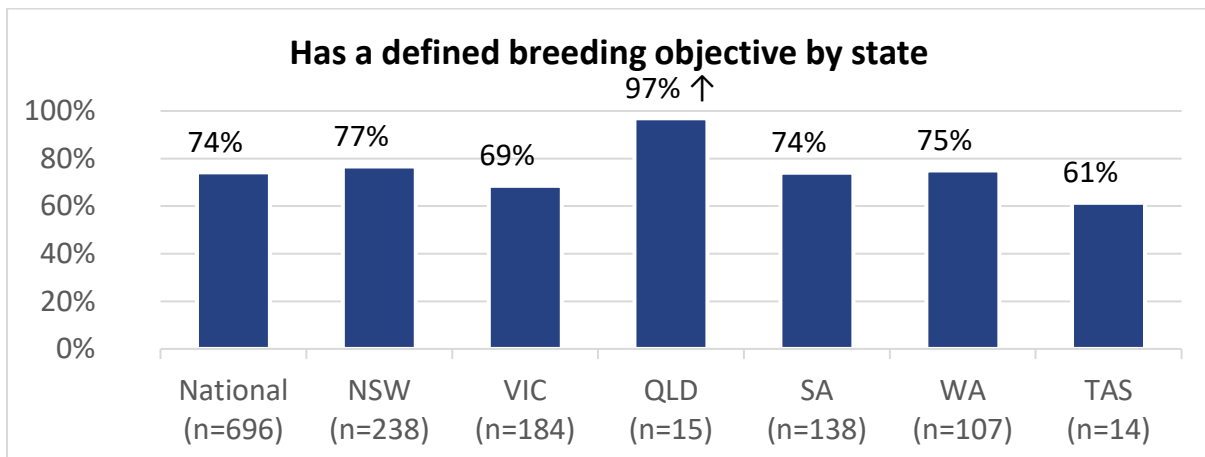


Figure 79. The top 10 tracked measurements for genetic gains among sheep producers (n=696)

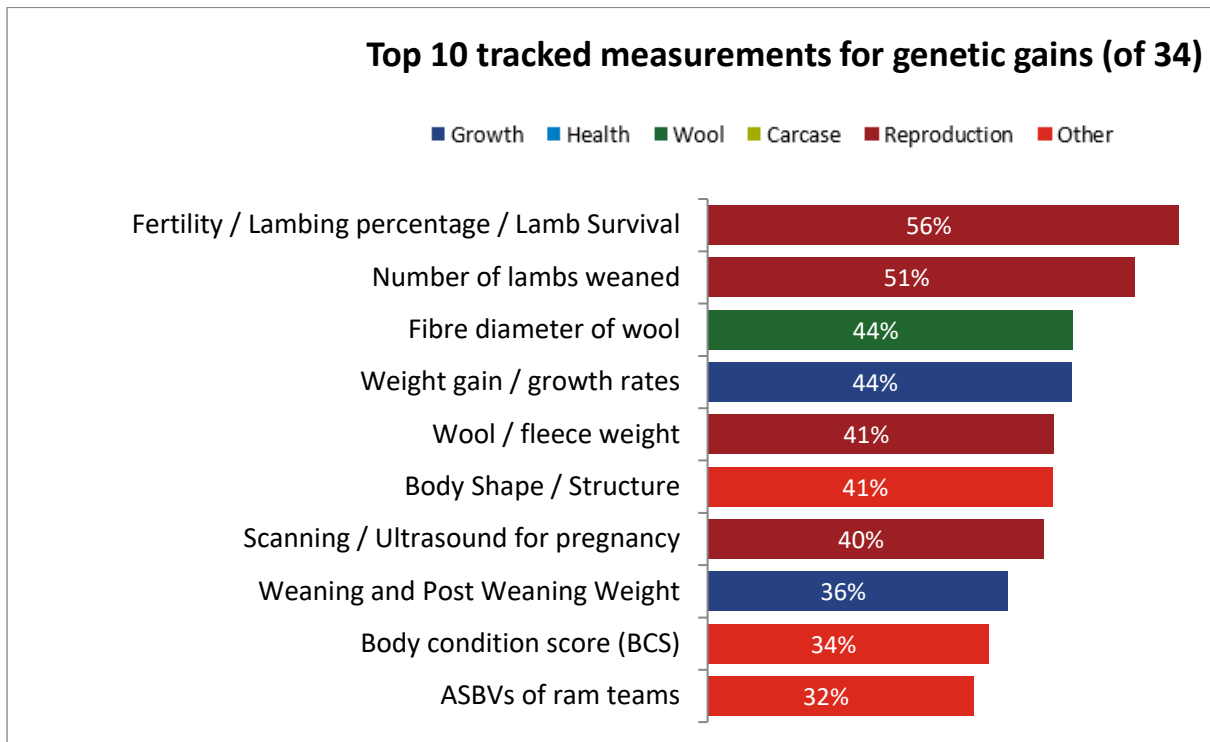
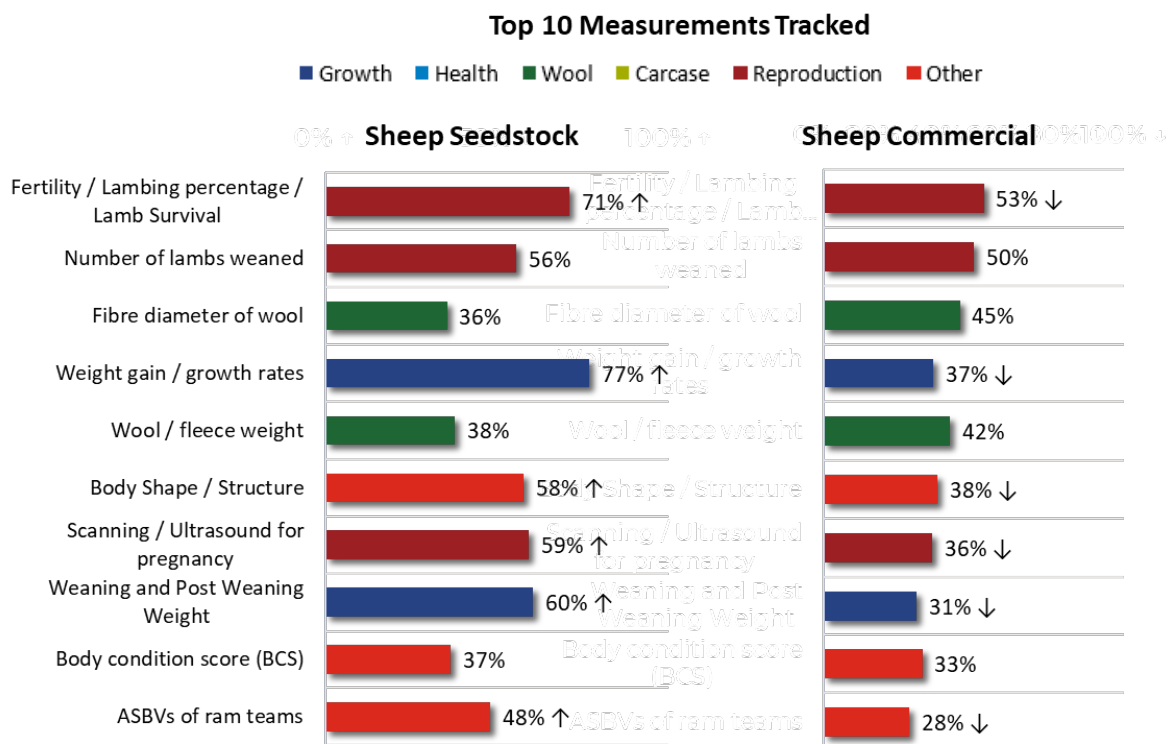


Figure 80. Top measurements for genetic gain tracked by sheep seedstock producers (n=111) and commercial producers (n=585)



5.5 Genetics Management

Around one third (35%) of seedstock producers used Pedigree Wizard / Pedigree Master data management software for animal management (Figure 81). Excel / Microsoft (21%) was also popular. Fewer commercial producers used data management software, with around two thirds (63%) using none, although Excel or Microsoft was relatively popular among commercial producers (20%).

Mating techniques used for breeding females varied by seedstock or commercial production (Figure 82). Almost all commercial and seedstock breeding females were mated naturally (89% and 99% respectively) although artificial insemination was more frequently used for seedstock breeding females (9%).

Around half (56%) of sheep seedstock producers were a member of Sheep Genetics (Figure 83), with more than a third (37%) using LAMBPLAN, 15% using MERINOSELECT and a few (3%) using both (Figure 85). When split by production type (Figure 84), there was little difference in Sheep Genetics membership rates between seedstock producers who were wool specialists (53%), meat specialists (58%) and both (57%). Where seedstock sheep producers did not use Sheep Genetics services (Figure 86), almost two thirds (62%) had never used them, with 38% being past / lapsed users.

Similarly, 57% of commercial producers used ASBVs (Figure 87), with 14% reporting they use MERINOSELECT only, 11% using LAMBPLAN only and 11% using both (Figure 90). Queensland producers (85%) and South Australian producers (66%) were significantly more likely to use ASBVs (Figure 88). Split by sheep production type (Figure 89), significantly more commercial producers who have both wool and meat use ASBVs (66%) compared to wool specialist (57%) and meat specialists (44%).

Figure 81. Data management software used by sheep producers

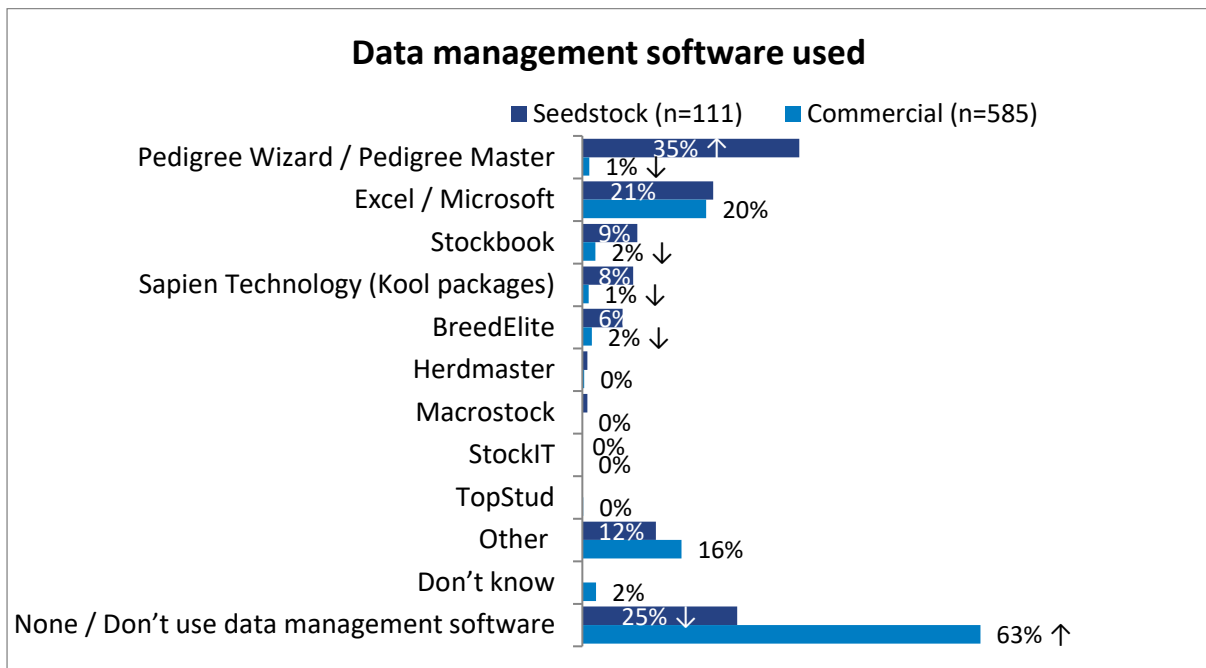


Figure 82. Percentage of breeding females mated using each of the following breeding techniques

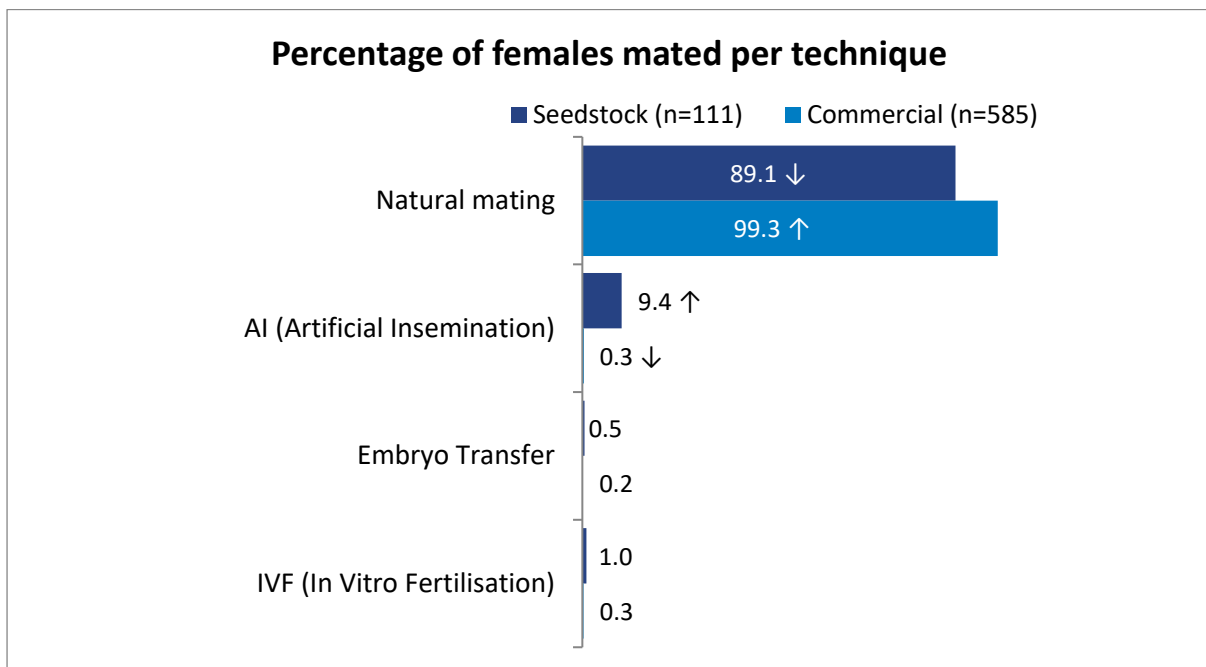


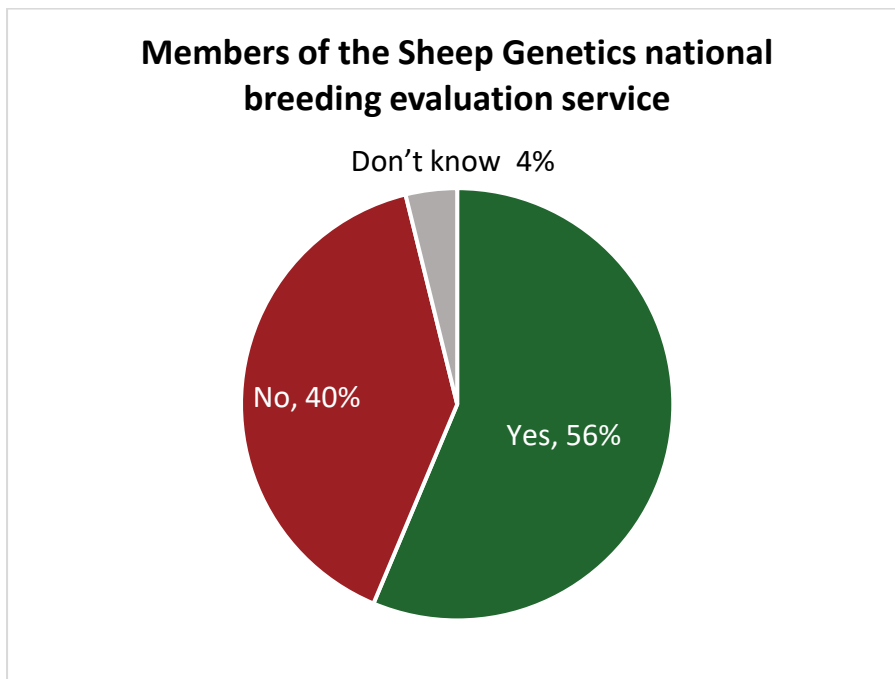
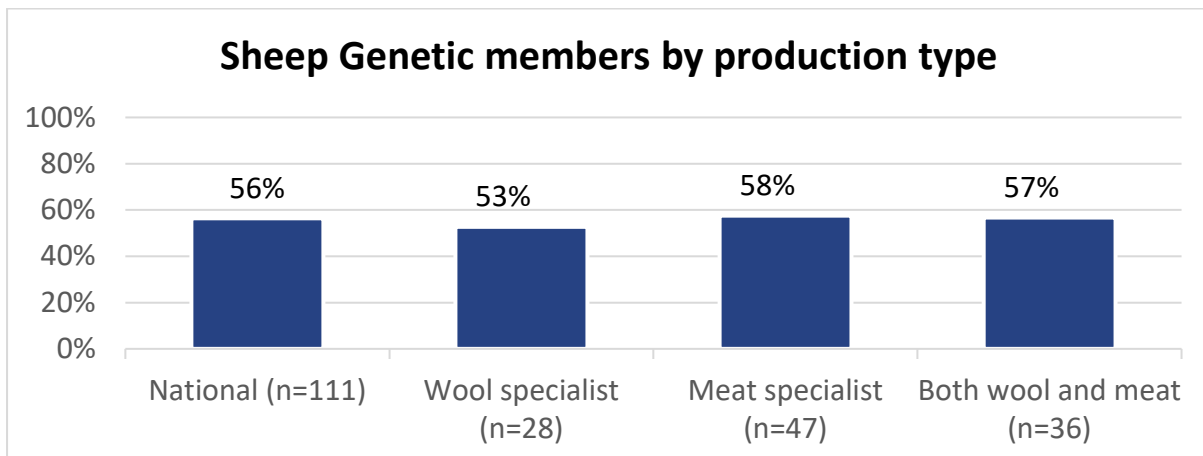
Figure 83. Seedstock sheep producers who are a member of Sheep Genetics (n=111)**Figure 84. Seedstock sheep producers who are a member of Sheep Genetics by production type**

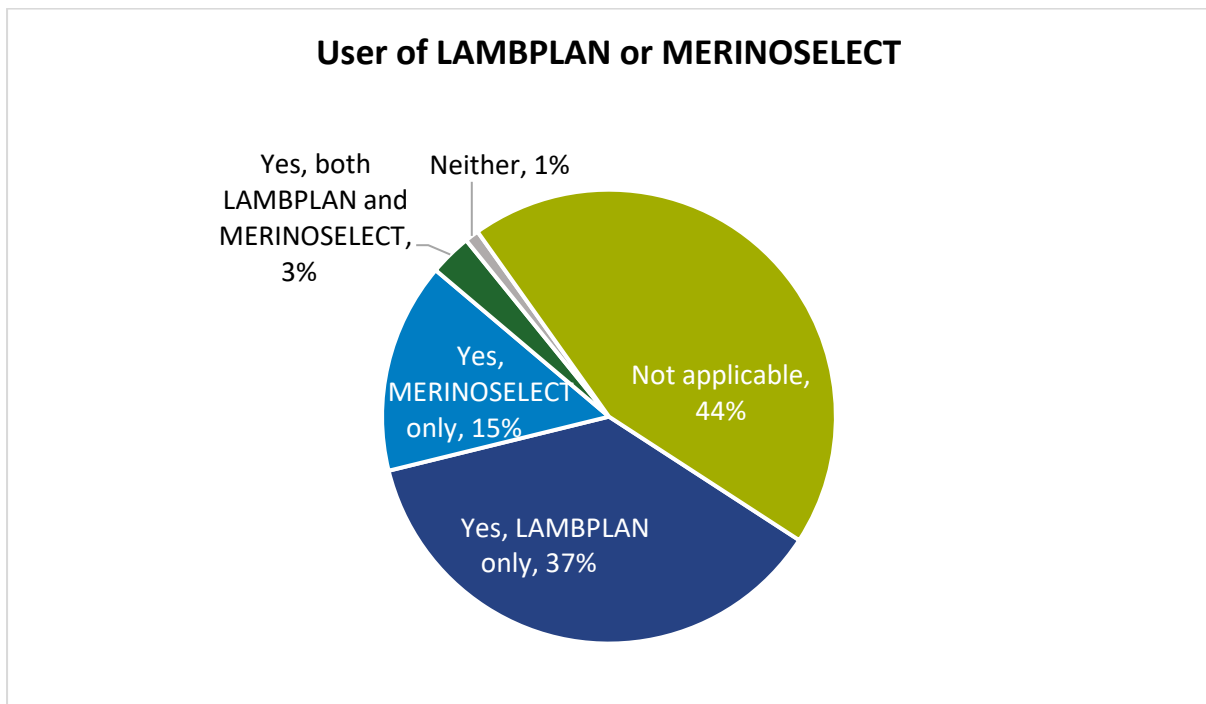
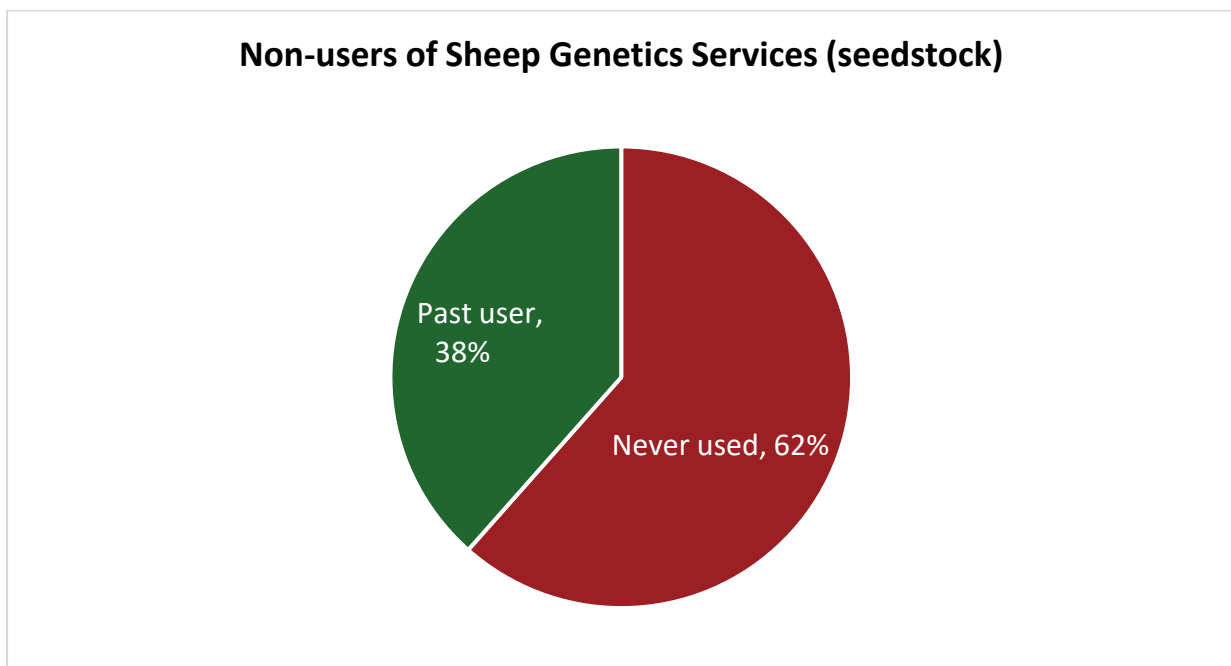
Figure 85. Seedstock sheep producers who use LAMBPLAN or MERINOSELECT (n=111)**Figure 86. Past users of Sheep Genetics services among seedstock producers who have never used Sheep Genetic Services (n=46)**

Figure 87. Commercial sheep producers who use ASBVs (n=586)

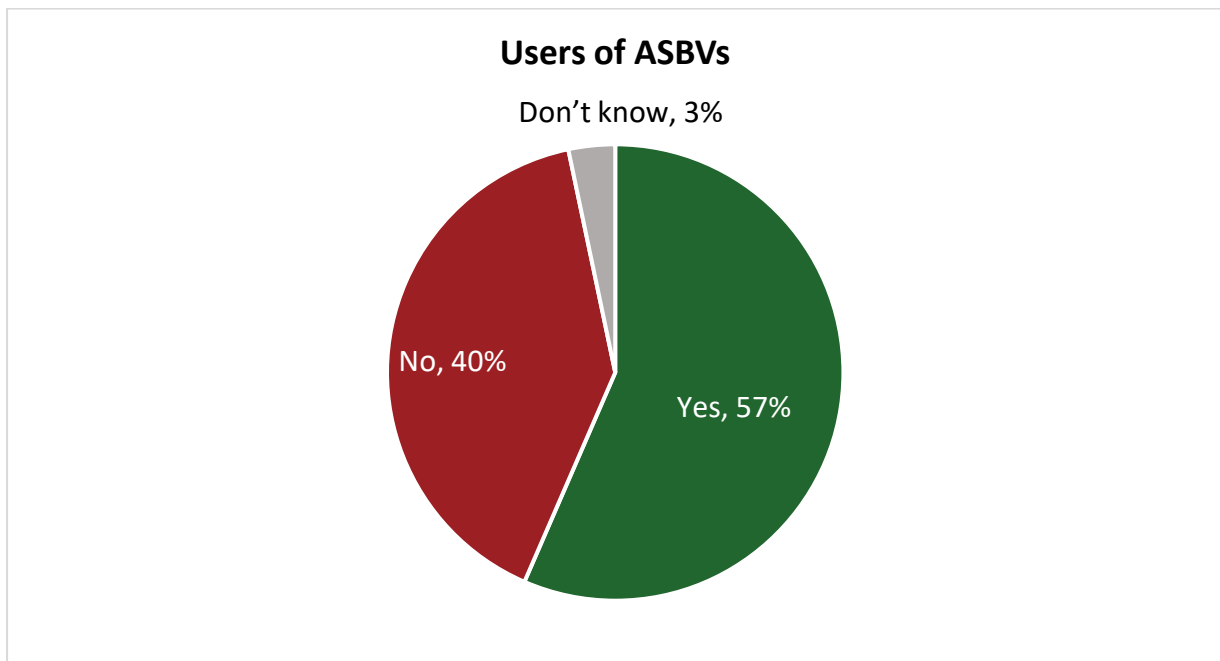


Figure 88. Commercial sheep producers who use ASBVs by state

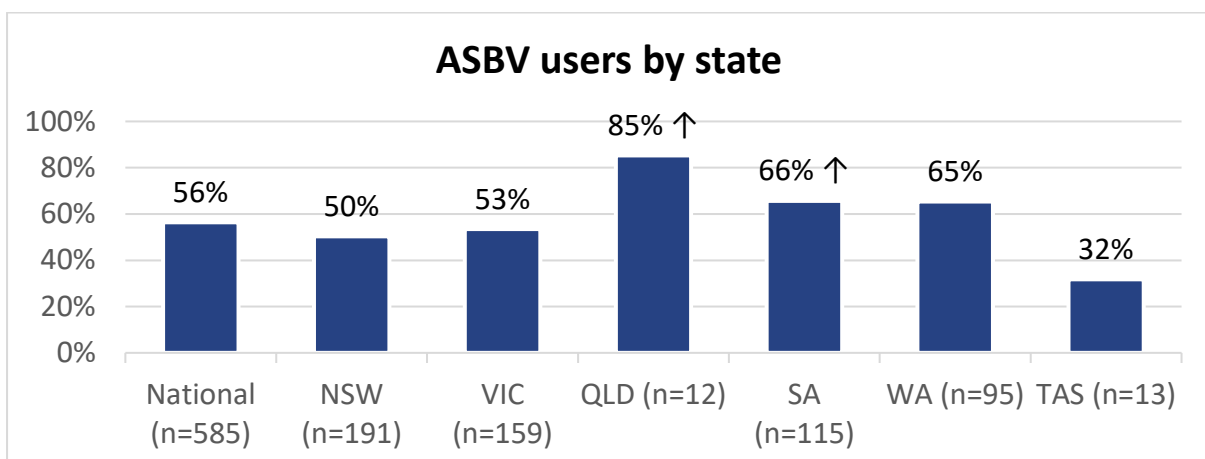


Figure 89. Commercial sheep producers who use ASBVs by production type

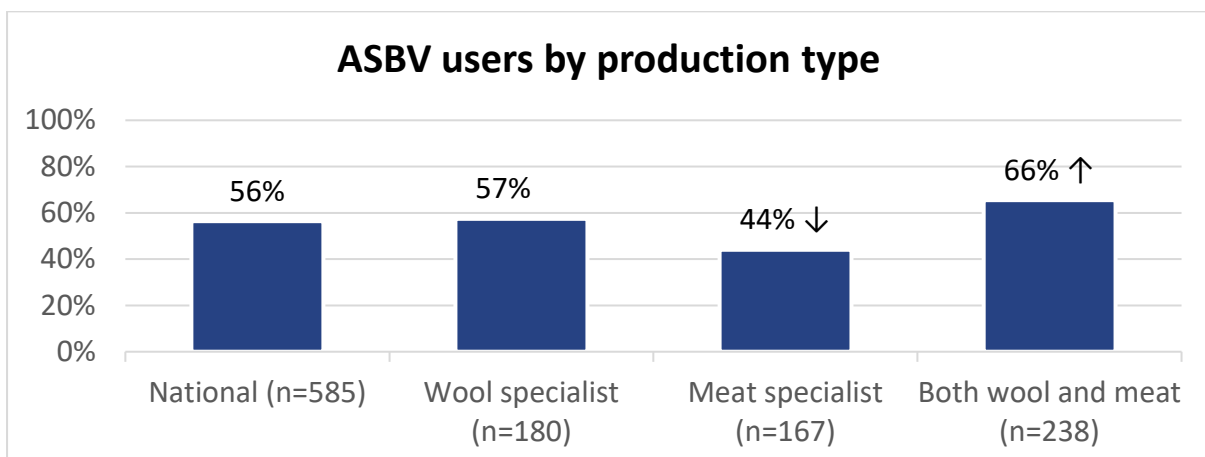
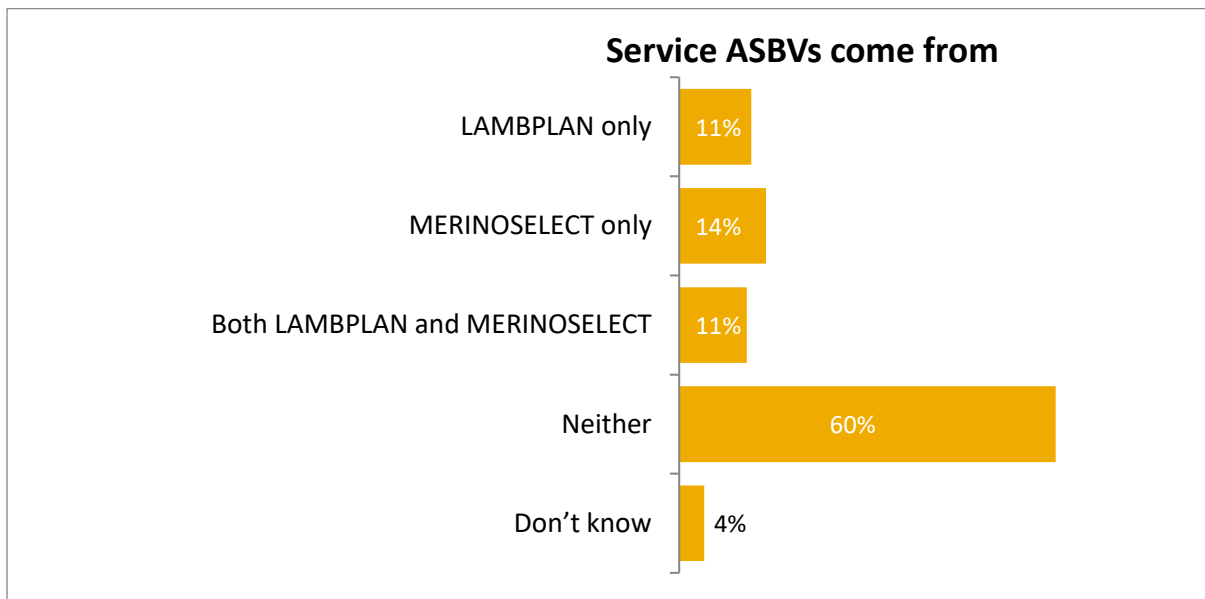


Figure 90. Service commercial sheep producers use for ASBVs (n=586)

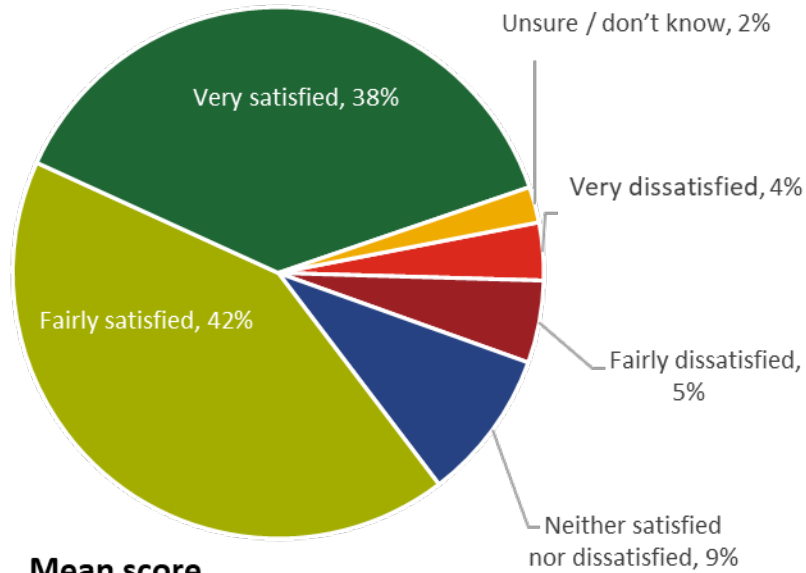
The majority of producers were satisfied with the genetic gains achieved in their sheep over the last ten years (Figure 91) with 38% very satisfied and 42% fairly satisfied. This high level of satisfaction was consistent across different segments of sheep producers, including seedstock, commercial and ASBV users and non-users. Where producers were not satisfied, the top two reasons they gave were that there is always room for improvement (45%) and climatic/ environmental factors (24%) (Figure 92).

Seedstock sheep producers were very positive about the financial health of their operations with 73% saying that it is improving (Figure 93). Commercial sheep producers were also positive with 52% saying the financial health of their operation was improving and 42% saying it was stable (Figure 94). However, seedstock producers are significantly more likely than commercial producers to say that the financial health of their business is improving.

Commercial producers who do use ASBVs are significantly more likely to say that they think their financial health is improving compared to commercial producers (61% versus 41%) (Figure 95).

Figure 91. Satisfaction with genetic gains in sheep over the past 10 years (n=696)

Satisfaction over last 10 years



Mean score

(assuming 1 = Very unsatisfied and 5 = Very satisfied)

| | |
|---------------------------|-----|
| Sheep Total | 4.1 |
| Sheep Seedstock | 4.1 |
| Sheep Commercial | 4.1 |
| Genetic Evaluation Users | 3.9 |
| Genetic Eval. non-users | 4.2 |
| Commercial ASBV users | 4.1 |
| Commercial ASBV non-users | 4.1 |

Figure 92. Reasons given by producers for being less than fully satisfied with the genetic gains of their sheep (n=125)

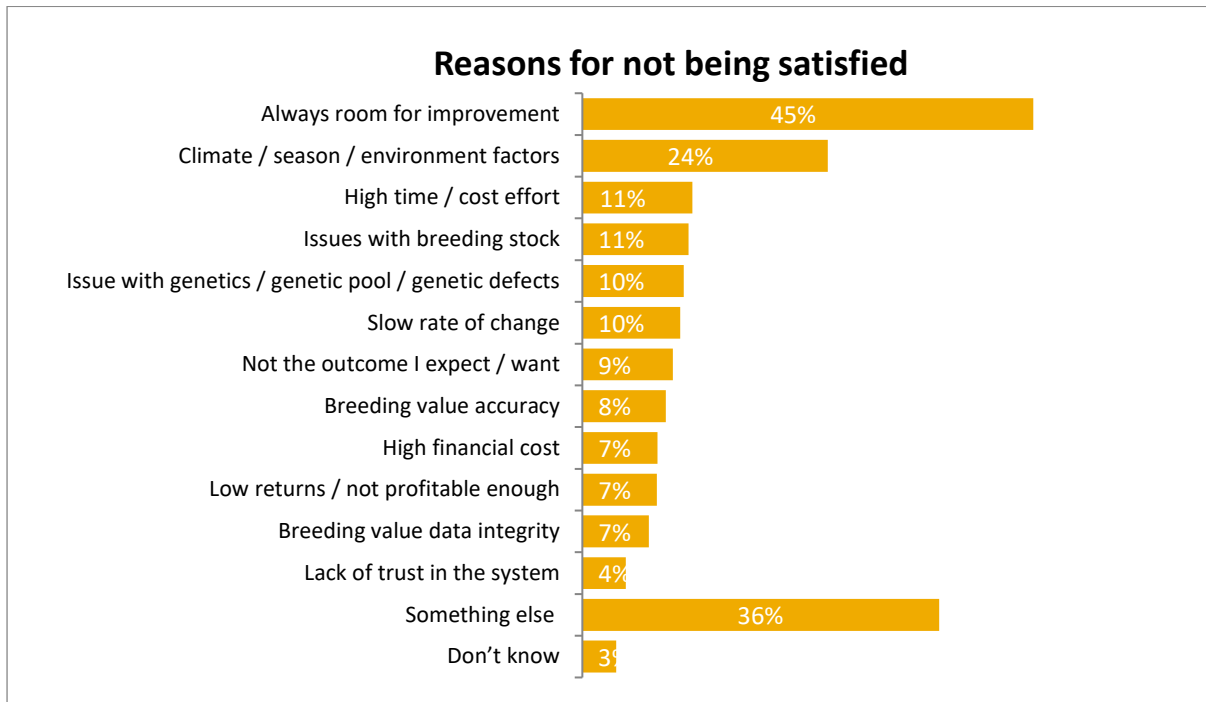


Figure 93. Trend in the financial health of seedstock sheep producers (n=111)

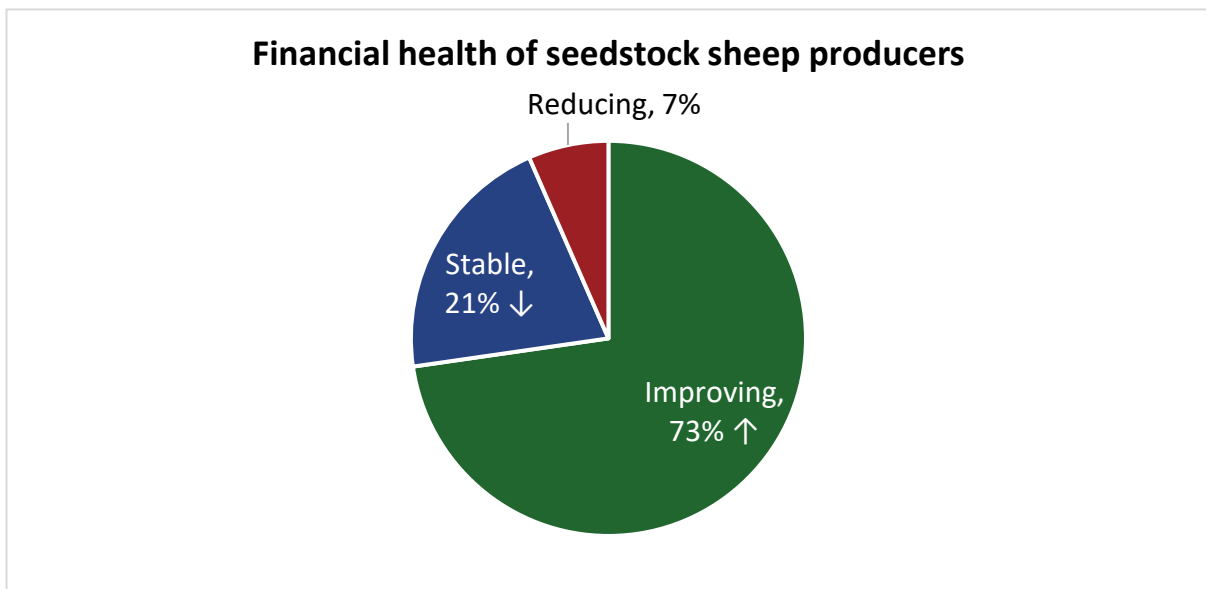


Figure 94. Trend in the financial health of commercial sheep producers (n=585)

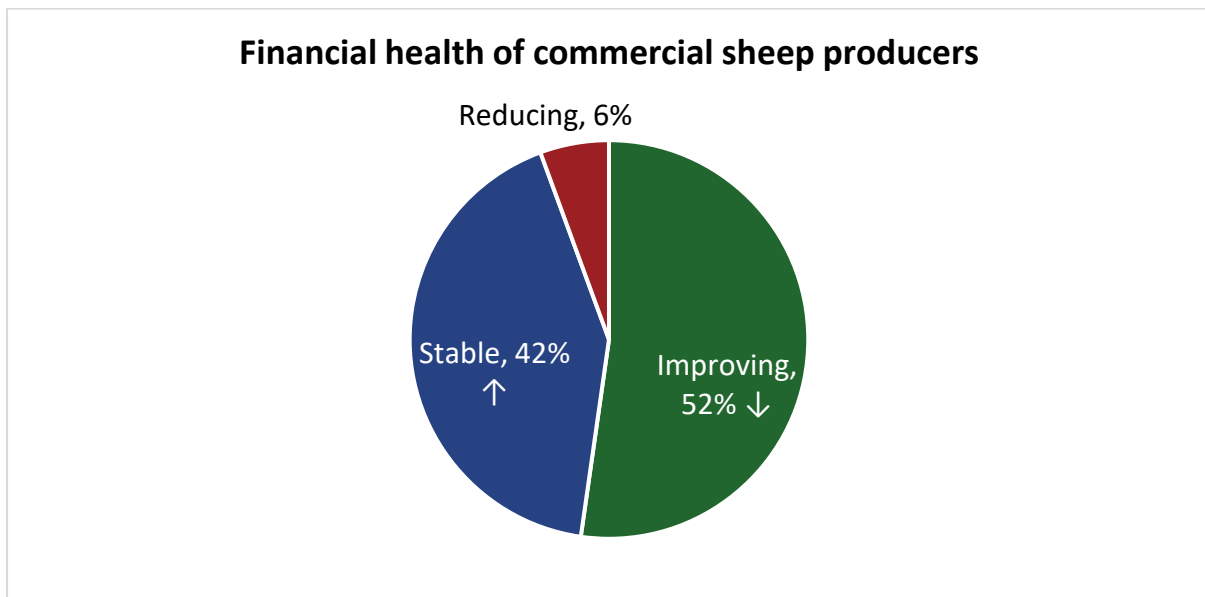
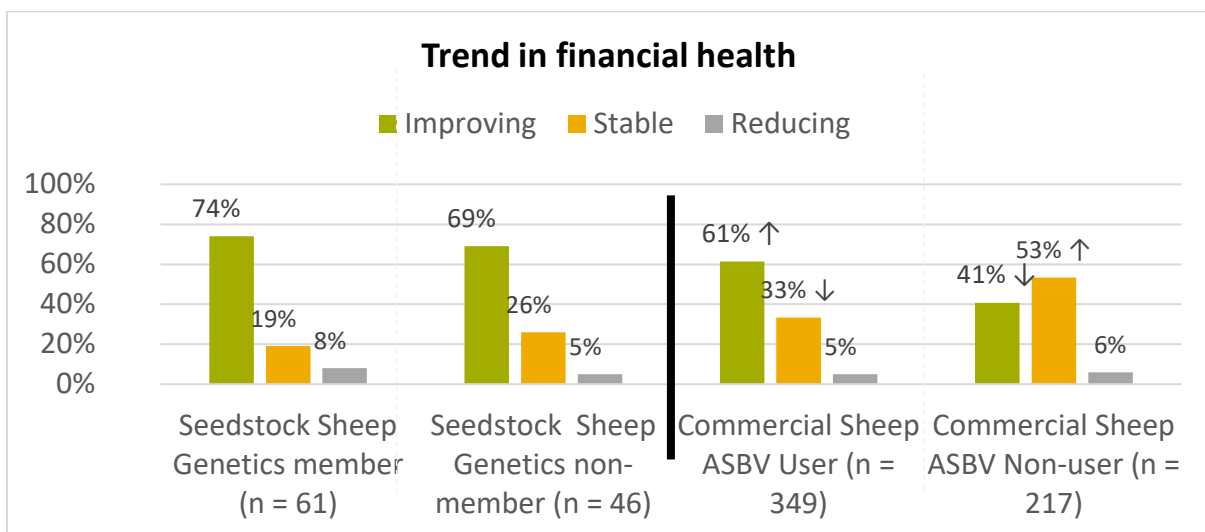


Figure 95. Trend in financial health among sheep producers comparing sheep genetics members, non-members and ASBV users and non-users.



Most sheep producers (75%) did not use genomics products. When split by seedstock and commercial (Figure 96), a higher proportion (43%) of seedstock sheep producers use genomic products with only 16% utilising product. Products used were primarily DNA test for performance (43%) or parentage (42%) (Figure 97). The majority of seedstock producers use DNA test for performance (72%) and parentage (59%) (Figure 98). In contrast only 10% of commercial producers use genomic products and favour flock profile (49%).

Figure 96. Use of genomic products for sheep producers split by production type

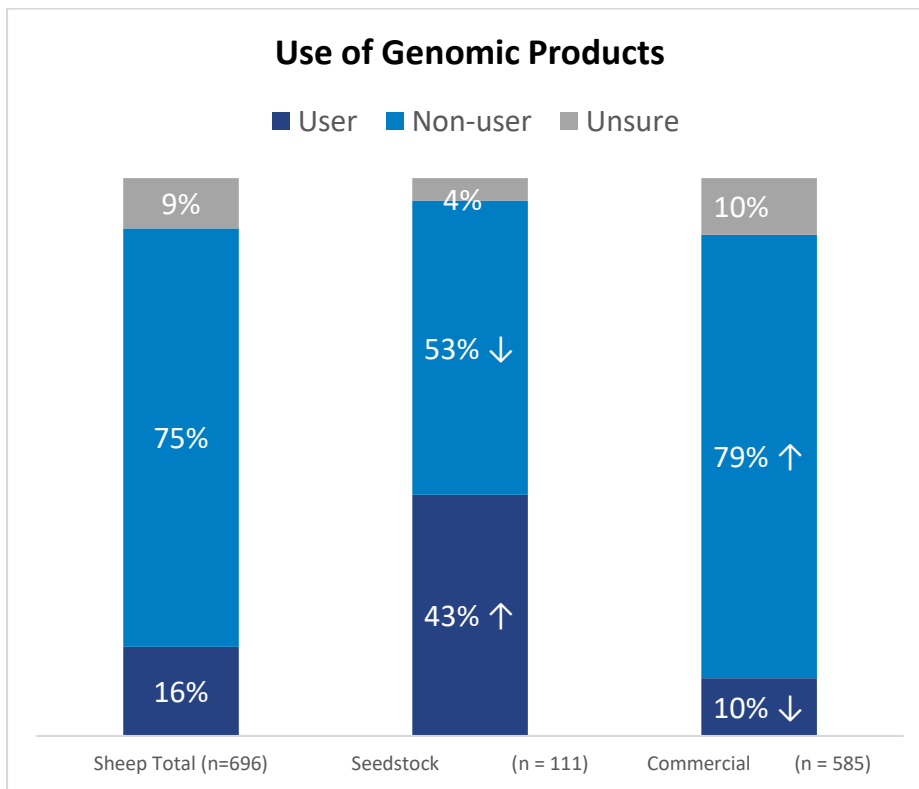


Figure 97. Genomic products used by sheep producers (n=129)

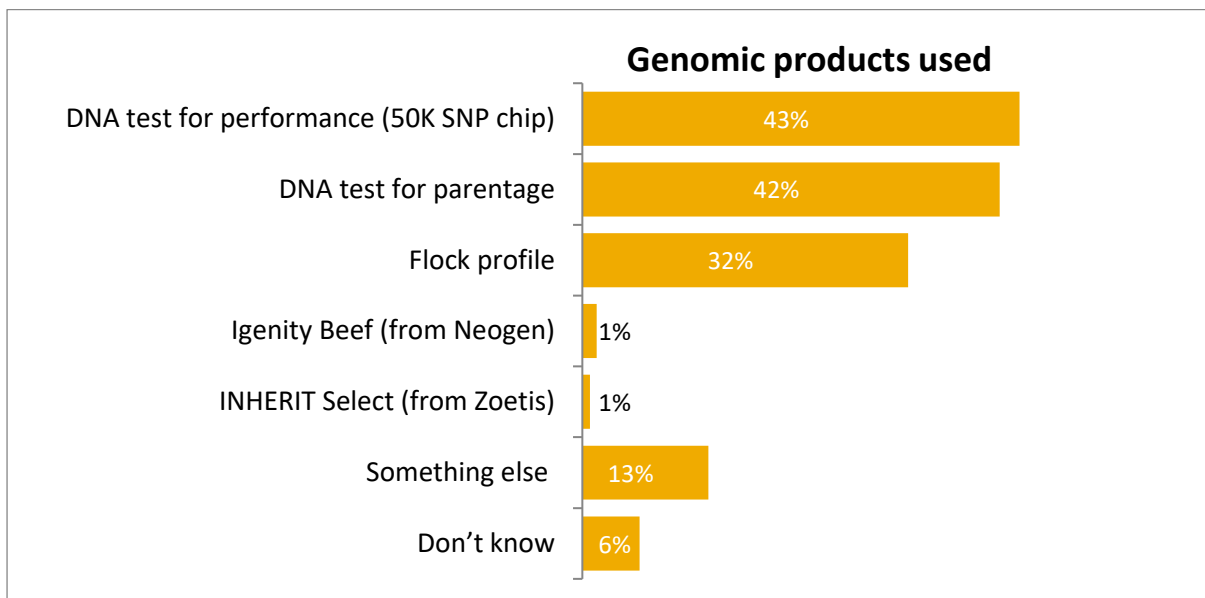
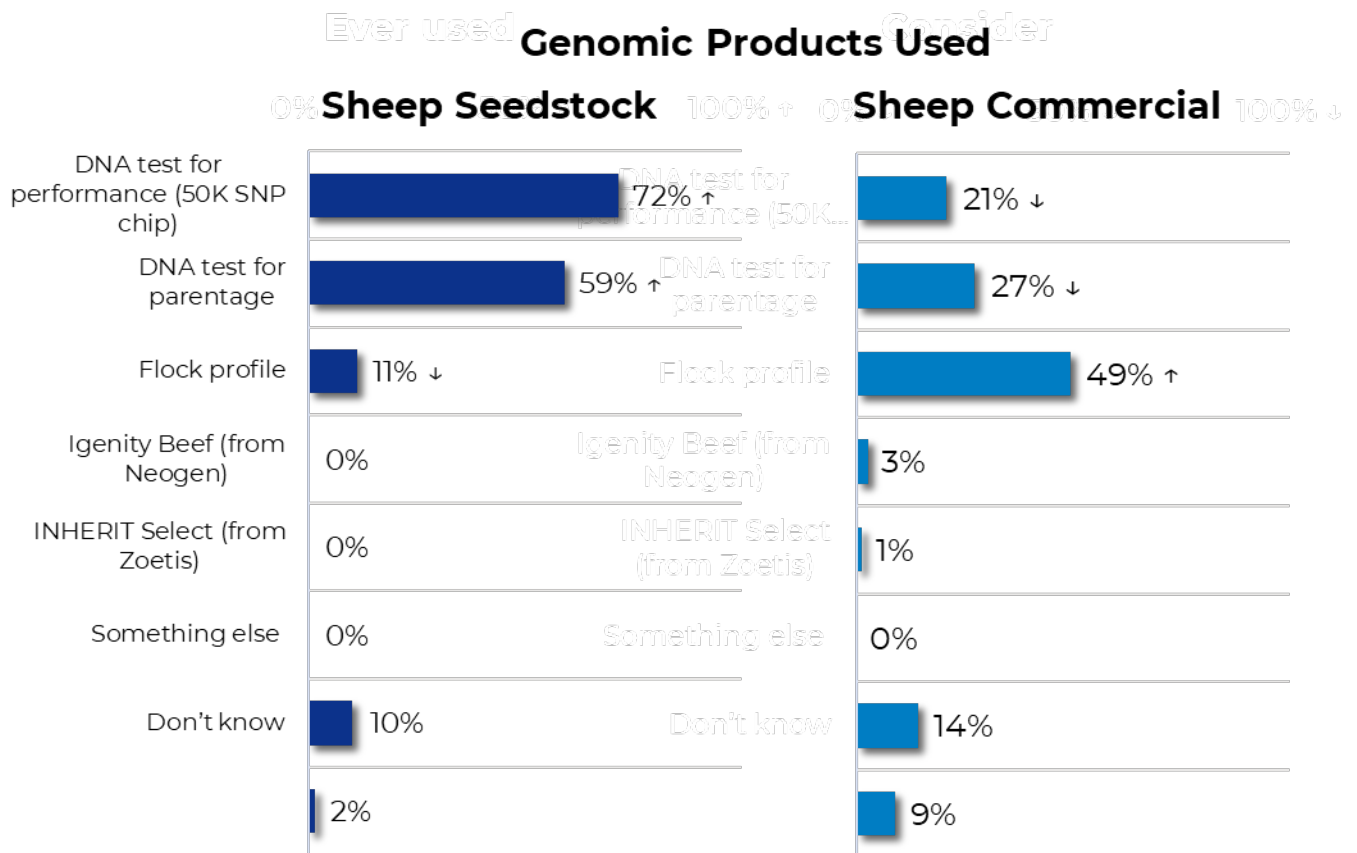


Figure 98. Use of genomic products split by seedstock (n=56) and commercial (n=73) sheep producers



5.6 LAMBPLAN and MERINOSELECT

Sheep producers had a broad understanding of LAMBPLAN / MERINOSELECT (Figure 99) with producers overall saying it is a database they can use (27%), provides data to assist in decision making (22%) and data regarding genetics (20%). This is mirrored among commercial sheep producers (24%, 22% and 19%, respectively) (Figure 101). Seedstock sheep producers however (Figure 100) were significantly more likely to say that LAMBPLAN / MERINOSELECT is a database that can be used (40%) and that they can be used to record and measure genetic traits (19%).

Figure 99. Understanding of LAMBPLAN / MERINOSELECT among sheep producers- Top 15 responses (n=696)

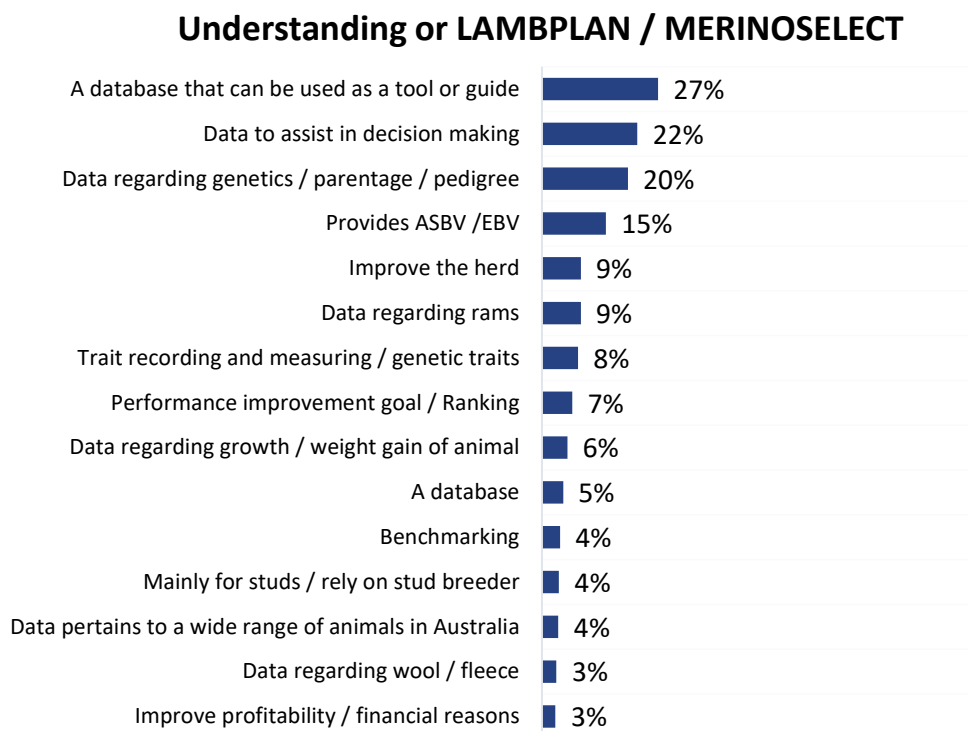


Figure 100. Understanding of LAMBPLAN / MERINOSELECT among seedstock sheep producers - Top 15 responses (n=111)

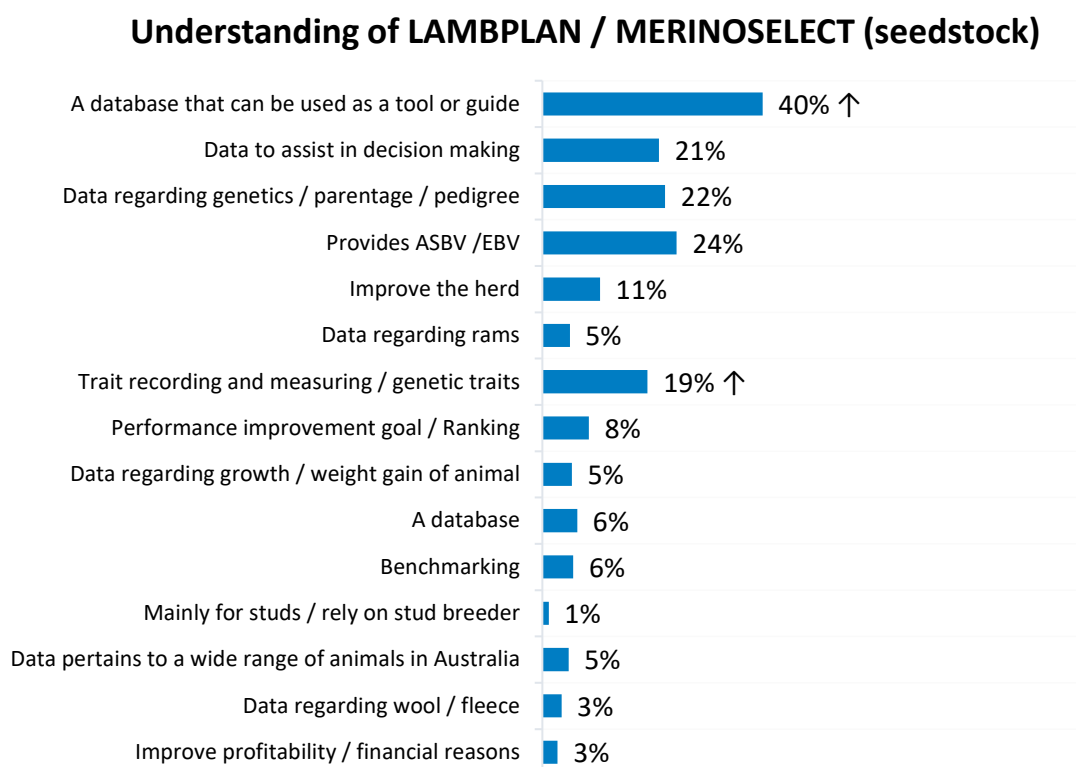
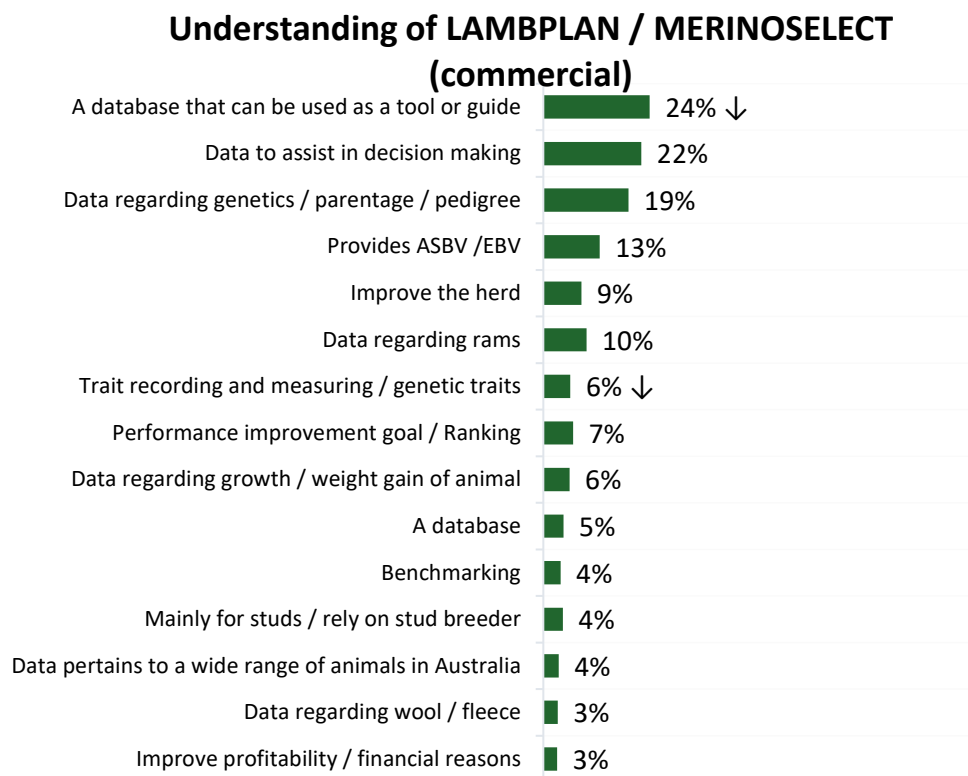


Figure 101. Understanding of LAMBPLAN / MERINOSELECT among commercial sheep producers - Top 15 responses (n=585)



Overall, the number one thing driving a positive perception of LAMBPLAN / MERINOSELECT among sheep producers (Figure 102) is that it aids in selection / decision making (21%) which is mirrored in seedstock (Figure 103) at 24% and commercial (Figure 104) at 20%. For sheep producers overall, for benchmarking / comparison purposes was the next most common factor (13%) followed by improving genetics (12%) and acts as a guide (12%).

Among sheep producers, one quarter (25%) were not able to name any drawbacks to LAMBPLAN / MERINOSELECT and a further fifth (22%) said there was nothing negative about LAMBPLAN / MERINOSELECT (Figure 105). This is driven by a high number of commercial sheep producers (Figure 107) who cannot name a negative (29%) or have no negative comments (24%). Seedstock sheep producers (Figure 106) cite issues with data capture as the primary negative factor (26%).

Figure 102. Positive perceptions of LAMBPLAN / MERINOSELECT among sheep producers - Top 15 responses (n=696)

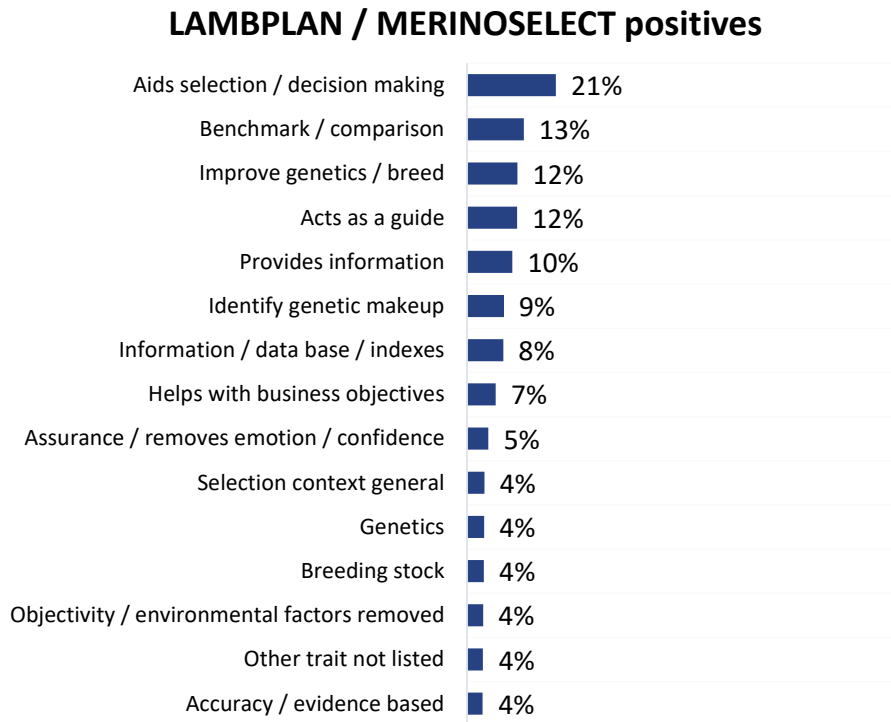


Figure 103. Positive perceptions of LAMBPLAN / MERINOSELECT among seedstock sheep producers - Top 15 responses (n=111)

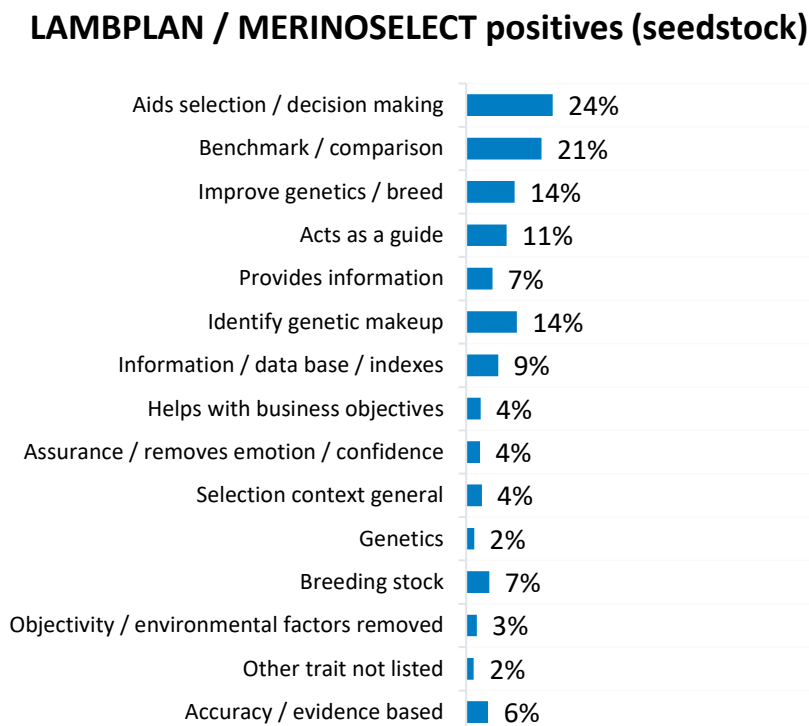


Figure 104. Positive perceptions of LAMBPLAN / MERINOSELECT among commercial sheep producers - Top 15 responses (n=585)

LAMBPLAN / MERINOSELECT positives (commercial)



Figure 105. Drivers of negative perceptions of LAMBPLAN / MERINOSELECT among sheep producers (n=696)

LAMBPLAN / MERINOSELECT negatives

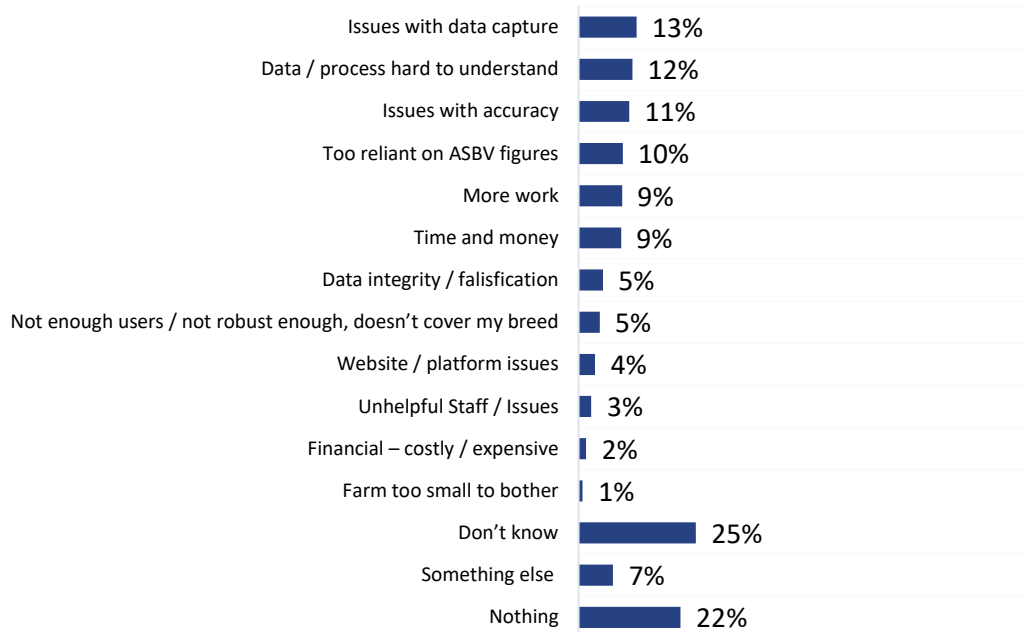


Figure 106. Drivers of negative perceptions of LAMBPLAN / MERINOSELECT among seedstock sheep producers (n=111)

LAMBPLAN / MERINOSELECT negatives (seedstock)

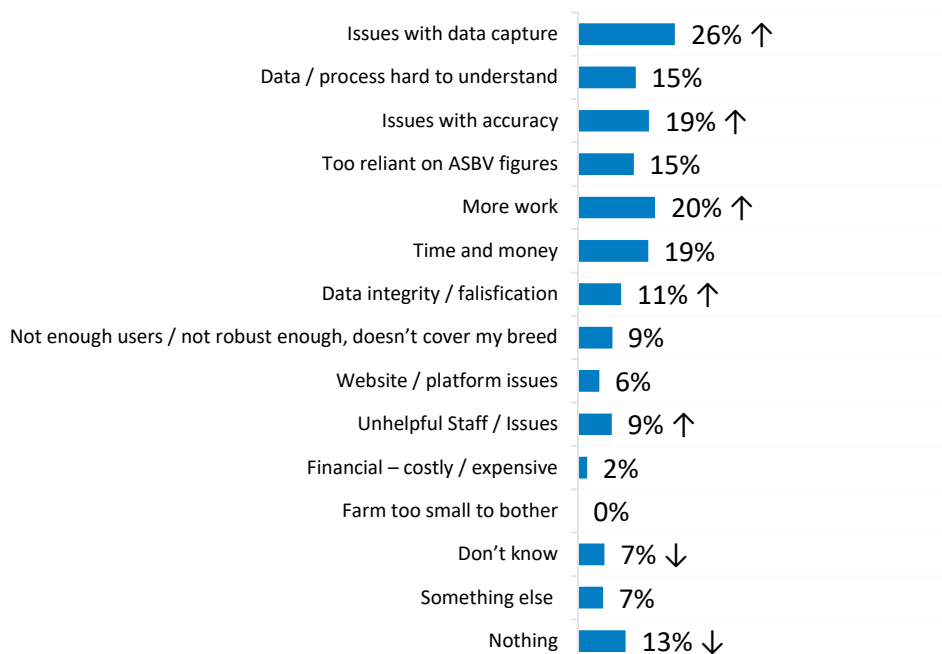
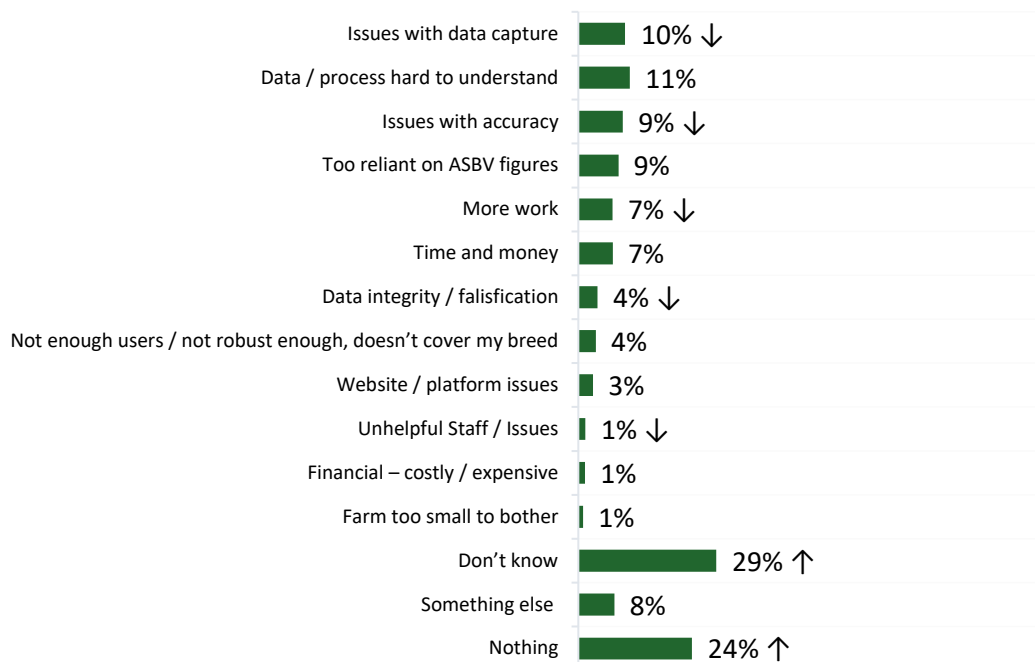


Figure 107. Drivers of negative perceptions of LAMBPLAN / MERINOSELECT among commercial sheep producers (n=585)

LAMBPLAN / MERINOSELECT negatives (commercial)



Sheep producers considered an array of traits when selecting sires (Figure 108), with fertility most important (49%) followed by fibre diameter (46%) and fleece weight (43%). When split by

production type, seedstock producers (Figure 109) were most interested in postweaning weight target (61%) and fertility (56%) while commercial sheep producers (Figure 110) were most concerned with fibre diameter (49%) and fertility (48%).

Sheep producers were asked the nominate important factors for their business over the next ten years. For both seedstock (Figure 111) and commercial (Figure 112) producers, most producers were concerned about several factors with welfare / animal health (81% and 77%, respectively) and cost of production / efficiency mentioned most frequently (72% and 82%, respectively). Seedstock producers were most likely to nominate animal welfare / health as a key factor for the future (81%), while commercial producers slightly favoured cost of production / efficiency (82%).

Figure 108. The most important traits for sire selection for all sheep producers by category (n=696)

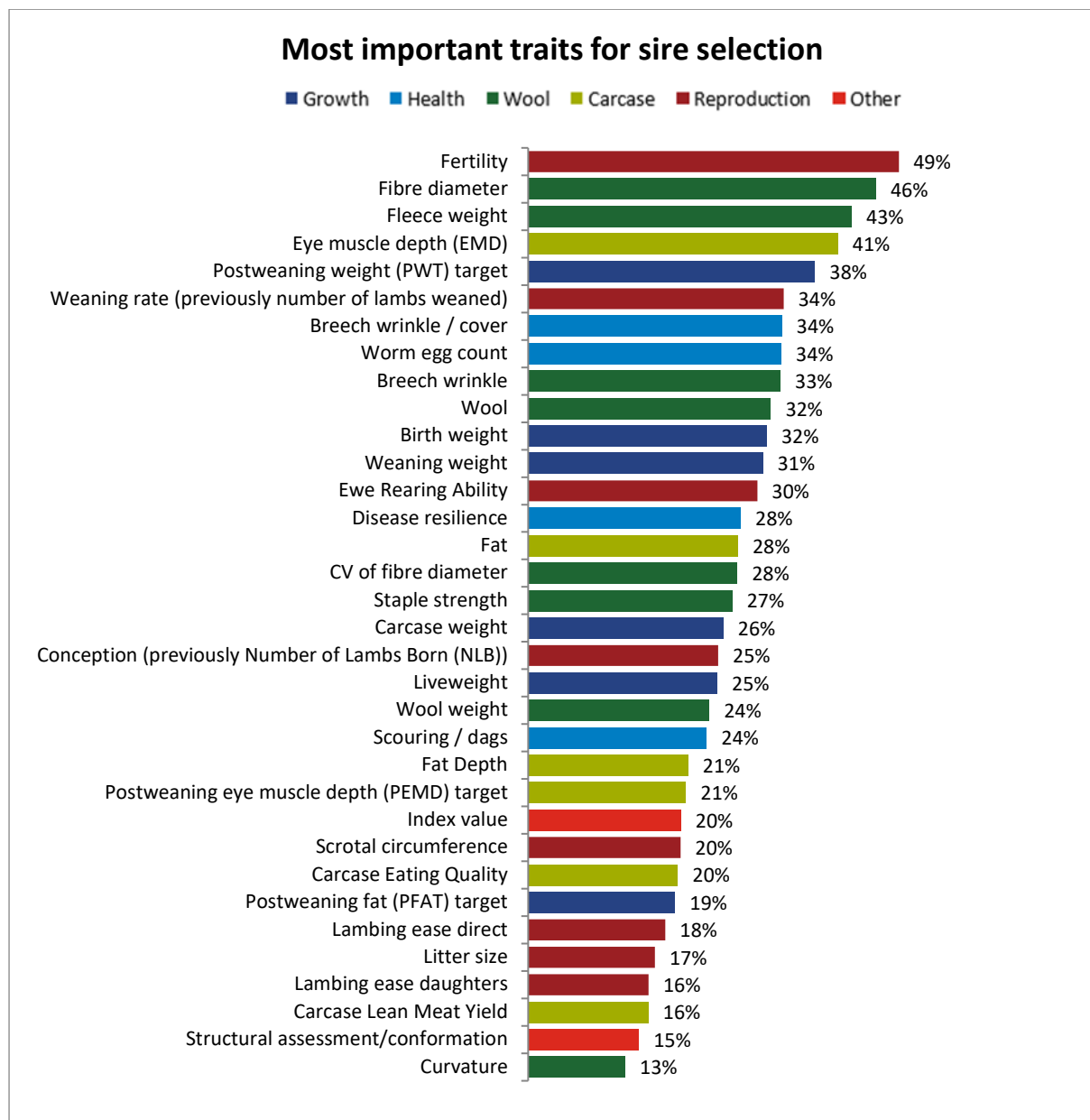


Figure 109. Most important traits for selecting sires among seedstock sheep producers (n=111)

Important selection traits (seedstock)

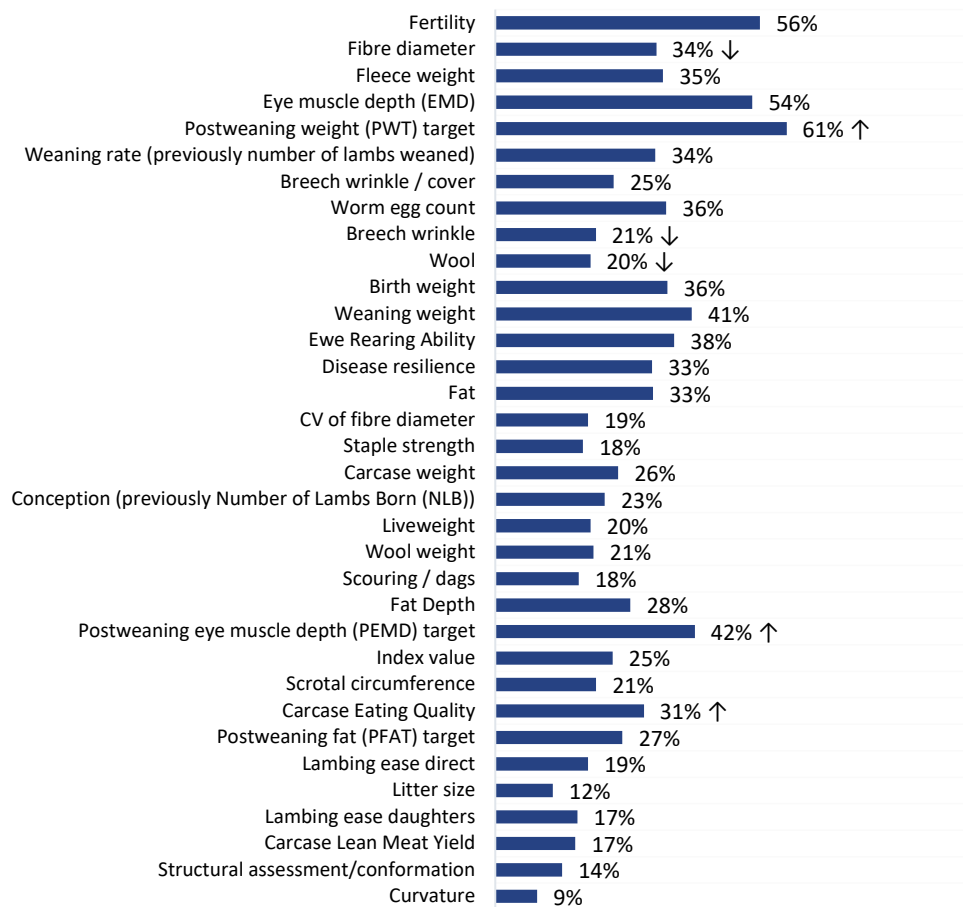


Figure 110. Most important traits for selecting sires among commercial sheep producers (n=585)

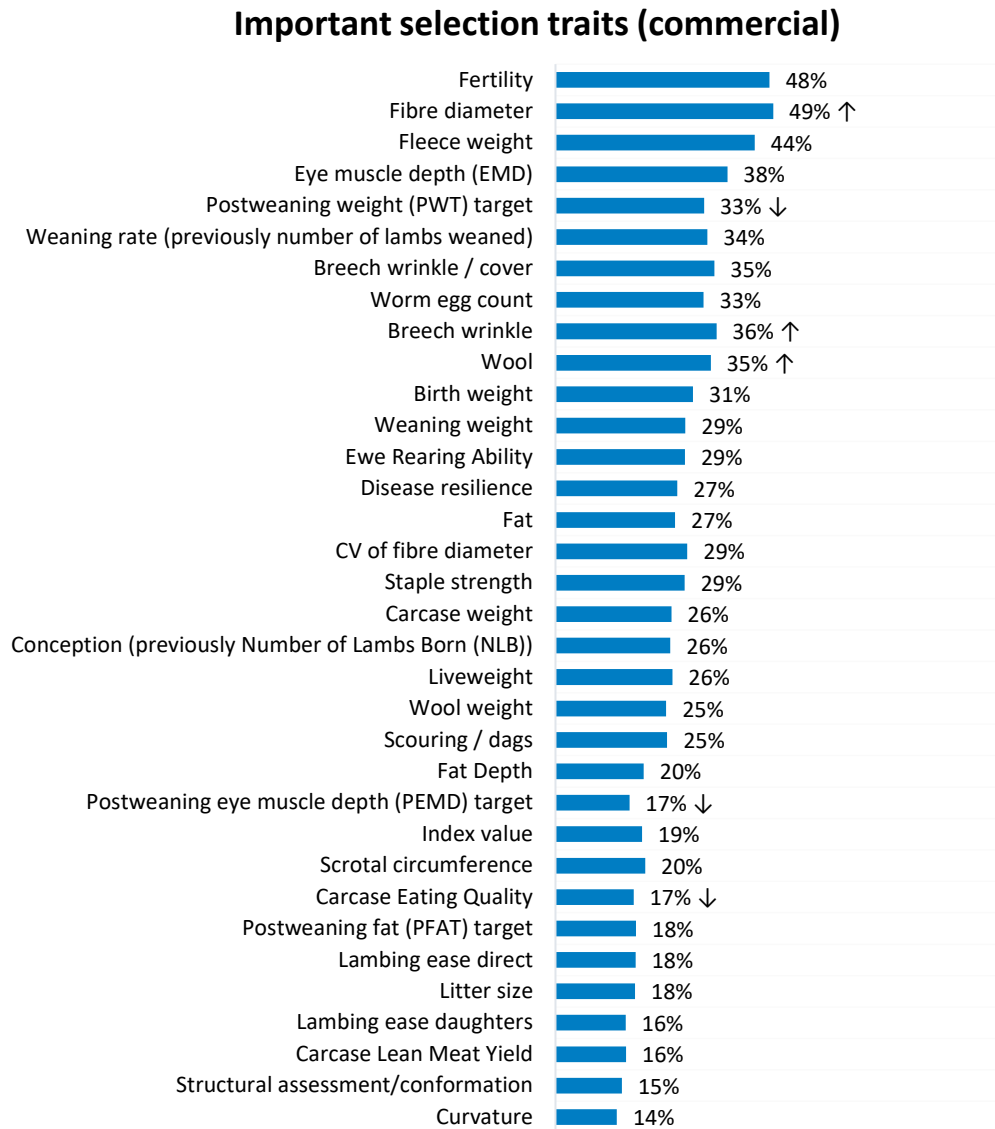


Figure 111. Most important factors over the next ten years for the businesses of seedstock sheep producers (n=111)

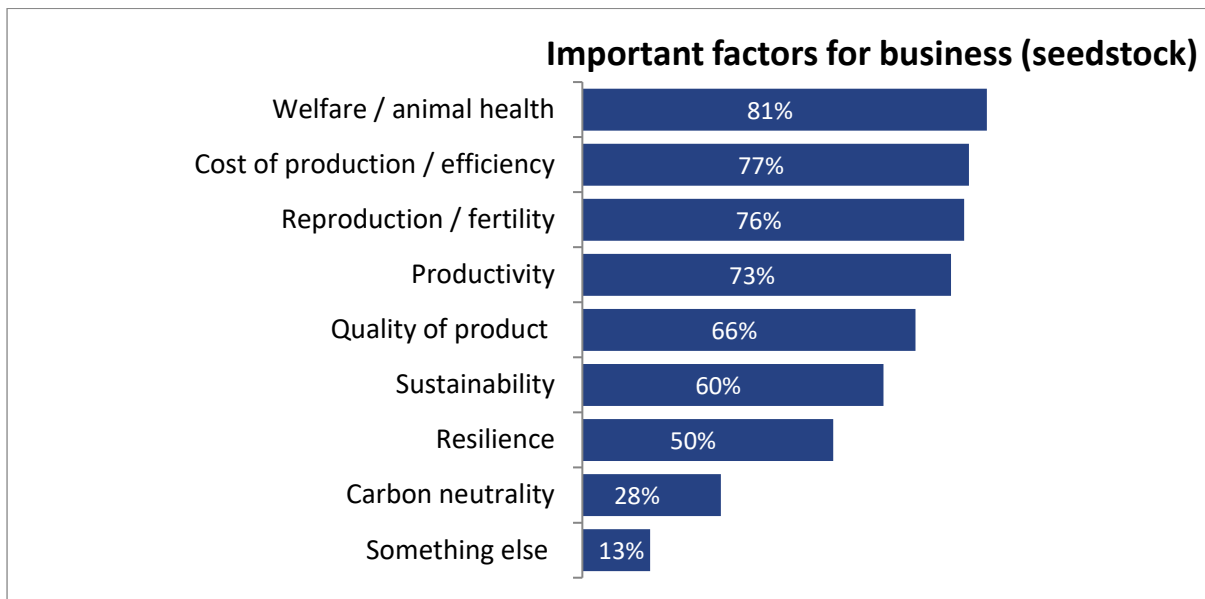
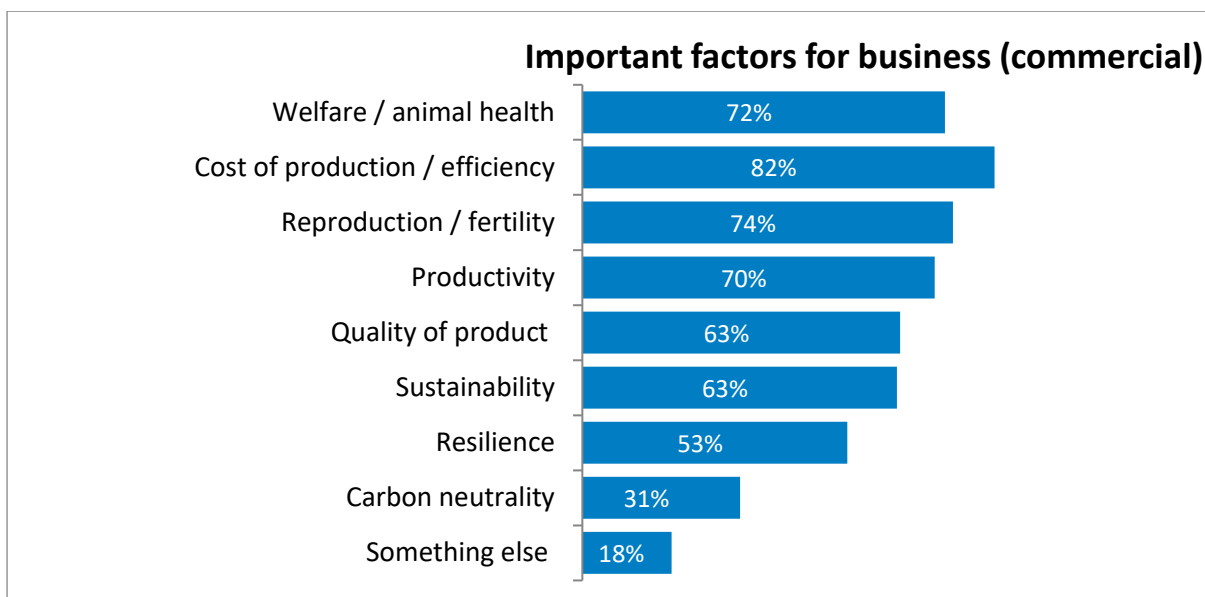


Figure 112. Most important factors over the next ten years for the businesses of commercial sheep producers (n=585)



Overall, seedstock producers were significantly more likely to record performance data compared to commercial producers (Figure 113) with weaning weight (86% vs 28%) and post weaning weight (75% vs 24%) most likely to be recorded by seedstock producers. There was a small drop off when it comes to submitting this data to LAMPLAN or MERINOSELECT (Figure 114), with weaning weight submitted by 82% of seedstock producers and post weaning weight submitted by 69%.

While commercial sheep producers considered several factors when selecting a stud (Figure 115), the biggest driver was their relationship with the ram breeder (55%). When selecting a sire, both the sire's looks and breeding values (44%) and the sire's looks and raw measurements (44%) were important to selection (Figure 116).

Figure 113. Performance data recorded by seedstock (n=62) and commercial (n=305) producers - Top 10 responses

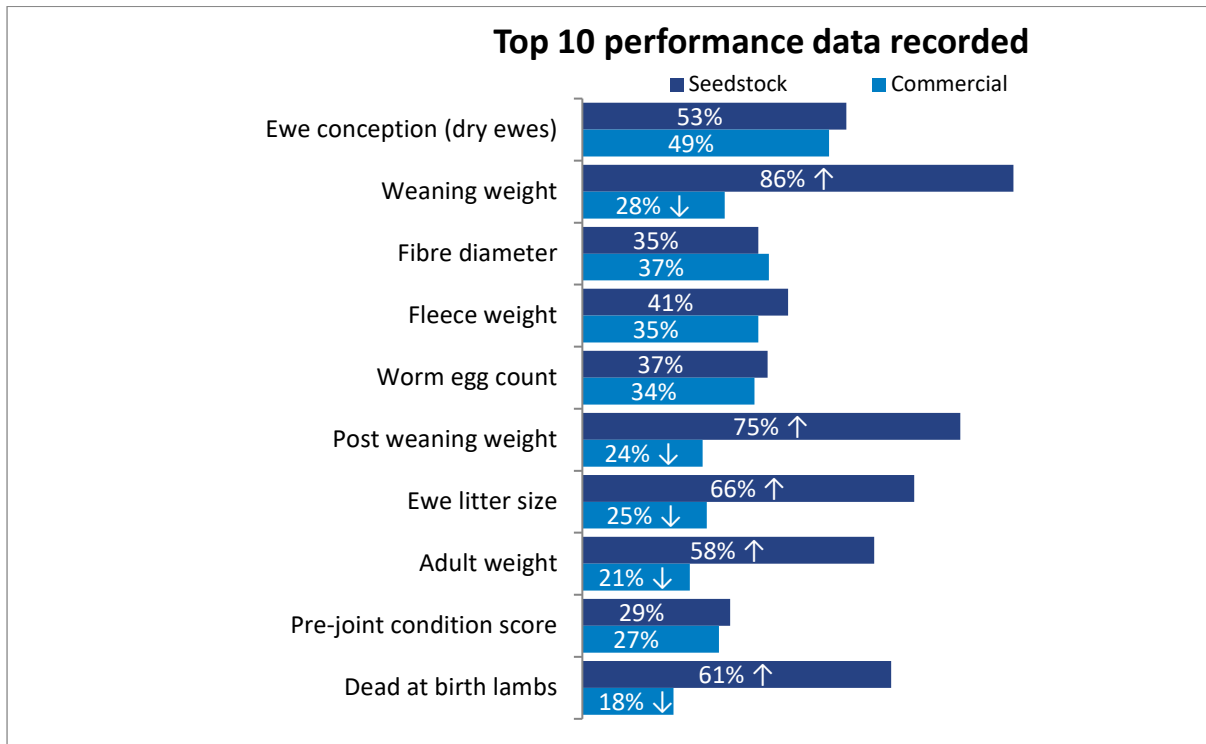


Figure 114. Top 10 performance data recorded regularly sent to LAMBPLAN or MERINOSELECT by seedstock producers (n=62)

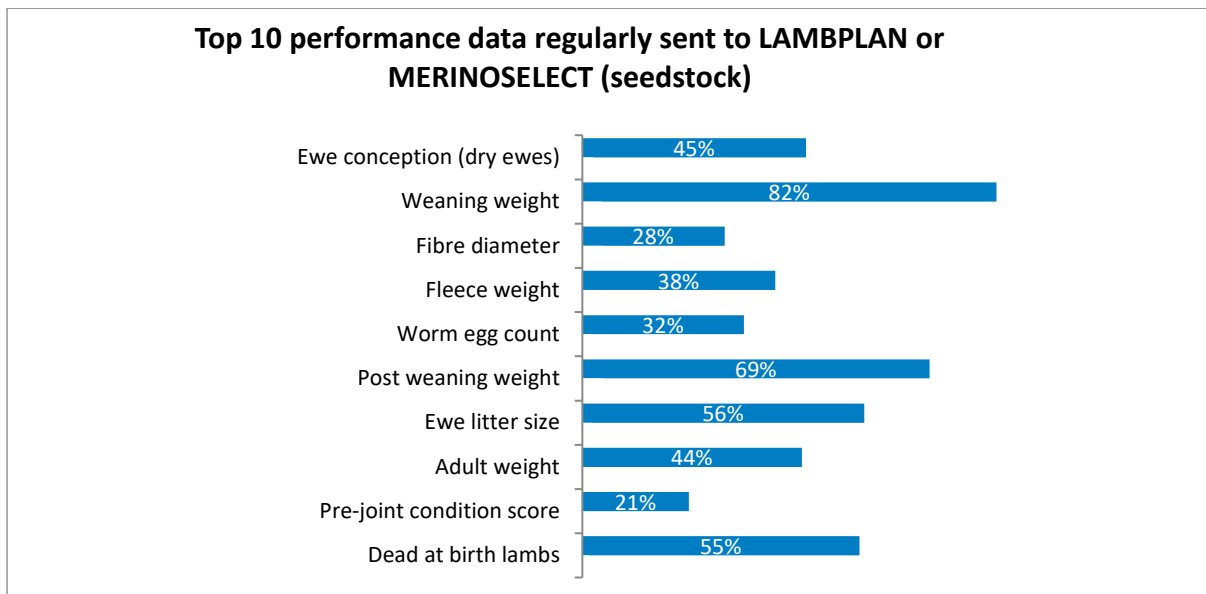
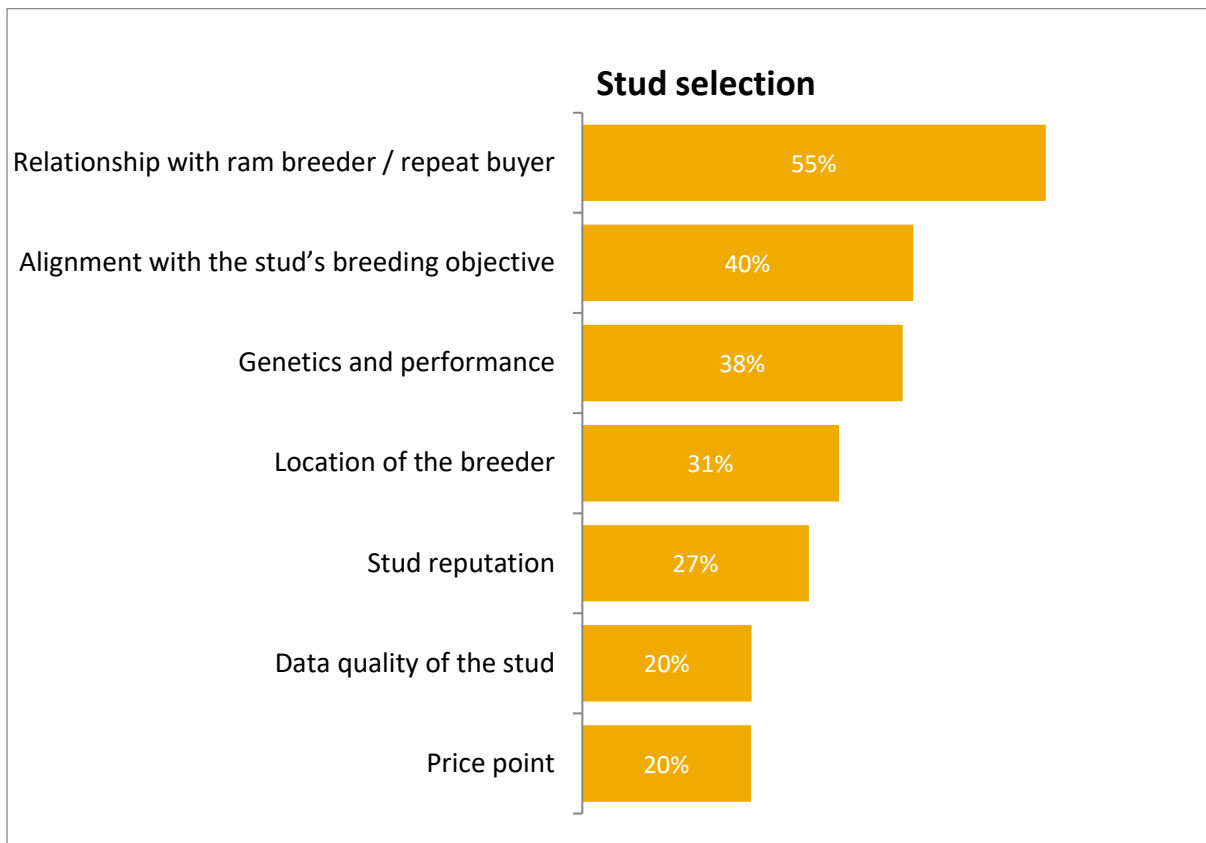
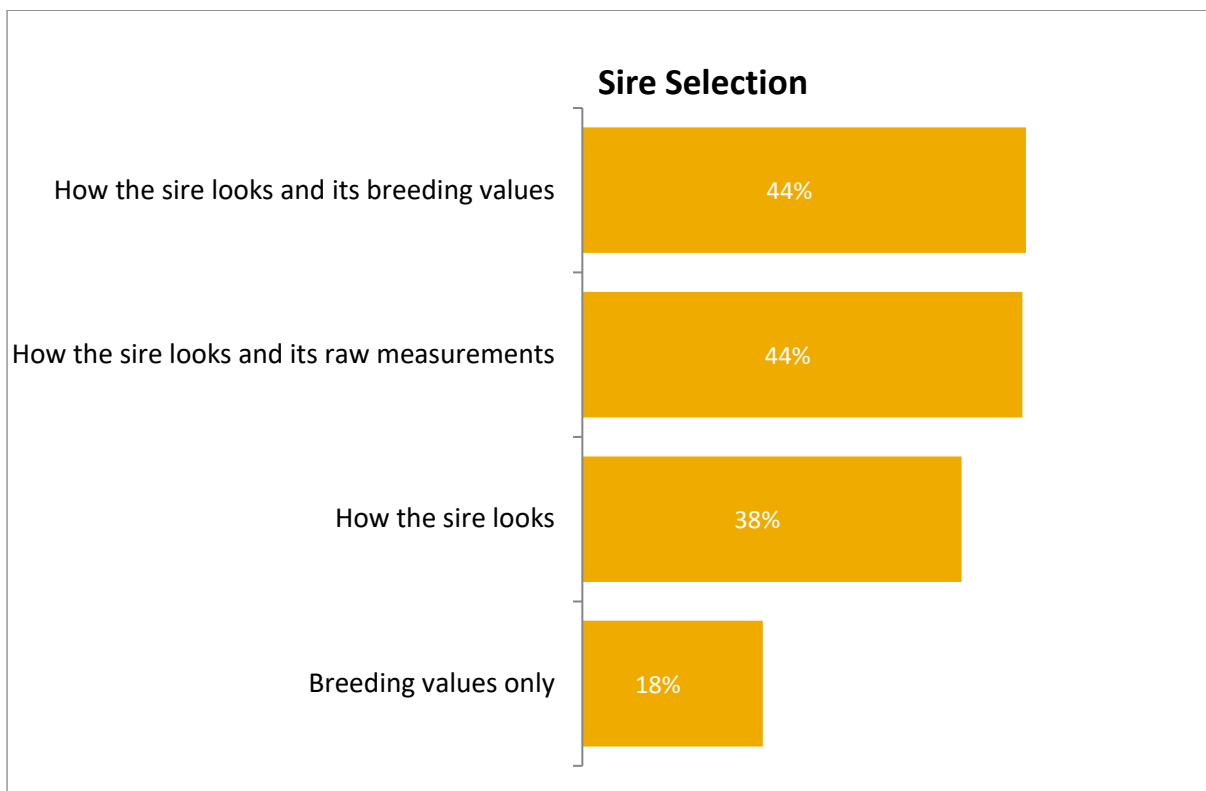


Figure 115. Drivers of stud selection among commercial sheep producers (n=619)**Figure 116. Drivers for selection of sires among commercial sheep producers (n=619)**

5.7 Attitudes

Regarding attitudes towards Sheep Genetics (Table 7), both seedstock and commercial sheep producers have high respect, reliance, expectation, commitment, understanding and ease of use ratings, but, as with cattle, there is still more to learn about Sheep Genetics, as reflected in the lower percentage of sheep producers who feel like they know everything they need to know about it. These percentages were calculated from the rating that producers gave for each statement, from 1 (completely disagree) to 7 (describes you perfectly). The numbers in the table show the percentage of producers who rate the statement as either 5, 6 or 7 i.e. high agreement. Statements are listed in order from highest to lowest based on results for all sheep producers.

Table 7. Attitudinal statements by seedstock and commercial sheep producers

| | Seedstock Sheep (n=111) | Commercial Sheep (n=585) |
|---|----------------------------|-----------------------------|
| I respect and rely upon the people behind Sheep Genetics to be constantly improving it | 67% | 79% |
| My customers expect me / I expect my stud suppliers to use Sheep Genetics to improve the quality of my / their breeding animals | 54% | 85% |
| I definitely intend to keep using Sheep Genetics for the foreseeable future | 64% | 65% |
| When I use Sheep Genetics my confidence in getting the genetic traits I want and avoiding the ones I don't want is increased | 51% | 67% |
| I understand how genomics fits in my business | 66% | 51% |
| I am easily able to use internet-based services like Sheep Genetics to help make better business decisions. | 53% | 48% |
| Using Sheep Genetics is something I easily do as a routine part of my breeding decisions / work | 51% | 48% |
| I find indexes simple to use | 51% | 49% |
| It is easy to see the genetic payback from using Sheep Genetics | 51% | 48% |
| There is plenty of training and guidance available to help people like me use Sheep Genetics better | 50% | 49% |
| I always use Sheep Genetics because it helps improve profits | 47% | 50% |
| Indexes reflect my breeding objective | 38% | 51% |
| I always use Sheep Genetics to keep track of our animals' genetic progress | 56% | 31% |
| I know everything I need to know about Sheep Genetics to use it effectively | 43% | 28% |
| The Sheep Genetics data provides me with all I need to know when making breeding decisions | 45% | 42% |

On average, sheep producers thought ASBVs were of neutral to moderate importance (4.8/7), with seedstock producers placing more emphasis on ASBVs than commercial producers (5.1/7 and 4.8, respectively) (Figure 117). Selection Indexes were neutral to moderately important (4.3/7 for total, seedstock and commercial producers) (Figure 118).

A more in-depth breakdown of attitudes is included in appendix 1.3.

Figure 117. Importance of ASBVs for breeding ram selection for total sheep (n=696), seedstock (n=111) and commercial (n=585) producers

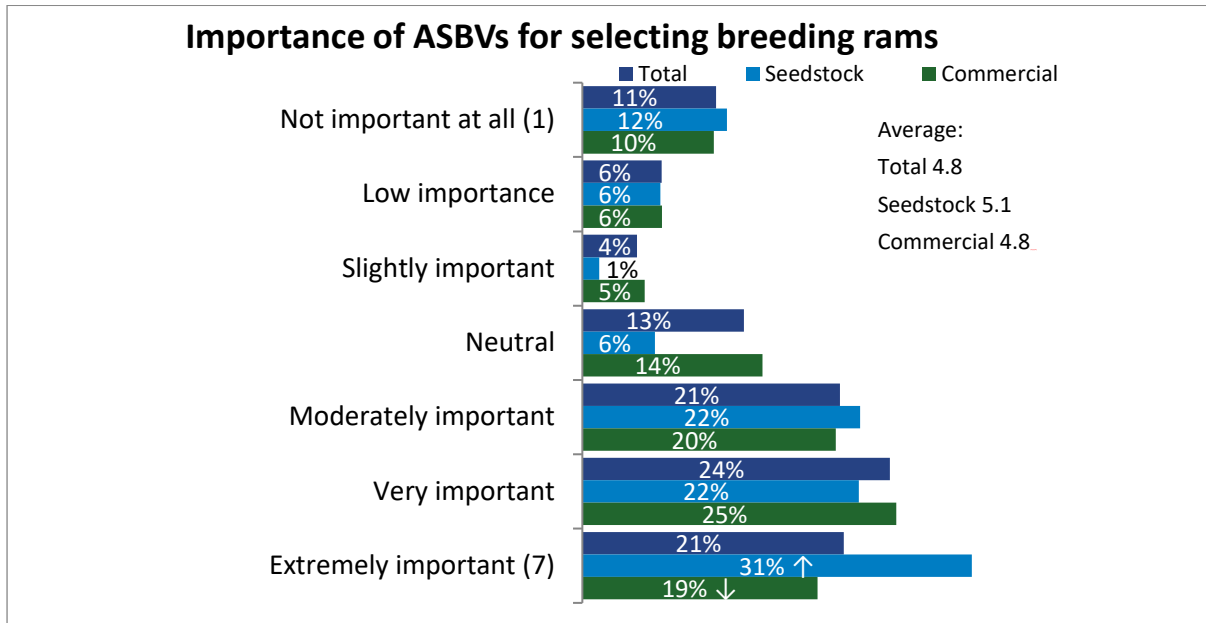
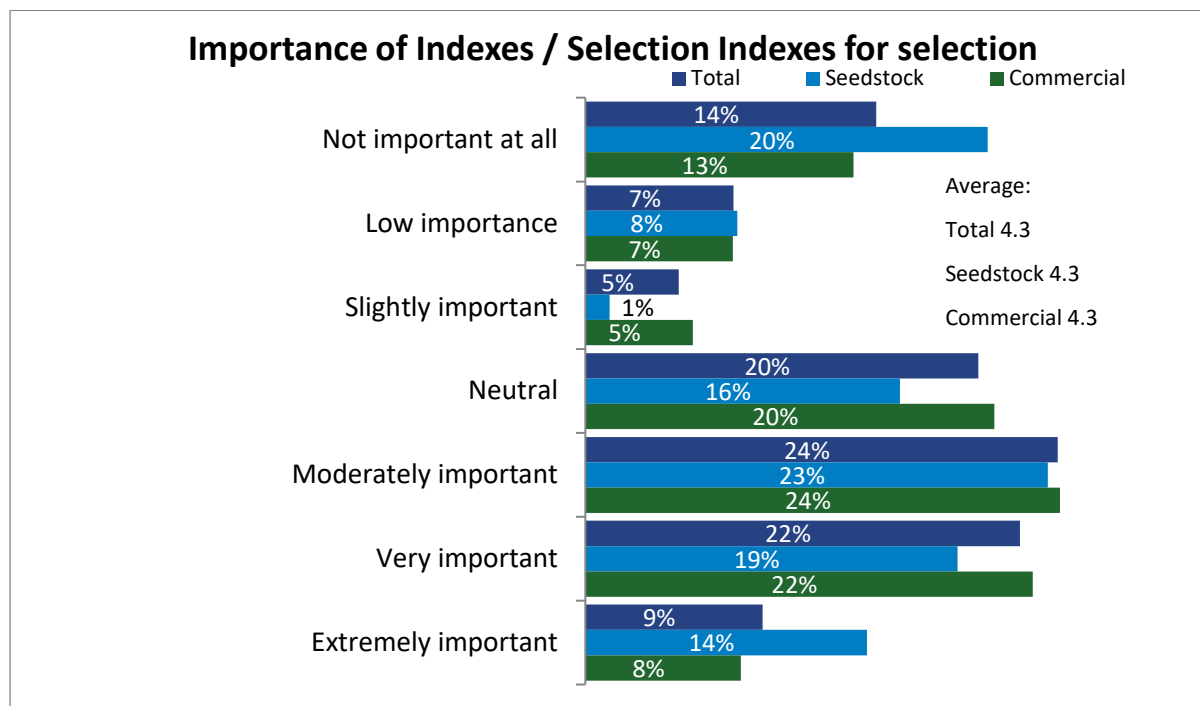


Figure 118. Importance of Indexes / Selection Indexes for breeding ram selection for total sheep (n=696), seedstock (n=111) and commercial (n=585) producers



By segmenting the sheep seedstock and commercial producers into users and non-users of genetic services, a number of attitudes have been identified that limit non-users in their uptake of genetic services.

Seedstock Sheep Genetics non-members and Commercial ASBV non-users share the following attitudinal barriers to adoption:

- Lack of ease in using Sheep Genetics as a routine part of their breeding decisions / work
- Fewer see a genetic payback from using Sheep Genetics
- Little linkage between Sheep Genetics and improving profits
- Indexes are less likely to reflect their breeding objective
- Lack knowledge about how to use Sheep Genetics effectively
- Sheep Genetics data does not provide all they need to know when making breeding decisions

Commercial ASBV non-users also:

- Lack an understanding of how genomics fits in their business
- Are less able to use internet-based services like Sheep Genetics to help them make better business decisions
- Are less likely to find indexes easy to use

In addition, many Seedstock Sheep Genetics non-members lack the confidence that by using Sheep Genetics they will get the genetic traits they want and avoid the ones they do not want.

In contrast, Seedstock Sheep Genetic members and Commercial ASBV users largely agree that they have the knowledge and understanding of Sheep Genetics, can see the financial and decision-making benefits it offers and that they can easily use it.

Full details of the attitudinal differences between users and non-users of genetic services are summarised in Appendix 1.3.

5.8 Training and information

For sheep producers overall, there was a reliance on stock agents (42%) and other farmers (28%) as sources of genetics advice (Figure 119). There were no significant differences among states (Figure 120). Seedstock sheep producers (Figure 121) were likely to prefer to seek advice from Sheep Genetics (36%) or other farmers (35%) while commercial producers (Figure 122) relied more heavily on stock agents (47%).

Figure 119. Sources of genetics advice for sheep producers (n=696)

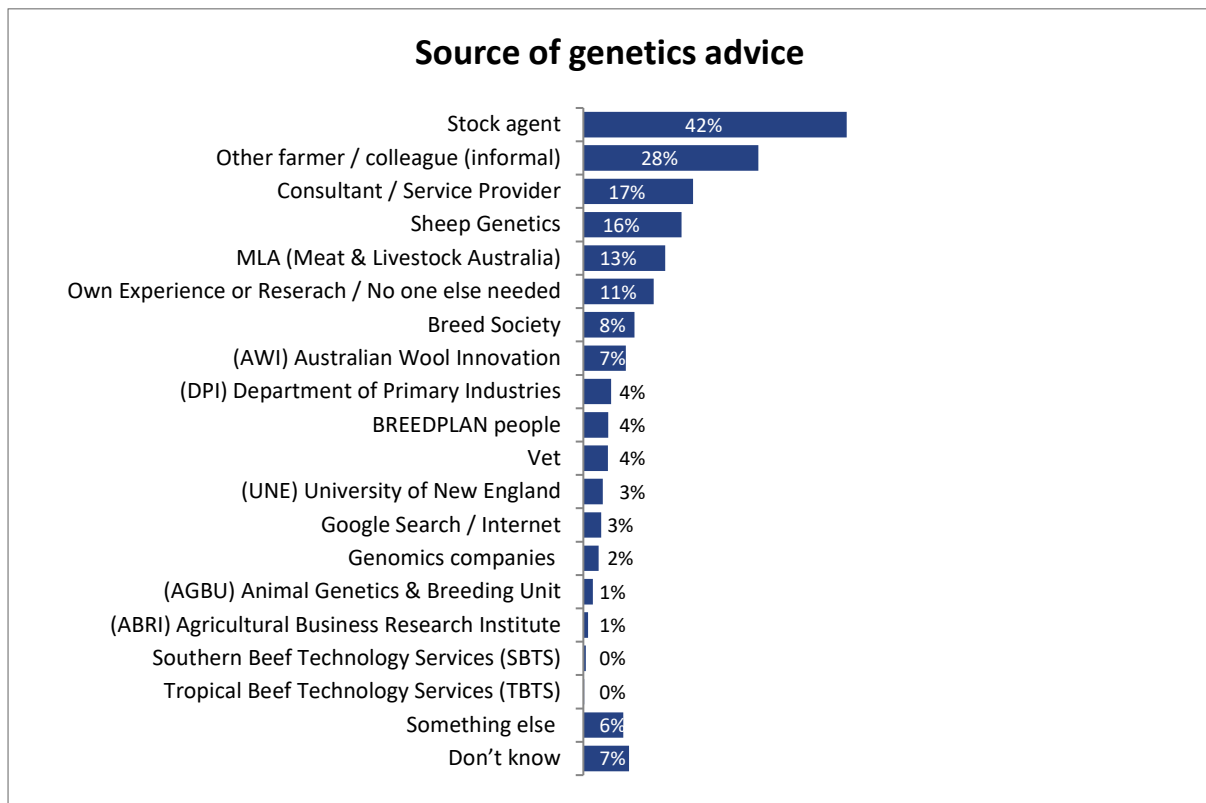


Figure 120. Sources of genetics advice for sheep producers by state

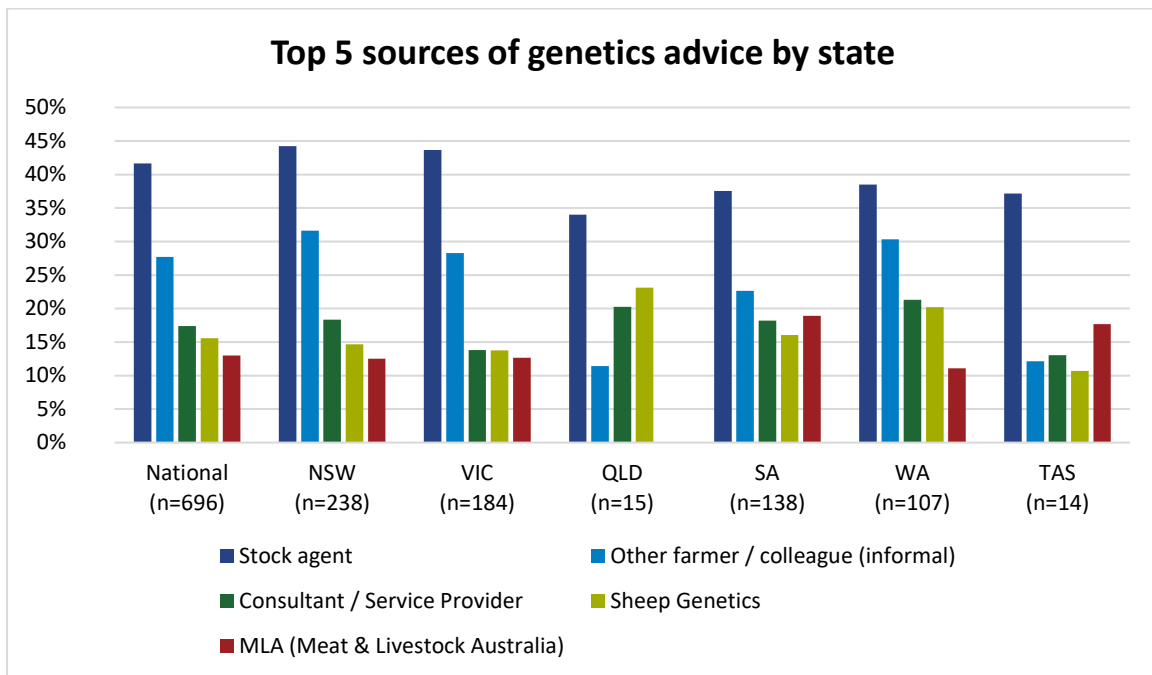


Figure 121. Sources of genetics advice for seedstock sheep producers (n=111)

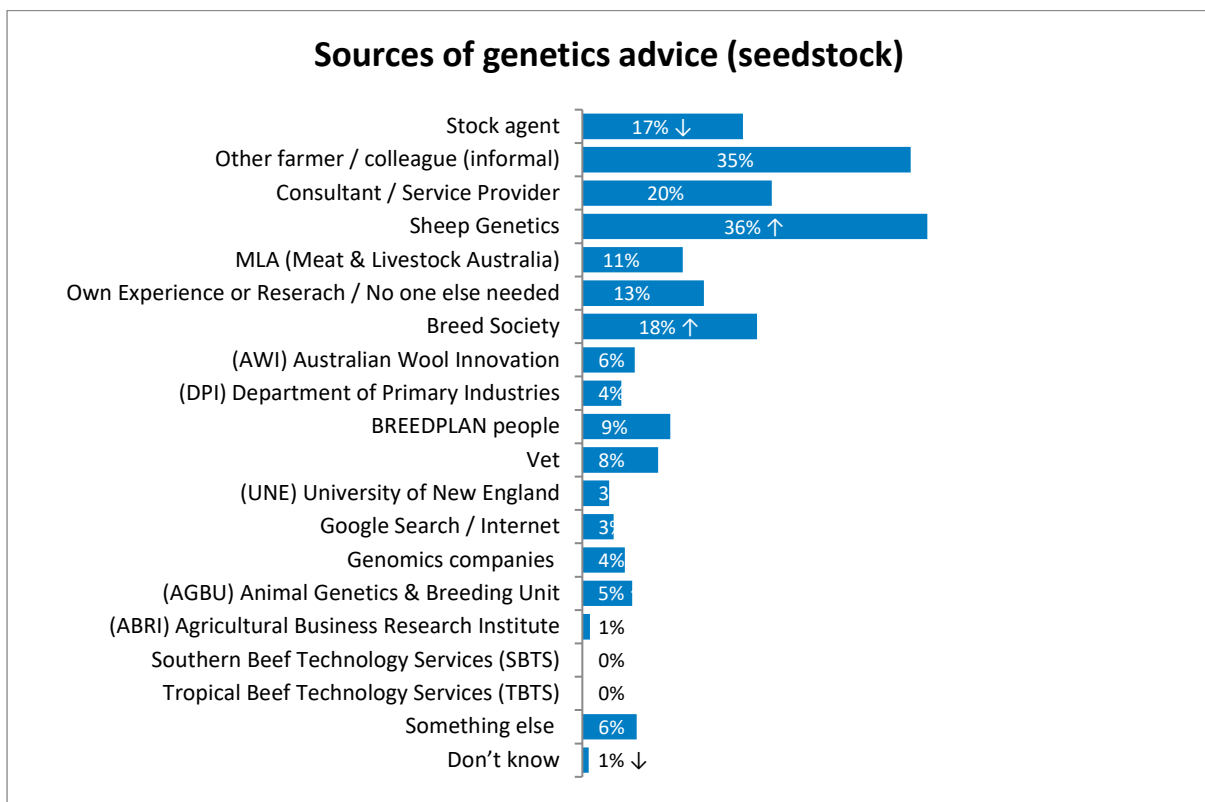
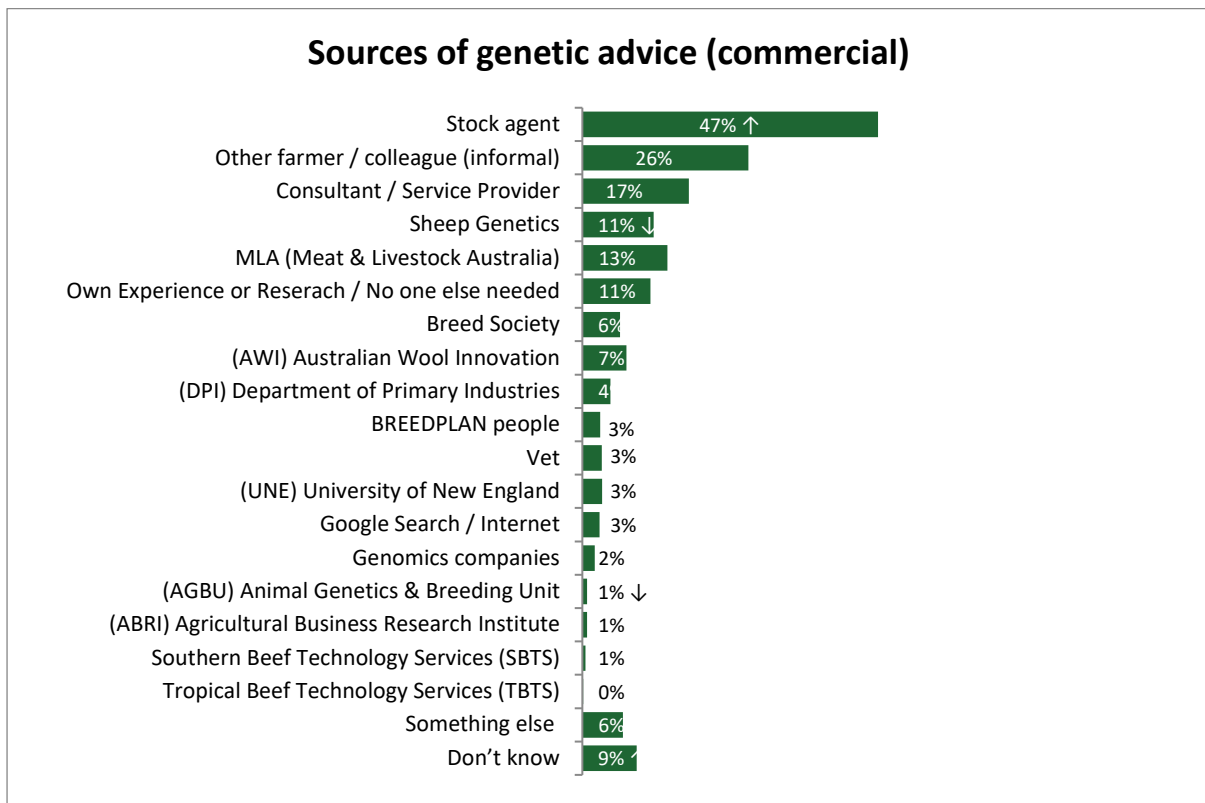


Figure 122. Sources of genetics advice for commercial sheep producers (n=585)

The minority of all sheep producers (27%) had received proper training in the use of LAMBPLAN, MERINOSELCT or ASBVs (Figure 123), with seedstock producers significantly more likely to have training than commercial producers (39% compared to 25%).

When sheep producers did have formal training, Sheep Genetics was the most popular source overall (31%), followed by MLA (23%), a consultant (21%) and DPI (20%) (Figure 124). Seedstock sheep producers (Figure 125) were significantly more likely to have received training from Sheep Genetics (69% compared to 18% of commercial producers (Figure 126)). Commercial sheep producers utilised MLA (23%), consultants (23%) and DPI (24%) relatively equitably.

Where sheep producers have not had proper training or guidance (Figure 127), the biggest reasons given is that they saw no need for it (21%) and that they never got around to it (20%). Both seedstock (Figure 128) and commercial (Figure 129) producers gave 'no need' as a primary reason for not having had proper training (24% and 20%, respectively).

Figure 123. Sheep producers who have participated in proper training or guidance on LAMBPLAN or MERINOSELECT and information such as ASBVs (n in chart)

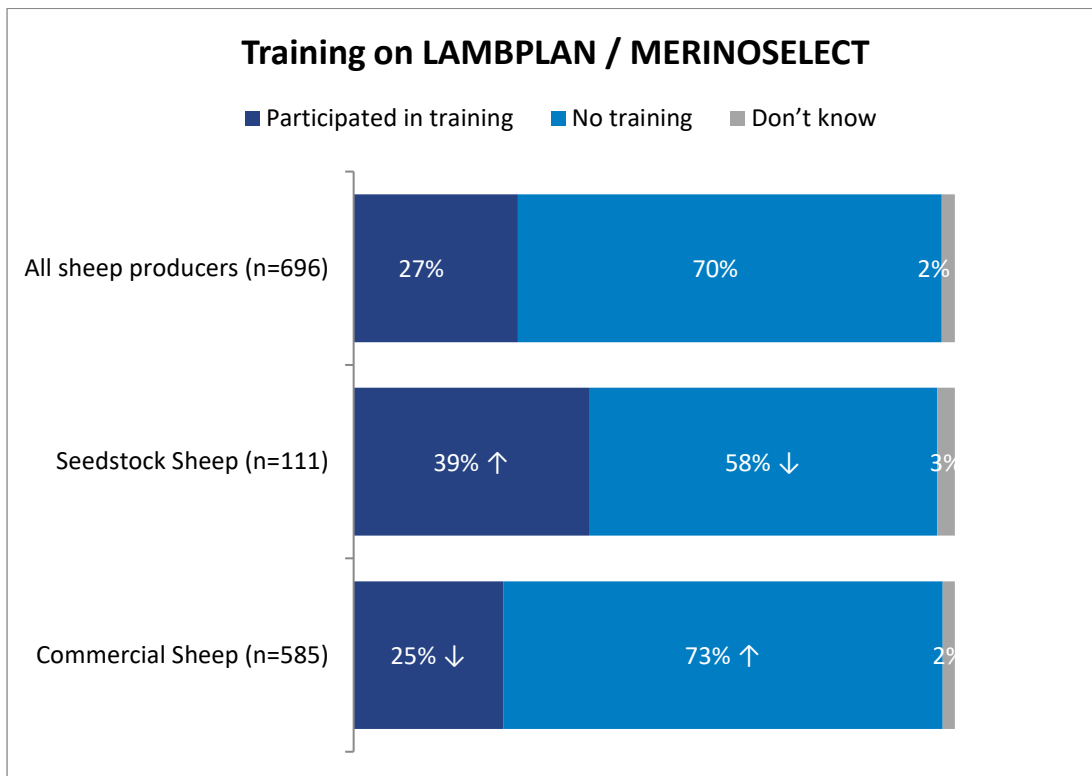


Figure 124. Genetics training providers for all sheep producers - Top 10 responses (n=232)

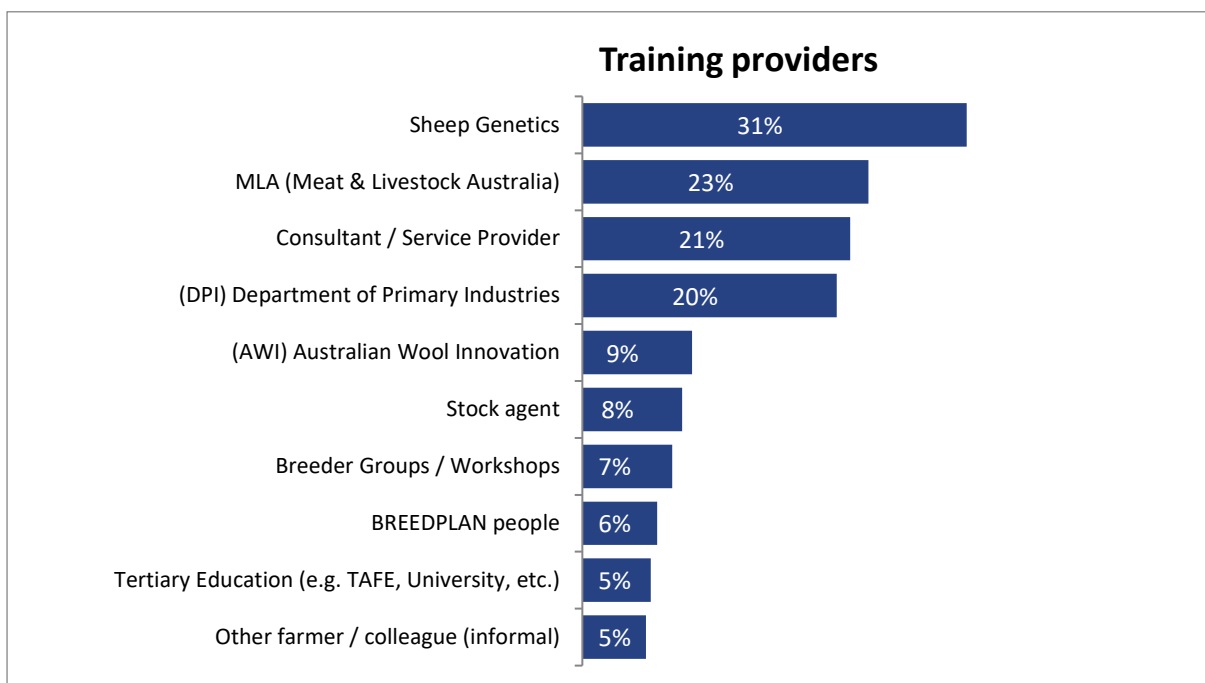


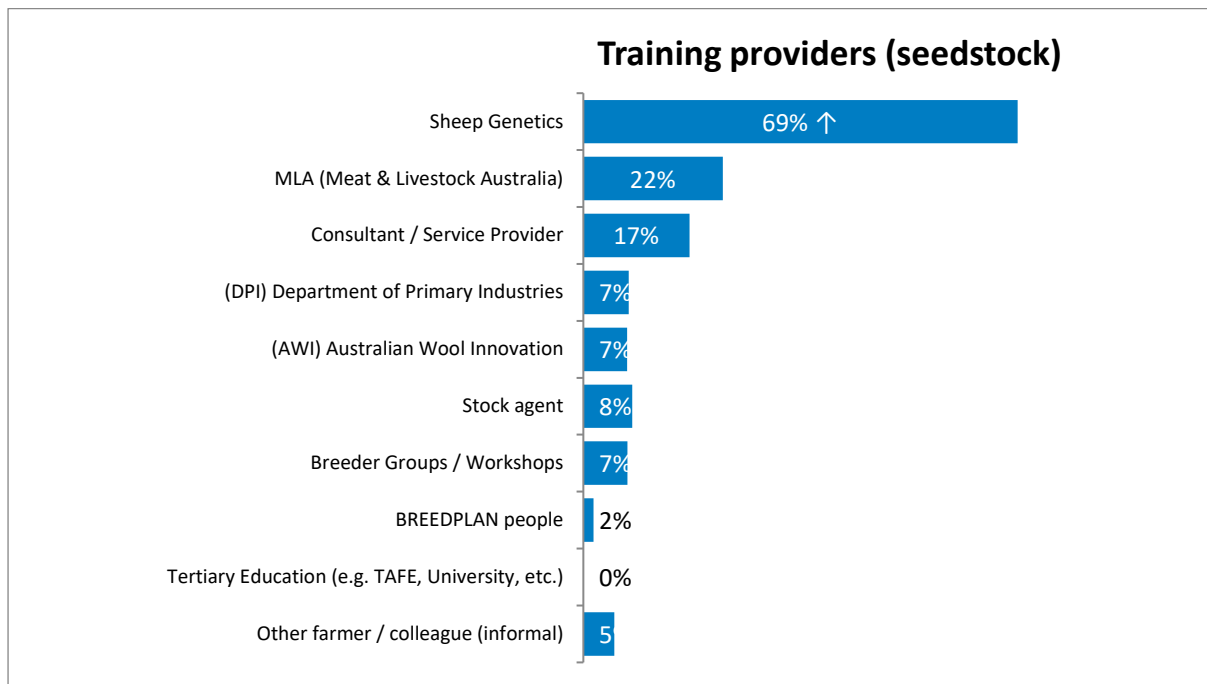
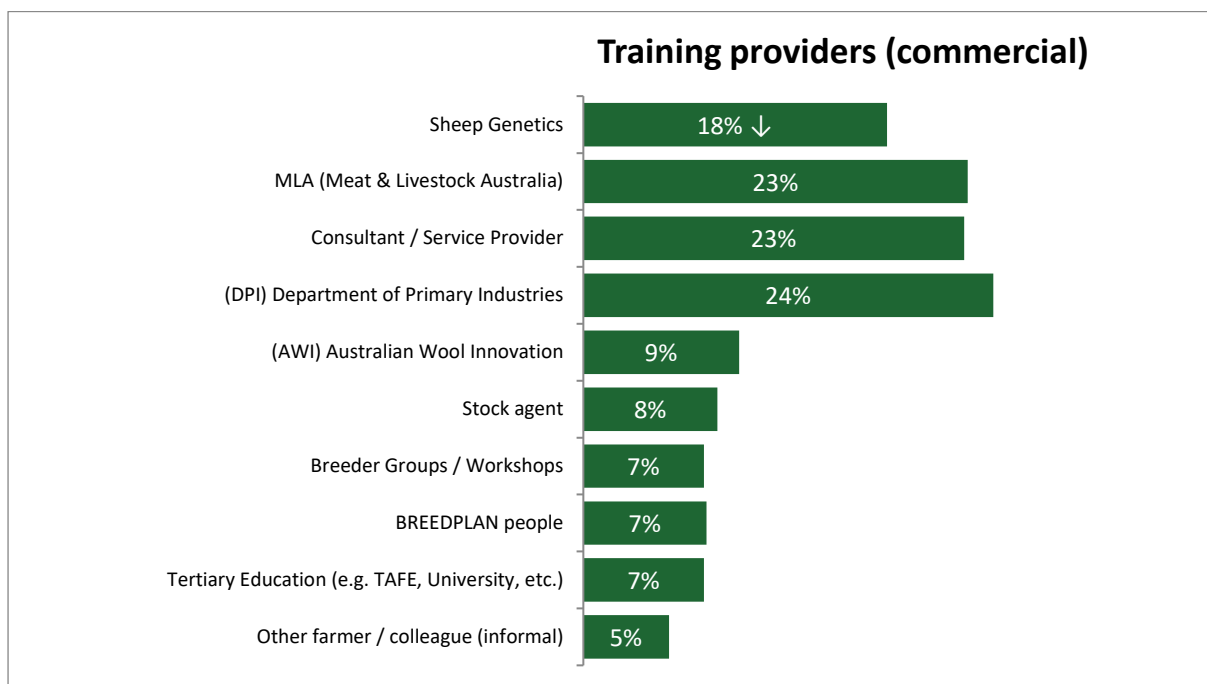
Figure 125. Genetics training providers for seedstock sheep producers - Top 10 responses (n=65)**Figure 126. Genetics training providers for commercial sheep producers - Top 10 responses (n=167)**

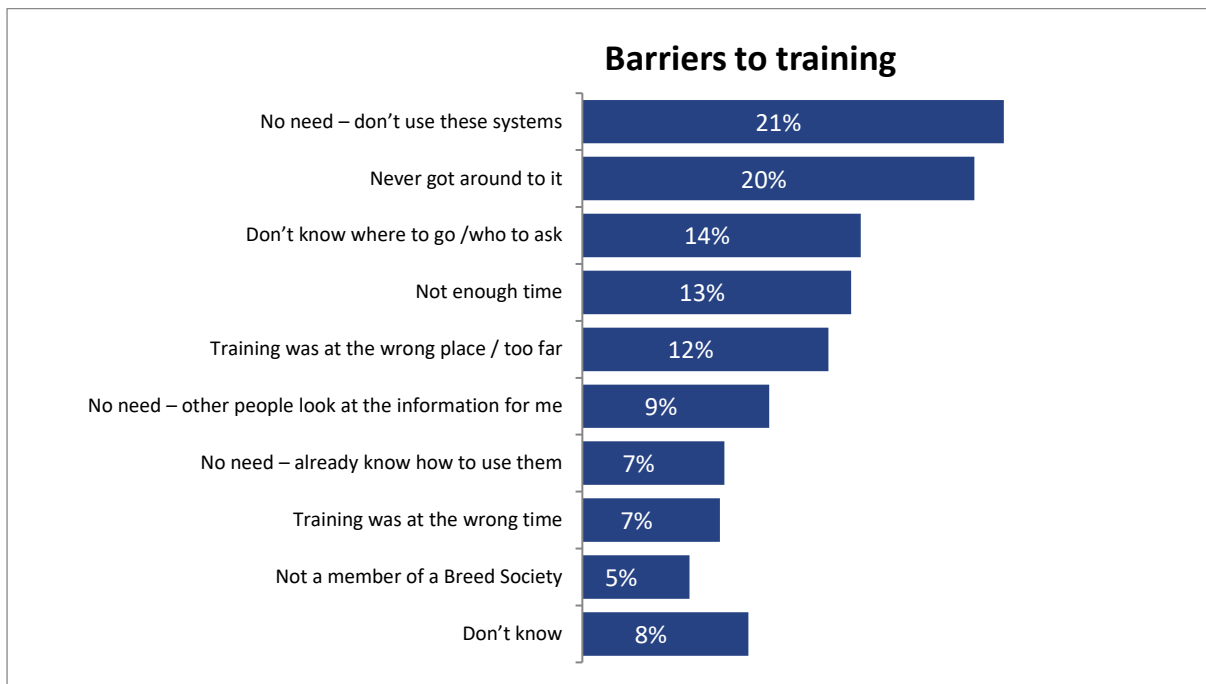
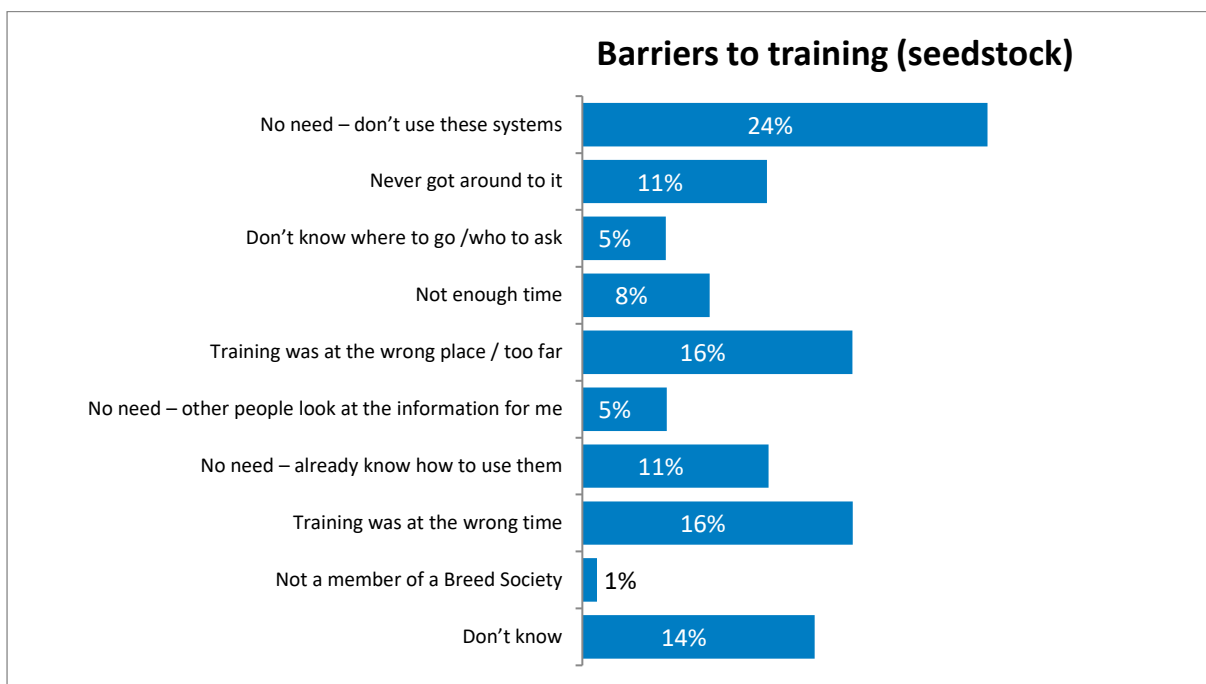
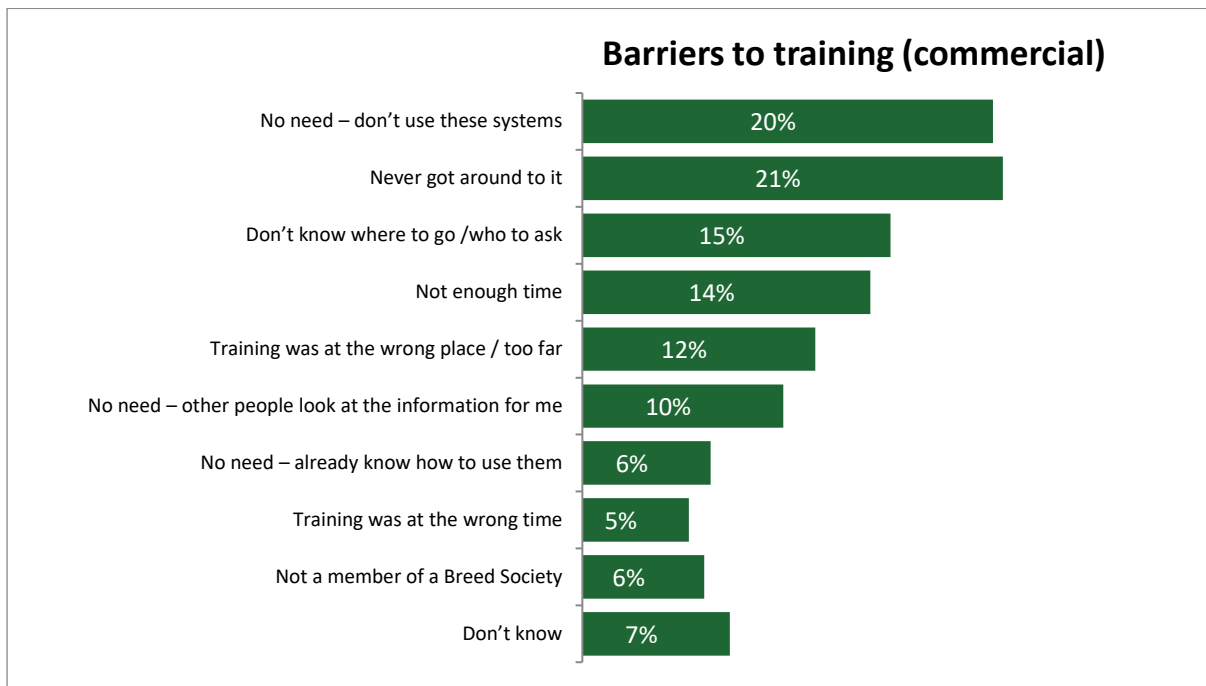
Figure 127. Barriers to receiving proper training or guidance for all sheep producers (n=507)**Figure 128. Barriers to receiving proper training or guidance for seedstock sheep producers (n=63)**

Figure 129. Barriers to receiving proper training or guidance for commercial sheep producers (n=444)



Sheep producers were also asked about where they would seek further training or guidance (Figure 130), with a third (29%) saying they would go to MLA and around a quarter (23%) unsure where they could obtain training. Seedstock producers (Figure 131) were significantly more likely to contact Sheep Genetics (46%), while the top source of further training for commercial sheep producers (Figure 132) was MLA (33%).

A little under half of sheep producers (46%) have visited the LAMBPLAN or MERINOSELECT websites (Figure 133), with ASBVs and indexes explained the most commonly used feature (76%) and MLA Genetics Hub the least used (9%) and lowest awareness feature (46%) (Figure 134).

Figure 130. Sources for further training and guidance for all sheep producers (n=696)

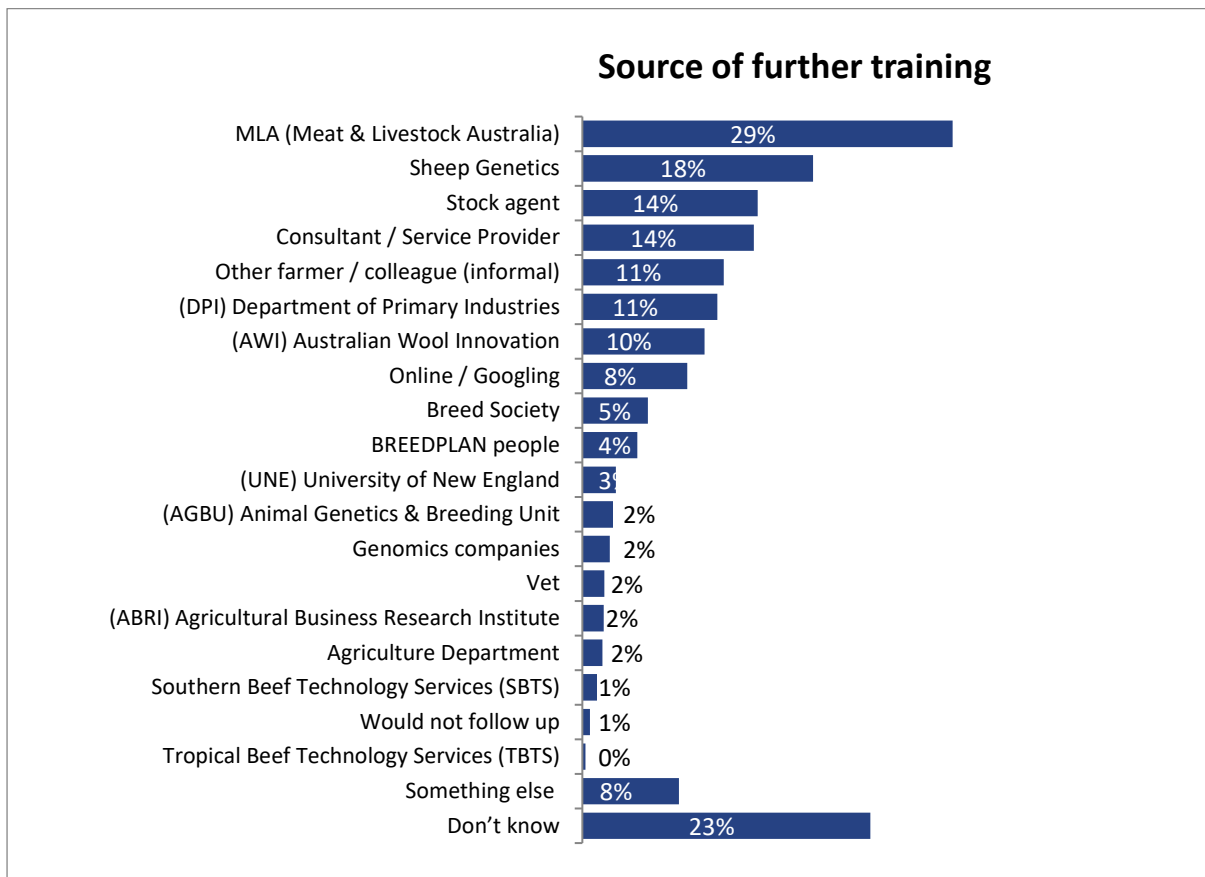


Figure 131. Sources for further training and guidance for seedstock sheep producers (n=111)

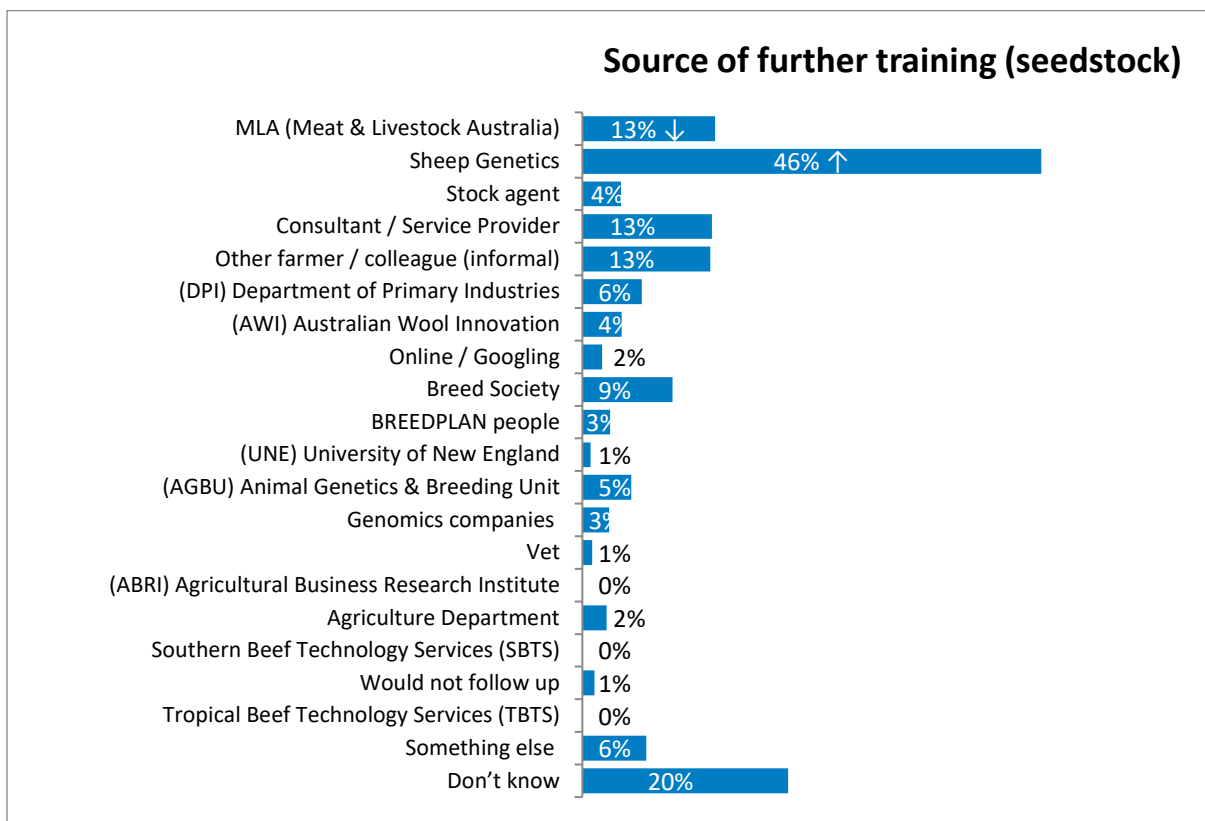


Figure 132. Sources for further training and guidance for commercial sheep producers (n=585)

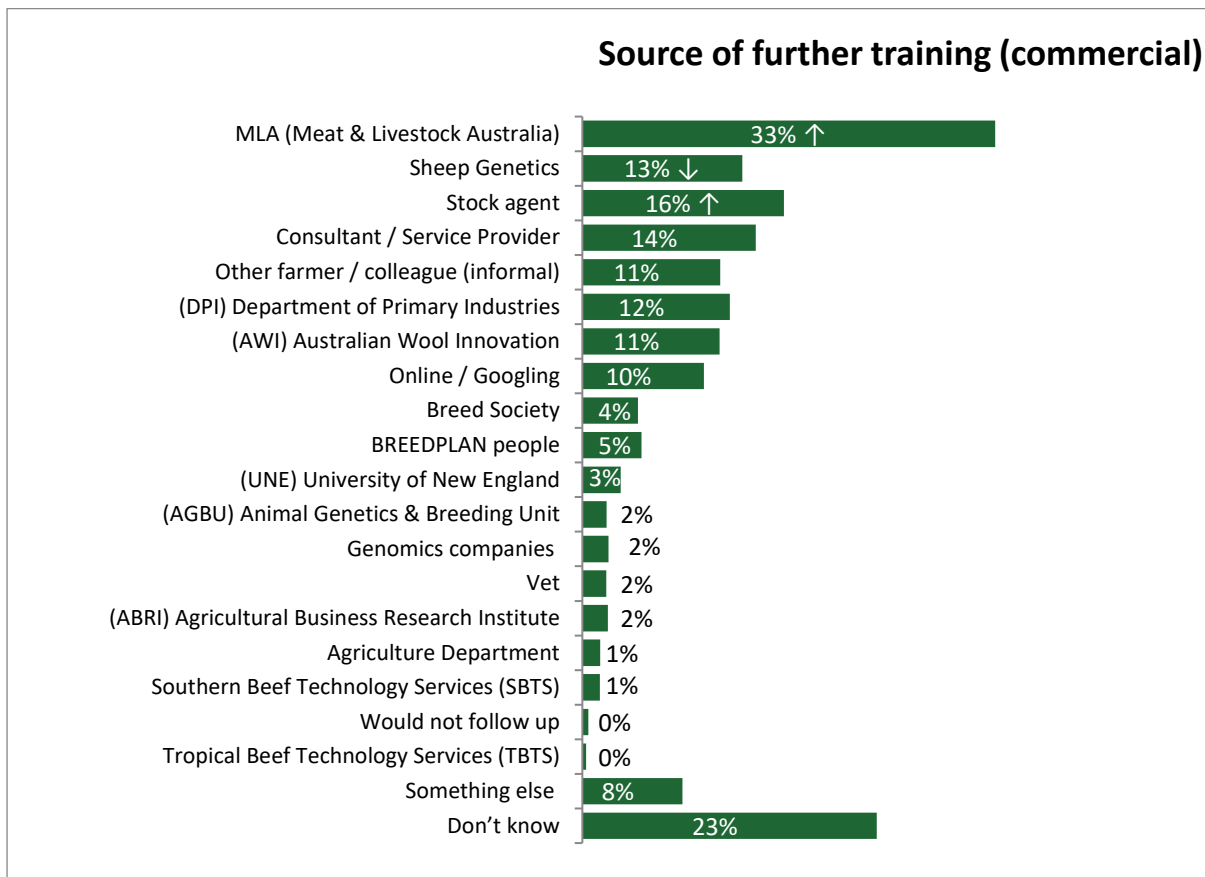


Figure 133. Sheep producers who have visited the LAMBPLAN or MERINOSELECT websites (n=696)

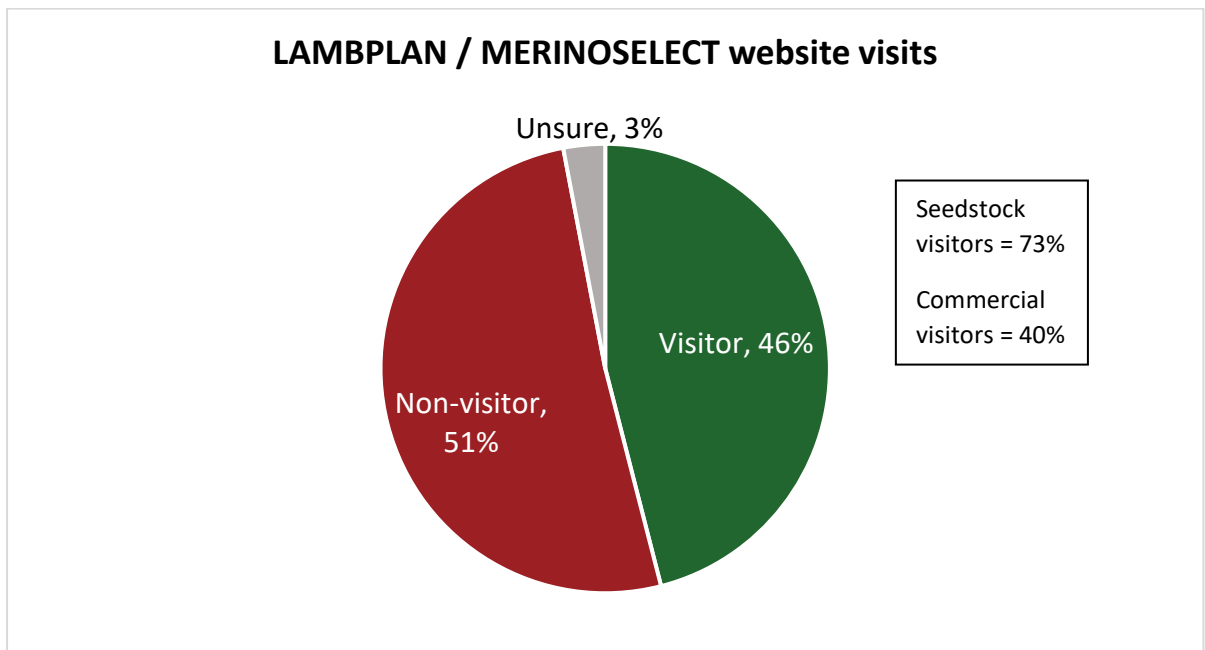
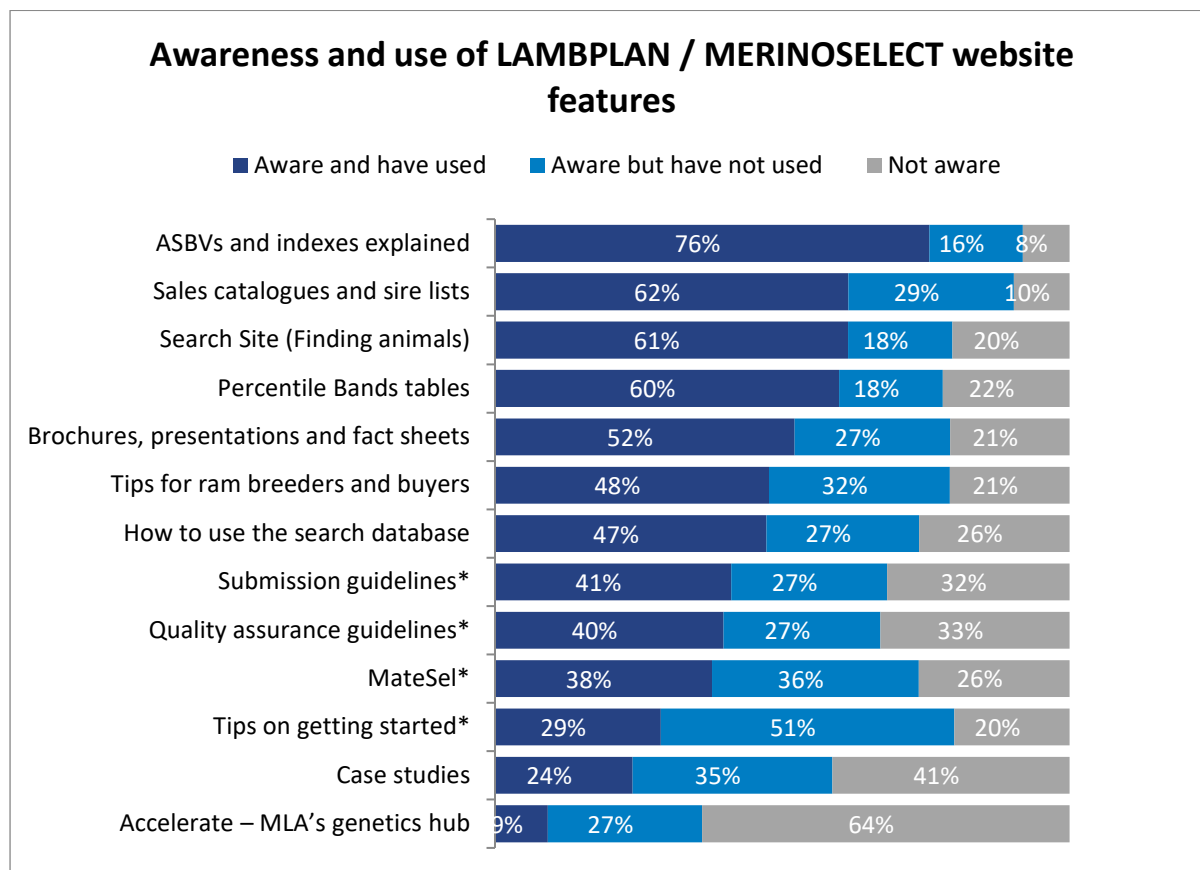


Figure 134. Awareness and use of the LAMBPLAN and MERINOSELECT website features by sheep producers (n=323)



* seedstock producers only (n=83)

5.9 Reputation

MLA was strongly associated with LAMBPLAN and MERINOSELECT by both seedstock (79%) and commercial (59%) sheep producers (Figure 135). Sheep Genetics was also strongly associated by seedstock producers (55%) but less so by commercial sheep producers (27%).

On average, sheep producers are 'just a little' (3.1/5) familiar with Sheep Genetics (Figure 136), with seedstock producers having higher familiarity (3.7/5) than commercial producers (3.0/5). Despite this, overall impressions of the Sheep Genetics systems are 'mainly favourable' (3.9/5 for total sheep and commercial and 3.8 for seedstock producers) (Figure 137).

Overall, sheep producers trusted the Sheep Genetics system 'a little' (4.2/5) (Figure 138), with relatively slightly less trust among seedstock (3.9/5) compared to commercial producers (4.2/5). Seedstock sheep producers also had a lower opinion of the Sheep Genetics system overall (Figure 139), with an average rating of 3.8/5 compared to commercial producers, who said they would speak highly of Sheep Genetics if asked (4.2/5).

Among sheep producers with a critical opinion of Sheep Genetics (Figure 140), the top reason given was issues with methodology (32%) followed by data integrity (23%). Commercial sheep producers were more likely to cite methodology (41%) and data integrity (34%) than seedstock producers (22% and 11%, respectively). Half of all producers who had a positive opinion (50%) of Sheep Genetics

had trust in the science and purpose of the system (Figure 141). There were few differences in the drivers of positive opinions between seedstock and commercial producers.

Figure 135. Organisations that seedstock (n=111) and commercial (n=585) producers associate with LAMPLAN / MERINOSELECT

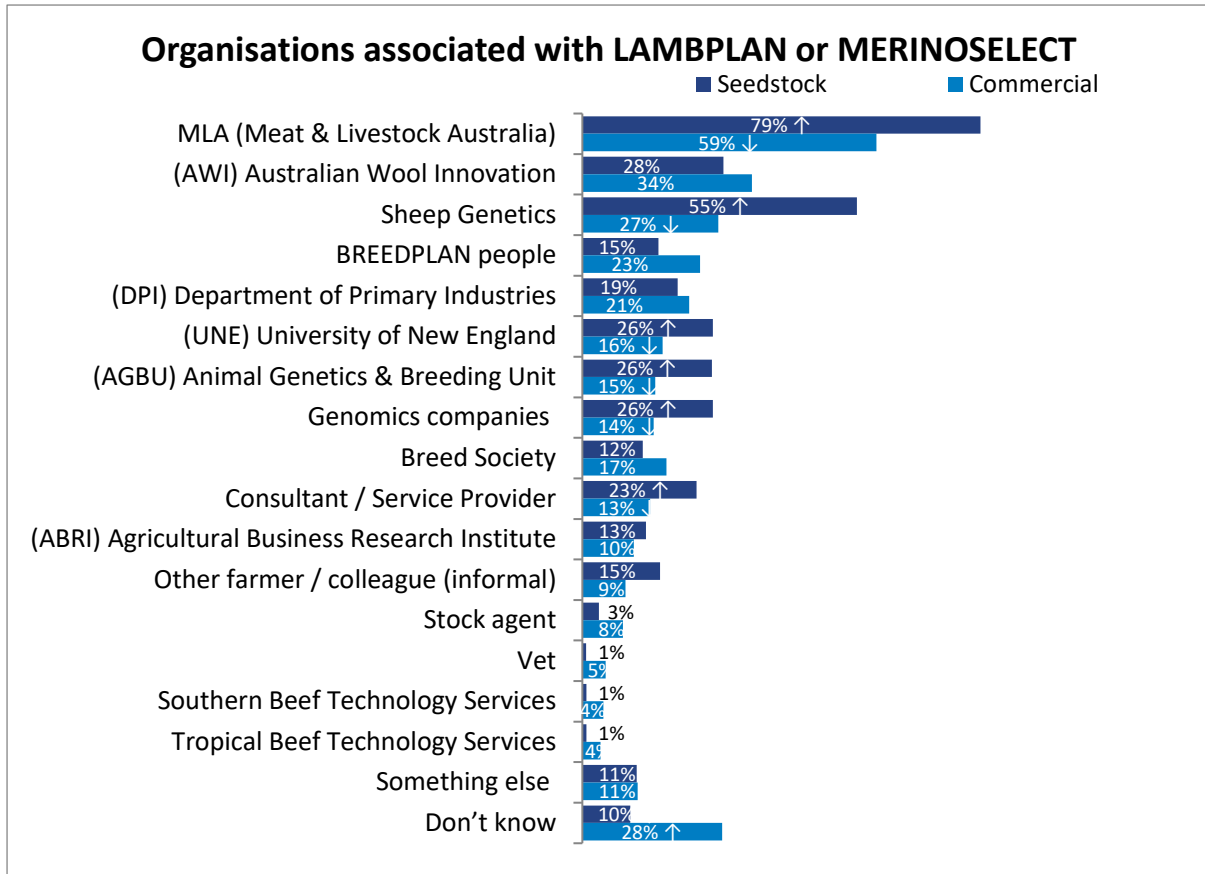


Figure 136. Familiarity with the sheep genetics system among all sheep producers (n=696), seedstock (n=111) and commercial (n=585) sheep producers

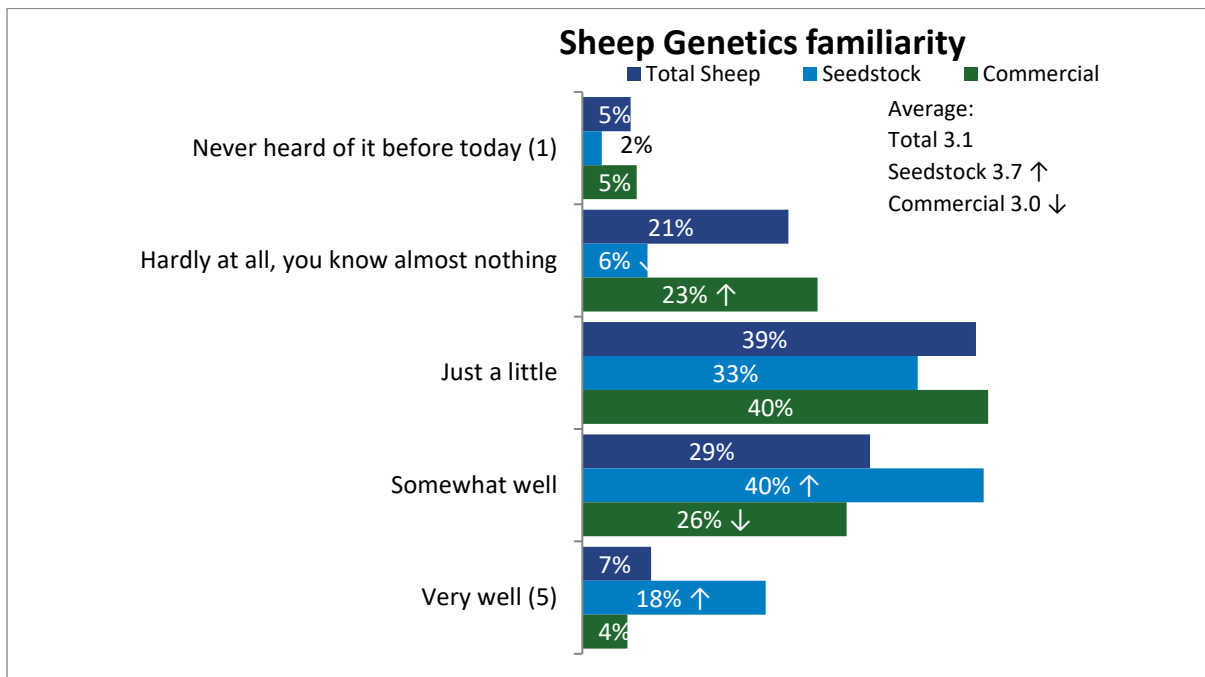


Figure 137. Impressions of the Sheep Genetics systems by all sheep producers (n=696), seedstock (n=111) and commercial (n=585) sheep producers

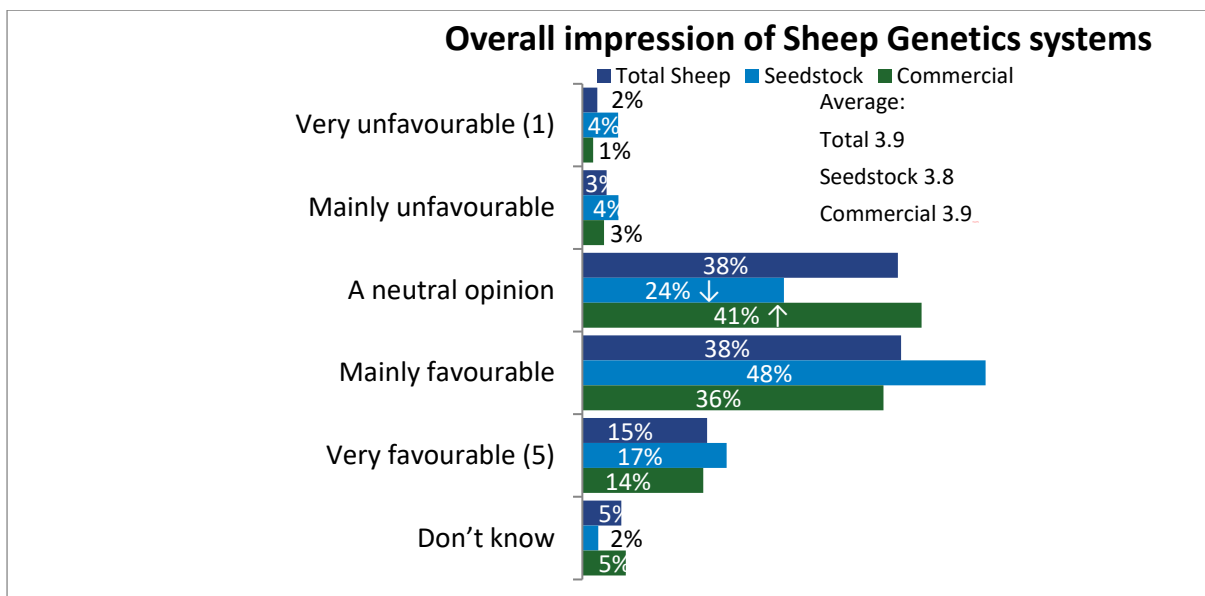


Figure 138. Trust in the overall Sheep Genetics system by all sheep producers (n=696), seedstock (n=111) and commercial (n=585) sheep producers

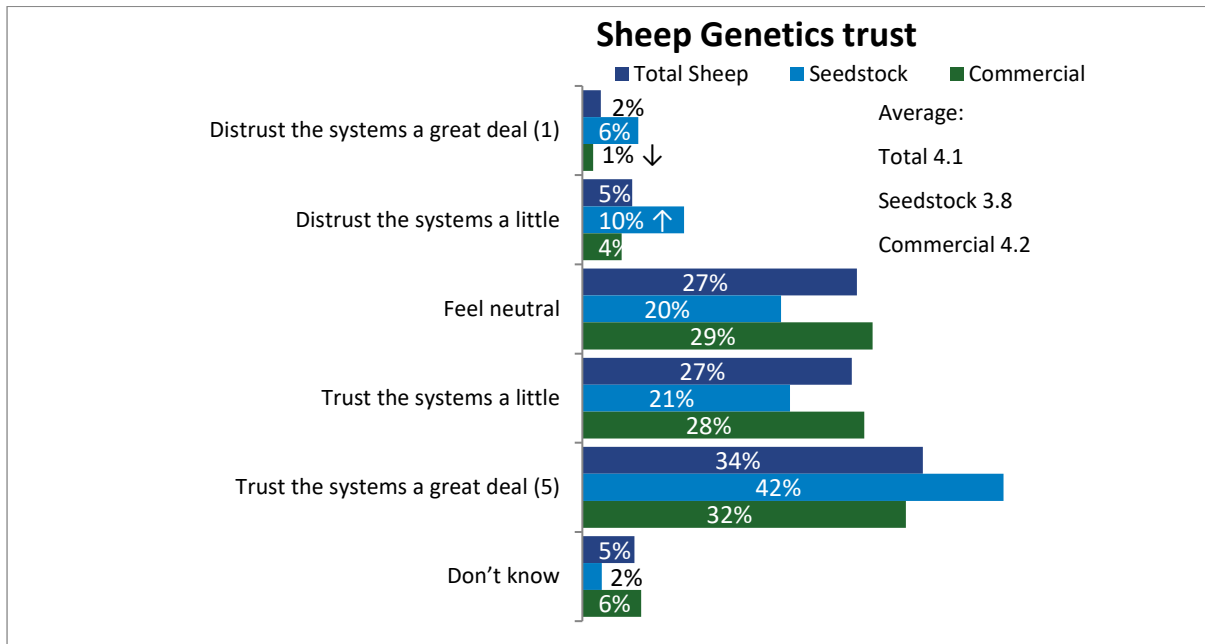


Figure 139. Overall opinion and perceptions of the Sheep Genetics system

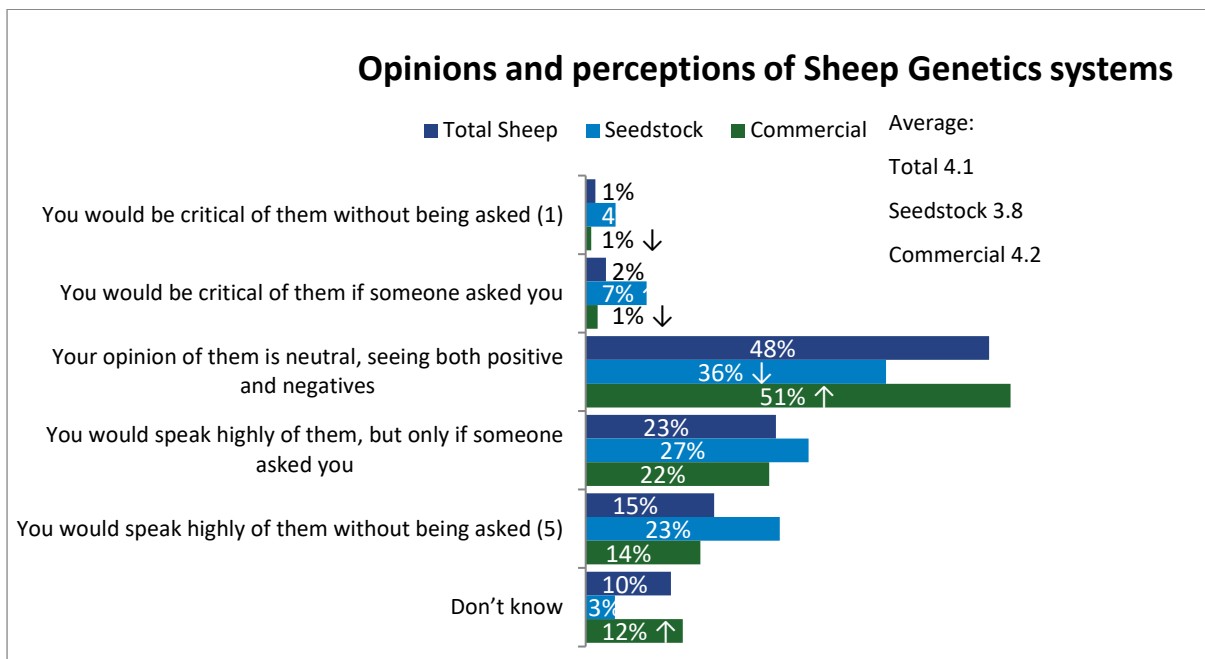


Figure 140. Reasons that sheep producers (n=26) have a critical opinion of Sheep Genetics (seedstock n=13 and commercial n=13)

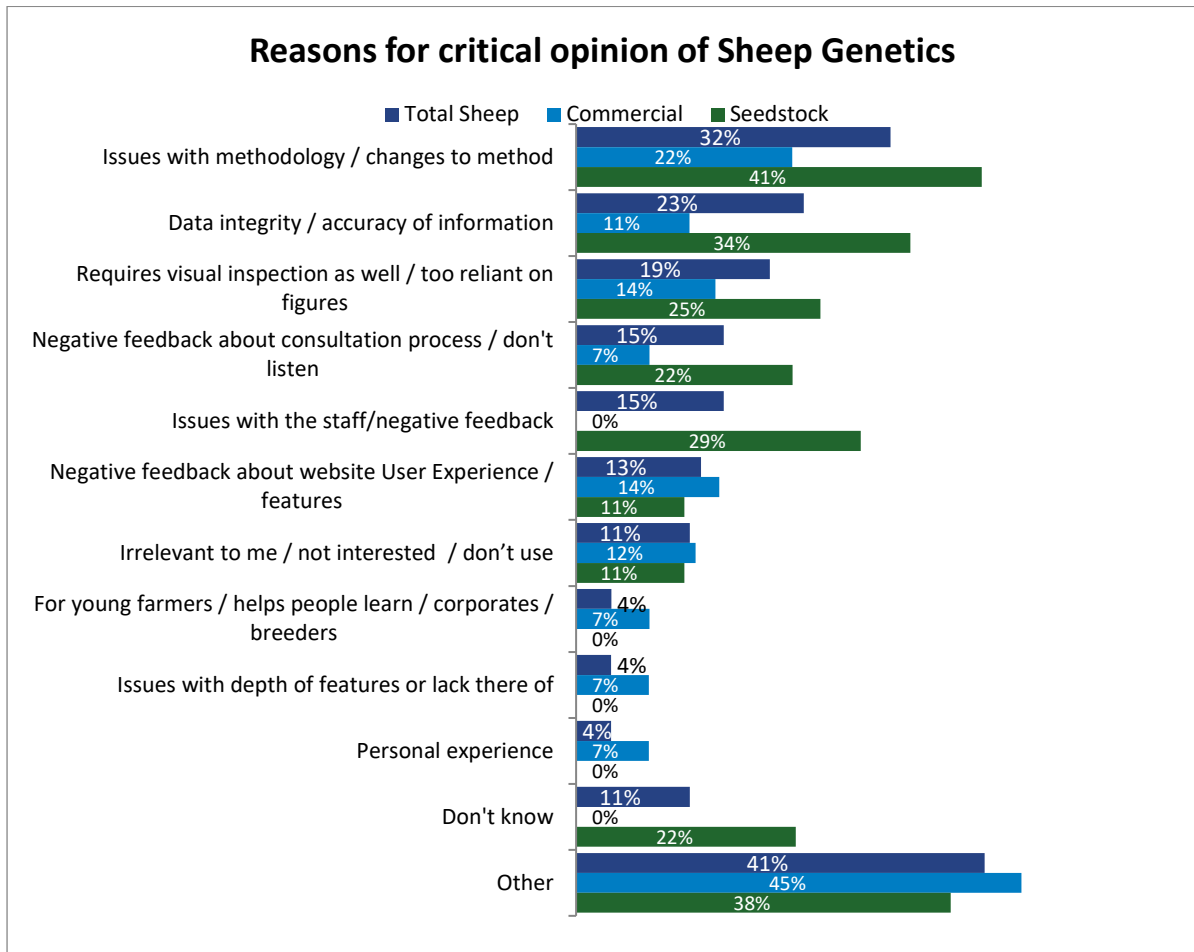
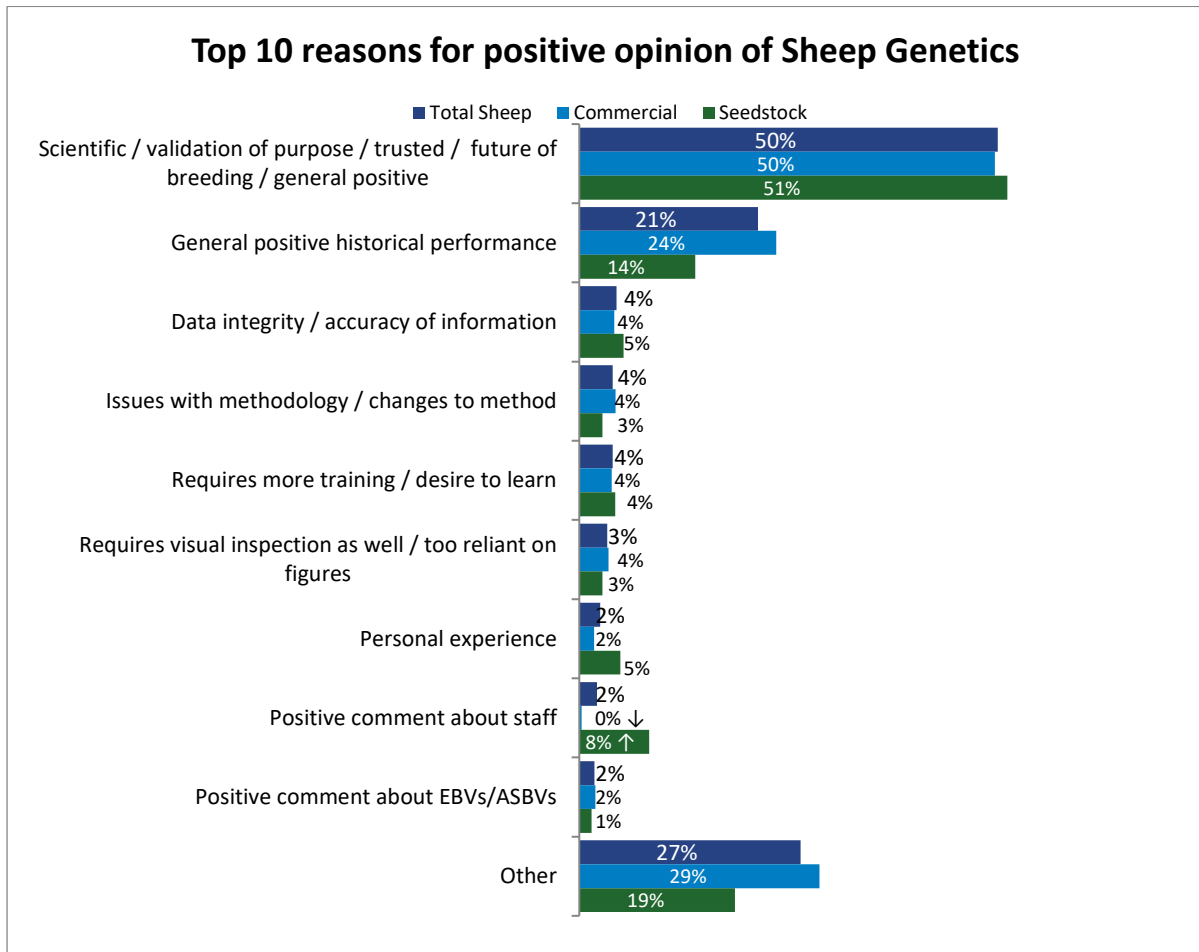


Figure 141. Reasons that sheep producers (n=261) have a positive opinion of Sheep Genetics (seedstock n=52 and commercial n=209)



6. Conclusion and recommendations

6.1 Conclusions

The conclusion from the research is that both cattle and sheep producers are adopting a range of practices and behaviours regarding the uptake of genetic technology of the Australian beef and sheep meat and wool industries. These include:

- The uptake of genetic technology and factors which encourage or inhibit uptake
- Sentiment towards genetic tools, programs and functionality
- Producers' preferred sources of livestock genetic information including different media, people / organisations and different formats (traditional, digital, etc),

The research has provided the benchmark and tracking data to guide MLA's investment and project planning initiatives targeted at cattle and sheep producers.

6.2 Recommendations

1. Develop strategies to address the main barriers to adoption of genetic tools, particularly among non-users

The research has identified the main reasons why producers are not utilising genetic tools. These include barriers such as trust in producers' own 'tried and true' methods, and concerns about accuracy or data capture. These barriers and reasons that prevent adoption of genetic tools and services can be used by MLA to develop message content and message delivery strategies to improve uptake. Producers do acknowledge the importance of EBVs / ASBVs, so there is scope for closing the adoption gap.

At present, the main benefits producers perceive for BREEDPLAN is that that it aids selection / decision making, provides information and acts as a guide. The main benefits perceived for LAMBPLAN / MERINOSELECT are it is a database they can use that provides data to assist in decision making and data regarding genetics. These benefits should be promoted to the target audiences to drive increased genetic tool use.

Importantly, significant differences were found in the attitudes of users and non-users of genomic services. Non-users faced issues around knowledge, understanding, benefits and ease of use of genetic services. MLA should address each of these issues in turn to drive adoption of EBVs and ASBVS.

2. Raise the profile of Sheep Genetics

Sheep producers have a favourable opinion of Sheep Genetics overall but describe themselves as 'just a little' familiar with Sheep Genetics and feel that they have more to learn in order to . There is a strong opportunity here for MLA to raise familiarity and understanding of Sheep Genetics among producers.

3. Improve producer opinions of BREEDPLAN

Producer perceptions of BREEDPLAN were largely positive, driven by a sentiment of trust and scientific validity and a historical reputation for efficacy. Although a minority, detractors voiced concerns about the integrity of the data and issues with the methodology. Addressing these concerns will further improve opinions and perceptions of BREEDPLAN detractors and may spur increased uptake.

4. Encourage producers to participate in formal training

It has been found that only a minority of producers have undertaken formal training or received guidance in the use of BREEDPLAN, LAMBPLAN or MERINOSELECT.

Producers see MLA as an important part of training and information, but there are additional sources they also refer to including other farmers, breed societies, consultants and stock agents. MLA could focus on utilising these other sources to disseminate information to a wider audience. MLA should tailor their information to the specific sources identified for each target audience, for example, breed societies are particularly important to seedstock cattle producers.

Producers say that they either never got around to it, do not know where to go, or do not see the need for training. Emphasising and educating producers about the importance of formal training and the value proposition and benefits of BREEDPLAN / LAMBPLAN / MERINOSELECT and increasing accessibility will also assist in closing the gap in adoption of genetic tools.

5. Increase accessibility of formal training

While nearly a third of producers recognise MLA as a source of further training or guidance, almost one quarter of producers were unable to say where they could obtain training. MLA should consider improving communication on training sources and how producers can access further training.

6. Drive traffic to the BREEDPLAN, LAMBPLAN and MERINOSELECT websites

Around half of producers are not utilising these websites. It is suggested to increase awareness of high priority features where awareness is relatively low or increase use of higher priority segments where awareness is higher but adoption low (i.e., low conversion).

7. Build on sources of genetics advice, including peer-to-peer learning

The main sources of genetics advice that both beef and sheep commercial producers sought from were from other producers/colleagues, stock agents, livestock advisors and vets (beef). It is suggested to increase adoption activities that build relationships with other producers (peer-to-peer learning) and to develop training activities specific for those who producers seek genetics advice from.

8. Repeat the full survey every two years to track industry progress

It is recommended to repeat the comprehensive, large-scale survey every two years. This will provide an accurate assessment of change across different groups of cattle and sheep producers and better guidance for MLA's strategy refinement.

Appendices

1.1 Sample Selection

Table 8. Sampling - Cattle

| State | 50 – 399 head | | 400 – 1,599 head | | 1,600+ head | | Total | |
|--------------|------------------|---------------------|------------------|--------------------|----------------|-------------------|------------|---------------|
| | Sample | Population | Sample | Population | Sample | Population | Sample | Population |
| NSW | 146 | 10,489 | 57 | 2,754 | 5 | 300 | 208 (33%) | 13,542 (35%) |
| VIC | 101 | 7,128 | 28 | 1,024 | 3 | 119 | 132 (21%) | 8,271 (21%) |
| QLD | 117 | 6,054 | 64 | 3,359 | 28 | 1,639 | 209 (33%) | 11,052 (28%) |
| SA | 10 | 645 | 10 | 1,129 | 5 | 627 | 25 (4%) | 2,401 (7%) |
| WA | 30 | 1,557 | 5 | 634 | 4 | 177 | 39 (6%) | 2,368 (6%) |
| TAS | 12 | 1,007 | 3 | 202 | - | 59 | 15 (2%) | 1,268 (3%) |
| NT | 1 | 24 | 3 | 26 | 7 | 138 | 11 (2%) | 188 (0.5%) |
| Total | 417 (65%) | 26,904 (69%) | 170 (27%) | 9,128 (23%) | 52 (8%) | 3,058 (8%) | 639 | 39,090 |

Table 9. Sampling - Sheep

| State | 50 – 499 head | | 500 – 1,999 head | | 2,000+ head | | Total | |
|--------------|---------------|---------------|------------------|--------------|-------------|--------------|------------|---------------|
| | Sample | Population | Sample | Population | Sample | Population | Sample | Population |
| NSW | 46 | 4,537 | 106 | 3,220 | 86 | 3,133 | 238 | 10,889 |
| VIC | 33 | 3,684 | 84 | 2,404 | 67 | 1,624 | 184 | 7,713 |
| QLD | 1 | 739 | 7 | 182 | 7 | 231 | 15 | 1,152 |
| SA | 17 | 1,536 | 74 | 1,724 | 47 | 1,404 | 138 | 4,664 |
| WA | 12 | 1,253 | 40 | 974 | 55 | 1,813 | 107 | 4,041 |
| TAS | 1 | 580 | 5 | 167 | 8 | 165 | 14 | 912 |
| Total | 110 | 12,330 | 316 | 8,670 | 270 | 8,371 | 696 | 29,371 |

1.2 Sampling

Interpretation of Results

- It should be noted that the results presented in this study are derived from a **survey** (as opposed to a census when all members of a population are captured). Survey results are used to make inferences about the total population
- As all surveys are subject to errors, a **survey result** should not be treated as a single value but rather as the **midpoint of the likely range** that the true population result would lie within. The range around the survey result is the “margin of error”
- For example, a survey result of 50% may have a **margin of error** of plus or minus 6 percentage points i.e., 44% - 56%. The margin of error depends on the sample size (smaller sample sizes have larger errors) and the actual sample result (a result closer to 50% has a larger percentage

error). Due to a high margin of error associated with a small sample, results based on a small sample in the analysis should be treated with caution. Care should be taken with any results from a sample of less than 20

- The margin of errors for different sample sizes and different survey results are presented in the following table. The matrix is based on a **90% confidence level**, that is, you are 90% confident that the true result (the result derived from interviewing the entire population) would be in the range specified in the table
- To aid the reader in identifying statistical differences between demographic groups, data points on charts in the report have been highlighted with an **up (↑) or down (↓) symbol**. The up arrow indicates that the result is statistically higher than the result for the total (national) sample at a 90% confidence level. The down arrow indicates the result is statistically lower than the total sample result. Similar highlights are used in the Excel tables.

Table 10. Margin of error* for survey results based on different sample sizes

| Sample | Survey Result | | | | | | | | | |
|--------|---------------|----------|---------|---------|---------|---------|---------|---------|---------|-----|
| | 5%/95% | 10%/ 90% | 15%/85% | 20%/80% | 25%/75% | 30%/70% | 35%/65% | 40%/60% | 45%/55% | 50% |
| 25 | 7% | 10% | 12% | 13% | 14% | 15% | 16% | 16% | 16% | 16% |
| 50 | 5% | 7% | 8% | 9% | 10% | 11% | 11% | 11% | 12% | 12% |
| 75 | 4% | 6% | 7% | 8% | 8% | 9% | 9% | 9% | 9% | 9% |
| 100 | 4% | 5% | 6% | 7% | 7% | 8% | 8% | 8% | 8% | 8% |
| 200 | 3% | 4% | 4% | 5% | 5% | 5% | 6% | 6% | 6% | 6% |
| 300 | 2% | 3% | 3% | 4% | 4% | 4% | 5% | 5% | 5% | 5% |
| 400 | 2% | 2% | 3% | 3% | 4% | 4% | 4% | 4% | 4% | 4% |
| 500 | 2% | 2% | 3% | 3% | 3% | 3% | 3% | 4% | 4% | 4% |
| 600 | 1% | 2% | 2% | 3% | 3% | 3% | 3% | 3% | 3% | 3% |
| 700 | 1% | 2% | 2% | 2% | 3% | 3% | 3% | 3% | 3% | 3% |

*Based on 90% confidence level

As a guide to interpretation, a survey result of 30% from a sample of 700 respondents (ie National Sheep sample n = 696) would have a margin of error of 3 percentage points, that is, you are 90% confident that the true answer would lie between 27% and 33%. A result of 30% from a sample of 100 respondents (eg Sheep Seedstock n = 111) would have a higher error of plus / minus 8%

Table 11. Significant differences based on a 90% confidence level are highlighted in the Excel cross-tabular results

| 2.34. Do you use genomics products in your business? by BANNER - Beef Tables | | | | | | | | | | | |
|--|----------|----------|-----|---------------------------|-----------|---------------------------|--------------------|-------|---------------------------------|---------|-------|
| | Total | S2 State | | S6 Beef Production System | | S12 Temperate or Tropical | | | S8 Herd size (breeding females) | | |
| Column % | National | NSW | VIC | Commercial | Seedstock | Temperate (TE Only) | Tropical (TR Only) | Both | 50-199 | 200-799 | 800+ |
| Yes | 23% | 28% ↑ | 23% | 13% ↓ | 70% ↑ | 25% | 23% | 13% ↓ | 18% ↓ | 24% | 34% ↑ |
| No | 67% | 61% ↓ | 68% | 76% ↑ | 27% ↓ | 65% | 64% | 79% ↑ | 71% | 66% | 61% |
| Don't know | 10% | 11% | 9% | 11% | 4% | 10% | 13% | 8% | 11% | 10% | 4% |
| Column n | 639 | 208 | 132 | 525 | 114 | 412 | 113 | 113 | 275 | 261 | 103 |

Note that results based on sample sizes less than 20 should be treated with caution.

1.3 In-depth attitude analysis

Figure 142. Cattle seedstock producer attitudes on breeding planning and production systems (1/2) (n=114)

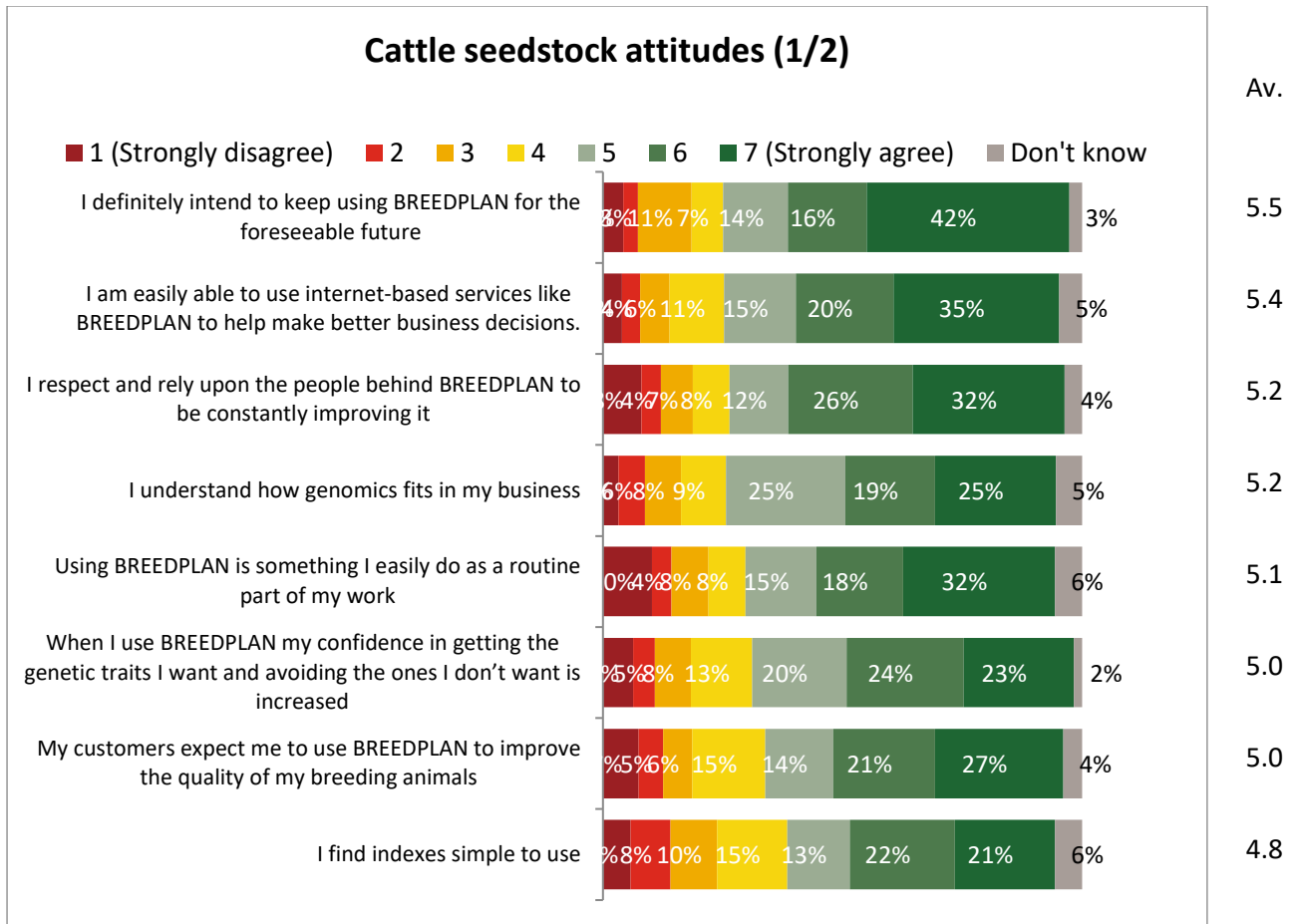


Figure 143. Cattle seedstock producer attitudes on breeding planning and production systems (2/2) (n=114)

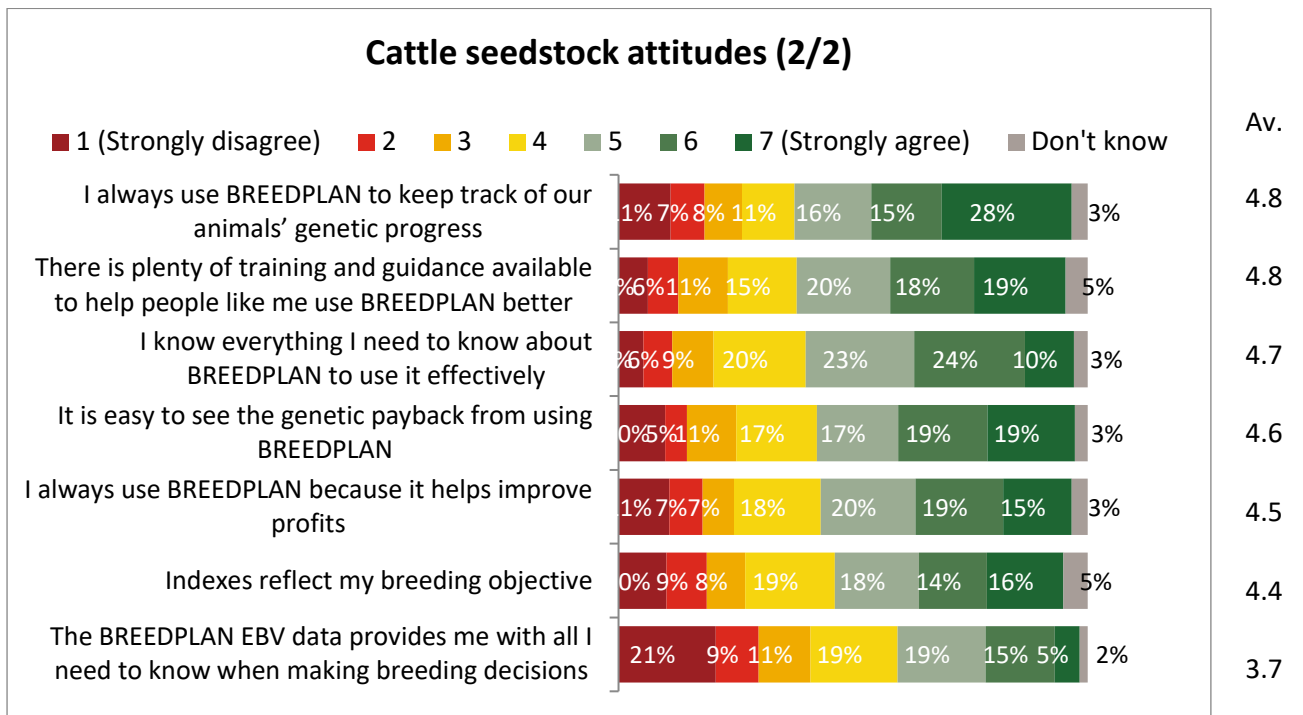


Figure 144. Cattle commercial producer attitudes on breeding planning and production systems (1/2) (n=525)

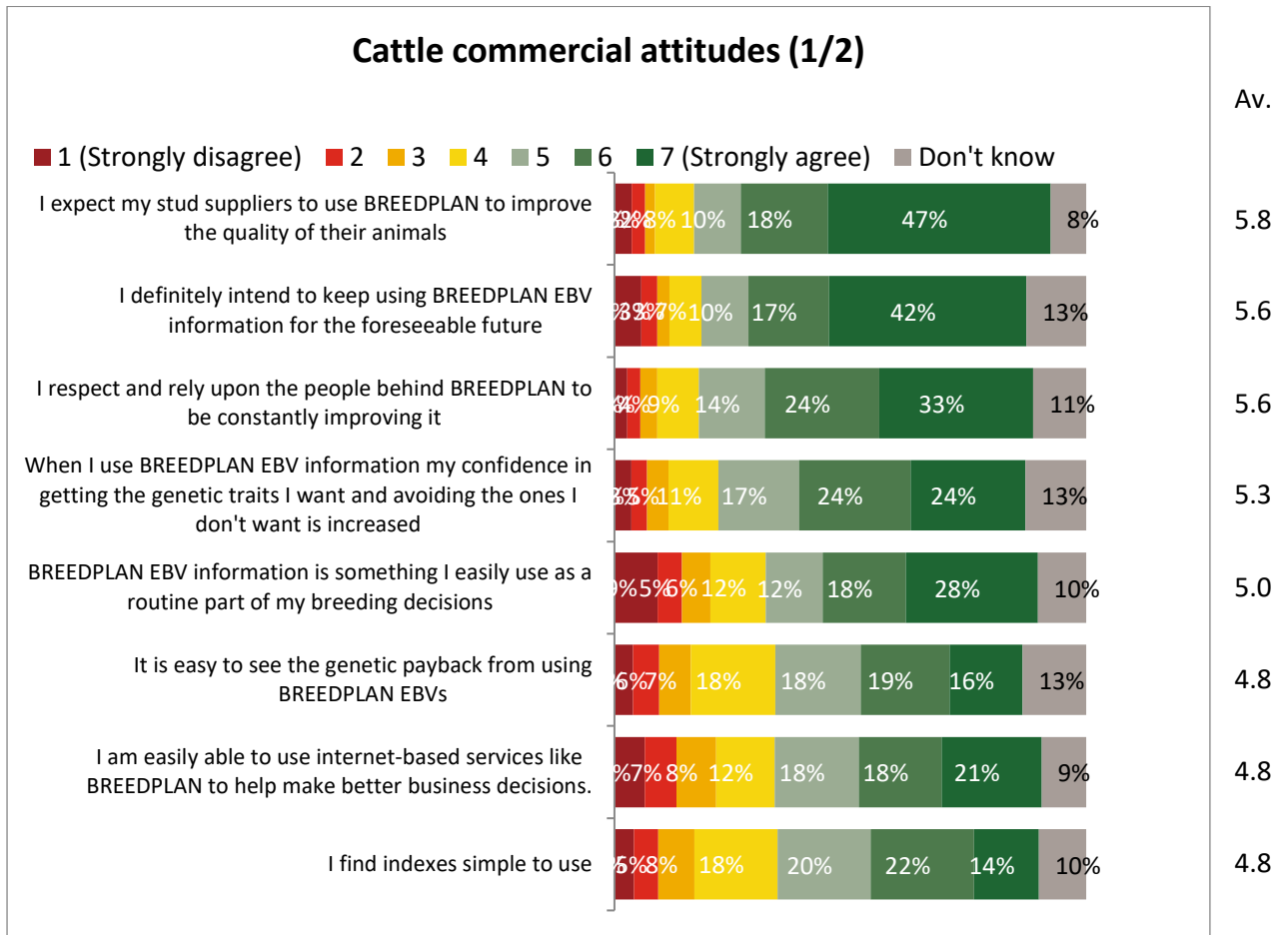


Figure 145. Cattle commercial producer attitudes on breeding planning and production systems (2/2) (n=525)

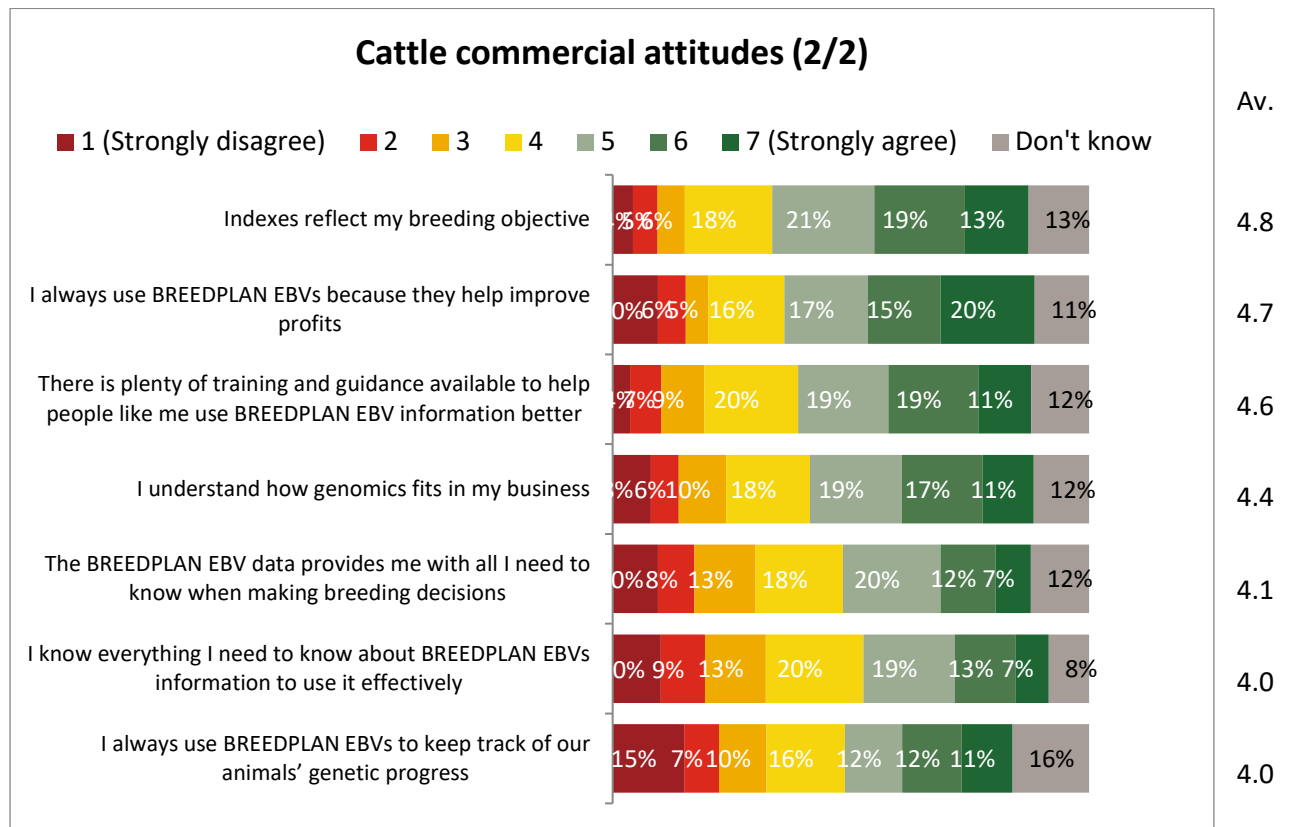


Figure 146. Sheep seedstock producer attitudes on breeding planning and production systems (1/2) (n=111)

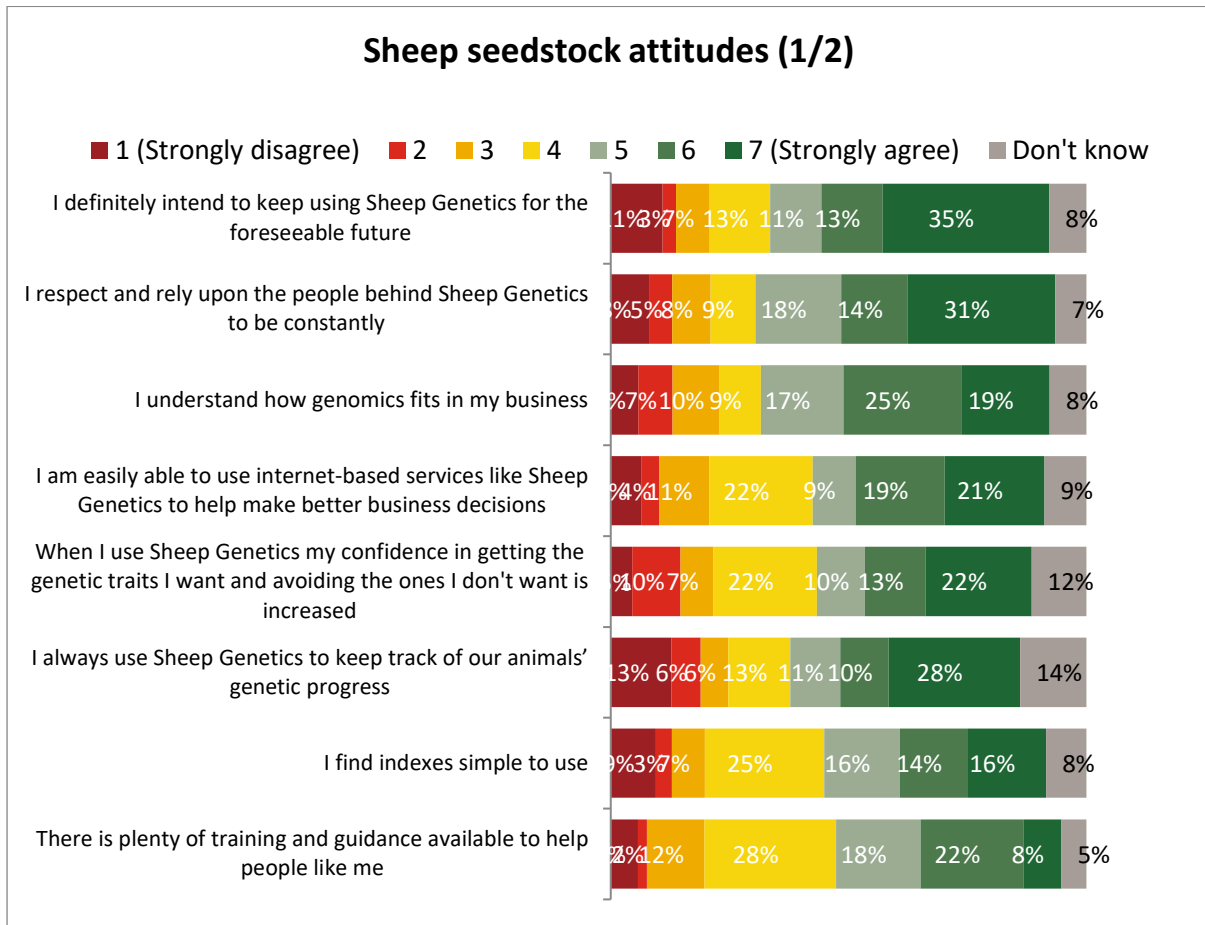


Figure 147. Sheep seedstock producer attitudes on breeding planning and production systems (2/2) (n=111)

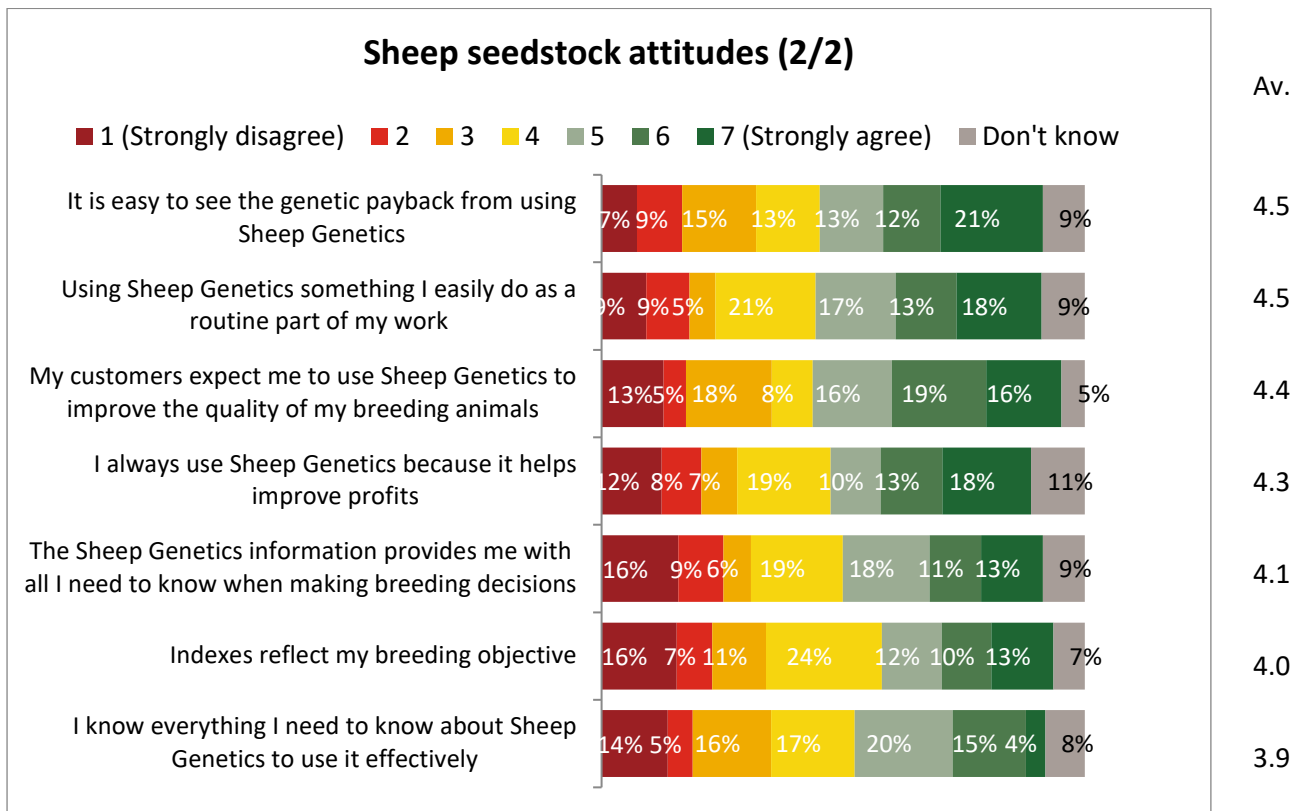


Figure 148. Sheep commercial producer attitudes on breeding planning and production systems (1/2) (n=585)

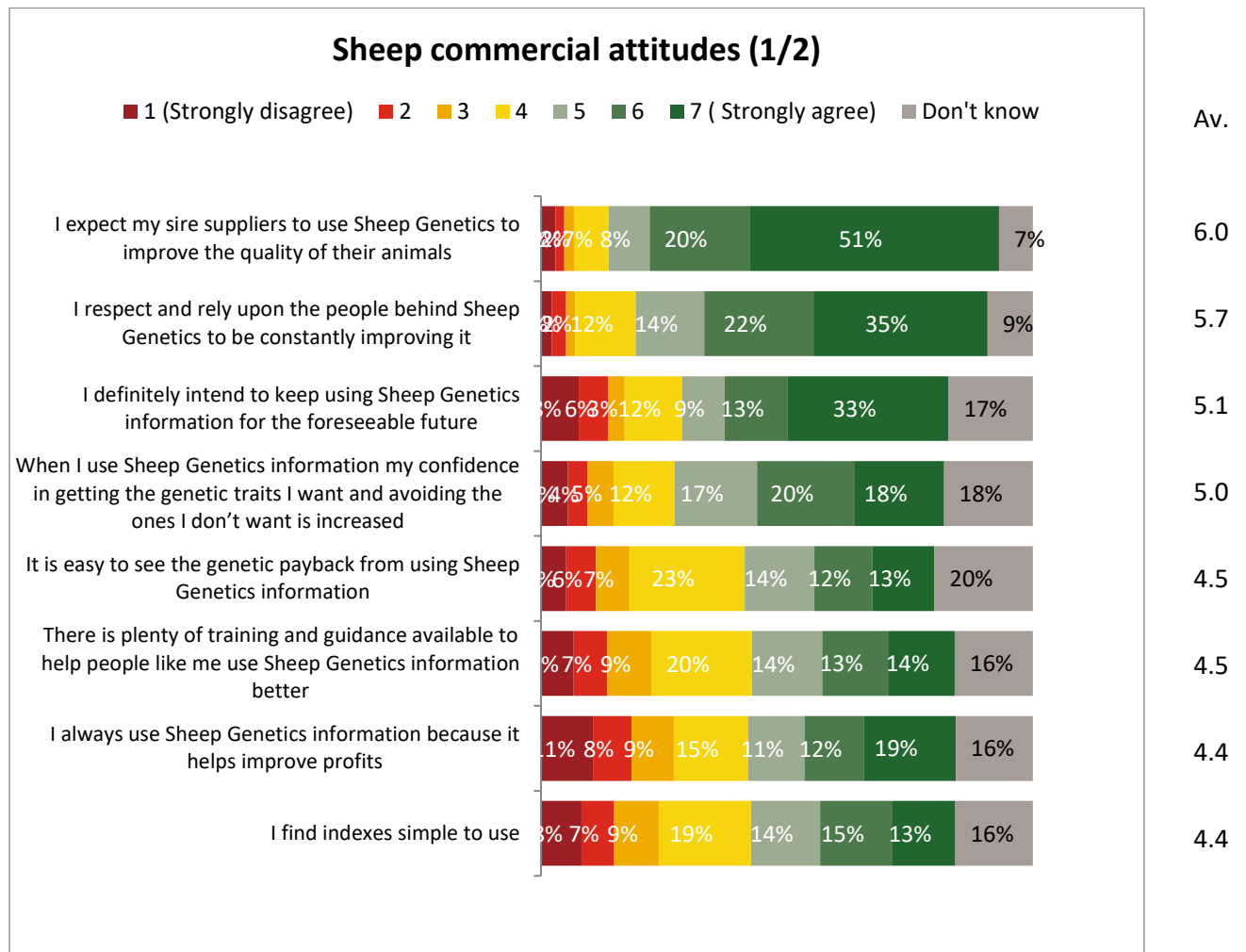


Figure 149. Sheep commercial producer attitudes on breeding planning and production systems (2/2) (n=585)

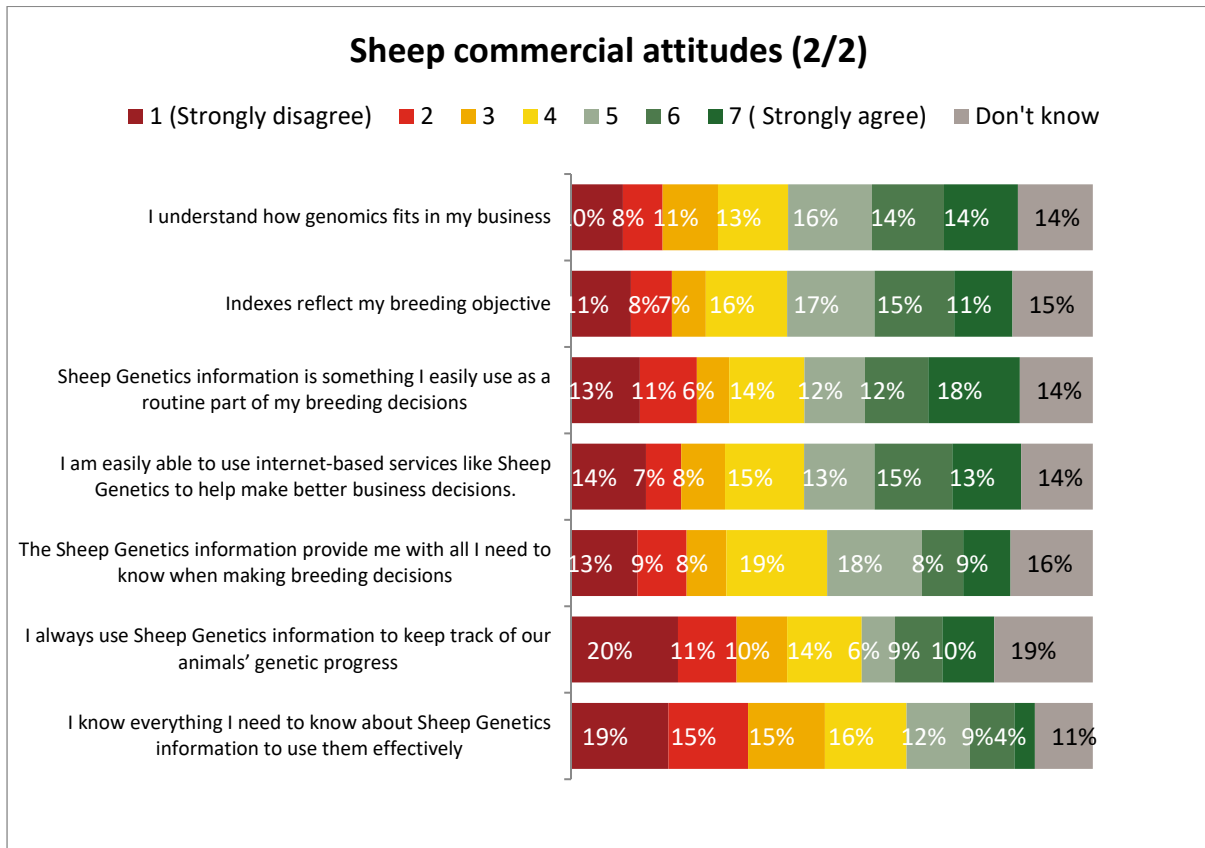


Figure 150. Cattle producer attitudinal statements

| | Seedstock Genetic Evaluation User (n=84) | Seedstock Genetic Evaluation Non-User (n=30) | Commercial EBV User (n=386) | Commercial EBV Non-User (n=128) |
|--|--|--|-----------------------------|---------------------------------|
| I respect and rely upon the people behind ___ *to be constantly improving it | 81% | 47% | 89% | 46% |
| My customers expect me / I expect my stud suppliers to use ___ to improve the quality of my / their breeding animals | 72% | 43% | 91% | 49% |
| I definitely intend to keep using ___ for the foreseeable future | 87% | 36% | 93% | 17% |
| When I use ___ my confidence in getting the genetic traits I want and avoiding the ones I don't want is increased | 80% | 36% | 86% | 20% |
| I understand how genomics fits in my business | 79% | 51% | 57% | 37% |
| I am easily able to use internet-based services like ___ to help make better business decisions. | 86% | 35% | 72% | 26% |
| Using ___ is something I easily do as a routine part of my breeding decisions / work | 81% | 31% | 78% | 6% |
| I find indexes simple to use | 68% | 32% | 71% | 25% |
| It is easy to see the genetic payback from using ___ | 69% | 21% | 71% | 11% |
| There is plenty of training and guidance available to help people like me use ___ better | 65% | 45% | 60% | 41% |
| I always use ___ because it helps improve profits | 68% | 18% | 72% | 26% |
| Indexes reflect my breeding objective | 58% | 32% | 71% | 20% |
| I always use ___ to keep track of our animals' genetic progress | 73% | 26% | 51% | 3% |
| I know everything I need to know about ___ to use it effectively | 71% | 23% | 49% | 18% |
| The ___ data provides me with all I need to know when making breeding decisions | 49% | 11% | 52% | 10% |

*BREEDPLAN / BREEDPLAN EBVs

Figures in red represent where agreement among non-users is significantly lower than users

Figure 151. Sheep producer attitudinal statements

| | Seedstock Sheep Genetics Member (n=61) | Seedstock Sheep Genetics Non-Member (n=46) | Commercial ASBV User (n=348) | Commercial ASBV Non-User (n=217) |
|--|--|--|------------------------------|----------------------------------|
| I respect and rely upon the people behind ___*to be constantly improving it | 78% | 51% | 86% | 69% |
| My customers expect me / I expect my sire suppliers to use ___ to improve the quality of my / their breeding animals | 71% | 25% | 93% | 74% |
| I definitely intend to keep using ___ for the foreseeable future | 61% | 32% | 84% | 31% |
| When I use ___ my confidence in getting the genetic traits I want and avoiding the ones I don't want is increased | 59% | 32% | 80% | 43% |
| I understand how genomics fits in my business | 72% | 53% | 62% | 37% |
| I am easily able to use internet-based services like ___ to help make better business decisions. | 57% | 51% | 59% | 30% |
| Using ___ is something I easily do as a routine part of my breeding decisions / work | 71% | 18% | 66% | 19% |
| I find indexes simple to use | 55% | 43% | 63% | 25% |
| It is easy to see the genetic payback from using ___ | 61% | 32% | 60% | 26% |
| There is plenty of training and guidance available to help people like me use ___ better | 53% | 47% | 52% | 46% |
| I always use ___ because it helps improve profits | 61% | 24% | 68% | 19% |
| Indexes reflect my breeding objective | 46% | 26% | 68% | 23% |
| I always use ___ to keep track of our animals' genetic progress | 76% | 16% | 45% | 10% |
| I know everything I need to know about ___ to use it effectively | 50% | 32% | 35% | 16% |
| The ___ data provides me with all I need to know when making breeding decisions | 51% | 33% | 50% | 27% |

* Sheep Genetics

Figures in red represent where agreement among non-users is significantly lower than