



Final report

MLA Project Proof Sheep

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Abstract

The Sheep Sustainability Framework (SSF) was launched in March 2021. The framework is constructed around the key themes of caring for sheep, enhancing the environment and climate, looking after people, customers and the community and ensuring a financially resilient industry. Quantitative studies were conducted by MLA and AWI in the years preceding the SSF launch however post launch, a more comprehensive survey was needed to track previous metrics and establish benchmarks for new SSF metrics. An online and telephone survey of 2,003 sheep producers involving 1,203 Merino producers and 800 non-Merino producers was therefore conducted in May to July 2022. The research identified that sheep producers have adopted, to different degrees, many of the animal husbandry, management and environmental practices that form part of a sustainable operation. Adoption of some practices however vary for different demographic groups such as state, sheep production system (Merino versus Non-Merino) and flock size. Recommendations have been made on further research into pain management, how to better collect data and measure some variables, and how producers can be better targeted by further profiling and database updating. The industry will benefit from the research as it will help guide MLA and AWI in identifying key sustainability priorities for future industry levy investment.

Executive summary

Background

The Australian sheep industry has developed key themes of caring for sheep, enhancing the environment and climate, looking after people, customers and the community and ensuring a financially resilient industry. These themes form a framework that guides sheep production to ensure that the industry operates sustainably. Regular tracking of sheep producers' attitudes and behaviours via survey-based methodologies helps ensure that progress against these themes can be measured and that industry initiatives to drive change can be developed and adapted.

Objectives

The primary objective was to benchmark and track key metrics and practices that underline the sustainability frameworks for the sheep industry to help guide MLA's and AWI's investment and project planning and provide transparency of production to consumer markets both domestically and internationally.

Methodology

The methodology for this project involved a survey of 2,003 sheep producers including 1,203 Merino producers and 800 non-Merino producers in May to July 2022. A mixed methodology was employed involving a 29-minute Online survey with 960 producers and a 25-minute survey with 1,043 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 flock size categories based on 2020 data from the Australian Bureau of Statistics (ABS) for representativeness.

Results

Over half of producers (54%) had flocks comprised of pure-bred Merino Poll with 24% having pure-bred Merino Horn, 6% Merino Dohne, 2% SAMM and 55% with breeds other than Merino and Merino Dohne (from multiple breeds selected).

Nationally, around two fifths of all producers (42%) ran 100 to 499 sheep with 21% running flocks of 3,000 head or more.

The majority of producers (84%) use polled sires (Merino: 76% and non-Merino 92%).

Almost one quarter of Merino producers nationally (24%) report an average adult Merino ewe micron of 19. Only 3% of producers report a micron of 22 or higher, with 2% reporting 15 micron or less.

Nearly two thirds of producers state that their mixed age ewes have low body wrinkle (65%), with 31% saying that their flocks have on average a medium body wrinkle and 3% saying their flocks have a high body wrinkle (Merino: 54% low, 44% medium and non-Merino 79% low, 18% medium).

One third of producers nationally (30%) join ewes to rams for eight weeks or longer. Compared to non-Merino ewes (8%), Merino ewes (4%) were significantly less likely to be joined for 4 or fewer

weeks and 8 weeks or greater (37% and 24% respectively). Merinos (17%) were more likely to be joined for 4.1 – 5 weeks than non-Merino (11%).

Nationally, 42% of producers pregnancy scan their ewes. Of these, over two thirds (69%) sought to find out if the ewe was dry or had single or multiple foetuses. Less than one third (31%) wanted to know if the ewe was simply wet or dry. Producers scanned on average 68 days after rams in. Around 1 in 3 producers manage their twin lambs separately (29%).

At the national level, 90% of producers tail dock their ewes (Merino: 95% and non-Merino 84%). 93% of producers tail dock their male lambs (Merino: 97% and non-Merino 89%).

Rubber rings were the most common tail docking technique (52%) for ewe lambs followed by a hot knife (44%) (Merino: 36% rings, 58% hot knife and non-Merino 72% rings, 26% hot knife). Rubber rings were also the most common technique (52%) used for tail docking of male lambs followed by a hot knife (43%) (Merino: 35% rings, 58% hot knife and non-Merino 73% rings, 25% hot knife).

Nationally, almost half of producers who tail dock ewe lambs, dock them to two joints (47%). Three joints is the next most common choice at 39%. The most common reasons cited for choosing a particular tail length were to protect the genital area (50%) and to provide sun protection (46%). Non-Merinos producers were more likely to cite ease of management and specific health reasons (26% and 24% respectively) than Merino producers. More than half of producers who tail dock male lambs dock them to two joints (52%). Three joints is the next most common choice at 34%. The most common reasons cited for choosing a particular tail length were to allow tail movement (37%) and to provide sun protection (35%) (Merino: 21% ease of management, non-Merino: 29% ease of management).

The most common reasons cited for using rings to dock ewe lambs was that it is easy (53%), bloodless (37%) and clean or neat (37%) (Merino: 17% quick, 22% effective, 19% efficient and non-Merino 41% quick, 37% effective and 37% efficient). For male lambs, the most common reasons cited for using rings was that it is easy (47%), clean or neat (39%) and bloodless (36%) (Merino: 37% easy, 9% quick, and 23% efficient and non-Merino 54% easy, 42% quick, and 37% efficient).

At the national level, the most common reasons cited for using a hot knife to tail dock ewes were that it is bloodless or seals the wound (65%) and clean or neat (40%) (Merino: 52% less stressful, 51% clean and neat, 19% efficient and non-Merino 35% less stressful, 36% clean and neat and 37% efficient). For male lambs, the most common reasons cited for using a hot knife were that it is bloodless or seals the wound (61%) and less stressful (38%) (Merino: 28% efficient, 29% quick, 23% less prone to infection, 20% reliable and non-Merino 46% efficient, 46% quick, 36% less prone to infection, 36% reliable).

When using cold knife on ewe and male lambs, producers state that it is efficient (42%) and quick (39%).

Nationally, 44% of producers use pain management at tail docking across all methods (Merino: 60% and non-Merino 24%). Adoption of pain management for ewe lambs however varies by tail docking method. When tail docking ewe lambs, fewer producers use pain management for rings (20%). Producers are split on using pain management for cold knife whereas pain management is used by almost three quarters of producers for hot knife (71%) and shears (72%) (Merino: 55% cold knife, 80% hot knife and non-Merino 19% cold knife, 45% hot knife). Likewise, adoption of pain management for male lambs varies by tail docking method and is highest for hot knife (71%) and lowest for rings (20%) (Merino: 80% hot knife, non-Merino 44% hot knife).

Anaesthetic and antiseptic spray at the site is the primary type of pain management for tail docking. Nationally, it is used by 80% of producers who use pain management products at tail docking. Analgesic oral gel and anaesthetic injection at the site were the second most frequent pain relief (each 10%) (Merino: 84% anaesthetic and antiseptic spray, 6% anaesthetic injection and non-Merino: 65% anaesthetic and antiseptic spray, 19% anaesthetic injection).

The most common reasons cited for choosing anaesthetic injections were improved animal health and welfare (63%), quick mothering-up (55%) and to reduce pain (50%). Producers said that anaesthetic and antiseptic spray at the surgery site were effective pain reduction (56%), fast recovery (46%) and to improve animal health and welfare (45%).

Reasons for using analgesic injections included effective pain reduction (59%), improved welfare (58%) and it is longer lasting (48%).

The most common reasons cited for choosing analgesic oral gel were improved animal health and welfare (57%), pain reduction (48%), vet recommendation and longer lasting (both 42%).

When asked why they don't use pain management at tail docking, producers said that they don't consider it necessary (50%). 24% of producers cited no particular reason with 21% claiming it was not practical or a quick procedure (Merino: 4% too expensive and non-Merino: 11% too expensive).

Virtually all producers castrate their male lambs (95% nationally) (Merino: 98%, non-Merino: 92%) and rubber rings were by far the most common technique (98%) used for castration of male lambs nationally.

25% of producers use pain management when castrating male lambs (Merino: 29% and non-Merino: 19%). Use of pain management for castrating male lambs varies by castration method and is higher for cold knife (36%) and lower for rings (24%) (Merino: 29% rings and non-Merino: 19% rings).

Anaesthetic and antiseptic spray at the site is the primary type of pain management for castration (Merino: 59% anaesthetic and antiseptic spray, 17% anaesthetic injection and non-Merino: 40% anaesthetic and antiseptic spray, 33% anaesthetic injection).

The most common reasons cited for choosing anaesthetic injections for castration were that it reduces pain (65%), improves animal health and welfare (64%) and lambs quickly mother-up afterwards (56%). Producers who chose anaesthetic and antiseptic spray said that it provided effective pain reduction (50%), to improve animal health and welfare (35%), and fast recovery (34%).

Producers who chose analgesic injections said they improve animal health and welfare (68%) and effective pain reduction (61%).

The most common reasons producers cited for choosing analgesic oral gel were improved animal health and welfare (56%) and pain reduction (52%).

The main barrier to the use of pain management for castration is that it is not considered necessary (45% of those not using pain management). 25% of producers cited no particular reason with 19% stating it was not practical or a quick procedure (Merino: 6% too expensive and non-Merino: 11% too expensive).

At the national level, 31% of producers mulesed their ewe lambs in 2021 (Merino: 52% and non-Merino: 8%) and 25% of producers mulesed their male lambs (Merino: 44% and non-Merino: 4%). The majority of producers who mules use pain relief (92%). Most producers who use pain management products at mulesing use anaesthetic and antiseptic spray at the surgery site (95%).

Effectiveness (57%) and fast recovery (51%) were the primary reasons for choosing an anaesthetic and antiseptic spray at the surgery site such as Tri-Solfen for mulesing.

Producers stated that analgesic injections gave effective pain reduction (71%) and fast recovery (53%), while analgesic oral gel offered pain reduction (75%) and improved animal health and welfare (61%).

The main barrier to the use of pain management for mulesing is that it is not considered necessary (44%). 18% of producers cited no particular reason with 14% stating it was too expensive.

Across Australia, of producers who mulesed in 2021, more than half (60%) said they were unlikely or very unlikely to cease mulesing. The top three alternatives to mulesing that would be adopted include flystrike chemicals (48%), more crutching (44%) and breeding for resistance (40%).

At the national level, nearly two thirds (63%) of producers who did not mules in 2021 have never mulesed. On average, producers who had ceased mulesing were most likely to have done so in 2012. The main reasons for ceasing mulesing are breeding for less body wrinkle (42%), animal ethics (25%) and lack of need (24%) (Merino: 23% industry/consumer pressure, 19% higher wool prices, 8% weather conditions and non-Merino: 9% industry/consumer pressure, 8% higher wool prices, 1% weather conditions).

88% of producers interviewed wean lambs in their operations (Merino: 93%, non-Merino: 82%) with the average age of weaning being 16 weeks.

Maiden ewes are more likely to have a weaning percentage between 81-90 percent (24%) (Merino: 33% between 61-80% and non-Merino: 24% more than 110%). Mature ewes (34%) were more likely to have weaning percentages 110% or greater (Merino: 60% between 71-100% and non-Merino: 53% greater than 110%).

9 out of 10 producers vaccinate at least some sheep in their flock. Nationally, an average of 65% of producers vaccinate pre-lambing, 97% at marking and 68% at weaning.

Slightly over two thirds (65%) of producers drench mixed age ewes two times or fewer. Merino producers (13%) were more likely than non-Merino (8%) not to drench. Slightly over two thirds (66%) of producers drench young ewes two times or fewer.

Nationally, an average of 35% of producers conducted a Worm Egg Count in 2021. For the 35% of producers testing, the average number of tests for worm egg counts annually tested was 4.4.

1 in 3 producers have done a drench resistance test at some stage (33%) (Merino: 37% and non-Merino 27%). Drench resistance tests are done very infrequently with over half of producers (56%) doing them every 5 years or longer.

WormBoss has the highest awareness level of the four parasite management websites considered (62%) (Merino: 49% FlyBoss, 44% LiceBoss and non-Merino: 37% FlyBoss, 34% LiceBoss). WormBoss also has the highest visitation level of the four parasite management websites (55%) (Merino: 36% FlyBoss, 31% LiceBoss and non-Merino 22% FlyBoss, 23% LiceBoss).

In 2021, on average, producers visited WormBoss 2.5 times, LiceBoss 1.3 times, and FlyBoss 1.7 times. Producers who had used one of the websites had used the information to make decisions and change their practices in 53% of cases, with 33% saying they have used the information to plan but have not yet implemented their knowledge and 15% saying they have not used the information at all.

The average weaned and adult ewe mortality rate is between 2% - 3%.

The majority of producers (87%) have heard of the Australian Animal Welfare Standards and Guidelines for Sheep. Of this group, most are aware of and have read the specific standards and guidelines for the Humane Killing of Sheep (59%).

2 out of 3 producers (60%) sedate their rams for shearing.

Very few producers have ever done a fly chemical resistance test (3%) (Merino: 4% and non-Merino: 2%).

Nationally, nearly one fifth of producers are involved in wool quality assurance schemes (19%). Where producers are involved, more than one third (37%) of producers are involved in SustainaWOOL.

Across Australia, 78% of producers report problems with predators and lose 29 sheep on average annually due to predation. Foxes are the number one predator (89%) followed by birds (54%) and wild dogs (14%).

Shooting foxes is the most common control method used (71% nationally), with poison or bait (59%) for wild dogs and shooting for pig control (87%). Traps (60%) and poison or bait (43%) are also frequently used for pigs. Conversely, most producers do not control birds (81% nationally).

Of producers who reported problems with predators, almost half (44%) have a predator management strategy. These strategies were split with around half being part of a collaborative group strategy (46%) or just for the producer's property (54%). Of producers who have a strategy, the majority (68%) have acted on it.

One quarter of producers nationally have an insect management strategy (25%).

Half (50%) of producers generate and use renewable energy. A further 11% of producers stated that they use renewable energy bought from their energy retailer with 43% not generating or buying any renewable energy.

Of the producers who generate their own renewable energy, the majority (83%) have solar without batteries. Slightly under a fifth (19%) generated solar with a battery.

Producers interviewed had generally not taken carbon accounting training (91%) and did not measure their emissions (97%), however, 24% did implement carbon emissions measures.

Producers who did conduct emission reduction activities often selected more than one measure. Almost two thirds of producers (61%) used carbon storage methods, but pasture management was also a popular technique (58%).

Almost one half (45%) of producers report no issues with general labour availability, and slightly over two fifths (41%) report no issues with availability with shearers. Around one third of producers however report a major availability issue with general labour (35%) or shearers (38%). Merino producers were less likely to report problems with general and shearer availability (35% for both labour types) compared to non-Merino (48% for both labour types).

Producers are at different stages in the succession planning process with 21% nationally having a formal succession plan in place but 29% not having commenced the planning process yet.

Nationally, around 4 out of 5 producers (82%) report that they have completed chemical safety training. Around three quarters of producers (77%) who have completed chemical safety courses report that they have ChemCERT accreditation or a current ChemCERT card.

When it comes to Workplace Health and Safety, the most common action producers take is to encourage workers to identify safety concerns (80%).

Benefits to industry

The benefits to industry of this research are that it has demonstrated that sheep producers have adopted, to different degrees, a wide range of sustainability practices and strategies in relation to animal husbandry, management and the environment.

The industry will benefit as the benchmark and tracking data collected will guide MLA and AWI in investment and planning to continue to improve the sustainability of sheep producers' operations and maximise the value gained from industry levies.

Future research and recommendations

Four recommendations have been made from this research:

1. Explore the understanding and use of different types of pain management products
2. Consider streamlining questions involving ewe lambs and male lambs
3. Introduce new sources for data collection
4. Repeat the full survey every two years to track industry progress
5. Expand the profile and regularly update MLA's Member database.

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1. Background

1.1 Sustainability framework and need for research

Sustainability and sustainability initiatives is a movement that has been gathering pace in recent times. The genesis of the movement in its current form can largely be attributed to the ground-breaking leadership of European leaders and has now become a mainstay in business globally. Environmental, social and governance reporting is commonplace in leading global businesses and mandatory for some. It is an initiative that consumers relate to strongly and has driven consumer choice not only for product selection but with investment. Companies that lack a framework to reduce their environmental and social impact are finding it increasingly difficult to source capital to support the viability of their business. It is a movement that has become so deeply ingrained in the global community that no industry can afford to be left behind with adoption.

Agriculture and agricultural production are essential for life as we know it but that production too leaves an environmental footprint. Greenhouse gas emissions, pollution, chemical residues and animal welfare are some of the key areas that need to be tackled to reduce agriculture's impact. It's a topic that has at times been a divisive issue in Australia between government, industry and consumers. The phasing out of mulesing, the removal of certain chemicals from the market, the increase in traceability in the supply chain and regular discussion on emissions trading schemes are some examples of sustainability driven initiatives.

Leaders in the sheep industry have recognised that sustainability holds huge importance with regards to Australia both in maintaining its presence in global markets but also grow its presence in other markets in the future. It is for this reason sustainability frameworks have been constructed with heavy consultation with industry organisations, leaders and producers.

A key requirement for sustainability is the ability to track development and placing increased focus on driving adoption and improvements. It is essential to quantify and profile current practices and measure changes over time to allow continual refinement of industry sustainability initiatives, investment and program development. Sustainability tracking is also essential for reporting, providing evidence for market access negotiations and for wider transparency for consumers. It is for these needs that MLA and others have sort to construct a robust and integrated tracking system to measure key metrics and trends over time.

2. Project objectives

The primary objective of this project was to benchmark and track key metrics and practices that underpin the sustainability framework for the sheep industry , to help guide MLA's investment and project planning and provide transparency of production to consumer markets both domestically and internationally.

To meet with these project objectives, the following research topics were addressed:

1. Husbandry practices, management strategies and standards

Identifying the incidence and levels of key husbandry practices related to pest and disease control measures, and breeding practices. Highlight the use and understanding of specific management strategies and standards related to predators, insect pests and animal welfare

2. Environmental profile

Understand the level of environmental derived income through on-farm management activities and the use of renewable energy

3. Wool quality assurance and workforce labour

Ascertain producers' attitudes towards and use of tools, and quality assurance in their business. Understanding producers' views on workforce labour

4. Attitudes, drivers, barriers and pain points

Investigate and highlight producers' views towards sustainability initiatives and practices and general on-farm issues including succession planning

5. Producer profile

Profiling producers by age, gender, education and years in farming to form a clear picture of producers in the industries.

3. Methodology

3.1 Questionnaire

A fully structured questionnaire to address the research objectives and issues was developed in conjunction with MLA and AWI. Where relevant, questions from a previous surveys conducted by MLA and AWI were included to maximise tracking of any demographic or behavioural change for comparison and validation purposes. This was particularly important where some questions related to differences in target audiences (Merino and non-Merino), class of stock (ewes and wethers) and age of stock (maiden ewes and mixed ewes). The current survey also needed to address topics and practices that were not covered in previous surveys.

All 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 draft online questionnaire was piloted with 3 Merino producers and 3 non-Merino producers on 18 May 2022. The average survey length was 24:29 minutes with the median being 26:37. As the interview length matched the budgeted 25 minutes and the programmed survey captured all required data, the survey was fully launched on 19 May 2022.

A copy of the questionnaire is provided in the Appendix.

3.2 Sample Design

A sample of 2,003 sheep producers was interviewed for this study, comprised of 1,203 Merino producers and 800 non-Merino producers. The samples were designed to achieve national results with a margin of error of +/- 2.1% with a 95% confidence level for the total sample, +/- 2.7% for the Merino sample and +/- 3.4% for the non-Merino sample. The Merino sample size was also consistent with AWI's 2017 Merino Animal Husbandry Practices Survey.

The total sample was stratified into 6 state and 3 flock size quotas (100 – 499, 500 – 1,999 and 2,000 head +) based on the latest ABS producer population data (18 quotas in total). The samples achieved for each quota is provided in **Table 9** in the Appendix.

Producers with larger flock sizes had a higher completion rate than those with smaller flock sizes. Two strategies were undertaken to address this:

1. Quotas for larger flock sizes in each state were closed to prevent any further completes from this group and allow interviewing to target smaller producers
2. Survey results were weighted to the distribution of flock sizes as given by ABS to ensure that larger flock sizes were not over-represented in the final results. For example, in unweighted results, the proportion of Merino producers nationally mulesing ewe lambs in 2021 was 60%. The practice is much more prevalent in larger flock sizes (who were over-represented in the sample). Weighting the results to ABS flock size data reduced the impact of the larger flock sizes on the national result and increased the impact of smaller flock sizes. The national proportion of Merino producers mulesing ewe lambs in 2021 using weighted data was therefore lower at 52%. For other variables though, weighting had little effect. For example, pain management for castration (33% unweighted; 30% weighted), weaning age in weeks (15.4 unweighted; 15.7

weighted, pre-lambing vaccination (67% unweighted, 66% weighted) and having a predator strategy (45% unweighted, 43% weighted). A comparison of unweighted and weighted results for 24 key variables is provided in **Table 10** in the Appendix.

3.3 Sample Selection

MLA provided Kynetec with a database of 15,286 sheep producer members who had an email address and a phone number and a further 6,041 who had a phone number only. 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 sheep husbandry practices on their property
2. Have farm income from sheep for wool and / or mutton, lambs for meat or lambs for wool in the previous three financial years
3. Have a minimum flock size of 100 head in 2022
4. Merino producers must join maiden and / or mixed age Merino ewes to Merino rams to qualify as “Merino”
5. Non-Merino producers must have breeds other than Merino or Merino Dohne or if they had Merino sheep, they must not join them to Merino rams (i.e., they could join Merino ewes to non-Merino rams, or they could run Merino wethers).

If a producer qualified for both Merino and non-Merino, they were allocated to the lowest quota (either Merino or Non-Merino). They were then advised that the survey related only to their Merino (or Non-Merino) sheep enterprise, not the other sheep enterprise that they may have and to think only of their Merino (or Non-Merino) enterprise when answering the questions.

All respondents were also directed at the beginning of each section of the questionnaire to answer the questions only in relation to their Merino or non-Merino sheep, whichever quota they had been selected for.

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 1,600 Online and 400 CATI.

A pilot (soft launch) for the Online survey was conducted on 18 – 19 May 2022 and following the successful pilot, the Online survey was fully launched to MLA’s Member database by providing each a unique link to the Online survey. In conjunction with the full launch, MLA was provided a generic link to the Online survey so that MLA could promote participation in the survey via MLA’s social media channels and website. Five reminder emails were sent to non-respondents throughout May and June.

Following the closure of the Online survey on 15 June 2022 with 960 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. Due to the lower response to the Online survey though (960 instead of 1,600), a CATI boost sample was conducted and the final sample of

2,003 producers comprised of 1,203 Merino producers and 800 non-Merino producers was reached on 22 July 2022.

Average survey length was 29:25 minutes for Online and 25:20 minutes for CATI.

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

Table 1: Sample methodology

Methodology	Total	Merino	Non-Merino
Online	960	505	455
Unique link	820	449	371
Generic link	140	56	84
CATI	1,043	698	345
Total	2,003	1,203	800

For the Online survey, of 15,174 sheep producers sent a unique link by email, 295 screened out because they did not meet the minimum requirements to qualify, 121 could not continue because the quota for their state and flock size was full, and 820 were completed. With the addition of the 140 Online surveys completed via the generic link, the final number of Online surveys was 1,043.

For the CATI survey, a total of 2,891 conversations were held with individual in-scope producers. Of these, there were 1,043 completes, 1,519 refusals and 329 call backs giving a response rate of 36%. A further 3,785 producers were excluded from the survey as the quota for their state and flock size was already filled.

A full breakdown of the CATI statistics is provided in **Table 11** in the Appendix.

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) 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 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 – 2,000) and different survey results (from 5% to 95%) assuming a 95% confidence level is contained in **Table 12** in the Appendix. The main statistically significant differences in results between states, Merino versus Non-Merino and flock size are also highlighted throughout this report.

4. Sheep results and discussion

4.1.1 Background to the analysis

This section presents the results and discussion summarising the current practices of Australian sheep meat and wool producers. Results are presented at the national and state level with differences between Merino and non-Merino producers highlighted where relevant. Some differences are also provided by flock size where relevant.

4.2 Producer demographics

Producer demographics such as region, sheep breed, number of ewes jointed, income, education, age and gender are presented below in **Figure 1** to **Figure 8**. These charts illustrate the diverse demographic range of the sheep industry in Australia.

The sample comprises of producers from New South Wales (35%), Victoria (22%), Queensland (5%), South Australia (19%), Western Australia (16%), and Tasmania (3%) (**Figure 1**).

On average, producers nationally earn 63% of their income from sheep (**Figure 4**).

A quarter (26%) of producers are tertiary educated (**Figure 6**).

The largest age segment of producers was those 65 and over (40%), almost all producers were 35 and over, with only 1% 18 - 24 and 4% 25 – 34. Less than 1% of producers declined to state their age (**Figure 7**).

The majority (80%) of producers identified as male. One fifth (20%) identified themselves as female. Less than one percent (here rounded to 0%) preferred not to identify themselves (**Figure 8**).

Figure 1: Respondent demographic by state

Base: All producers n = 2,003

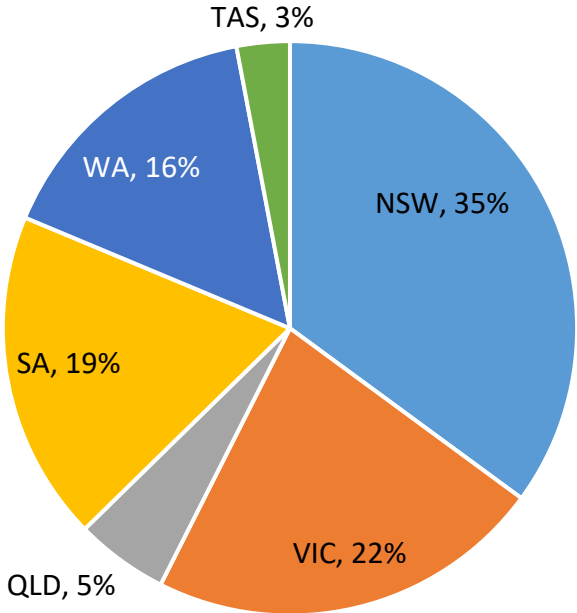


Figure 2: Respondent demographics by sheep breed

Base: All producers n = 2,003

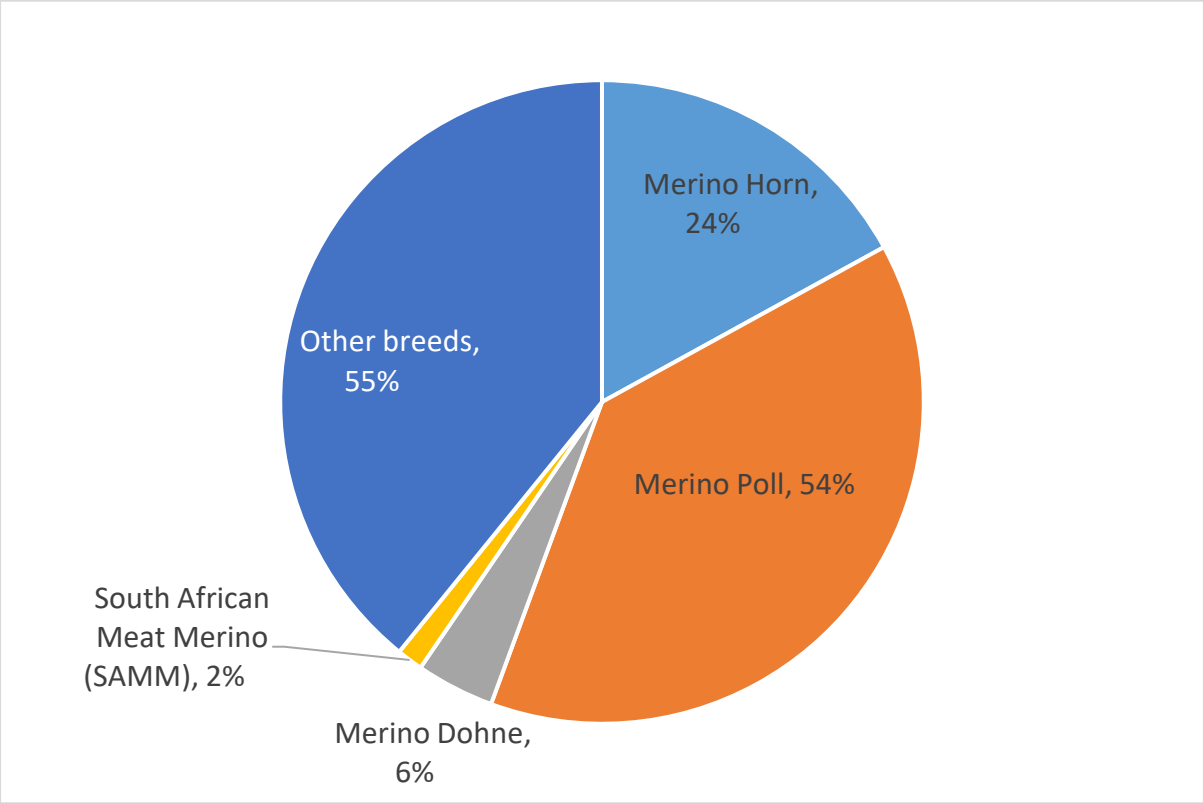


Figure 3: Number of maiden ewes and mixed ewes joined

Base: All producers n = 2,003

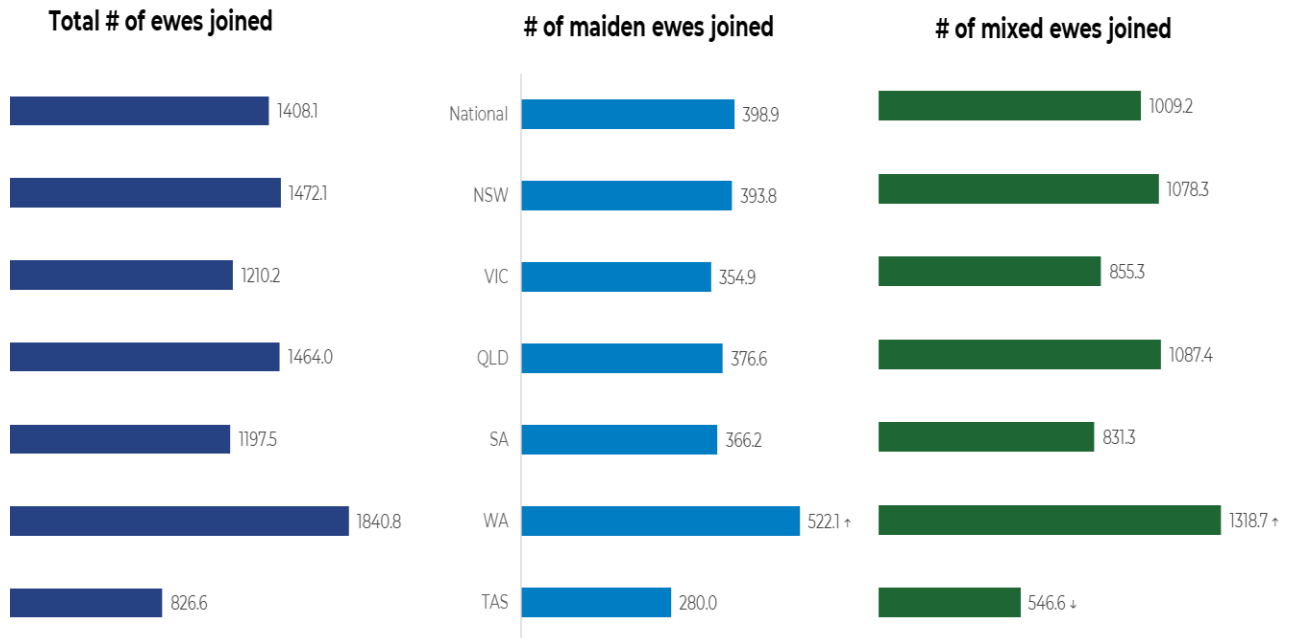


Figure 4: Percentage of gross farm income from sheep by state

Base: All producers n = 2,003

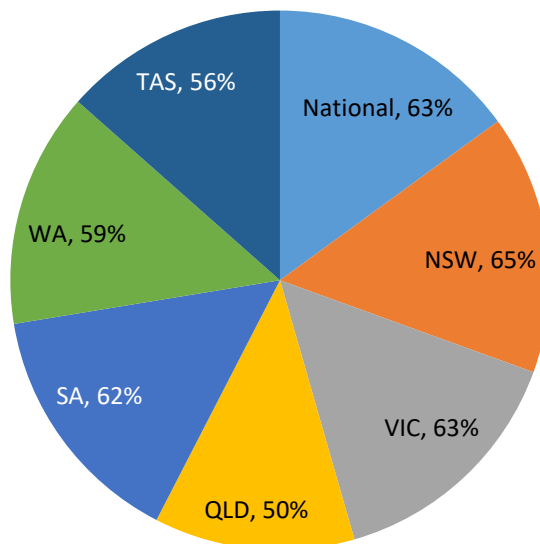
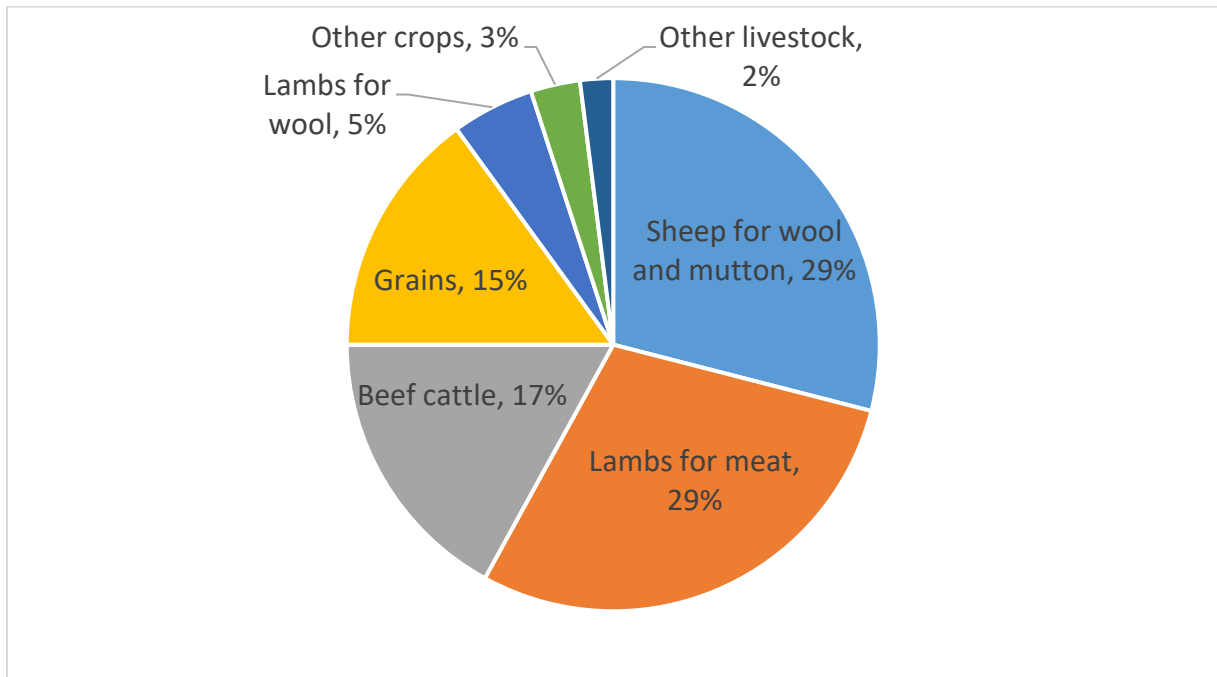


Figure 5: Percentage of gross farm income nationally

Base: All producers n = 2003

**Figure 6: Respondent demographic by education**

Base: All producers n = 2003

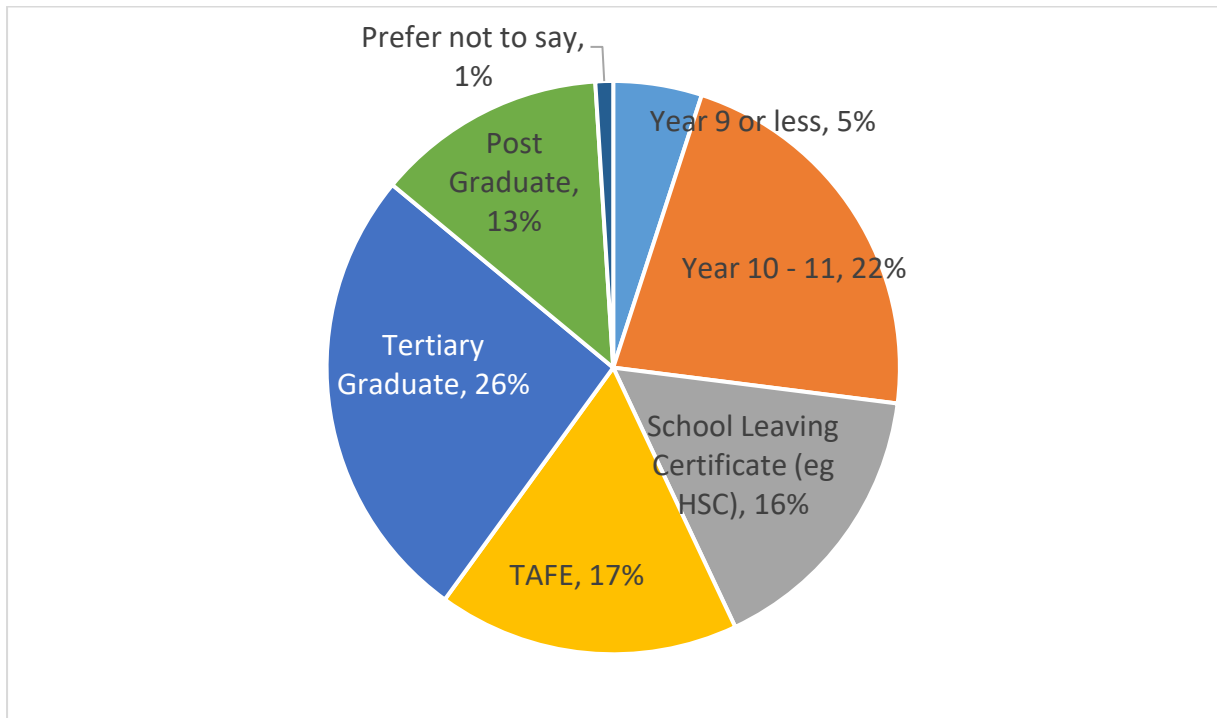


Figure 7: Respondent demographic by age

Base: All producers n = 2,003

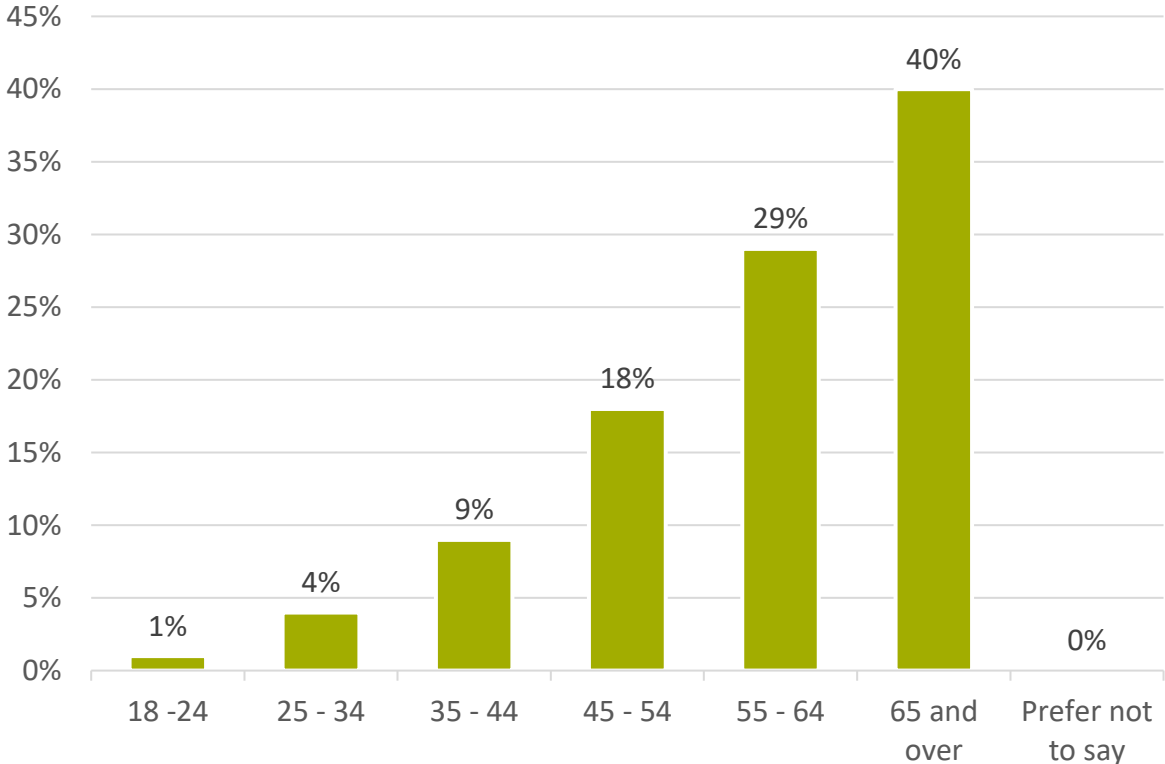
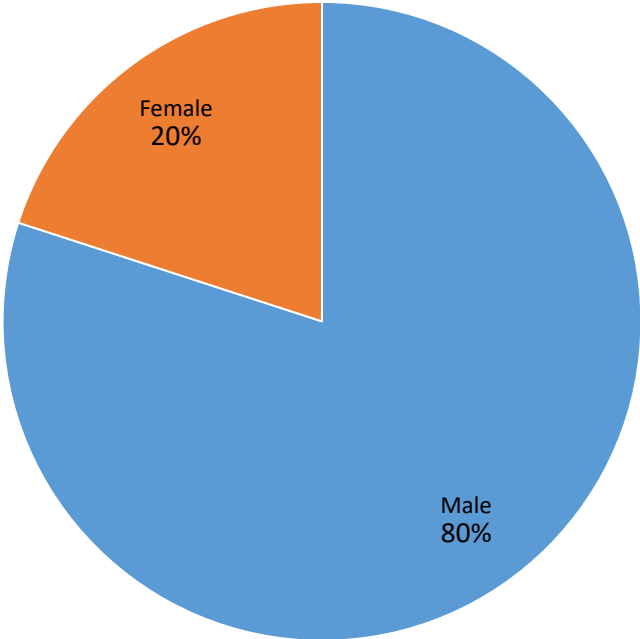


Figure 8: Respondent demographics by gender

Base: All producers n = 2,003



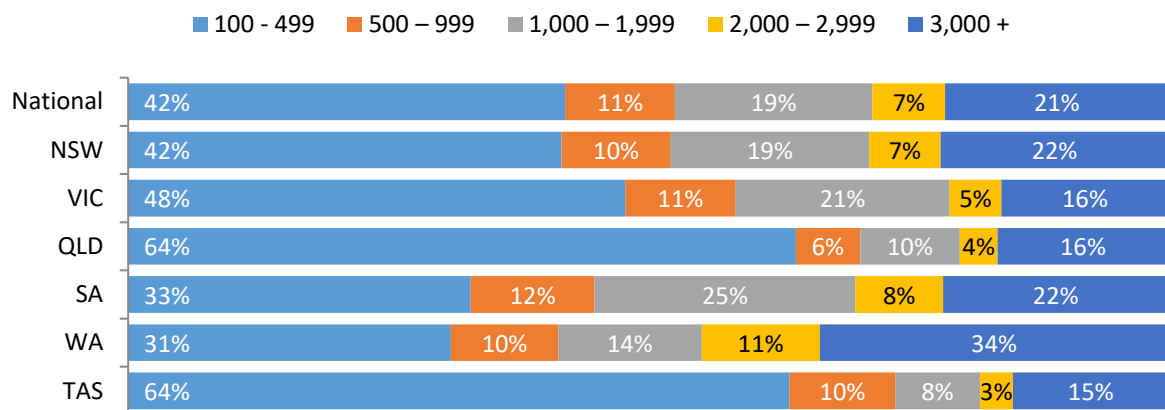
4.3 Flock Demographics

Nationally, more than two fifths of all producers (42%) ran between 100 and 499 sheep while 11% ran 500 - 999 sheep, and 19% between 1,000 – 1,999 sheep. 7% of producers ran between 2,000 – 2,999 sheep, and 21% ran 3,000 or more sheep (**Figure 9**).

Producers in Queensland and Tasmania were most likely to have smaller flock sizes of 100 – 499 sheep (both 64%), while producers in Western Australia tended to be more likely to have larger flocks of 3,000+ sheep (34%). Merino producers also were more likely to have larger flock sizes (28%) of 3,000+ while non-Merino producers were most likely to have small flocks (57%) of 100 – 499 head.

Figure 9: Respondent demographic by total flock size

Base: All producers n = 2,003



4.4 Joining and Scanning

Almost one third of producers nationally (30%) join ewes to rams for eight weeks or longer. Tasmanian producers were significantly more likely than other states to join for 4 weeks or fewer (17%), while New South Wales producers were more likely to join for between five and six weeks (34%). Compared to non-Merino ewes (8%), Merino ewes (4%) were significantly less likely to be joined for 4 or fewer weeks and 8 weeks or greater (37% and 24% respectively). Merinos (17%) were more likely to be joined for 4.1 – 5 weeks than non-Merino breeds (11%). (**Figure 10**).

Pregnancy scanning is undertaken by fewer than half of producers with 42% of producers nationally stating that they scan. Producers in Queensland were significantly less likely to conduct pregnancy scanning (24%) (**Figure 11**). Over 2 in 3 producers scanned for dry, single and multiple fetuses. Less than one third (31%) wanted to know if the ewe was simply wet or dry. (**Figure 12**).

Nationally, producers scanned on average 68 days after rams in. There was no significant deviation from this pattern in either the states or the Merino and non-Merino populations. (**Figure 13**).

Around 1 in 3 producers manage their twin lambs separately. Western Australian producers were significantly less likely to manage twins separately (78%). Separate management of twin lamb rates for other states did not differ significantly from the national rate. Even though non-management was even higher in QLD (83%), this is not statistically different to the national result of 71% due to the smaller sample size in QLD and the higher margin of error with the QLD result (**Figure 14**).

Figure 10: Joining period in weeks

Base: All producers n = 2003

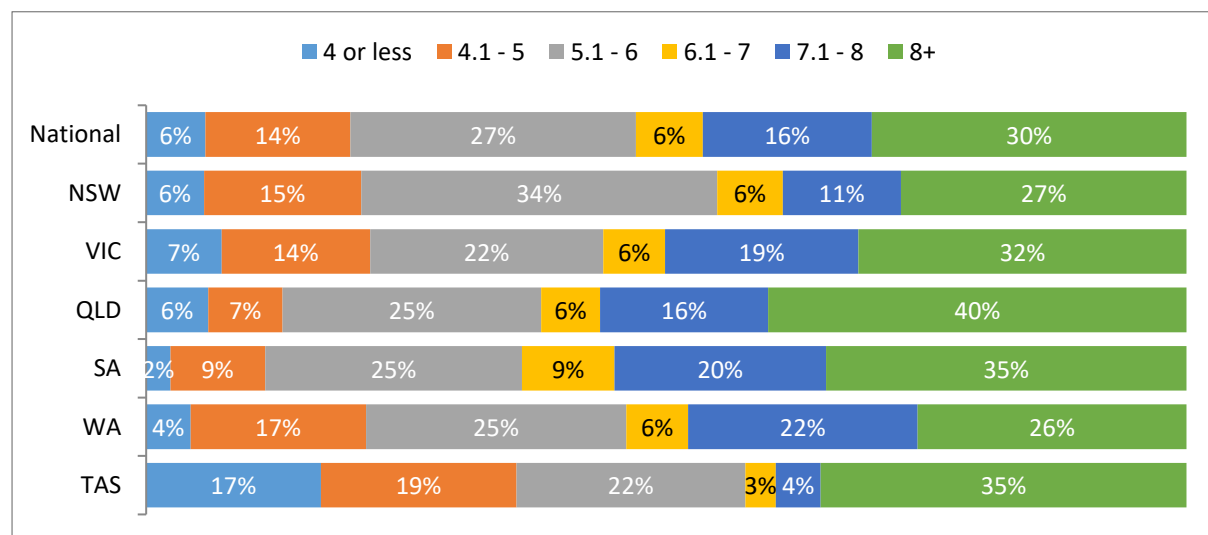
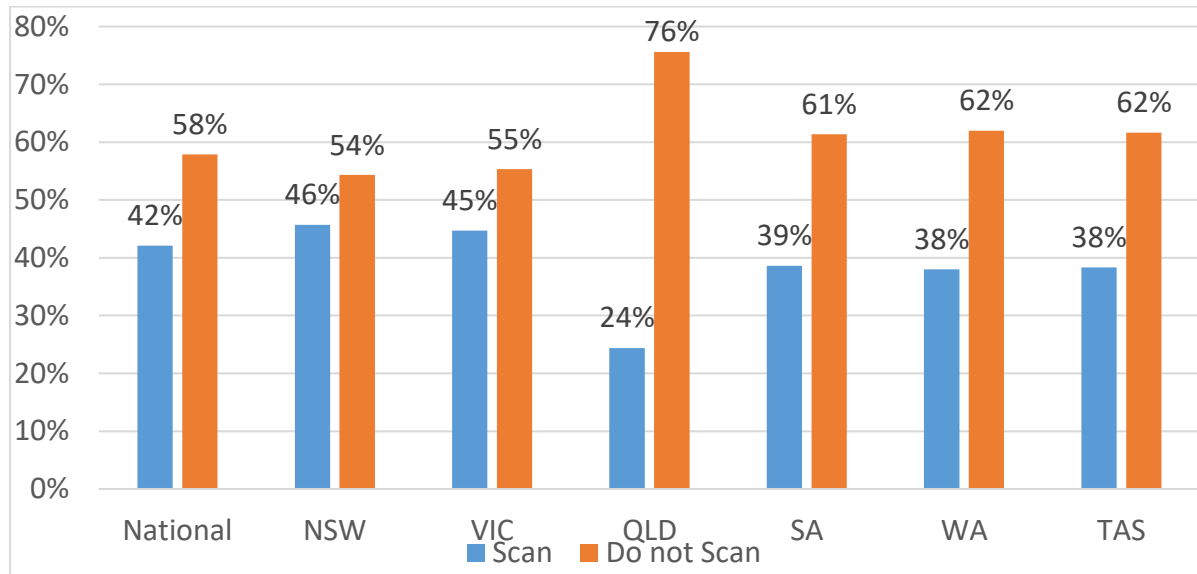


Figure 11: Pregnancy scanning of ewes

Base: n = 2003

**Figure 12: Scanning for dry, single and multiple foetuses**

Base: Producers who scan for pregnancy n = 1021

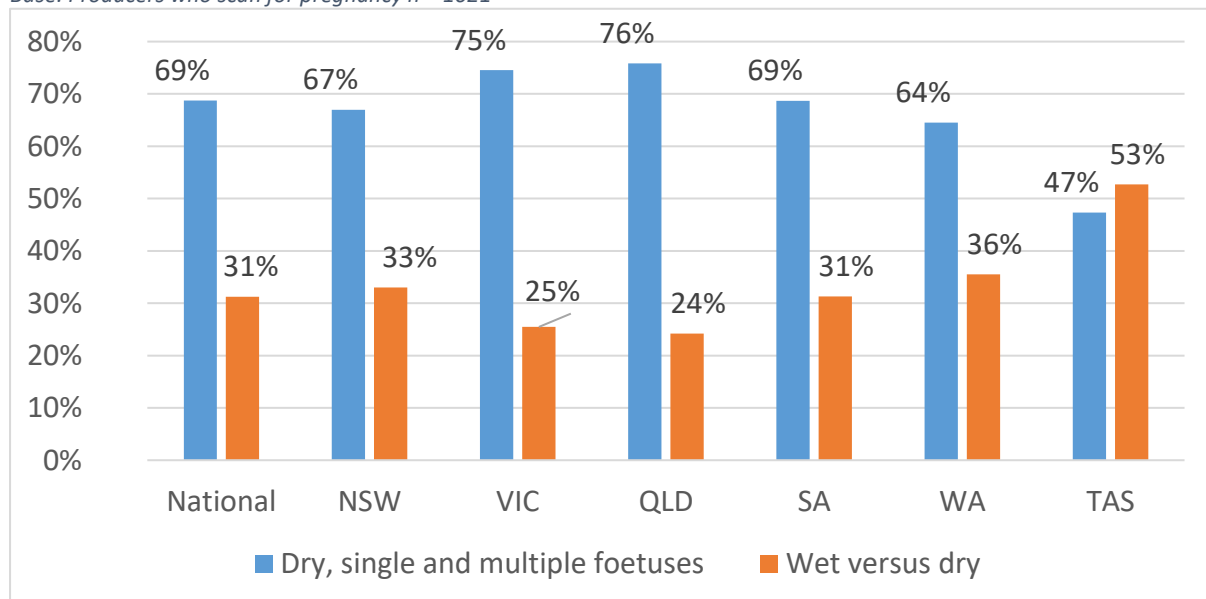


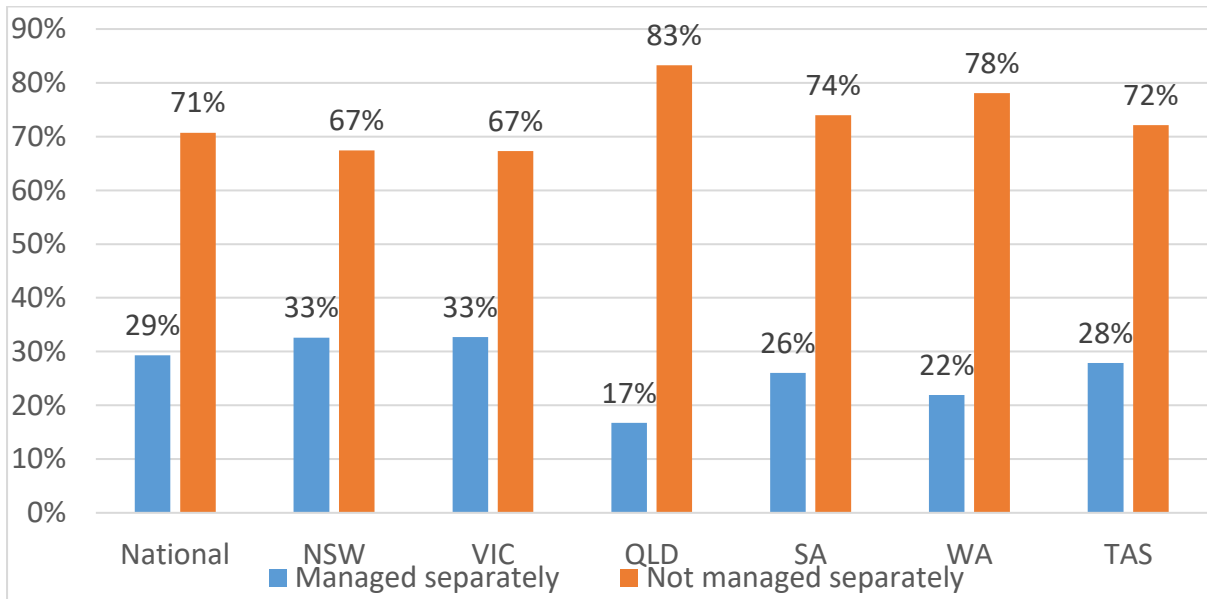
Figure 13: Number of Days after Rams in when Scans are Performed

Base: Producers who pregnancy scan n = 1021



Figure 14: Separate management of twin lambs

Base: n = 2003



4.5 Tail Docking

4.5.1 Overview

At the national level, 90% of producers tail dock their ewes. Producers in Queensland were significantly less likely to tail dock lambs (75%). Producers with smaller flock sizes (100 - 499 head) were more likely not to tail dock their ewe lambs (13%) (**Figure 15**). 95% of Merino producers dock their ewes' tails, while 84% of non-Merino producers dock their ewes' tails.

At the national level, 93% of producers tail dock their male lambs. Producers in Queensland were significantly less likely to tail dock male lambs (73%). Compared to the national incidence, producers with flocks of 100-499 head were significantly less likely to tail dock male lambs (90%). (**Figure 16**) 97% of Merino producers dock their male lambs' tails, while 89% of non-Merino producers dock their male lambs' tails.

Figure 15: Tail docking of ewes

Base: All producers n = 2003

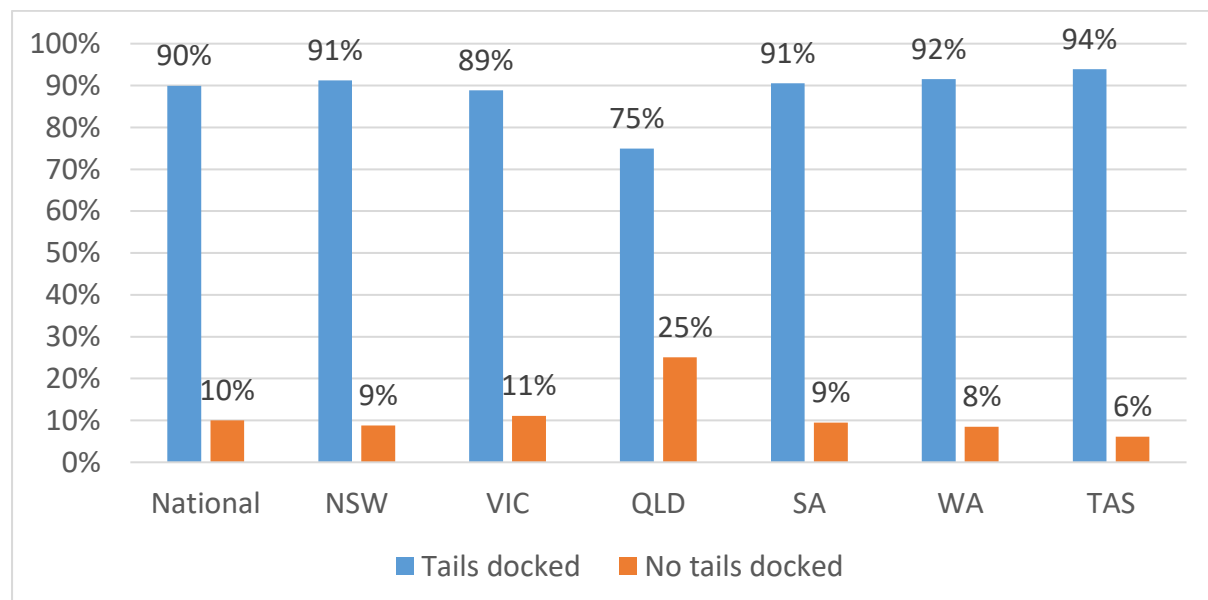
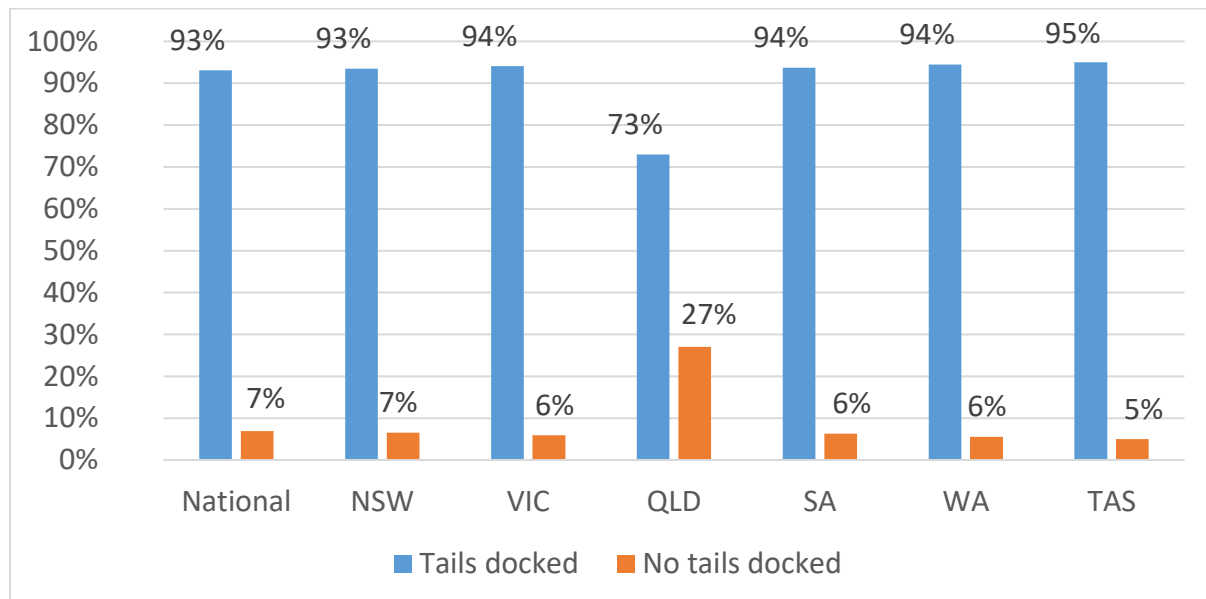


Figure 16: Tail docking of male lambs

Base: All producers n = 2003



4.5.2 Docking method

Rubber rings (52%) and hot knife (44%) are the most commonly used methods to tail dock ewes (**Figure 17**). There was a significant state effect for tail docking method. Rubber rings were significantly more commonly used in New South Wales (62%), Victoria (60%) and Tasmania (77%). Merino producers were more likely to use hot knife (58%) and rings (36%) while non-Merino producers were more likely to use rings (72%) and hot knife (26%).

Rubber rings (52%) and hot knife (43%) are the most frequently used methods to tail dock male lambs (**Figure 18**). There was a significant state effect for tail docking method. Rubber rings were significantly more commonly used in New South Wales (62%), Victoria (60%) and Tasmania (82%). Merino producers were more likely to use hot knife (58%) and rings (35%) while non-Merino producers were more likely to use rings (73%) and hot knife (25%).

The most common reasons cited for using rings to tail dock ewe lambs was that it is easy (53%), bloodless (37%) and clean or neat (37%) (**Figure 19**). Queensland producers were significantly less likely to cite rings as a preferable (7%), effective (5%), cost effective (2%), reliable (2%), less flystrike (2%) or safer method for operators (1%).

The most common reasons cited for using rings to tail dock male lambs was that it is easy (47%), clean or neat (39%) and bloodless (36%) (**Figure 20**). Queensland producers were significantly less likely to cite rings as less prone to infection (5%), reliable (4%), a safer method for operators (3%), effective (5%), cost effective (2%), and less prone to flystrike (2%). Likewise, there were significant differences between Merino and non-Merino, with non-Merino producers more likely to consider rings an easy method (54%) which is quick (42%) and efficient (37%).

At the national level, the most common reasons cited for using a hot knife to tail dock ewe lambs were that it is bloodless or seals the wound (65%) and clean or neat (40%) (**Figure 21**). Queensland producers were less likely than other states to say that hot knife was clean or neat (9%), efficient (2%) and reliable (2%). Merino producers said that this method is less stressful (52%), clean and neat (51%) and efficient (19%). Conversely, 35% of non-Merino producers said it was less stressful, 36% that it is clean and neat and 37% that it is efficient.

Nationally, the most common reasons cited for using a hot knife to tail dock male lambs were that it is bloodless or seals the wound (61%) and less stressful (38%). Queensland producers were less likely than other states to say that hot knife was clean or neat (9%), less stressful (9%), effective (5%), efficient (2%) and quick (2%) (**Figure 22**). There were significant differences between the reasons cited for using this method on ewes for Merino and non-Merino producers. Non-Merino producers were more likely to say this method was efficient (46%), quick (46%), less prone to infection (36%) and reliable (36%).

At the national level, the most common reasons cited for using a cold knife was that it is efficient (42%) and quick (39%) (**Figure 23**). There was no significant difference in reasons for using cold knife between states. Reasons given for using the cold knife on male lambs matched the ewe lambs (**Figure 24**).

Less fly strike (31%) and contractor preference (28%) are the main reasons for using shears for tail docking ewe lambs (**Figure 25**).

The most common reasons cited for using shears to tail dock male lambs were that they were a better method (35%), that results in less fly strike (27%) and is clean and neat (26%) (**Figure 26**). Western Australian producers were significantly more likely to state that shears were the preferred method of their contractors (76%).

Figure 17: Method for tail docking ewes

Base: Producers who tail dock ewes n = 1830

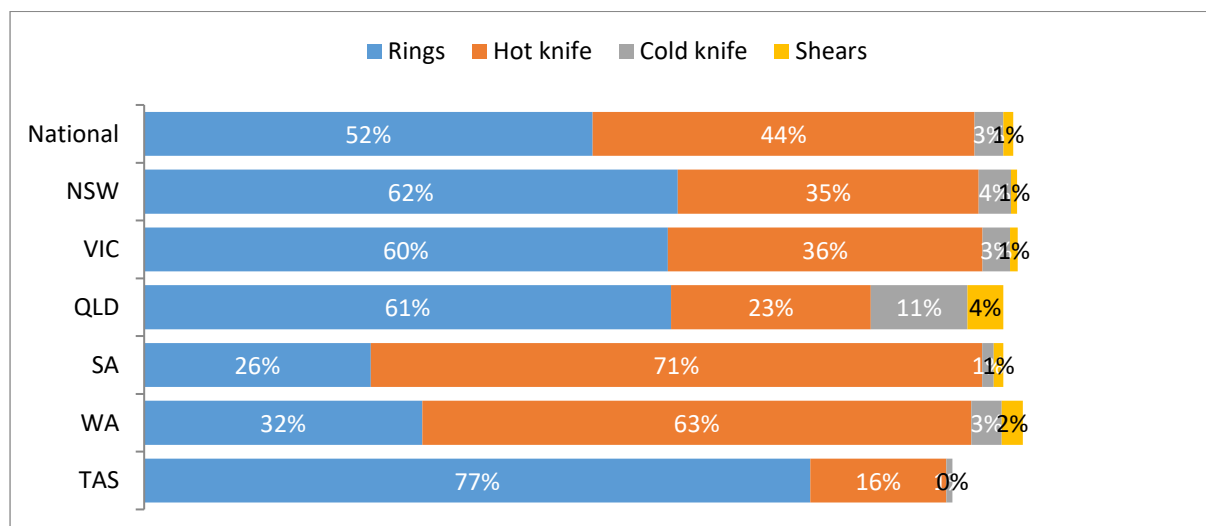


Figure 18: Method for tail docking male lambs

Base: Producers who tail dock male lambs n = 1896

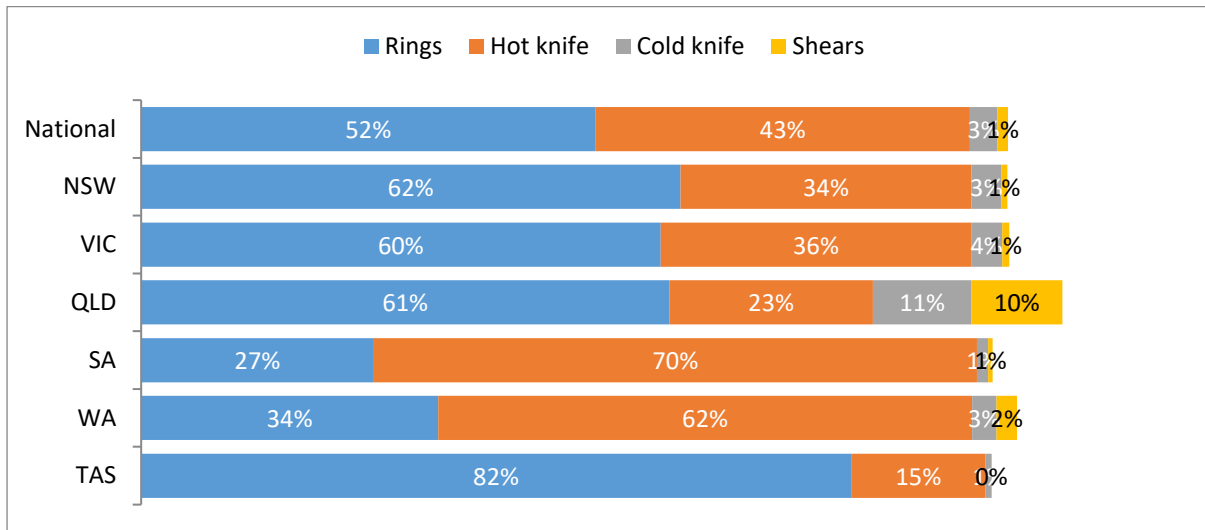


Figure 19: Reason for using rings to tail dock ewes

Base: Producers who tail dock ewes using rings n = 772

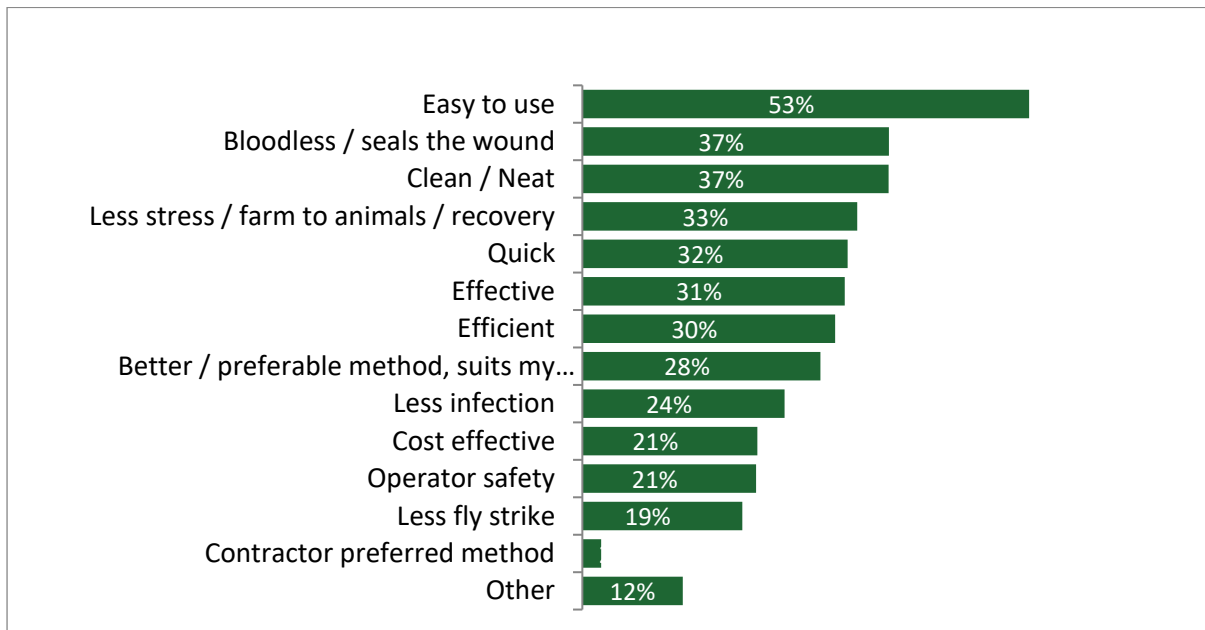


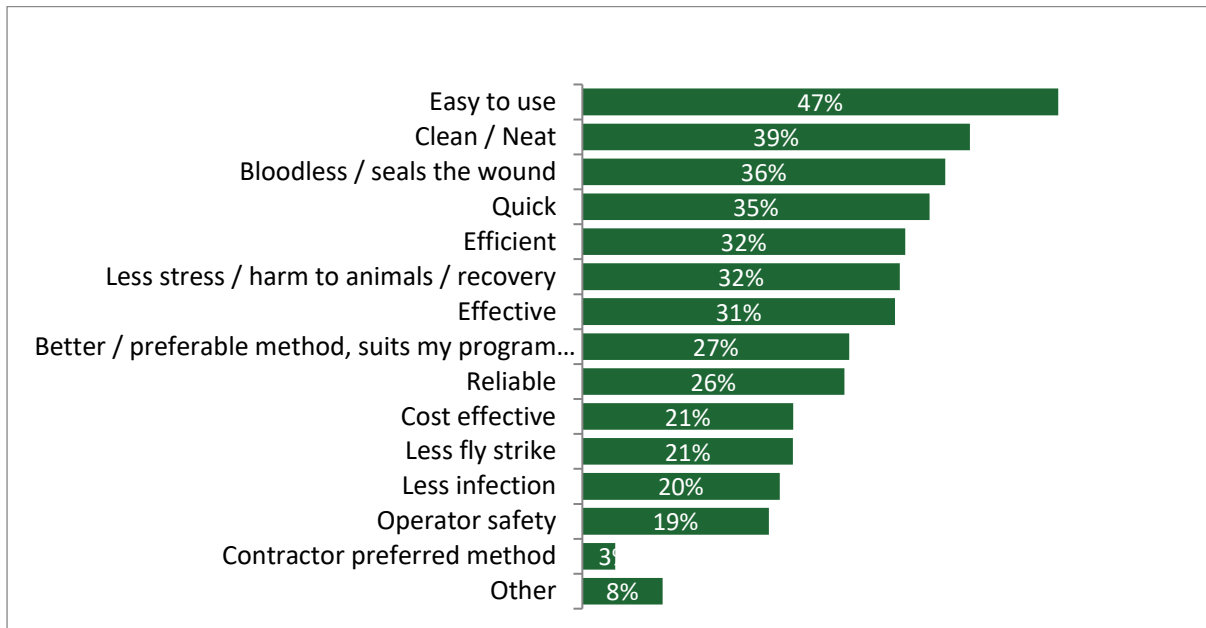
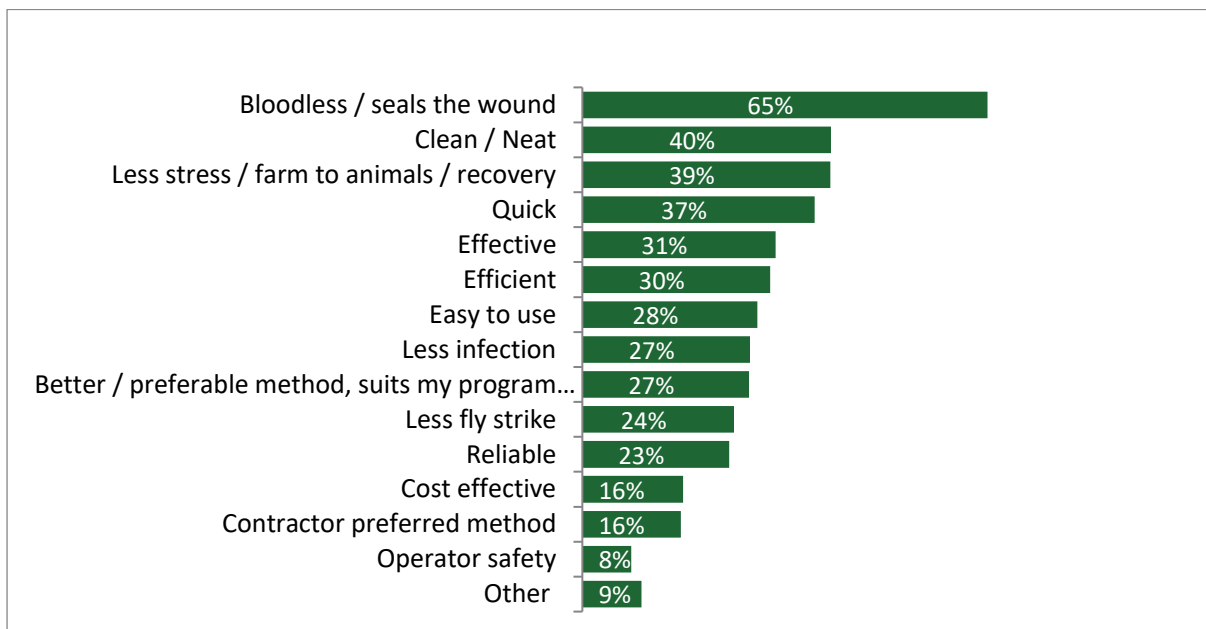
Figure 20: Reason for using rings to tail dock male lambs*Base: Producers who tail dock male lambs using rings n = 829***Figure 21: Reasons for using hot knife on ewe lambs***Base: Producers who tail dock ewes using hot knives n = 961*

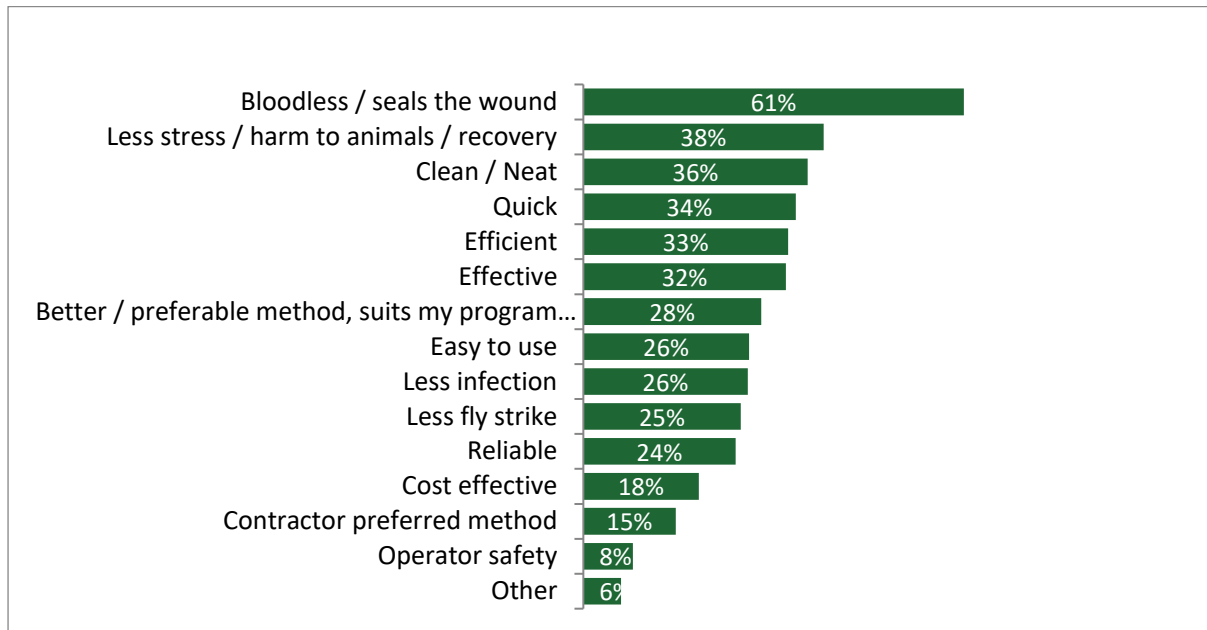
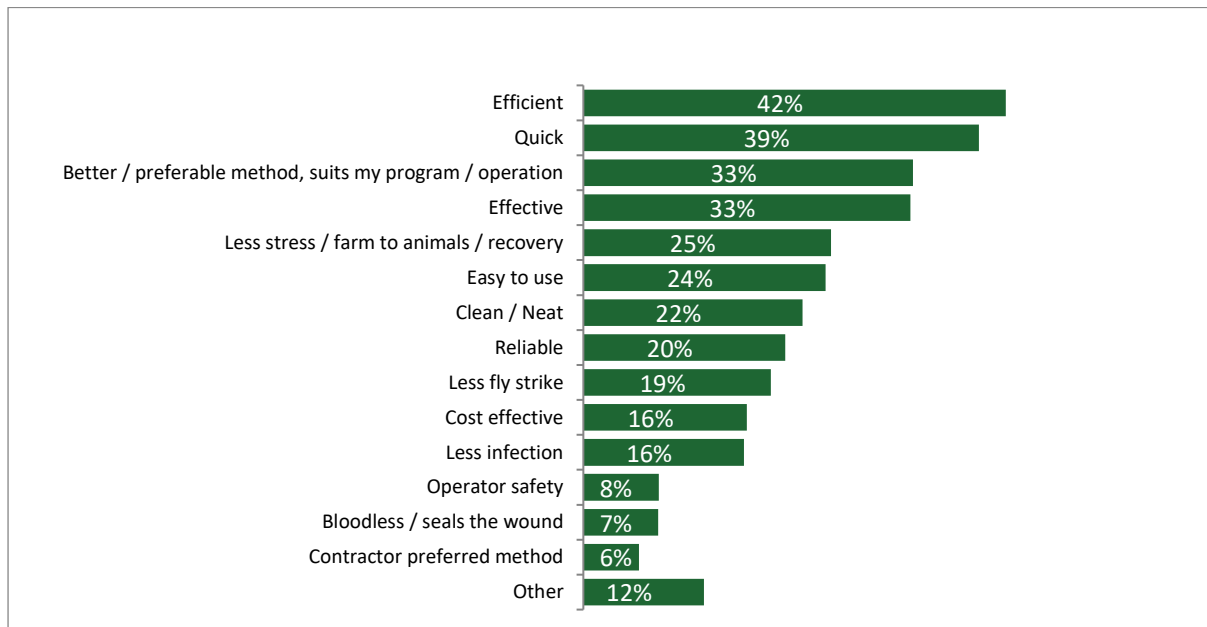
Figure 22: Reason for using hot knife to tail dock male lambs*Base: Producers who tail dock male lambs using hot knives n = 969***Figure 23: Reasons for using cold knife to tail dock ewe lambs***Base: Producers who tail dock ewes using cold knife n = 71*

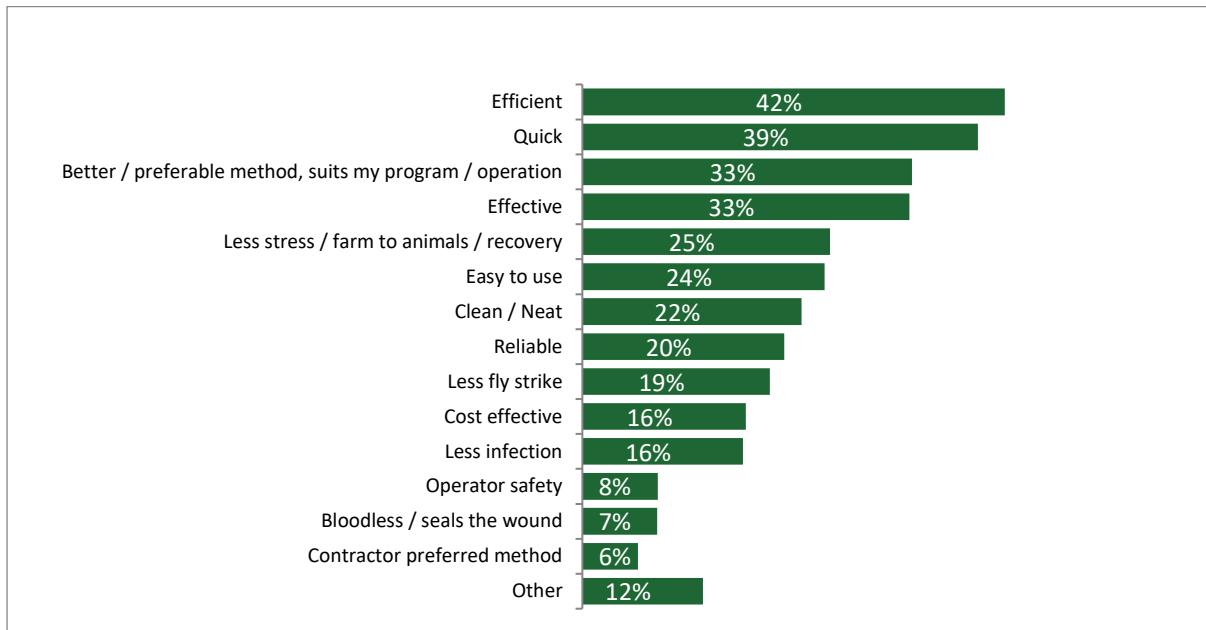
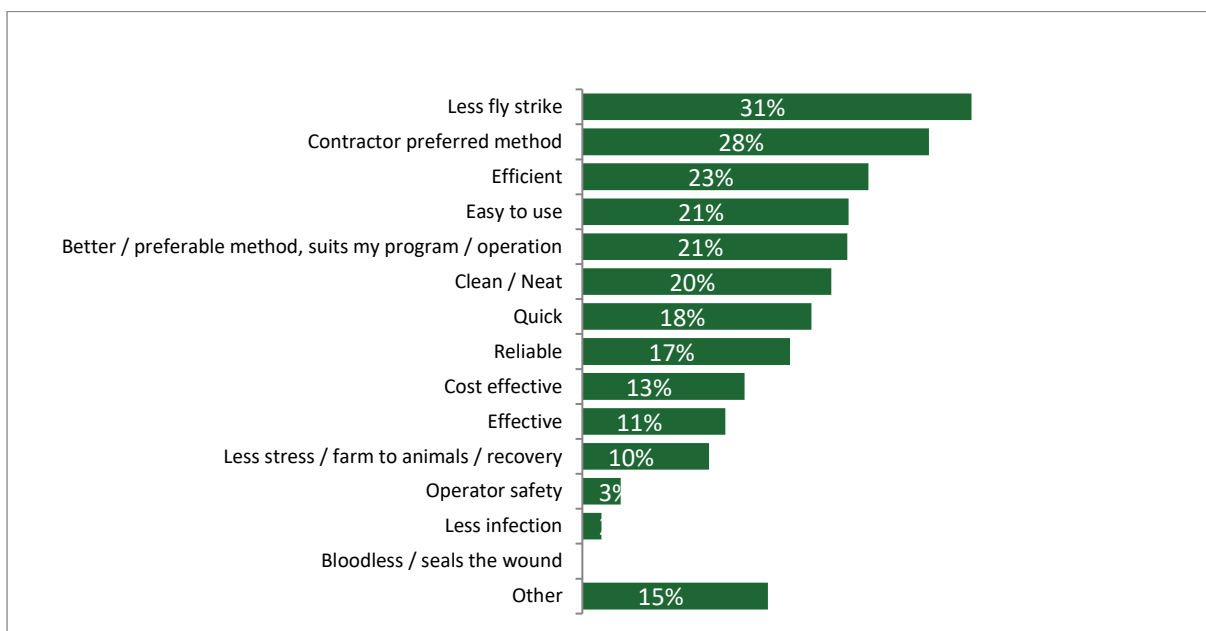
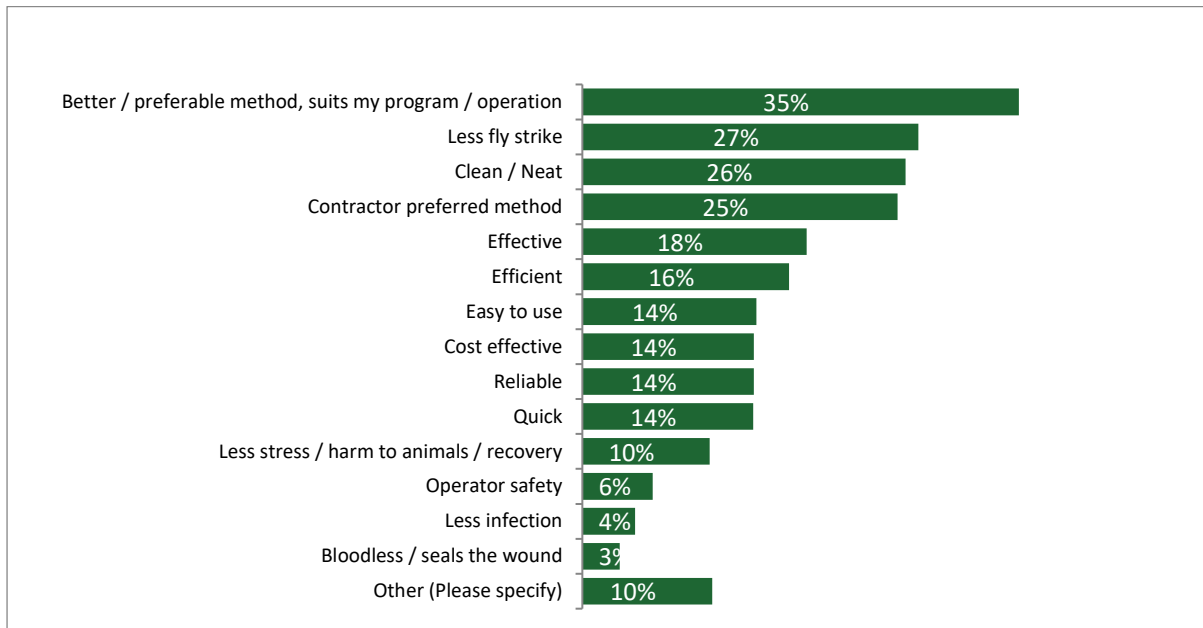
Figure 24: Reasons for using cold knife to tail dock male lambs*Base: Producers who tail dock male lambs using cold knives n = 70***Figure 25: Reasons for using shears to tail dock ewe lambs***Base: Producers who tail dock ewes using shears n = 27*

Figure 26: Reasons for using shears to tail dock male lambs

Base: Producers who tail dock male lambs using shears n = 26



4.5.3 Tail Length

Nationally, almost half of producers who tail dock ewe lambs, dock them to two joints (47%). Three joints is the next most common choice at 39%. This is largely consistent across states and breeds, although South Australian producers were significantly more likely to dock at two joints (60%). (Figure 27). Nationally, more than half of producers who tail dock male lambs dock them to two joints (52%). Three joints is the next most common choice at 34% (Figure 28).

The most common reasons cited for choosing a particular tail length when docking ewe lambs were to protect the genital area (50%) and to provide sun protection (46%) (Figure 29). Queensland producers were significantly less likely to cite cleanliness and industry practice as reasons (10% and 7% respectively). South Australians were more likely to claim the chosen length is easy to manage (29%) while Western Australian producers were more likely than other states to defer to contractor's recommendations (8%). Non-Merino producers were more likely to cite ease of management and specific health reasons (26% and 24% respectively) than Merino producers.

When docking male lambs, producers selected a particular tail length to allow tail movement (37%) and to provide sun protection (35%) (Figure 30). Queensland producers were significantly less likely to cite cleanliness and industry practice as reasons (17% and 8% respectively). South Australians were more likely to claim the chosen length provides sun protection (45%) and easy to manage (35%). Non-Merino producers were more likely to cite ease of management (29%) than Merino producers (21%).

Figure 27: Length of docked ewe lamb tails

Base: Producers who dock ewe lamb tails n = 1830

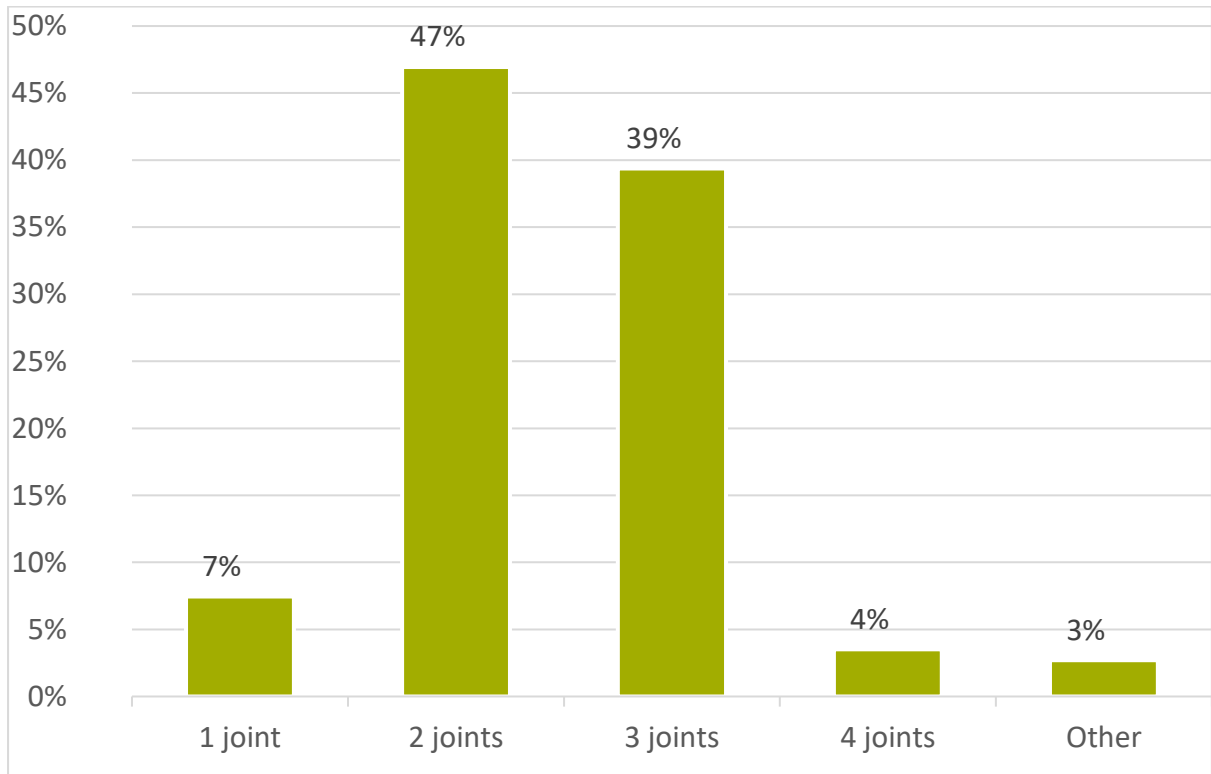


Figure 28: Length of docked male lamb tails

Base: Producers who tail dock male lambs n = 1896

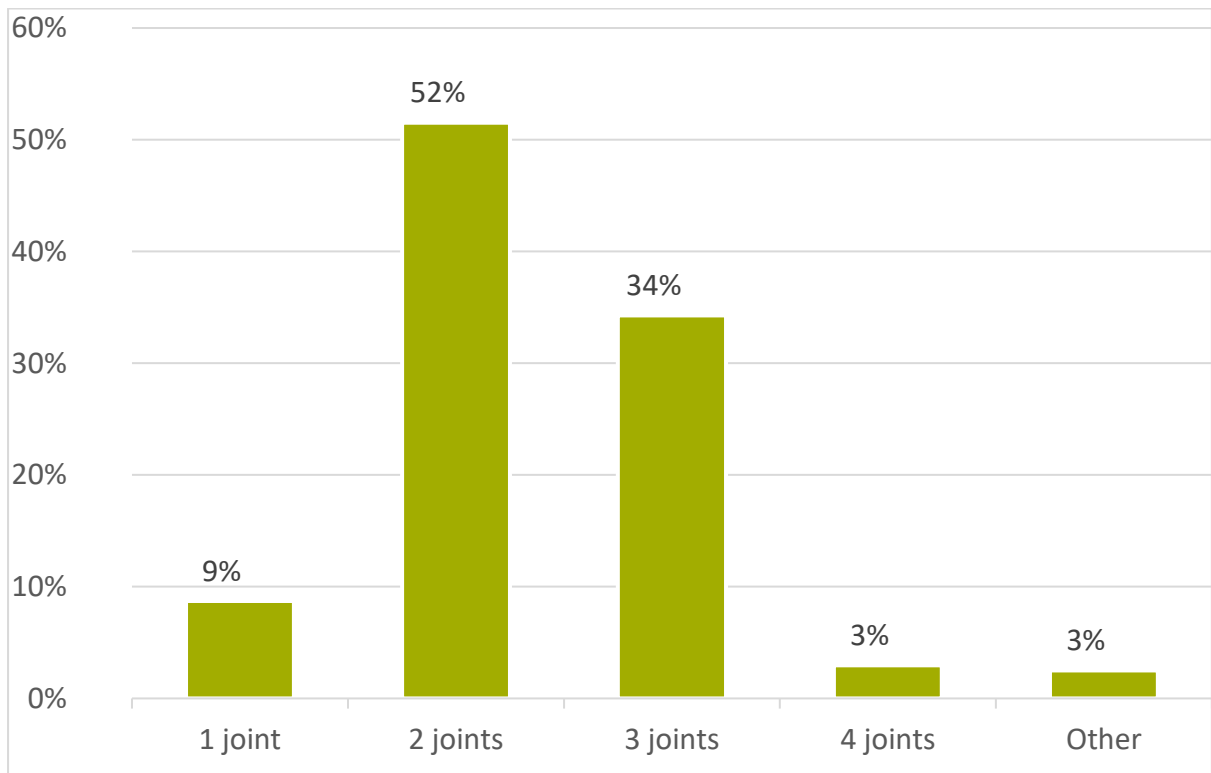
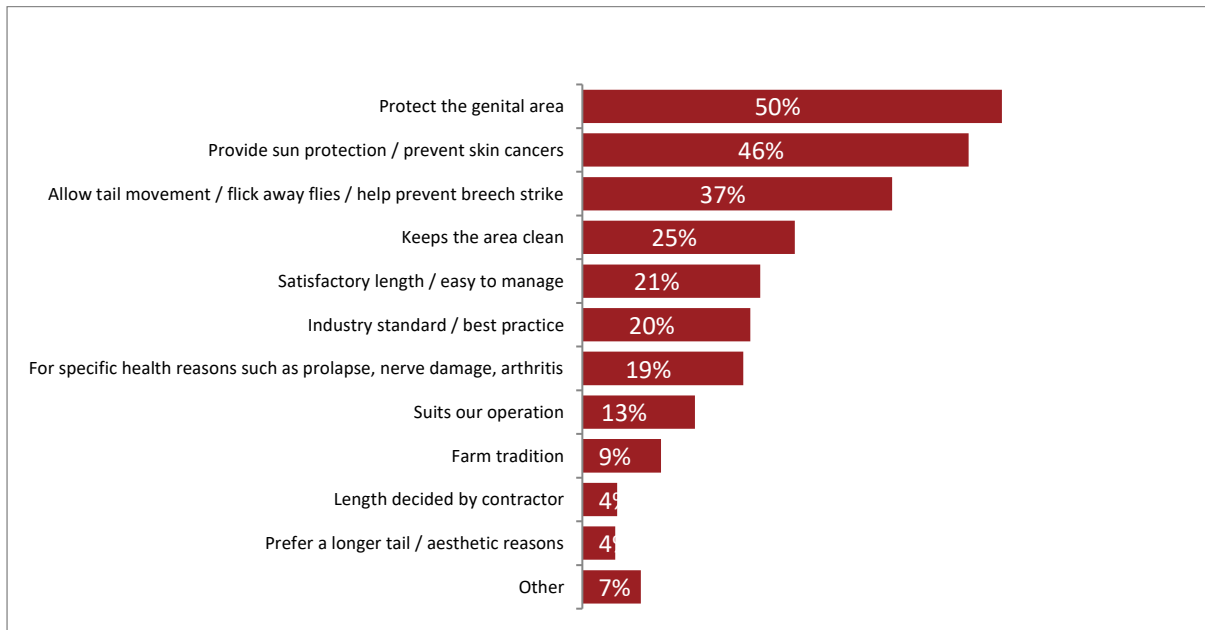
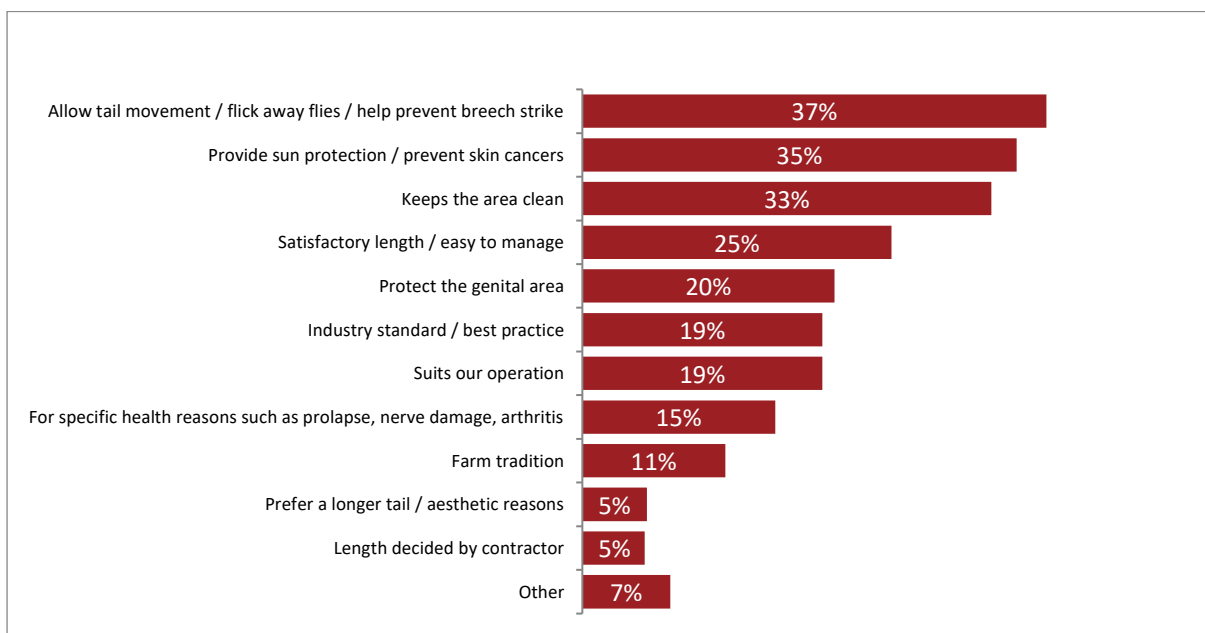


Figure 29: Reason for length of docked ewe lamb tails*Base: Producers who dock ewe lamb tails n = 1830***Figure 30: Reason for length of docked male lamb tails***Base: Producers who dock male lamb tails n = 1896*

4.5.4 Pain management

Nationally, 44% of producers use pain management at lamb tail docking (**Figure 31**). Pain management is significantly more likely to be used in Tasmania and NSW (80% and 64%, respectively). Merino producers were more likely to use pain management (60%) compared to non-Merino producers (24%). Producers in South Australia and Western Australia were significantly more likely to use pain management (61% and 54% respectively).

While 44% of producers use pain management for tail docking ewe lambs across all methods, adoption of pain management however varies by tail docking method (**Figure 32**). When tail docking ewe lambs, fewer producers use pain management for rings (20%). Producers are split on using pain management for cold knife whereas pain management is used by almost three quarters of producers for hot knife (71%) and shears (72%). When comparing Merino and non-Merino, 80% of Merino producers use hot knife and 55% use cold knife while non-Merino producers 45% use hot knife and 19% use cold knife.

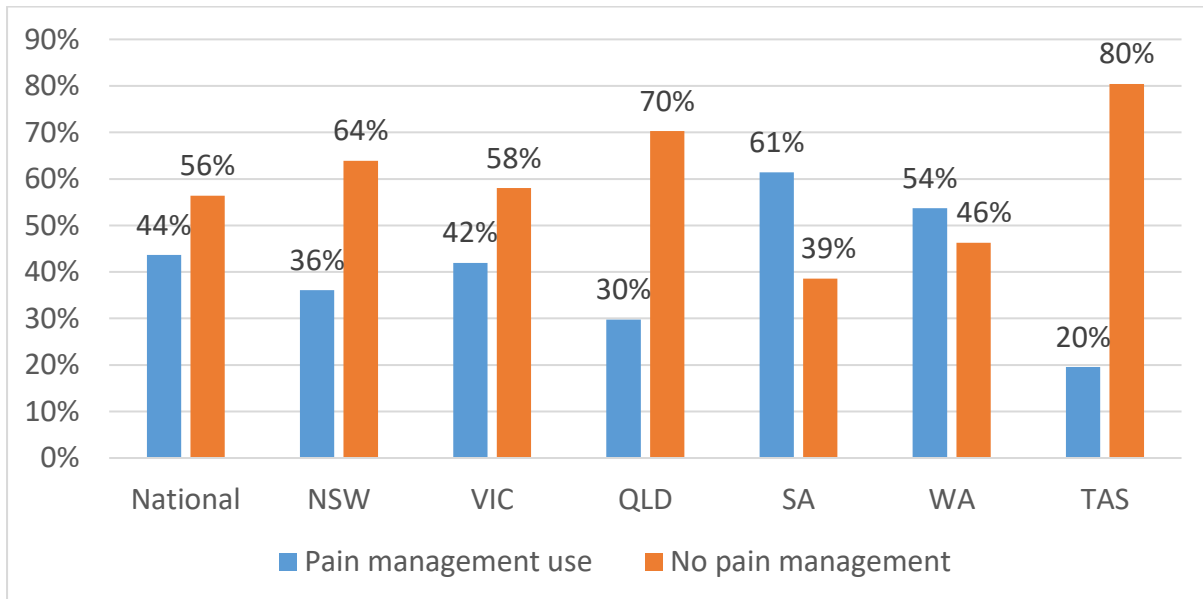
Adoption of pain management for male lambs also varies by tail docking method and is highest for hot knife (71%) and lowest for rings (20%) (**Figure 33**). 80% of Merino producers use hot knife compared to 44% of non-Merino producers.

Anaesthetic and antiseptic spray at the site was by far the most commonly used pain management method (**Figure 34**). Nationally, it is used by 80% of producers who use pain management products at tail docking. Analgesic oral gel and anaesthetic injection at the site were the second most popular pain relief (each 10%). South Australians were significantly more likely to use anaesthetic and antiseptic spray (88%), Tasmanians were more likely to use analgesic injections (32%) and Victorians more likely to use analgesic gel (17%) and anaesthetic injection (15%). 84% of Merino producers used anaesthetic and antiseptic spray with 6% using anaesthetic injection compared to non-Merino producers where 65% used anaesthetic and antiseptic spray and 19% used anaesthetic injection.

The specific type of pain management for each method of tail docking ewes is presented in **Table 2**. Products that are inappropriate for a specific method of tail docking are highlighted with an asterisk. These include using an anaesthetic and antiseptic spray at the surgery site (e.g., Tri-Solfen) for rings or using anaesthetic injection at the surgery site (e.g., Numnuts) for hot knife. This could reflect a misunderstanding among some producers as to the appropriate pain management type needed for tail docking. It is also possible that some producers may be doing multiple animal husbandry practices at the same time. Even though they were asked what pain management products they used specifically for tail docking, they may have selected products used for other invasive animal husbandry practices that are undertaken and treated at the same time as tail docking. These factors could account for the inappropriate pain management product use.

Figure 31: Use of pain management for tail docking of lambs

Base: Producers who tail docked ewe or male lambs n = 1913

**Figure 32: Use of pain management for tail docking by docking method for ewe lambs**

Base: n = 1,913

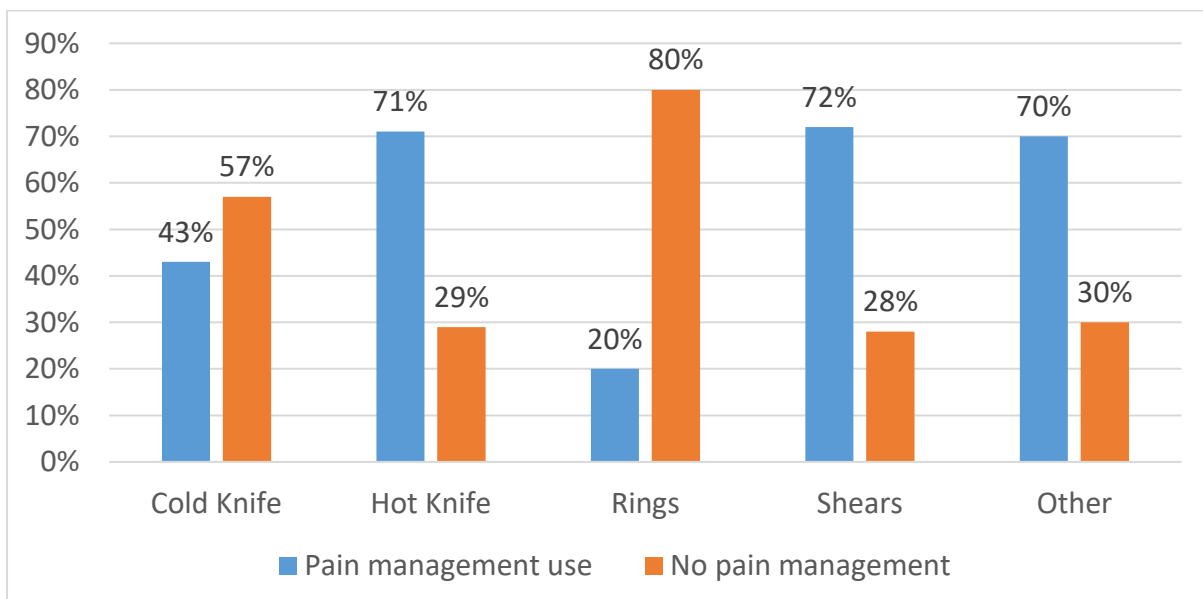


Figure 33: Use of pain management for tail docking by docking method for male lambs

Base: n = 1,913

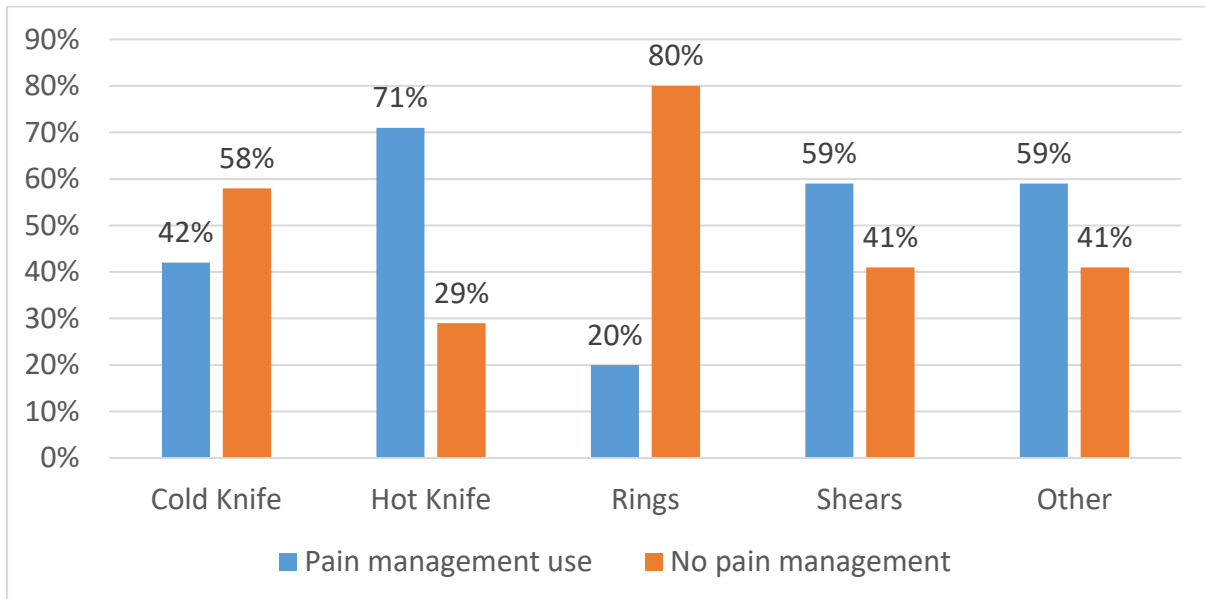


Figure 34: Use of pain management at tail docking

Base: n = 988

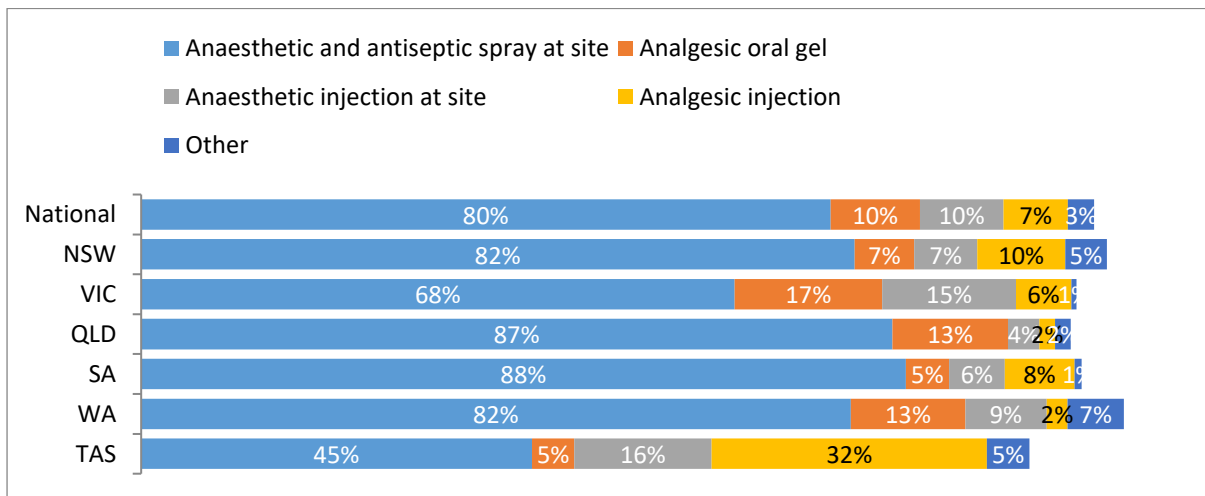


Table 2: Types of pain management products used by tail docking method for ewe lambs

Method of tail docking	Anaesthetic and antiseptic spray at the surgery site (e.g., Tri-Solfen)	Analgesic / pain killing oral gel (e.g., Buccalgesic)	Anaesthetic injection at the surgery site (e.g., Numnuts)	Analgesic / pain killing injection (e.g., Meloxicam)
Rubber Ring (n = 772) 20% use pain management (n = 188)	52%*	18%	24%	10%
Hot Knife (n = 961) 71% use pain management (n = 718)	89%	9%	5%*	7%
Cold Knife (n = 71) 43% use pain management (n = 41)	95%	5%	-	9%
Shears (n = 27) 59% use pain management (n = 21)	96%	4%	-	4%

*Inappropriate pain management product for tail docking method

Similar findings were evident for pain management type when tail docking male lambs with different methods.

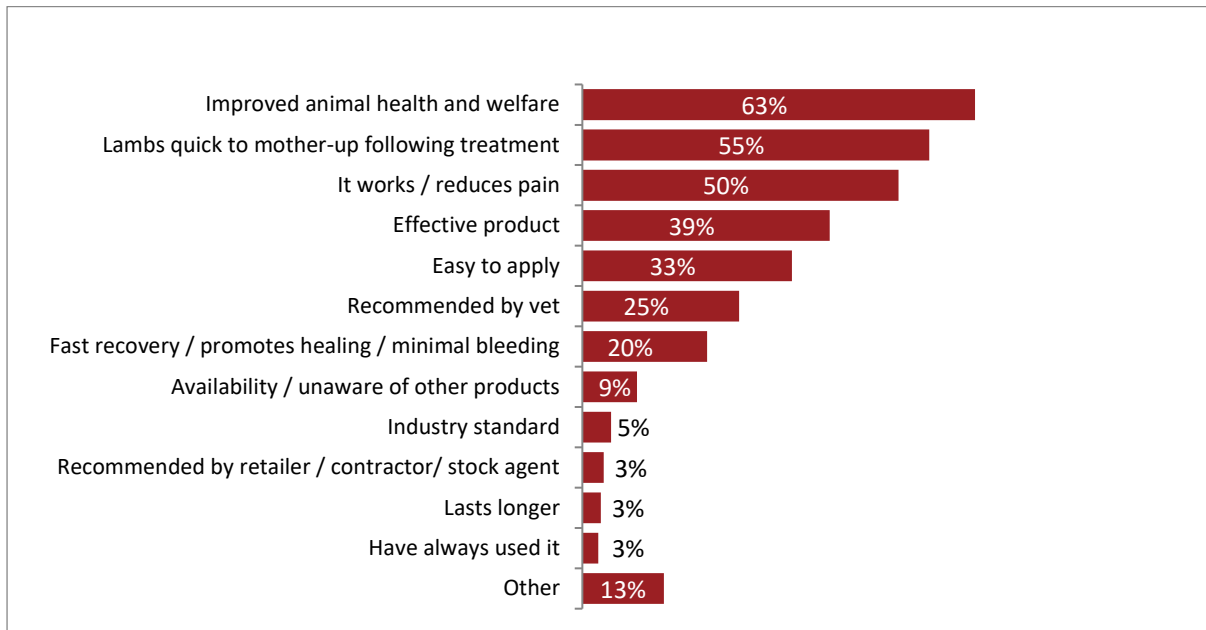
4.5.5 Rationale for pain management method

The most common reasons cited for choosing anaesthetic injections at tail docking of lambs were improved animal health and welfare (63%), quick mothering-up (55%) and to reduce pain (50%) (**Figure 35**). For anaesthetic and antiseptic spray at the surgery site (e.g., Tri-Solfen), the most common reasons cited were effective pain reduction (56%), fast recovery (46%) and to improve animal health and welfare (45%) (**Figure 36**). Producers who chose analgesic injections said they were effective for pain reduction (59%), improved welfare (58%) and it were longer lasting (48%) (**Figure 37**). The most common reasons cited for choosing analgesic oral gel were improved animal health and welfare (57%), pain reduction (48%), vet recommendation and longer lasting (both 42%) (**Figure 38**).

The most common reason given for not using pain management is that producers don't consider it necessary (50%). 24% of producers cited no particular reason with 21% claiming it was not practical or a quick procedure (**Figure 39**). 4% of Merino producers said pain management was too expensive compared to 11% of non-Merino producers.

Figure 35: Reason for using anaesthetic injection at surgery site

Base: n = 91

**Figure 36: Reason for using anaesthetic and antiseptic spray**

Base: n = 808

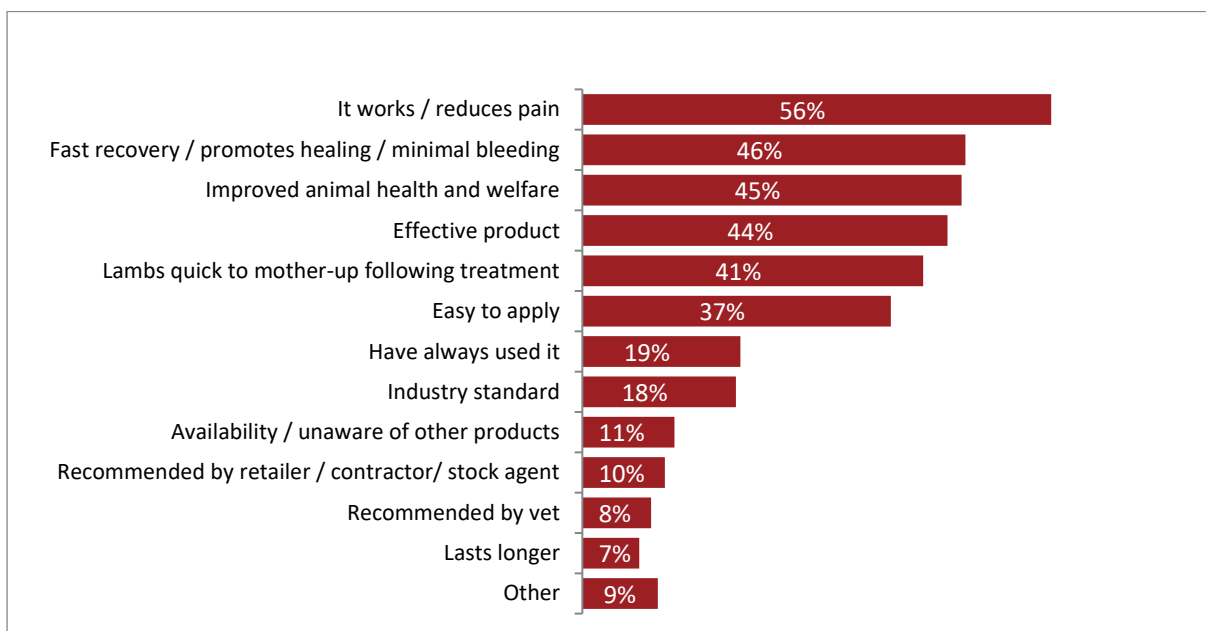
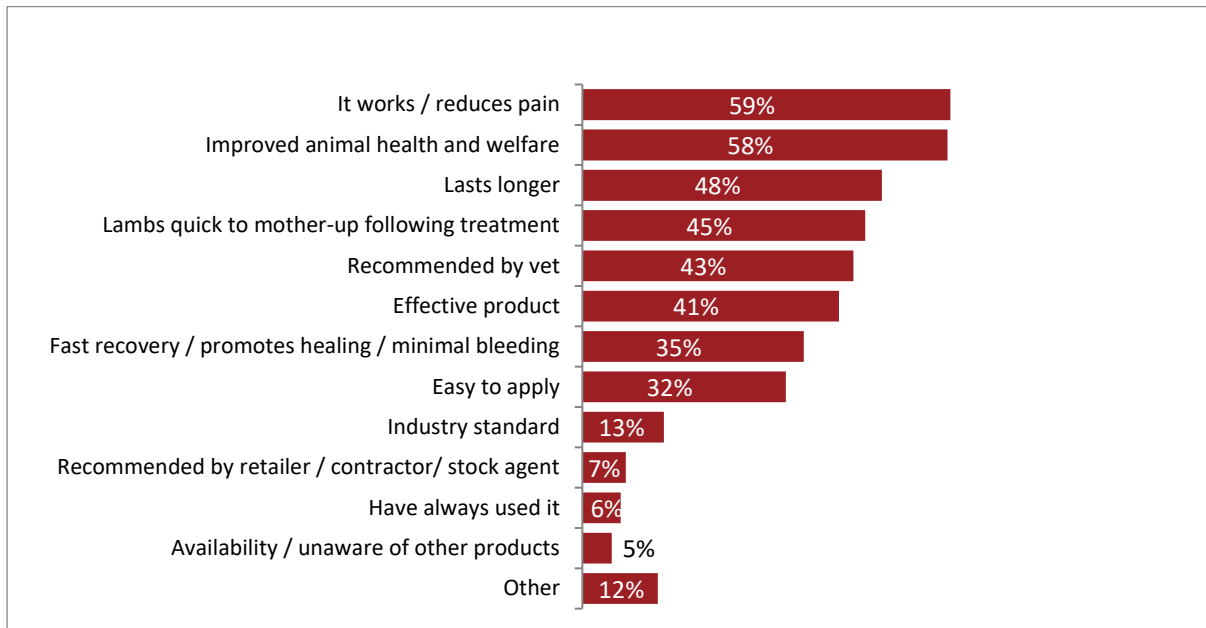


Figure 37: Reason for using analgesic injection

Base: n = 77

**Figure 38: Reason for using analgesic oral gel**

Base: n = 91

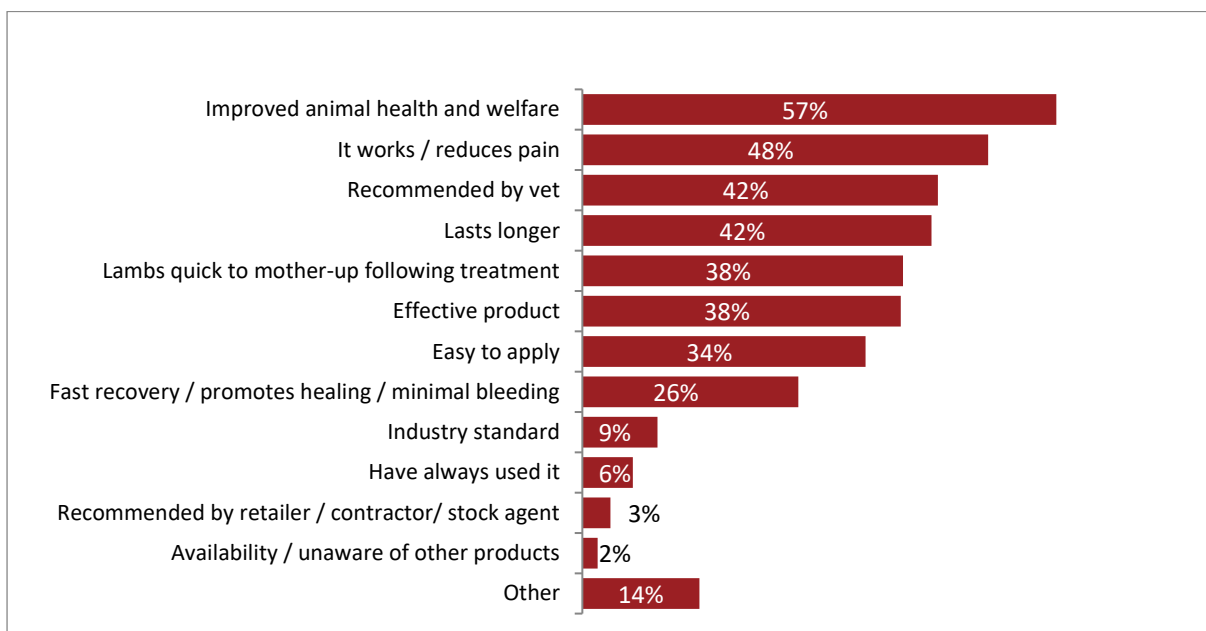
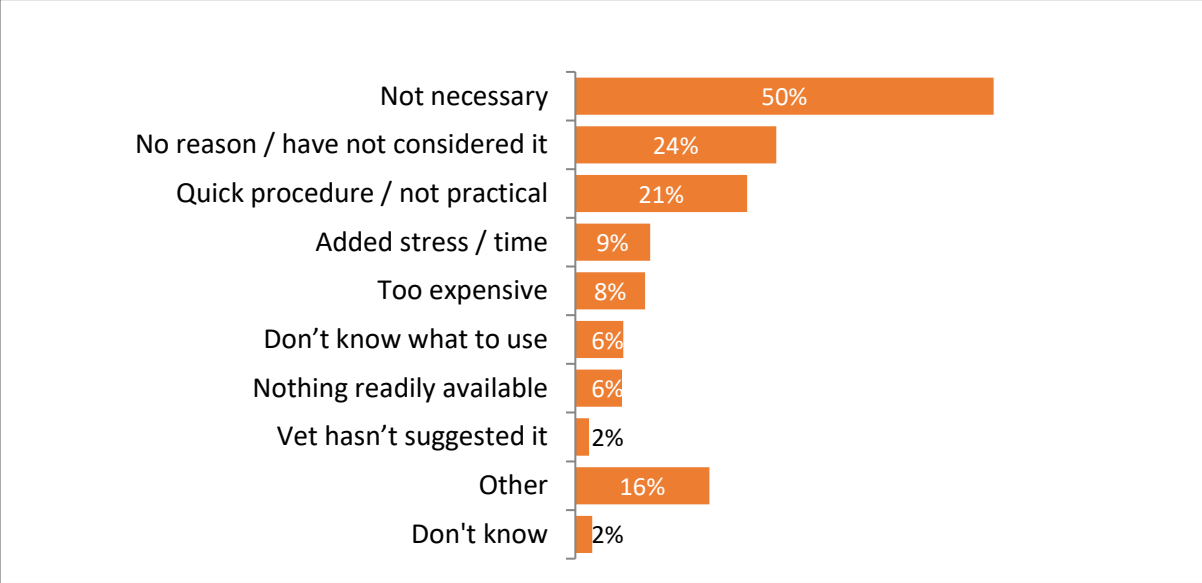


Figure 39: Reasons against using pain management for tail docking

Base: n = 925



4.6 Castration

4.6.1 Overview

At the National level, 95% of producers castrate their male lambs. **(Figure 40)**. Merino producers were more likely to castrate lambs (98%) than non-Merino producers (92%).

Rubber rings were by far the most common technique (98%) used for castration of male lambs nationally **(Figure 41)**.

Nationally, 25% of producers used pain management in 2021 when castrating male lambs **(Figure 42)**. Merino producers (29%) were more likely to castrate lambs than non-Merino producers (19%).

Figure 40: Castration of male lambs

Base: n = 2,003

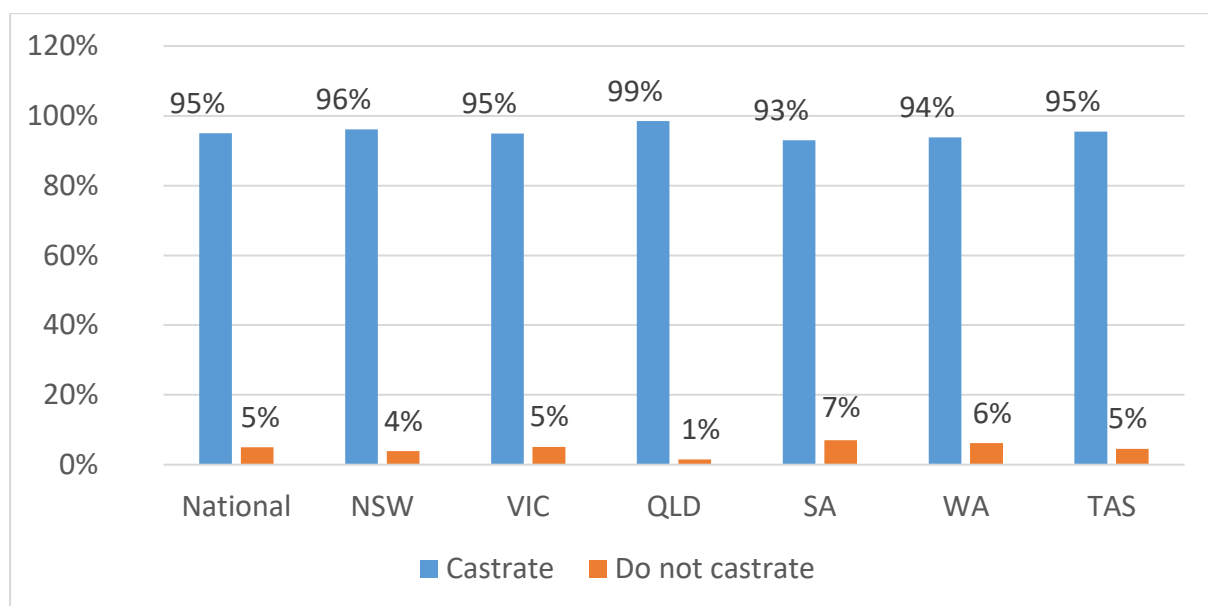


Figure 41: Lamb castration methods by state

Base: Producers who castrate male lambs n = 1,913

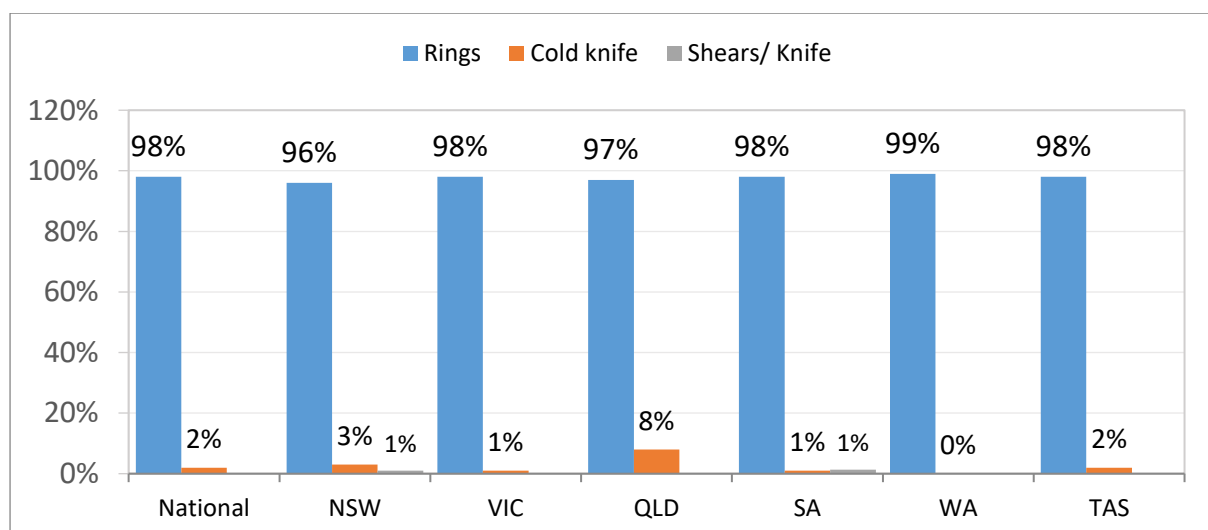
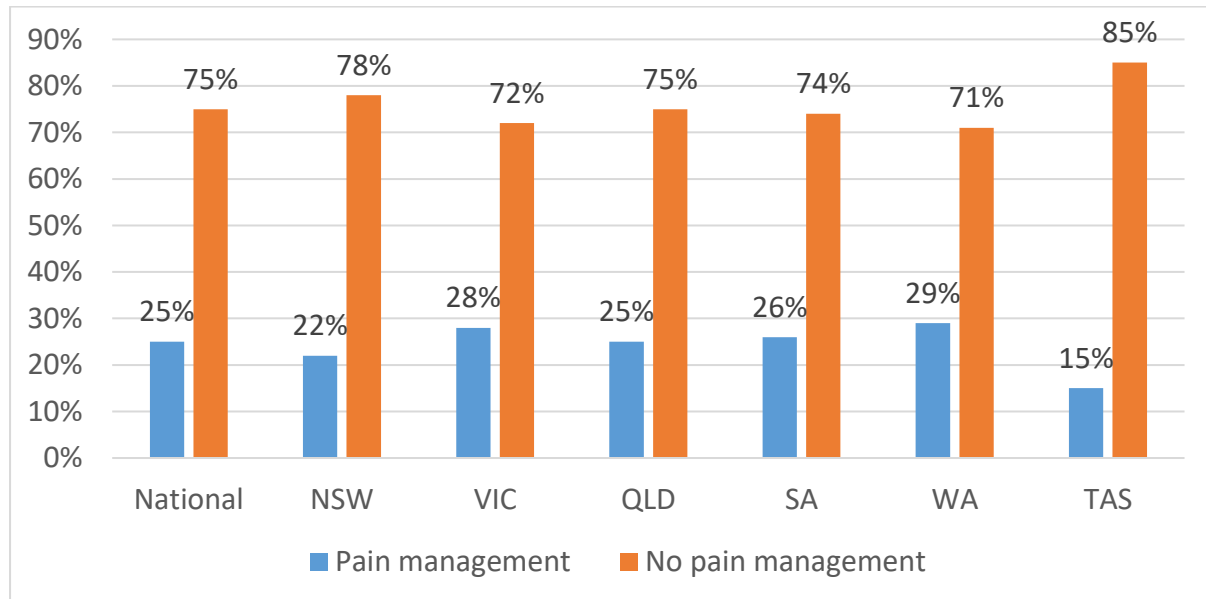


Figure 42: Use of pain management for castrating male lambs in 2021

Base: Producers who castrated male lambs in 2021 n = 1,913



4.6.2 Pain management method

Use of pain management for castrating male lambs varies by castration method (**Figure 43**), with only 24% of producers who practice lamb castration using rings also using pain management. Producers in NSW were less likely to use pain management than other states (21%). Merino producers (29%) were more likely to use pain management to castrate lambs using rings than non-Merino producers (19%).

Anaesthetic and antiseptic spray at the site is the primary type of pain management for castration (**Figure 44**). Slightly more than half of producers who use pain management products at castration (52%) use anaesthetic and antiseptic spray at the surgery site. There was some variation between states with 65% of New South Wales producers reporting using an anaesthetic and antiseptic spray. Victorians were more likely to use analgesic oral gel (26%) and South Australians to use analgesic injections (22%). Merino producers use anaesthetic and antiseptic spray (59%) and anaesthetic injection (17%). Conversely, non-Merino producers use anaesthetic and antiseptic spray (40%) and anaesthetic injection (33%).

The specific type of pain management for each method of castration is presented at **Table 3**. Products that are inappropriate for a specific method of castration are highlighted with an asterisk. These include using an anaesthetic and antiseptic spray at the surgery site (e.g., Tri-Solfen) for rings or using anaesthetic injection at the surgery site (e.g., Numnuts) for cold knife or shears / knife. As with tail docking, this could reflect a misunderstanding around the appropriate pain management type for castration or that multiple animal husbandry practices are conducted and treated at the same time as castration.

Figure 43: Use of pain management by castration method

Base: Producers who castrated male lambs n = 1,913

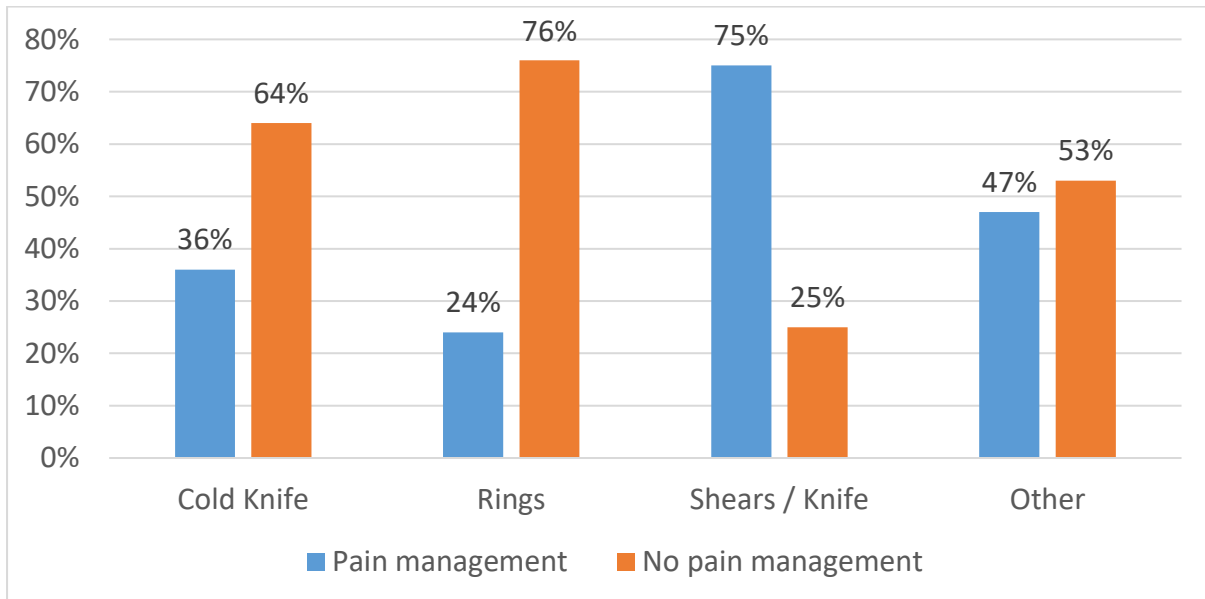


Figure 44: Types of pain management products used at castration

Base: Producers who castrate male lambs using pain management products n = 541

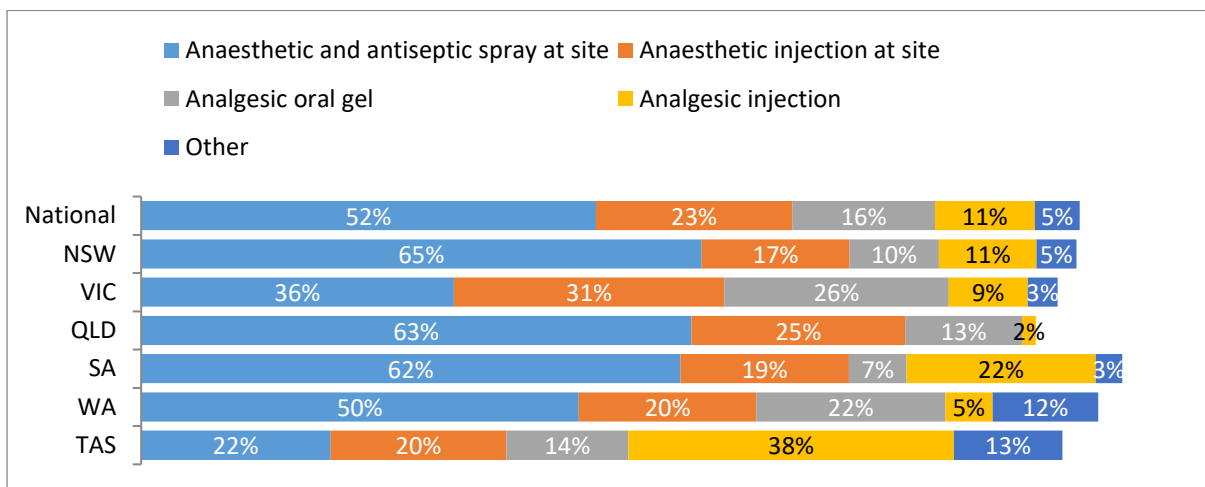


Table 3: Types of pain management products used by castration method

Method of castration	Anaesthetic and antiseptic spray at the surgery site (e.g., Tri-Solfen)	Analgesic / pain killing oral gel (e.g., Buccalgesic)	Anaesthetic injection at the surgery site (e.g., Numnuts)	Analgesic / pain killing injection (e.g., Meloxicam)
Rubber Ring (n=1,854) 24% use pain management (n = 507)	51%*	17%	23%	12%
Cold Knife (n = 38) 36% use pain management (n = 19)	84%	10%	5%*	6%
Shears / Knife (n = 12) 75% use pain management (n = 9)	89%	22%	15%*	-

*Inappropriate pain management product for tail docking method

4.6.3 Rationale for pain management method

The most common reasons cited for choosing anaesthetic injections were that it reduces pain (65%), improves animal health and welfare (64%) and lambs quickly mother-up afterwards (56%) (**Figure 45**).

The most common reasons cited for choosing anaesthetic and antiseptic spray were effective pain reduction (50%), to improve animal health and welfare (35%), and fast recovery (34%) (**Figure 46**).

The most common reasons cited for choosing analgesic injections were to improve animal health and welfare (68%) and effective pain reduction (61%) (**Figure 47**). There was no significant difference in reasons for using this product between states or sheep breeds.

The most common reasons cited for choosing analgesic oral gel were improved animal health and welfare (56%) and pain reduction (52%) (**Figure 48**).

The most common reason given for not using pain management is that producers do not consider it necessary (45%). 25% of producers cited no particular reason with 19% stating it was not practical or a quick procedure (**Figure 49**). Queensland producers were significantly less likely to cite that pain management was not available (1%). Merino producers (6%) were less likely to say that pain management was too expensive, compared to non-Merino producers (11%).

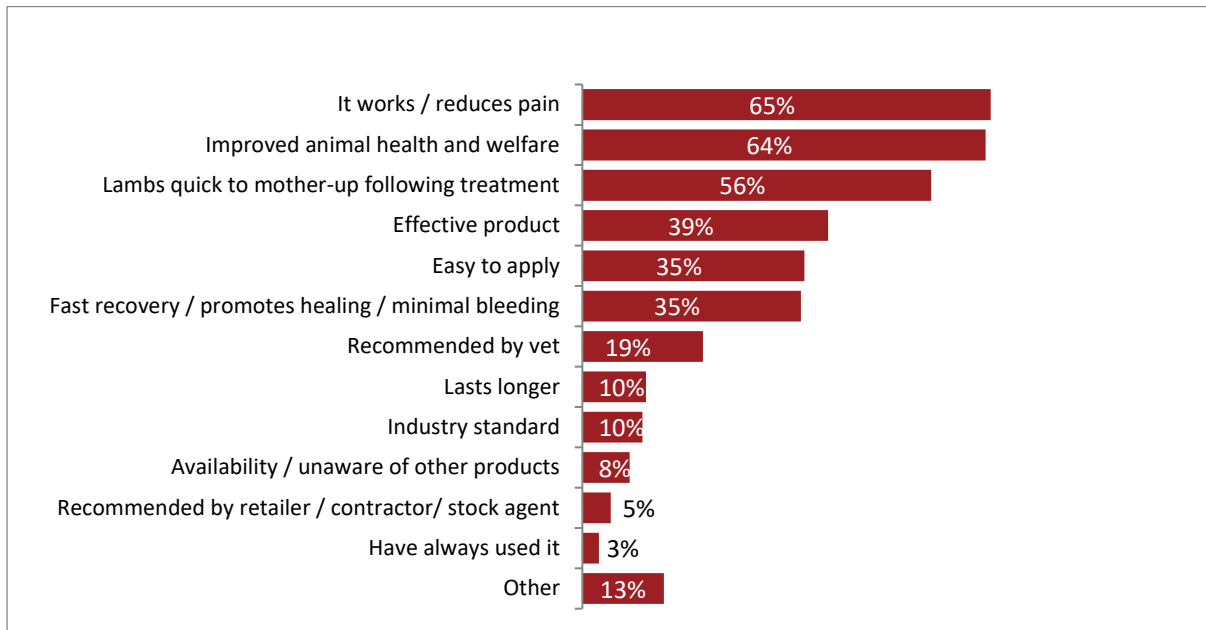
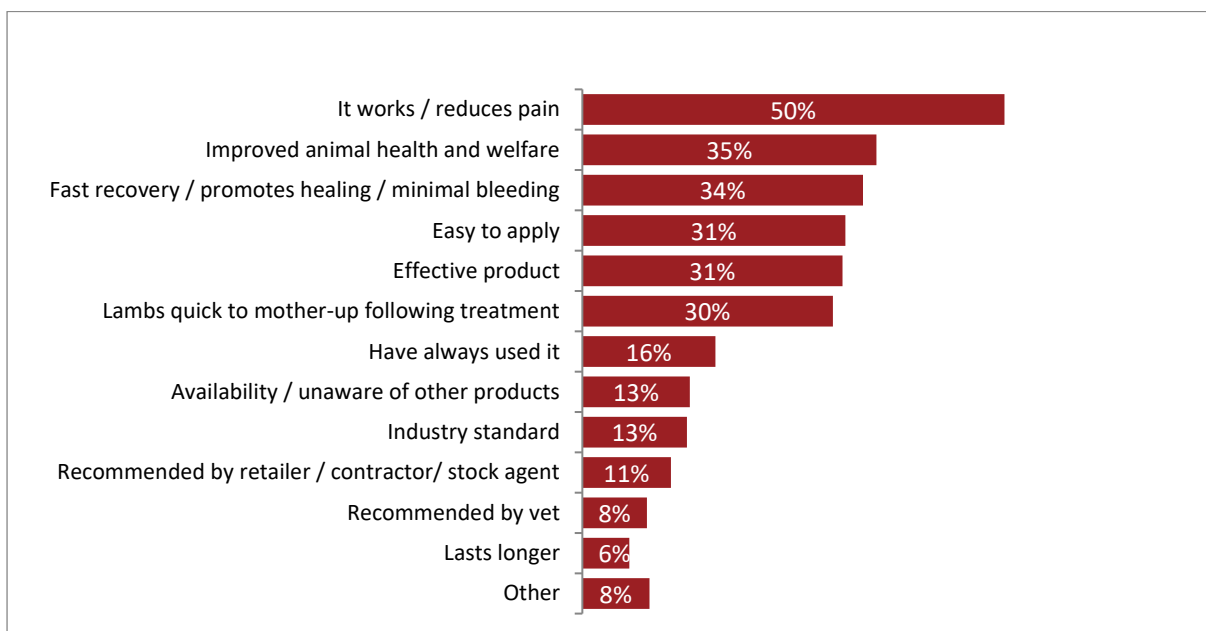
Figure 45: Reason for using anaesthetic injection to castrate lambs*Base: Producers who castrate lambs using anaesthetic injection n = 131***Figure 46: Reasons for using anaesthetic and antiseptic spray at castration***Base: Producers who castrate lambs using anaesthetic and antiseptic spray n = 290*

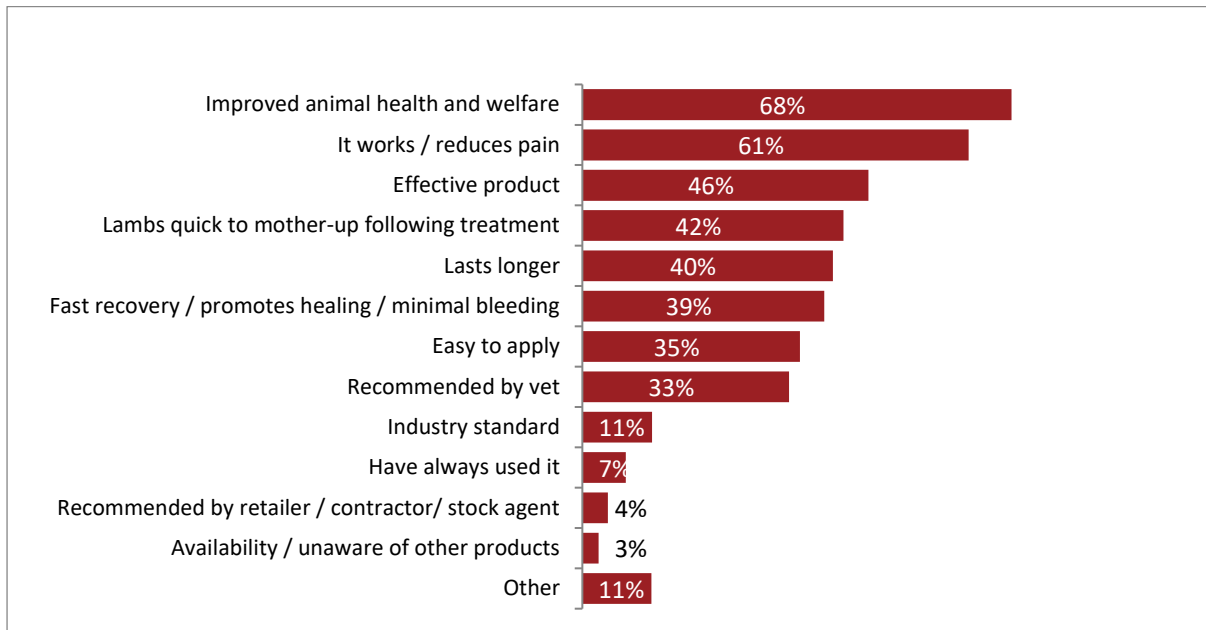
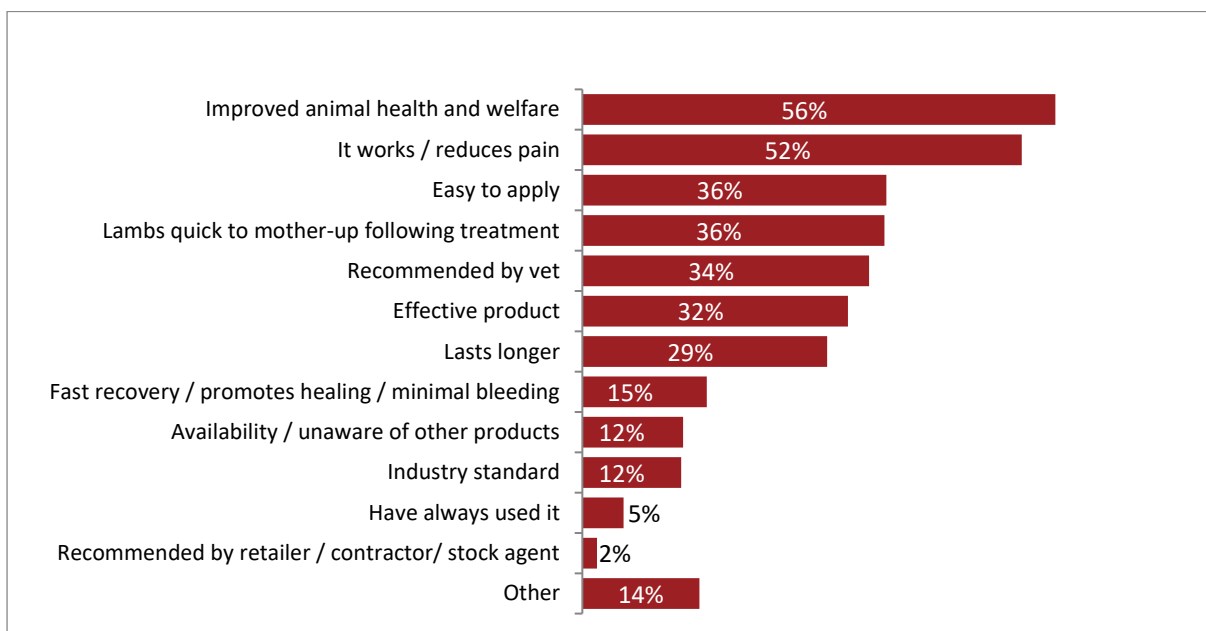
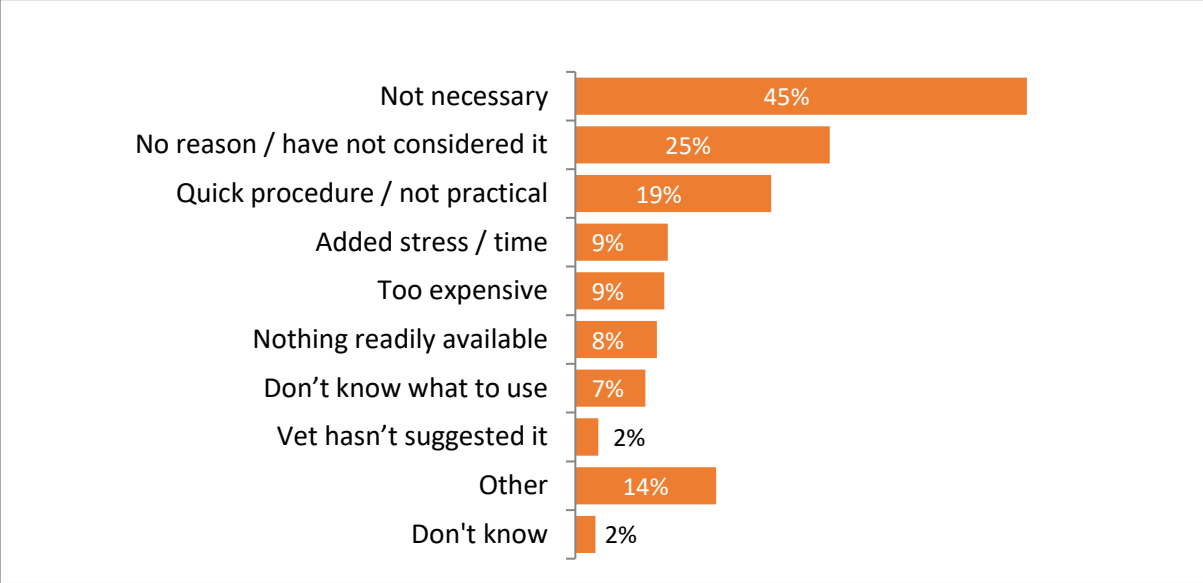
Figure 47: Reason for choosing analgesic injection at castration*Base: Producers who castrate lambs using analgesic injection n = 67***Figure 48: Reason for using analgesic oral gel at castration***Base: Producers who castrate lambs using analgesic gel n = 80*

Figure 49: Reason not to use pain management for castration

Base: Producers who did not use pain management products during castration n = 1,372



4.7 Mulesing

4.7.1 Overview

At the national level, 31% of producers mulesed their ewe lambs in 2021 (**Figure 50**). The practice varies significantly across states, with mulesing less frequent in Tasmania, Queensland, Victoria and New South Wales (6%, 8%, 24% and 26% respectively). South Australian and Western Australian producers were significantly more likely to mules (53% and 47% respectively). Mulesing of ewe lambs is significantly higher among Merino producers with more breeding ewes (1,001 – 2,000: 73%; 2,000+: 68%).

At the national level, 25% of producers mulesed their male lambs in 2021 (**Figure 51**). This varies significantly across states, with mulesing less frequent in Queensland, Victoria and Tasmania (4%, 5%, 19% and 19% respectively). South Australian and Western Australian producers were significantly more likely to mules (41% and 42% respectively). Mulesing of male lambs is significantly higher among Merino producers with more breeding ewes (1,001 – 2,000: 59%; 2,000+: 60%)

Across Australia, the majority of producers who mules use pain relief (92%) (**Figure 52**).

Figure 50: Mulesing of ewe lambs in 2021

Base: n = 2,003

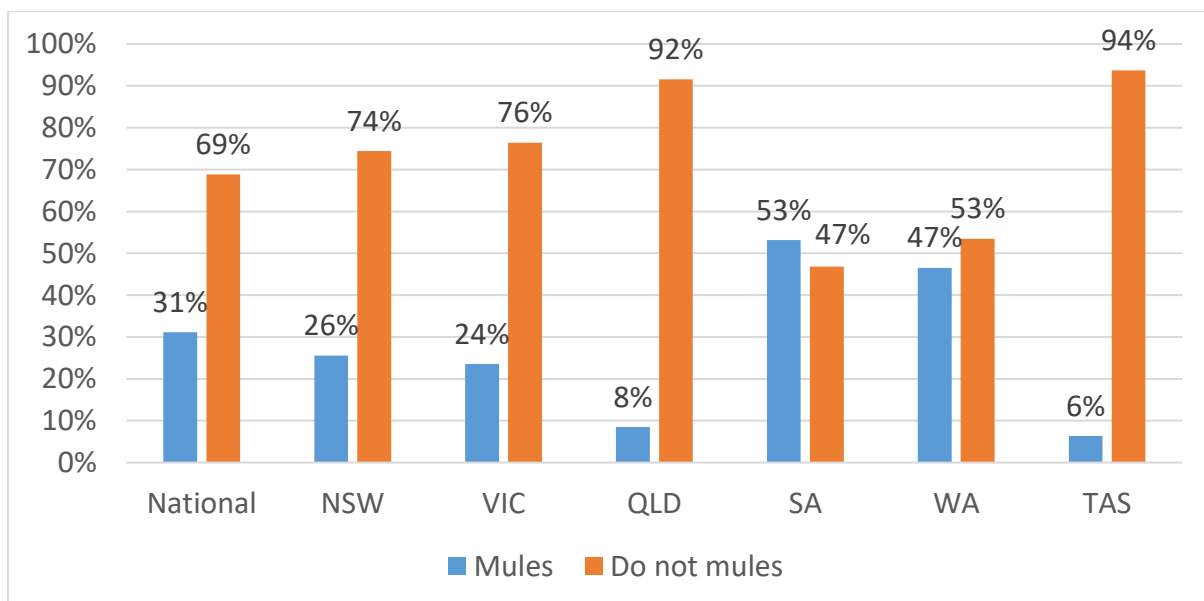
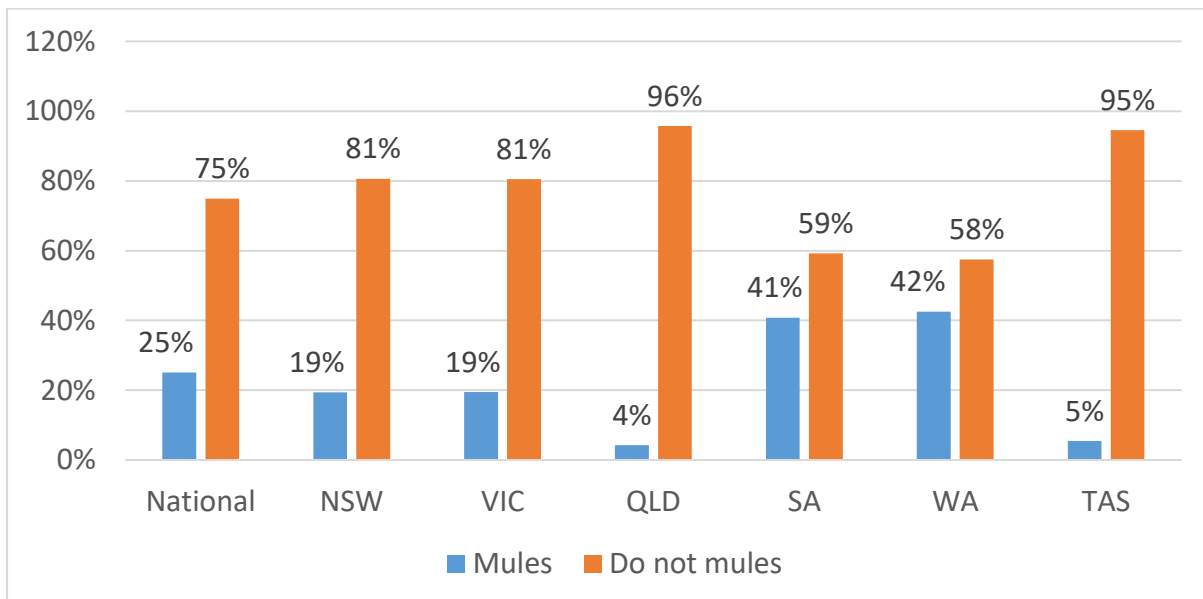
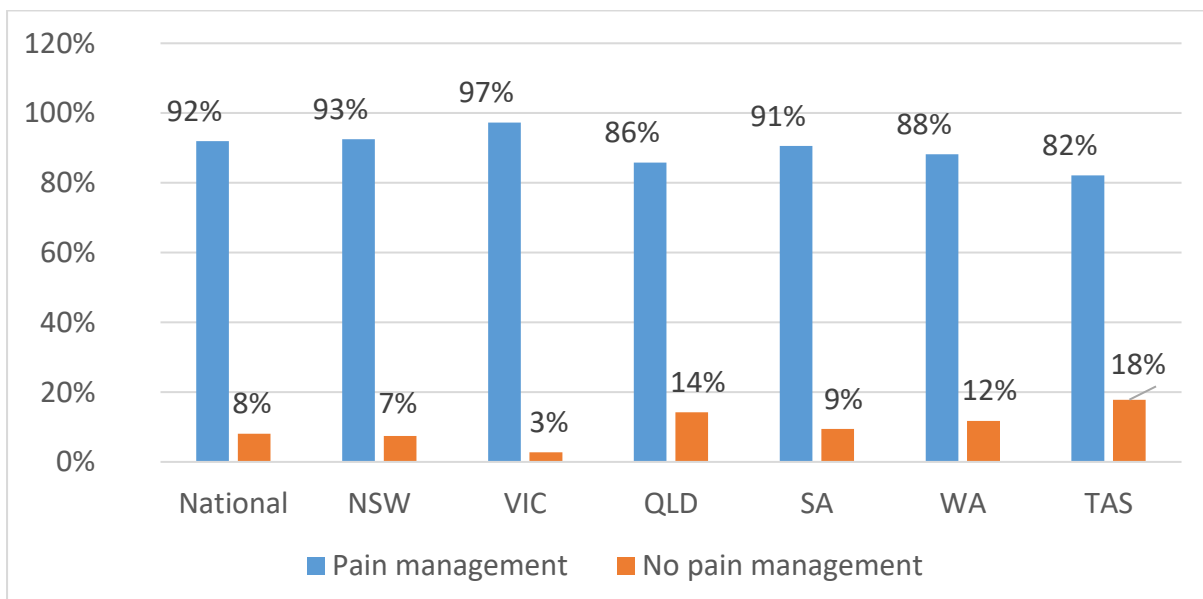


Figure 51: Mulesing of male lambs in 2021

Base: n = 2,003

**Figure 52: Use of pain management at mulesing in 2021**

Base: Producers who mulesed lambs n = 796

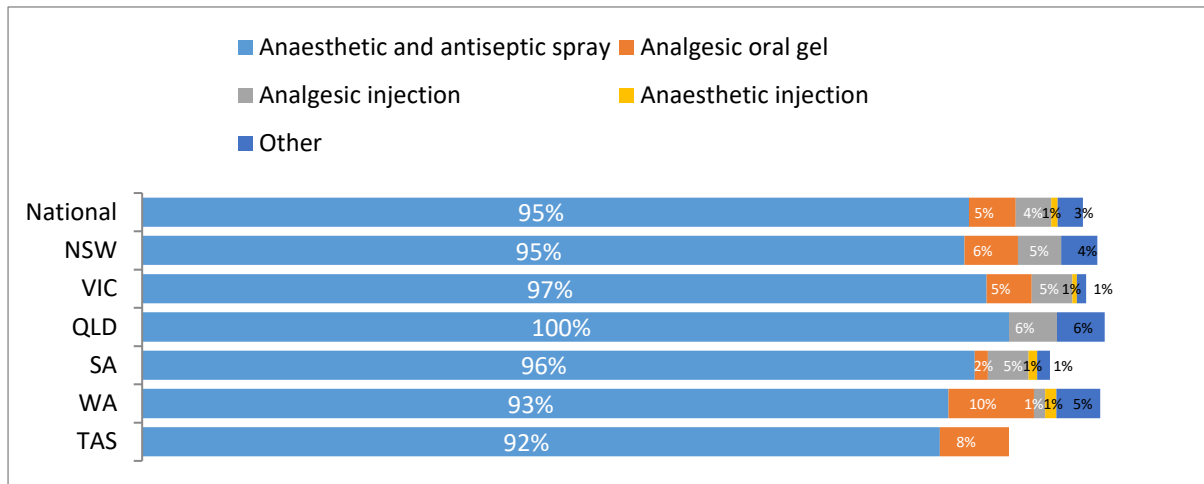


4.7.2 Pain management method

Nationally, of producers who use pain management products at mulesing, virtually all (95%) use anaesthetic and antiseptic spray at the surgery site (**Figure 53**).

Figure 53: Types of pain management used at mulesing

Base: Producers who mules lambs using pain management products n = 743



4.7.3 Rationale for pain management method

The most common reasons cited for choosing anaesthetic and antiseptic spray were effective pain reduction (57%) and fast recovery (51%) (**Figure 54**). There was no significant difference in reasons for using this product by state except for South Australian producers who were significantly more likely to say this product is easy to apply (53%).

Where producers choose analgesic injections, they stated that they provided effective pain reduction (71%) and fast recovery (53%) (**Figure 55**).

The most common reasons cited for choosing analgesic oral gel were pain reduction (75%) and improved animal health and welfare (61%) (**Figure 56**).

When producers did not use pain management it was largely because they do not consider it necessary (44%) (**Figure 57**). 18% of producers cited no particular reason with 14% stating it was too expensive.

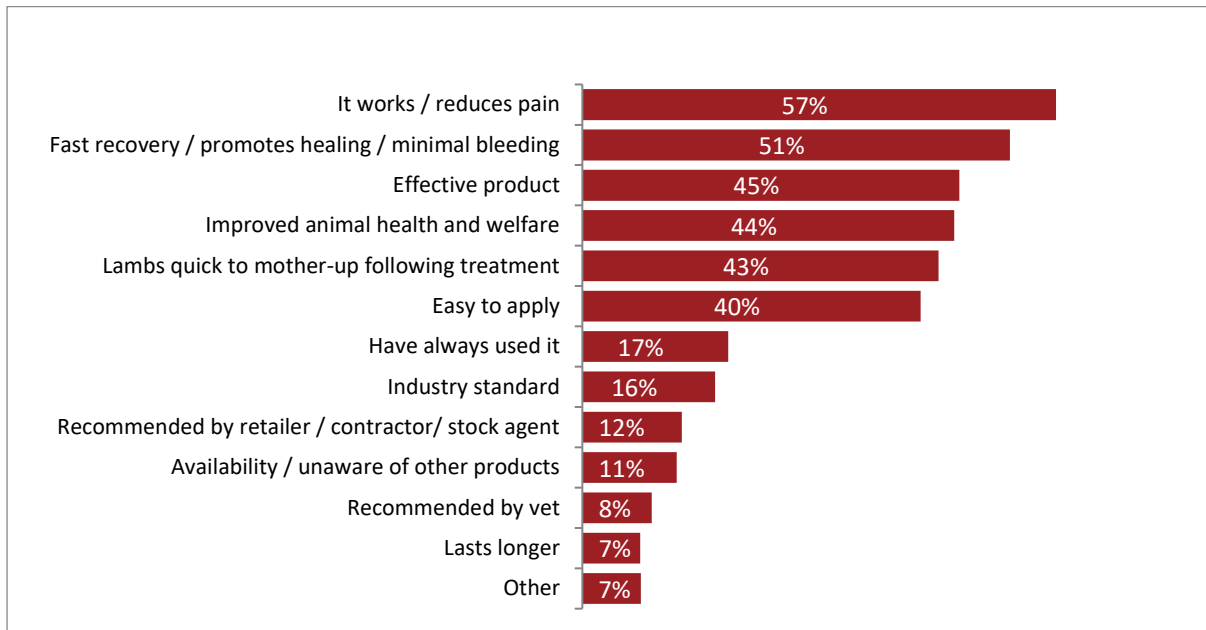
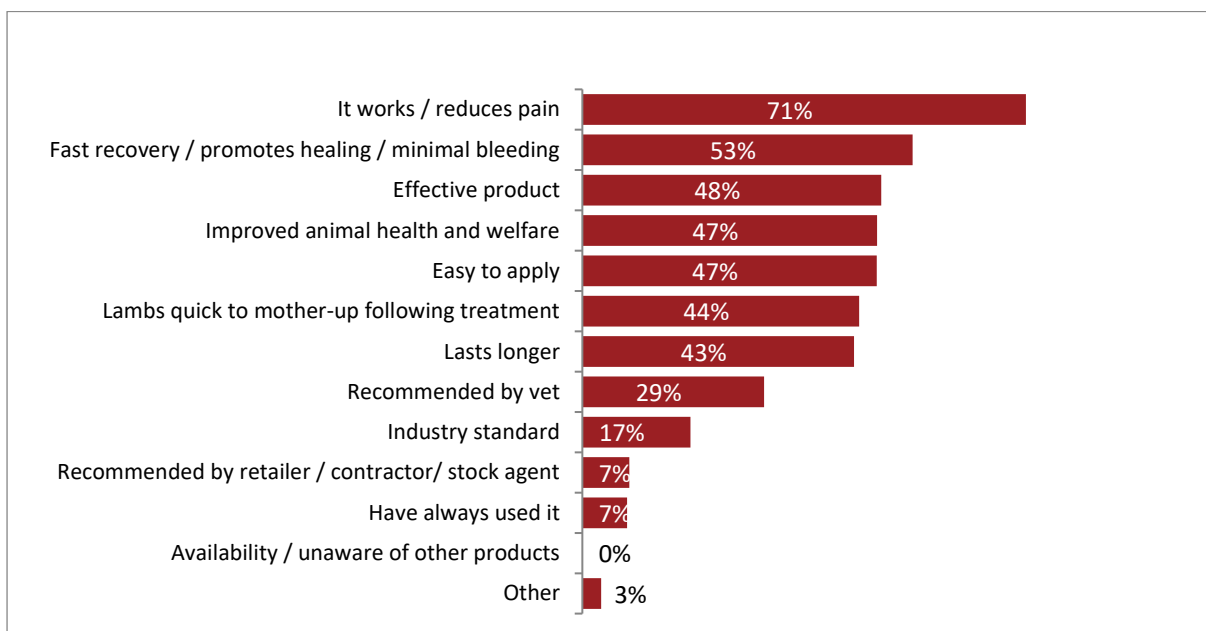
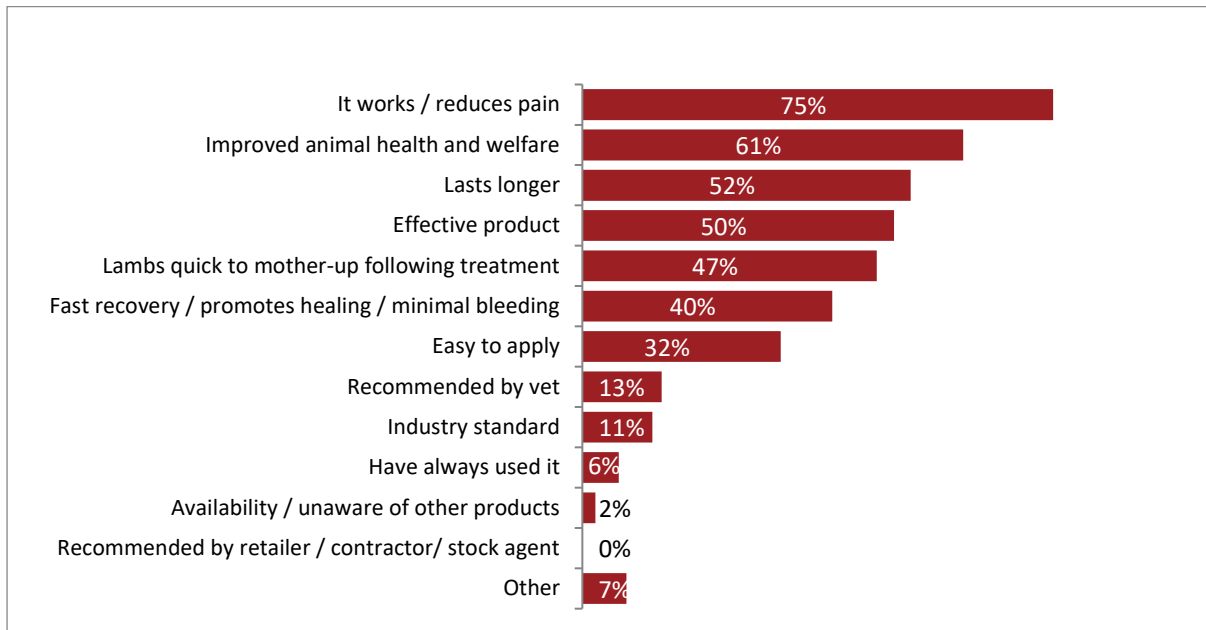
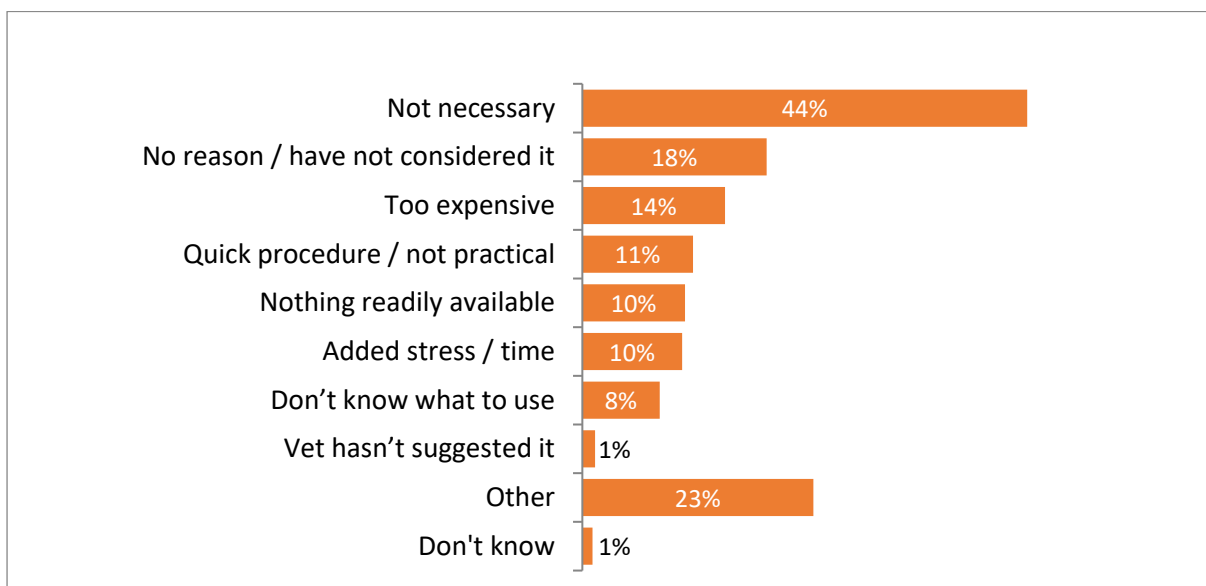
Figure 54: Reason for using anaesthetic and antiseptic spray*Base: Producers who mules lambs using anaesthetic and antiseptic spray n = 713***Figure 55: Reason for using analgesic injection***Base: Producers who mules lambs using analgesic injection n = 31*

Figure 56: Reason for using analgesic gel*Base: Producers who mules lambs using analgesic gel n = 42***Figure 57: Reason for not using pain management at mulesing***Base: Producers who did not use pain management products during mulesing n = 56*

4.7.4 Mulesing cessation

At the national level, of producers who mulesed in 2021, more than half of producers said they were unlikely or very unlikely to cease mulesing (60%) (**Figure 58**). South Australian producers were significantly more likely to state they could not say either way (28%).

If mulesing was no longer an option, the most common alternative to mulesing that producers would do is increased use of flystrike chemicals (48%) followed by increased crutching (44%) and breeding resistant sheep (40%) (**Figure 59**). New South Wales producers were significantly more likely to say that they would shift to a cattle enterprise (25%).

At the national level, nearly two thirds (63%) of producers who did not mules in 2021 have never mulesed, with Victorians significantly more likely than other states to have never mulesed (69%) (**Figure 60**). Non-Merino producers (76%) were significantly more likely to have never mulesed than Merino producers (40%).

Nationally and on average, producers who had ceased mulesing were most likely to have done so in 2012 (**Figure 61**). Queensland producers were significantly more likely to have ceased mulesing later than other states, with an average cease year 2016, conversely, Tasmanian producers were more likely to have ceased earlier (2009 on average). New South Wales producers ceased mulesing in 2010 on average, Western Australian and Victorian producers in 2012 and South Australians in 2013.

The most common reason given for ceasing mulesing is that producers are breeding sheep with less body wrinkle (42%) (**Figure 62**). Queensland producers were more likely to cite weather conditions (27%) while Victorians cite high sheep prices (7%). Merino producers were much more likely to cite industry pressure (23% compared to non-Merinos at 9%), higher wool prices (19% compared to non-Merinos at 8%), and weather conditions (8% compared to non-Merinos at 1%).

Figure 58: Likelihood to cease mulesing in the next five years

Base: Producers who mulesed lambs n = 796

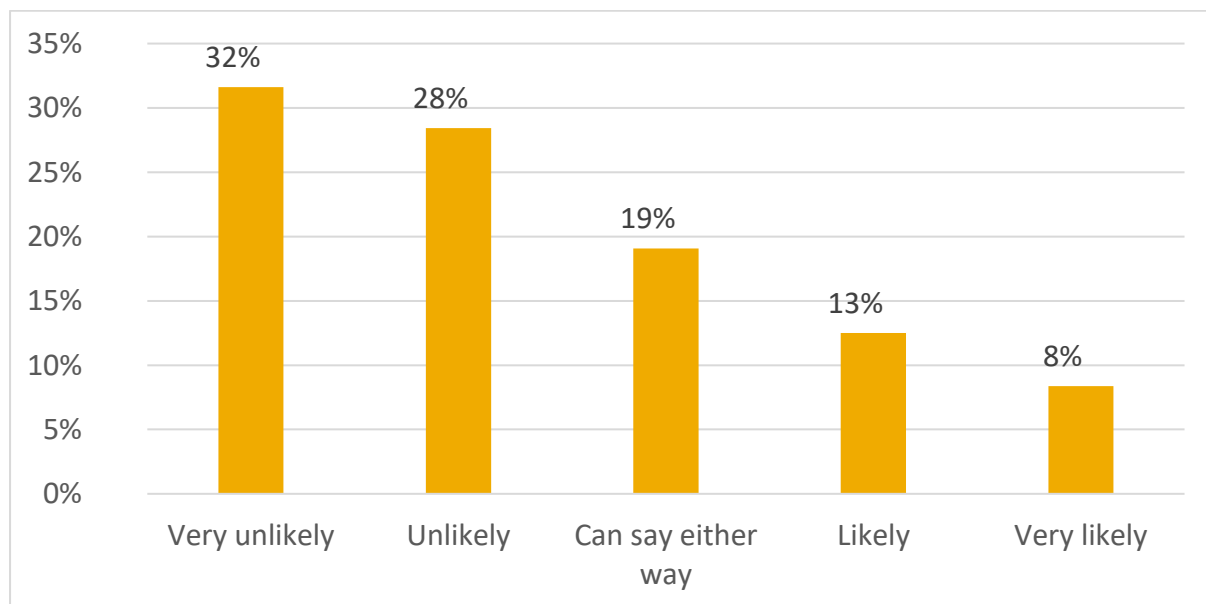


Figure 59: Alternatives used if mulesing was no longer an option

Base: Producers who mulesed lambs n = 796

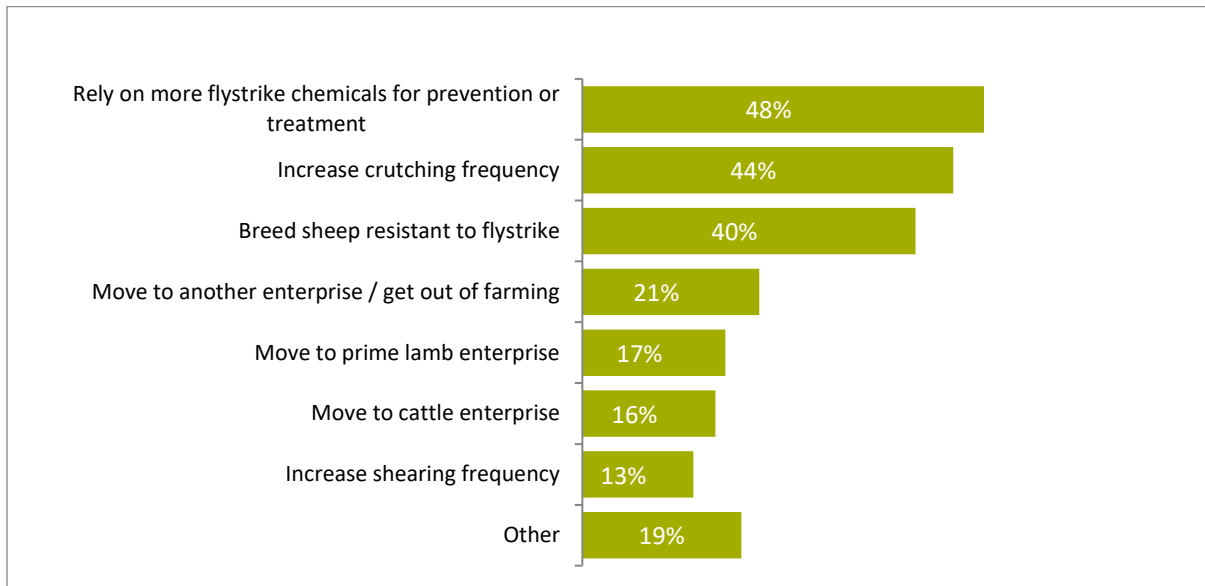


Figure 60: Mulesing cessation

Base: Producers who did not mules in 2021 n = 1,207

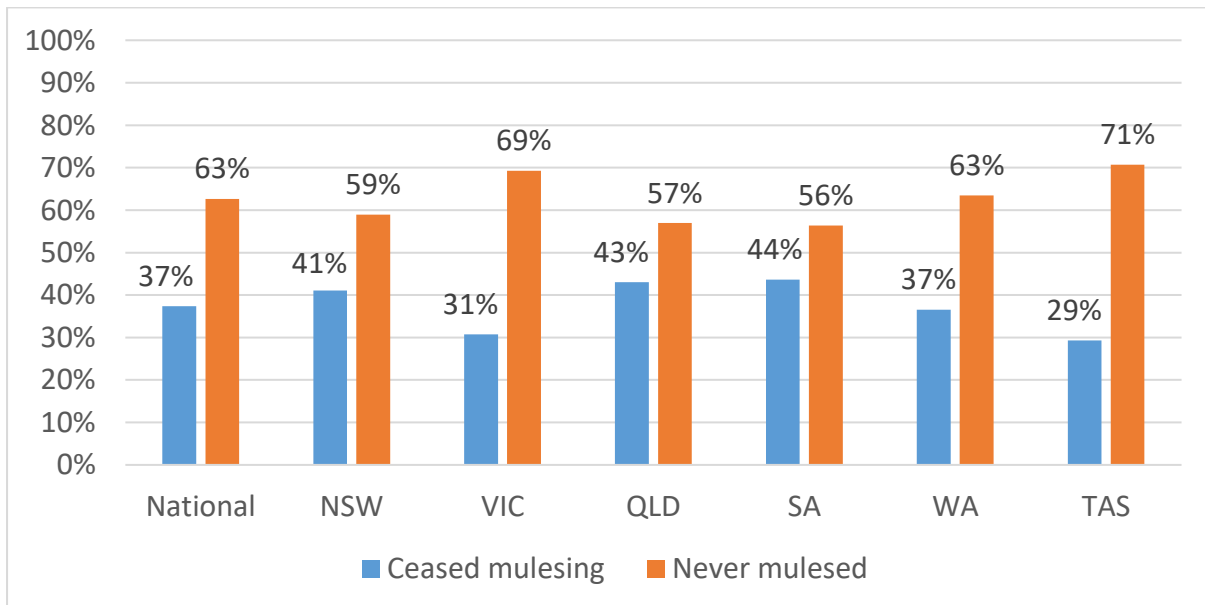


Figure 61: Average mulesing cessation year

Base: Producers who ceased mulesing lambs n = 511

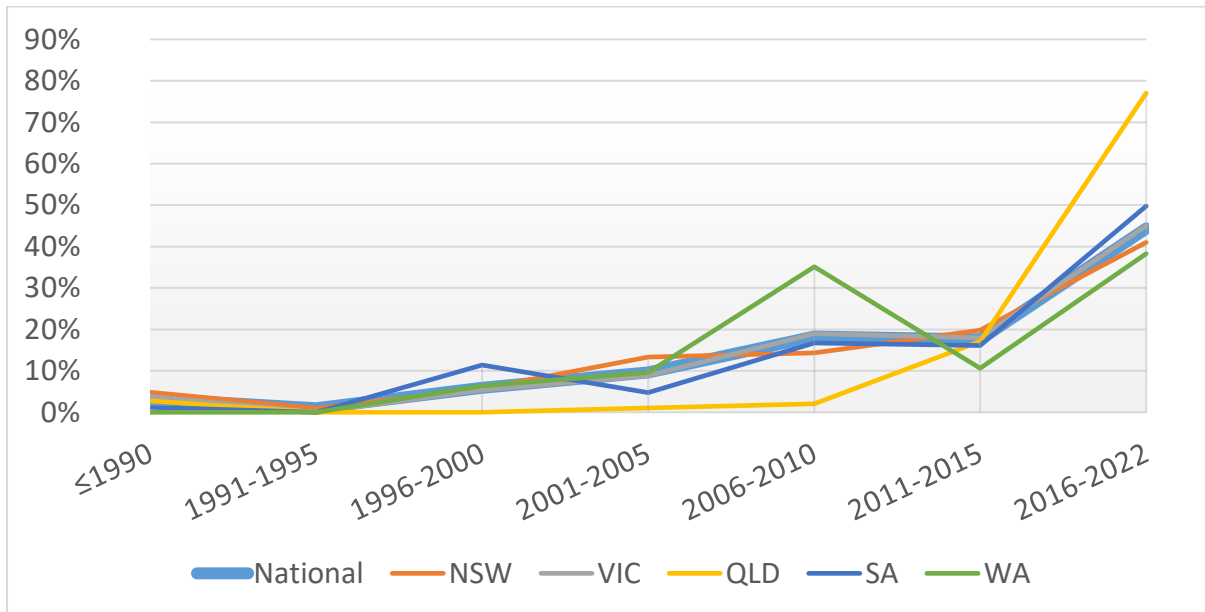
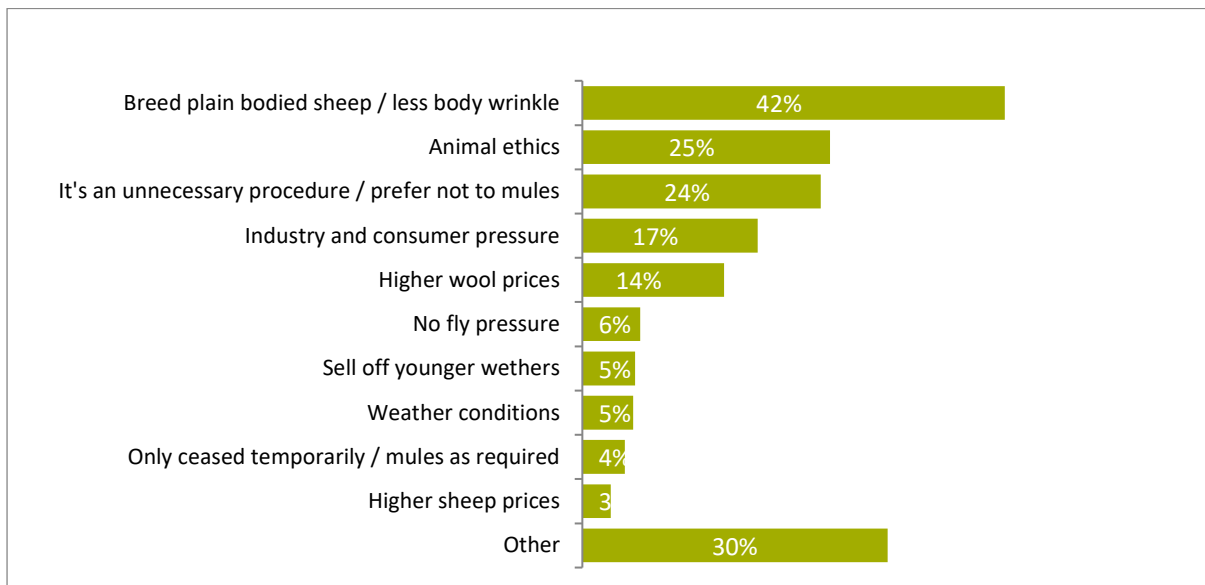


Figure 62: Reason for mulesing cessation

Base: Producers who ceased mulesing lambs n = 511



4.8 Weaning

88% of producers interviewed wean lambs in their operations (**Figure 63**). There were no significant differences between states, but Merino producers were significantly more likely than non-Merino producers to wean lambs (93% and 82% respectively).

67% of producers interviewed wean lambs between 9 and 16 weeks (**Figure 64**) with an average weaning age of 16 weeks.

Maiden ewes are more likely to have a weaning percentage between 81%-90% (24%). Queensland producers are more likely to have 50% or less (29%), Western Australian 71%-80% (26%) and Victorian greater than 110% (20%). Maiden ewes of Merino producers were more likely to have weaning percentages between 61-80% (33%) with non-Merinos more likely to have weaning percentages greater than 110% (24%).

Mature ewes (34%) were more likely to have weaning percentages 110% or greater (**Figure 65**), as were Victorian producers (42%) and non-Merinos (53%). Queensland producers were most likely to have 50% or less (22%) while South Australian (32%) and Western Australia (33%) were more likely to chart 91-100%. Merino producers were most likely to have a weaning percentage for mature ewes of 71-100% (60%).

Figure 63: Producers who wean lambs

Base: n = 2,003

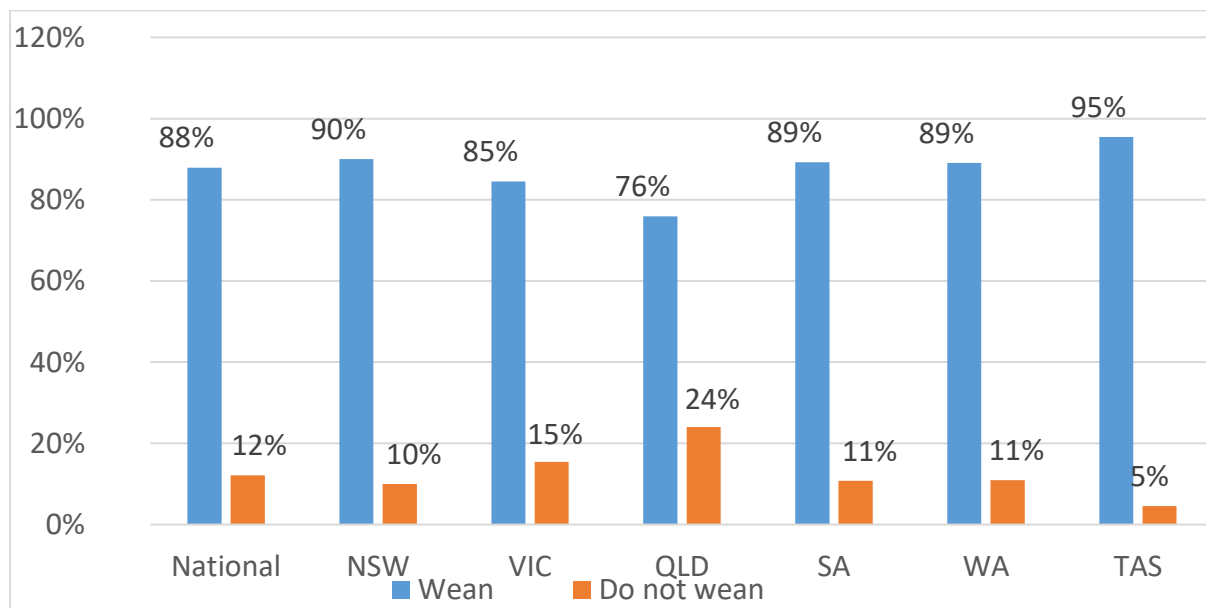


Figure 64: Average lamb weaning age in weeks

Base: Producers who wean lambs n = 1,830

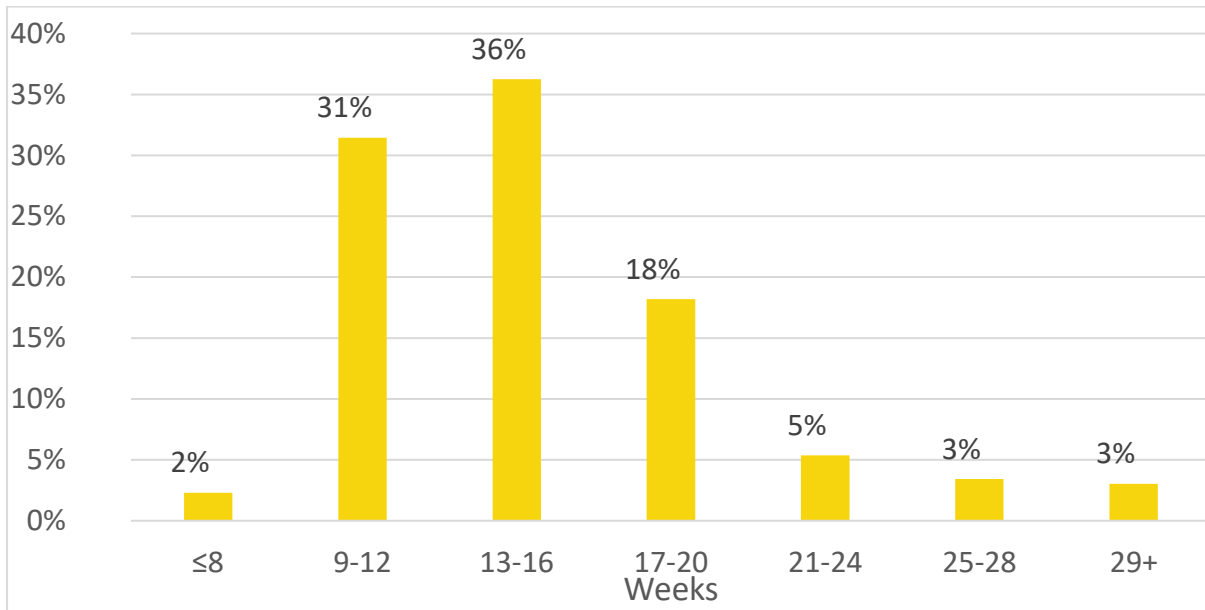
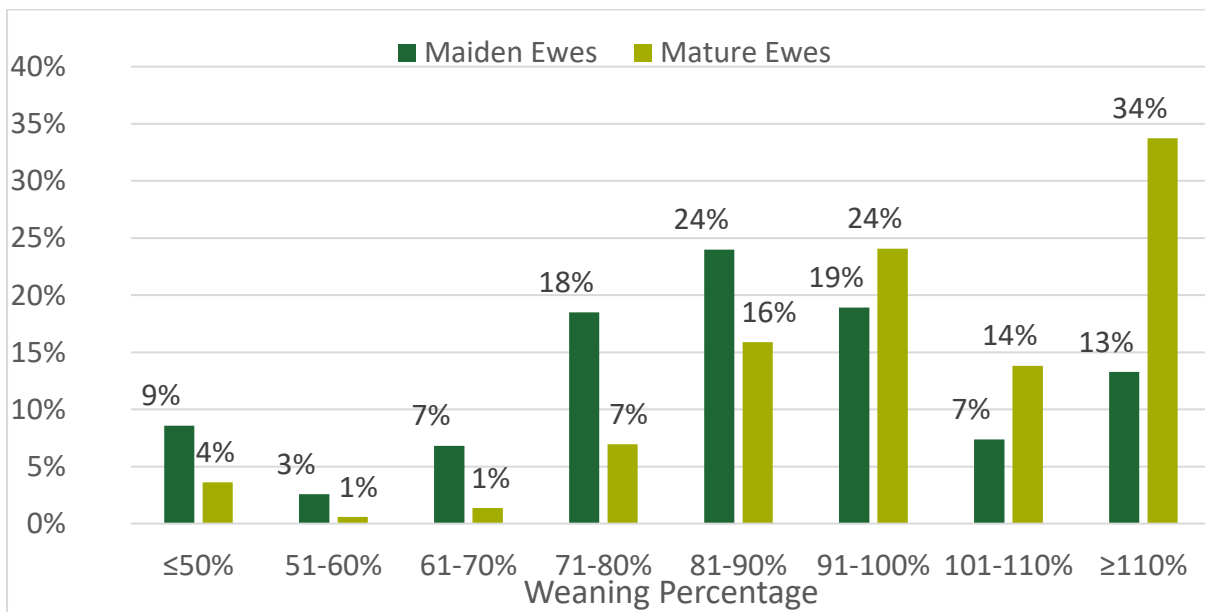


Figure 65: Weaning percentage for maiden ewes joined

Base: Producers who wean lambs n = 1,830



4.9 Vaccination

Nationally, an average of 91% of producers vaccinate at least some of their flock (**Figure 66**). Queensland producers were significantly less likely to vaccinate (55%). Further questioning revealed that on average, 97% of producers' entire flocks receive at least one vaccination of any type of vaccine.

Nationally, an average of 65% of producers vaccinate pre-lambing, 97% at marking and 68% at weaning (**Figure 67**). Of those who vaccinate pre-lambing, South Australians (77%) are significantly more likely to vaccinate, and Western Australians (53%) are significantly less likely. There were no significant differences at marking. At weaning, the only significant difference was between Merino and non-Merino producers (74% and 61% respectively).

Figure 66: Producers who vaccinate any sheep in flocks

Base: n = 2,003

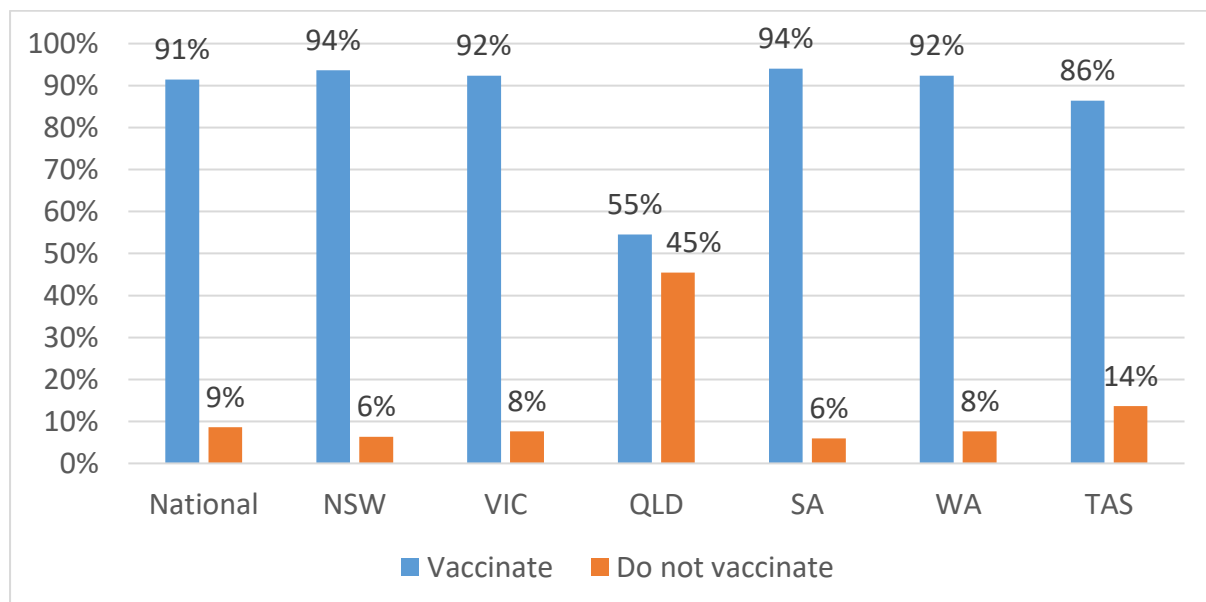
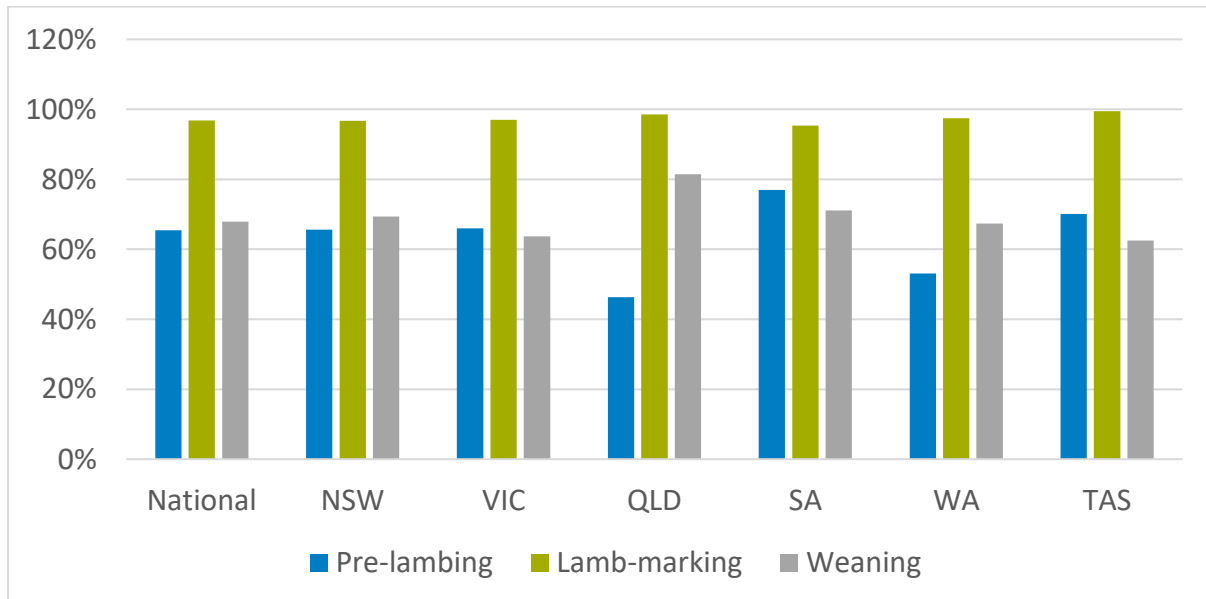


Figure 67: Vaccination timings

Base: Producers who vaccinate lambs n = 1,846



4.10 Drenching

Slightly over two thirds (65%) of producers drench mixed age ewes two times or fewer to an average of 2.2 times per producer (**Figure 68**). There were significant differences between states, with New South Wales producers more likely to treat four or more times (27%) and South Australian producers more likely to treat two or fewer times (93%), Victorians and Tasmanians were more likely to treat three times (25% and 49% respectively). Western Australians were more likely to treat once (41%). Merino producers (13%) were more likely than non-Merino (8%) not to drench.

As with mixed age ewes, slightly over two thirds (66%) of producers drench young ewes two times or fewer, with a producer average of 2.2 times per year (**Figure 69**). There were significant differences between states, with New South Wales producers more likely to treat four or more times (30%) and South Australian producers more likely to treat two or fewer times (51%), Tasmanians were more likely to treat three times (47%). Western Australians were more likely to treat once (31%).

Nationally, an average of 35% of producers conducted a Worm Egg Count in 2021 (**Figure 70**). New South Wales producers were significantly more likely to do worm egg counts (44%) and South Australian (26%) and Western Australian (26%) producers are less likely to do worm egg counts. Producers conduct an average of 4 worm egg counts per year (**Figure 71**).

Nationally, an average of 33% of producers have conducted a drench resistance test in the past (**Figure 72**). This number was higher for Merino producers (37%) and lower for non-Merino (27%). New South Wales producers were significantly more likely to (36%) and South Australian (26%) and Tasmanian (17%) producers were less likely to have done a drench resistance test.

Nationally, more than half of producers (56%) conducted a drench resistance test every five years or less frequently (**Figure 73**).

Figure 68: Number of times mixed age ewes are drenched annually

Base: n = 2,003

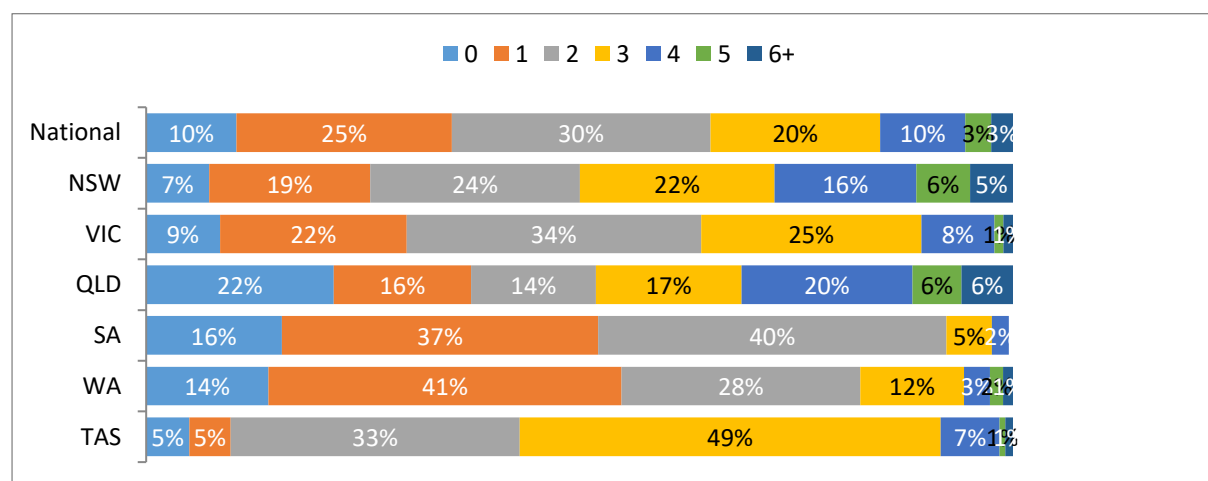


Figure 69: Number of times young ewes are drenched annually

Base: n = 2,003

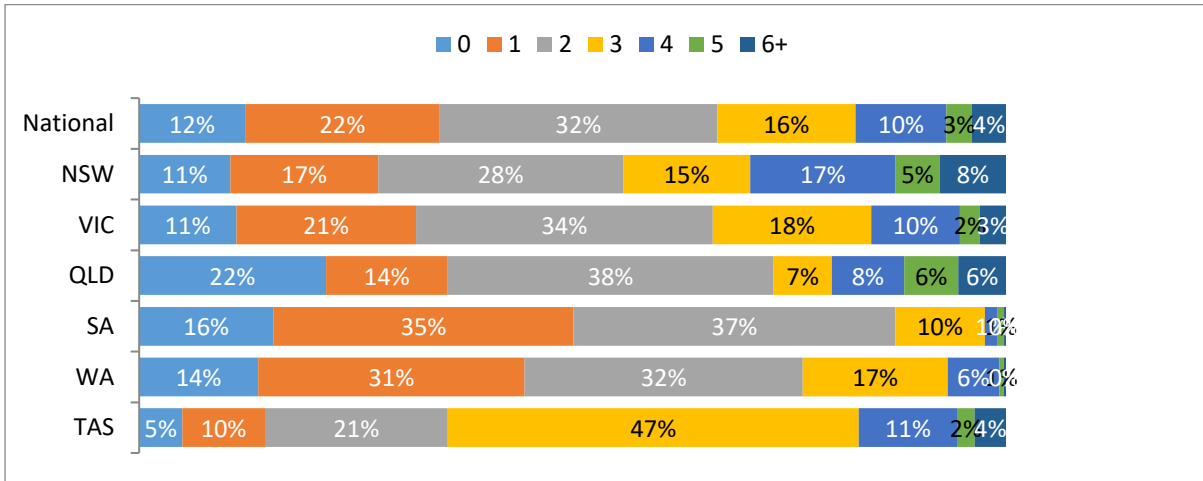


Figure 70: Worm Egg Counts conducted in 2021

Base: n = 2,003

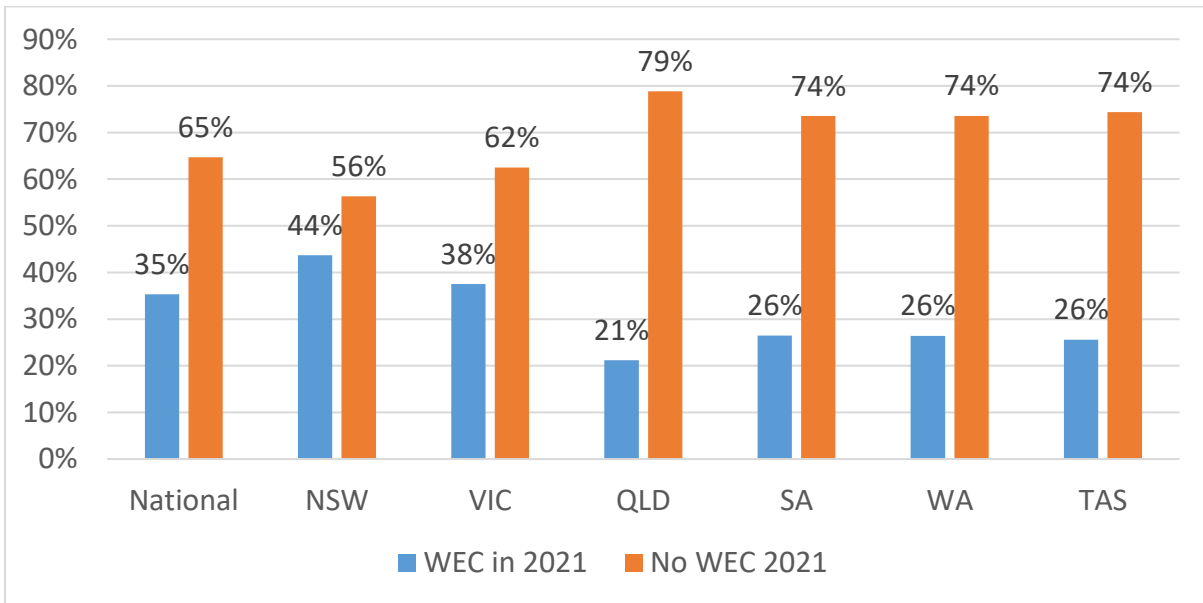
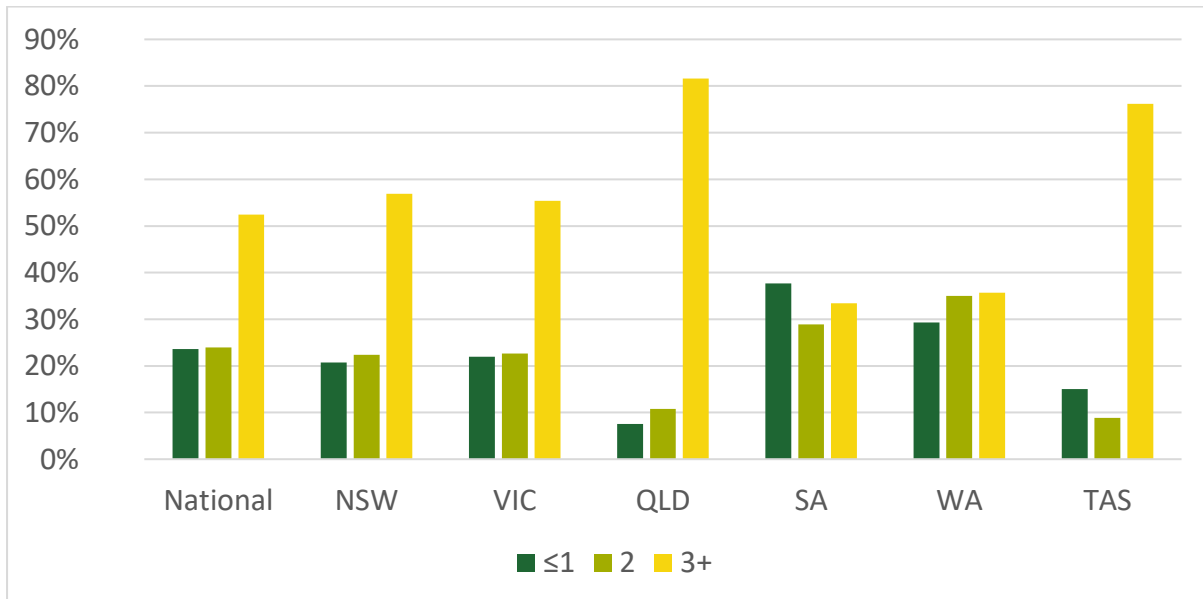


Figure 71: Annual number of Worm Egg Count tests

Base: Producers who are drenching and conducting WECs n = 842

**Figure 72: Drench resistance testing**

Base: n = 2,003

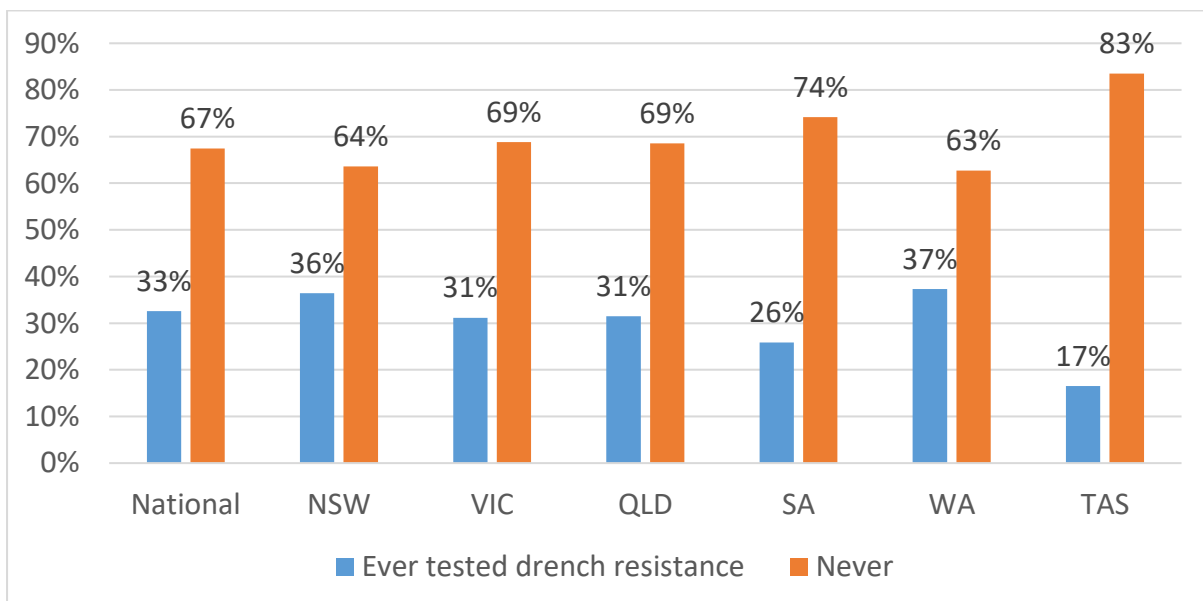
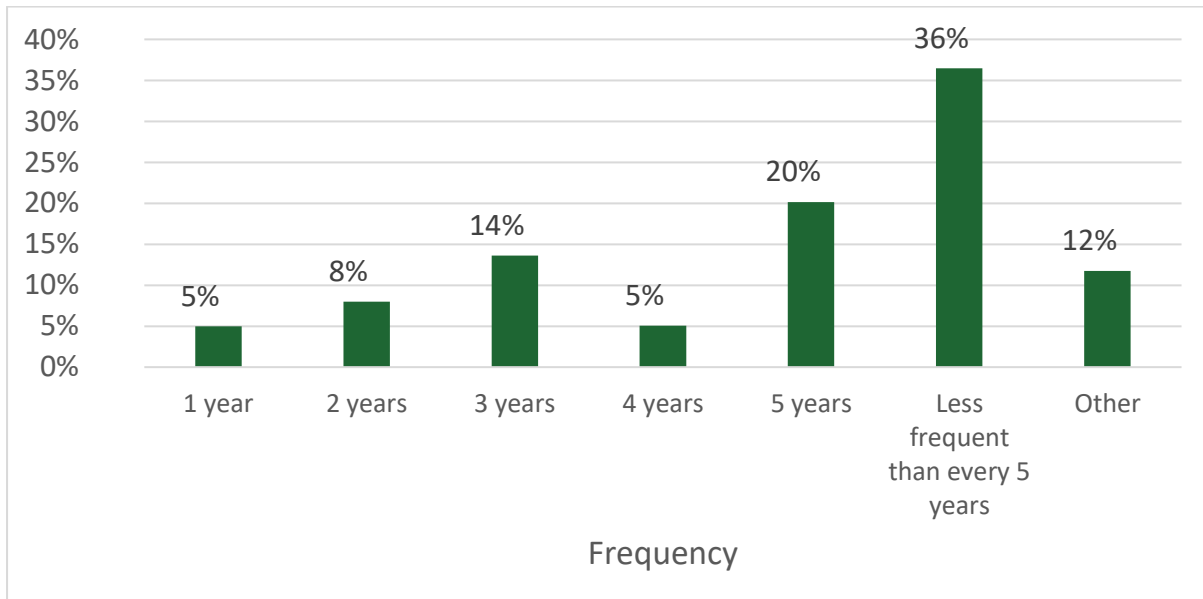


Figure 73: Frequency of drench resistance tests

Base: Producers who conduct drench resistance testing n = 753



4.10.1 Website Awareness

WormBoss has the highest awareness level of the four parasite management websites considered (62%) (**Figure 74**). Across all websites, slightly over one third (34%) of producers had not heard of any of them. Awareness for websites were consistent across the states, except in Western Australian producers were less likely not to have heard of any of the websites (43%). Queensland producers were less likely to have heard of LiceBoss (23%). Among Merino producers, 49% were aware of FlyBoss and 44% of LiceBoss. Awareness was lower amongst non-Merino producers with 37% aware of FlyBoss and 34% of LiceBoss.

WormBoss has the highest visitation level of the four parasite management websites considered (55%), followed by ParaBoss (30%), FlyBoss (29%), and LiceBoss (28%) (**Figure 75**). Producers in Western Australia were significantly more likely to have accessed LiceBoss than those in other states (40%). Victorian producers were less likely to visit FlyBoss (23%) and Queensland producers less likely to access LiceBoss (14%). Among Merino producers, 36% had visited FlyBoss and 31% had visited LiceBoss. Visitations were lower amongst non-Merino producers with 22% accessing FlyBoss and 23% accessing LiceBoss.

In 2021, on average, producers visited WormBoss 2.5 times, LiceBoss 1.3 times, and FlyBoss 1.7 times (**Figure 76**).

There has been significant call to action from visiting the Boss websites. Producers who had used one of the websites had used the information to make decisions and change their practices in 53% of cases, with 33% saying they have used the information to plan but haven't yet implemented their knowledge and 15% saying they have not used the information at all (**Figure 77**).

Figure 74: Awareness of the Boss websites

Base: n = 2003

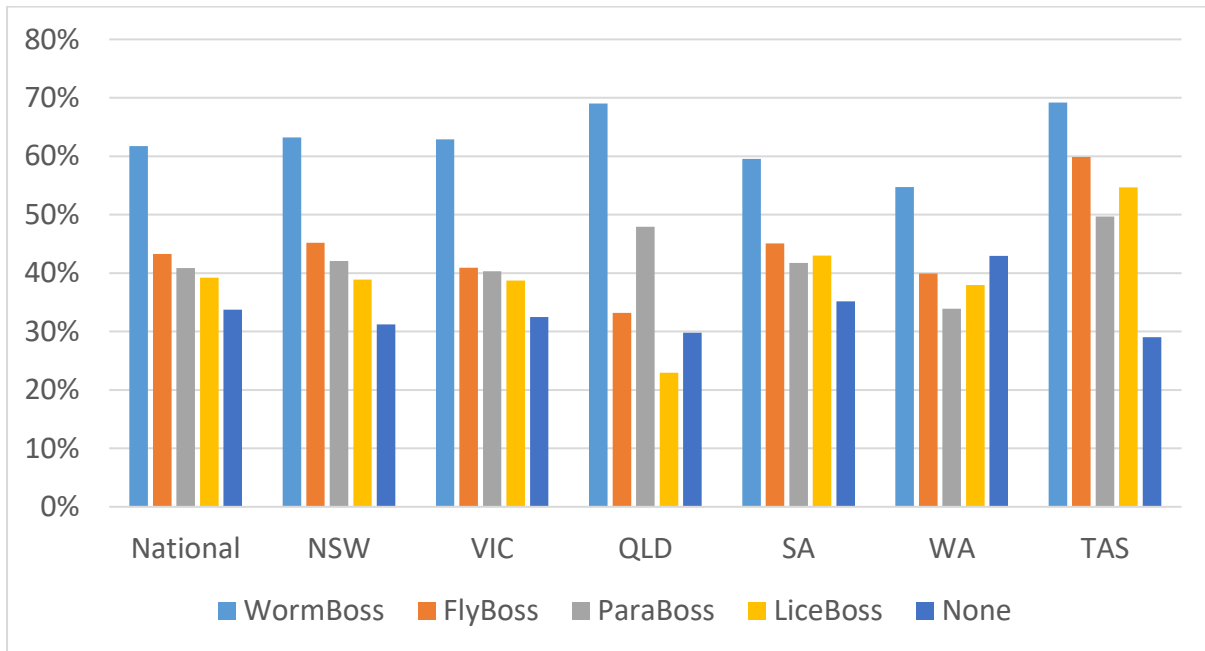


Figure 75: Visitation of Boss websites

Base: Producers who were aware of one or more Boss websites n = 1,388

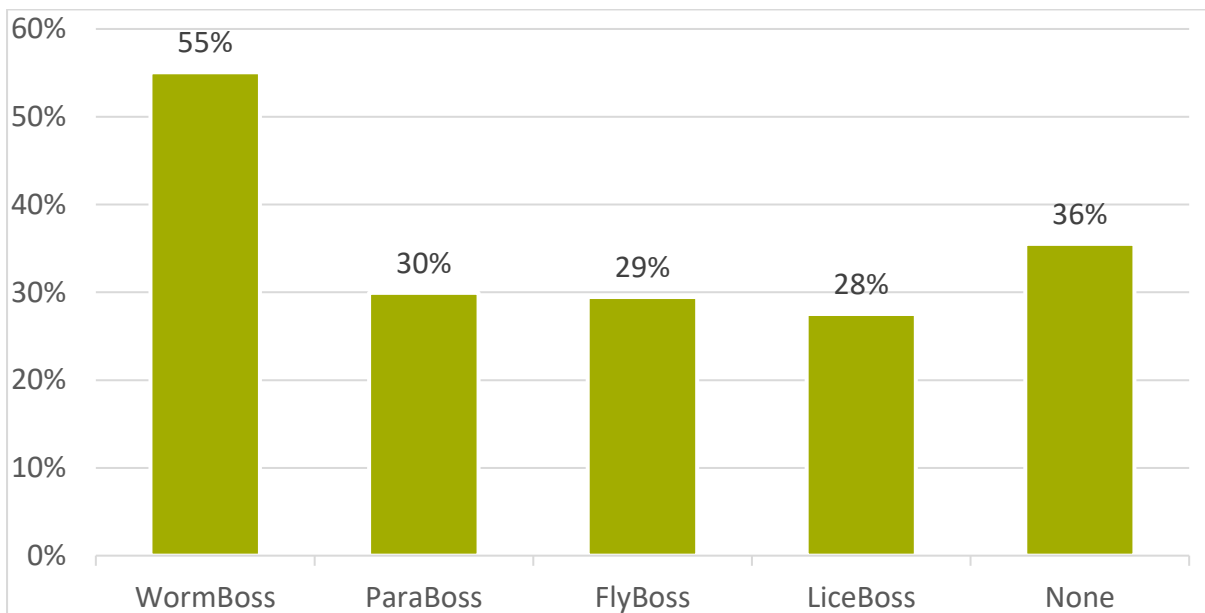


Figure 76: Frequency of website visits

Base: Producers who visited one or more Boss websites n = 766

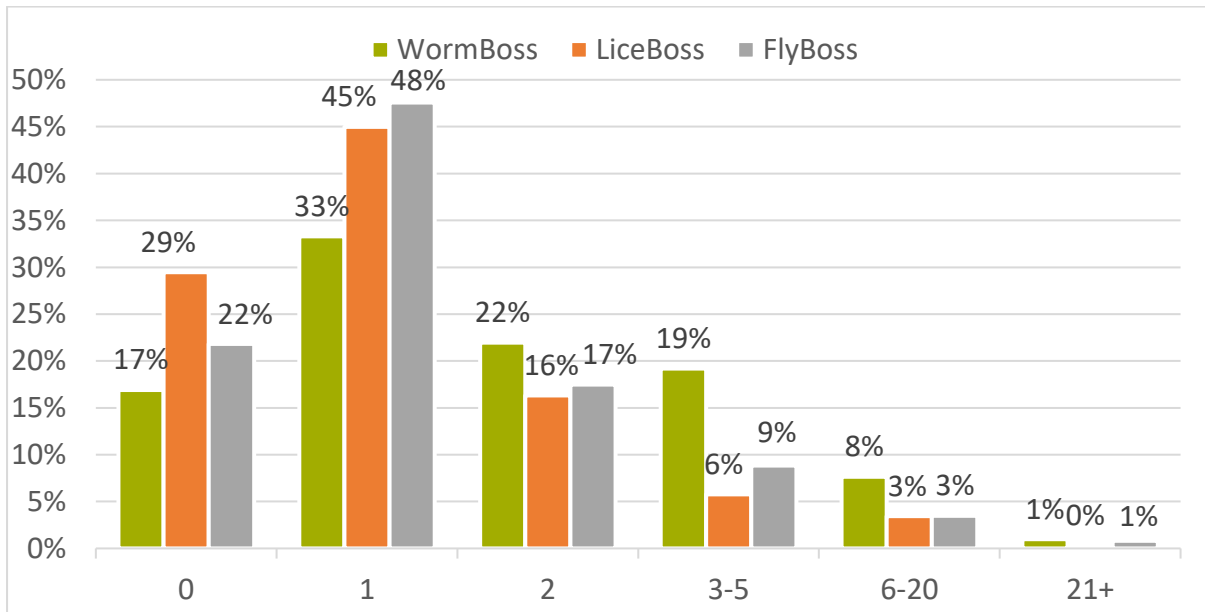
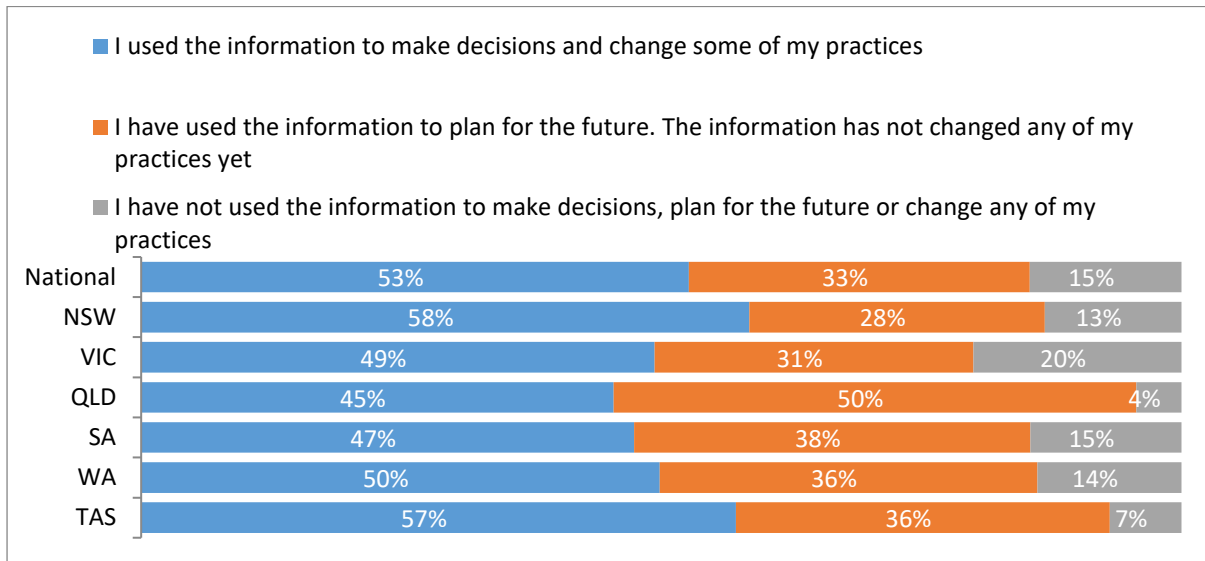


Figure 77: Action from visiting the Boss websites

Base: Producers who were aware of and visited at least one Boss website n = 856



4.11 Mortality and Euthanasia

Nationally, the average weaned ewe mortality rate before joining was 2.6% with the adult ewe mortality rate at 3% (**Figure 78**). Nearly three quarters of producers (72%) lost 2% or fewer weaned ewes before joining.

Nationally, the majority (87%) of producers have at least heard of the welfare standards and guidelines and almost two thirds (59%) have read them (**Figure 79**).

Of producers who are aware of the broader Australian Animal Welfare Standards and Guidelines for Sheep, a majority (59%) are aware of and have read the specific standards and guidelines for the Humane Killing of Sheep (**Figure 80**).

Figure 78: Mortality of weaned ewes and adult ewes

Base: All producers n = 2,003

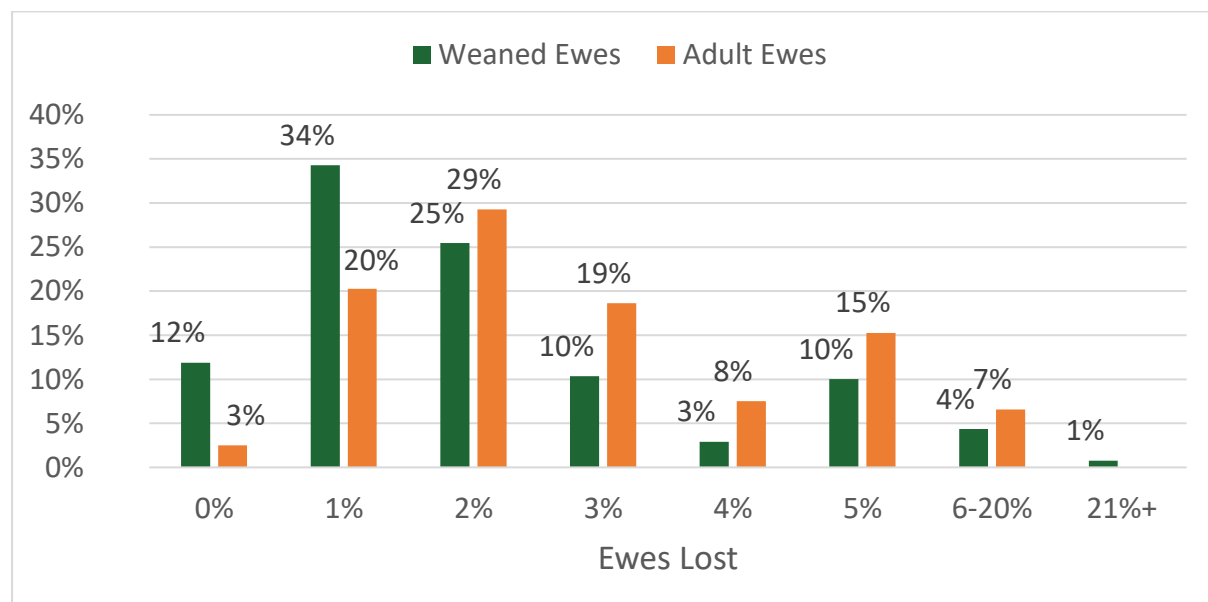


Figure 79: Awareness of the Australian Animal Welfare Standards and Guidelines for Sheep

Base: n = 2,003

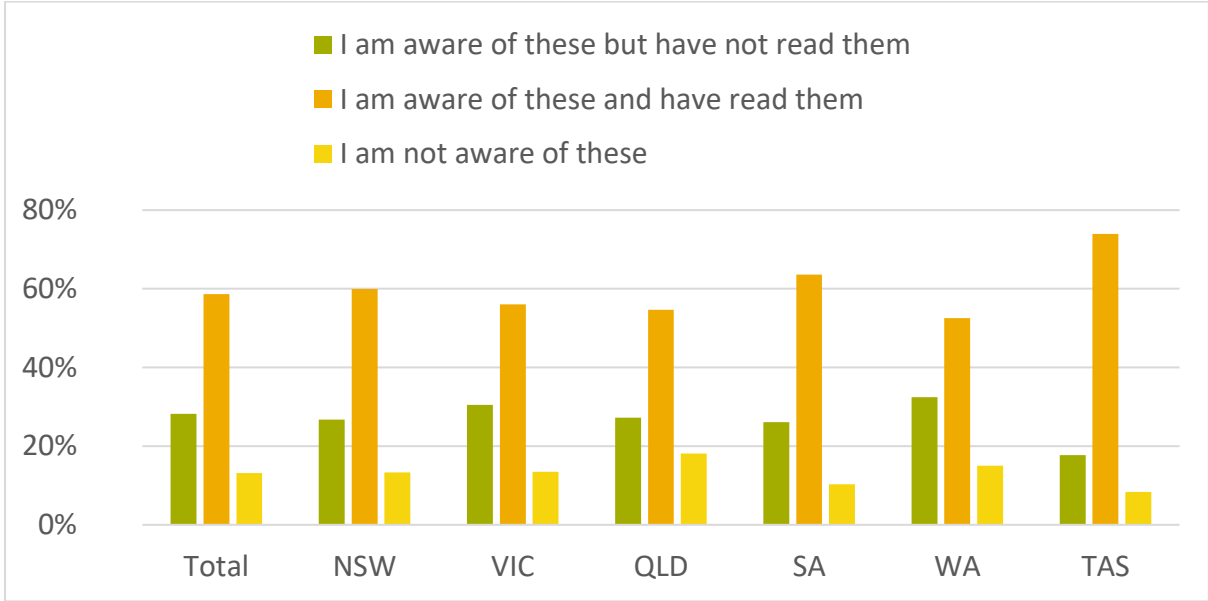
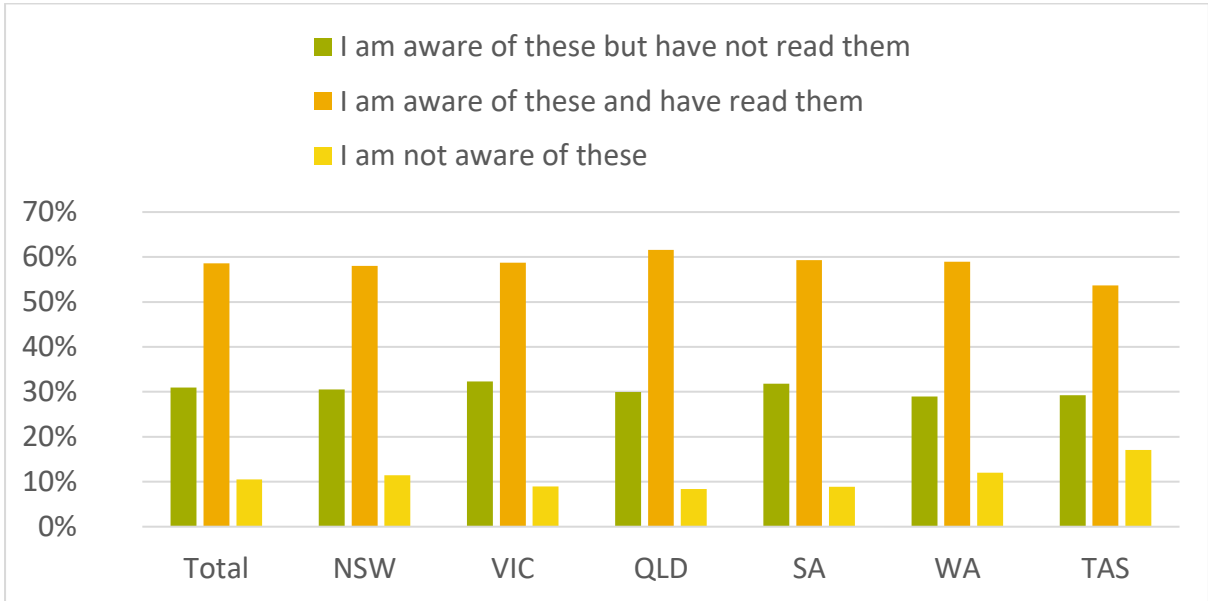


Figure 80: Humane killing of sheep guideline awareness

Base: Producers who are aware of the animal welfare standards for sheep n = 1,736



4.12 Shearing and Flystrike

Nationally, nearly two thirds of producers (60%) sedate their rams for shearing (**Figure 81**). Victorian producers were significantly more likely to sedate rams (69%) while Queensland producers were less likely to (21%).

Overall, very few producers (3%) have ever done a fly chemical resistance test (**Figure 82**). 4% of Merino producers have done a fly chemical test, while 2% of non-Merino producers have ever done a fly chemical test.

Figure 81: Ram sedation for shearing by state (excluding not applicable)

Base: Producers who shear rams n = 1,819

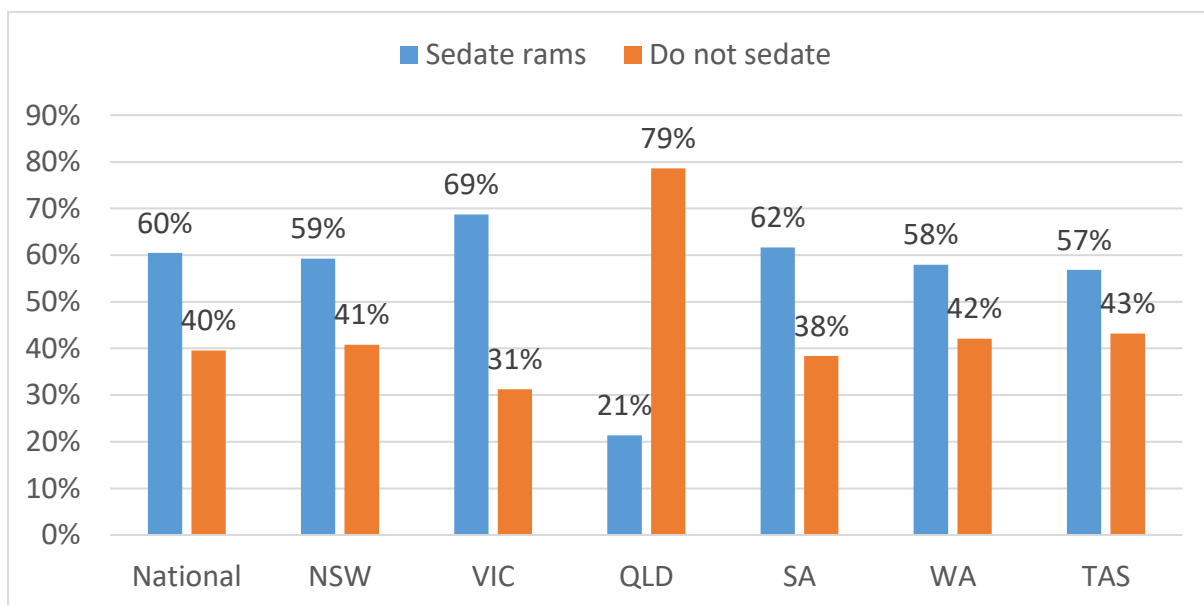
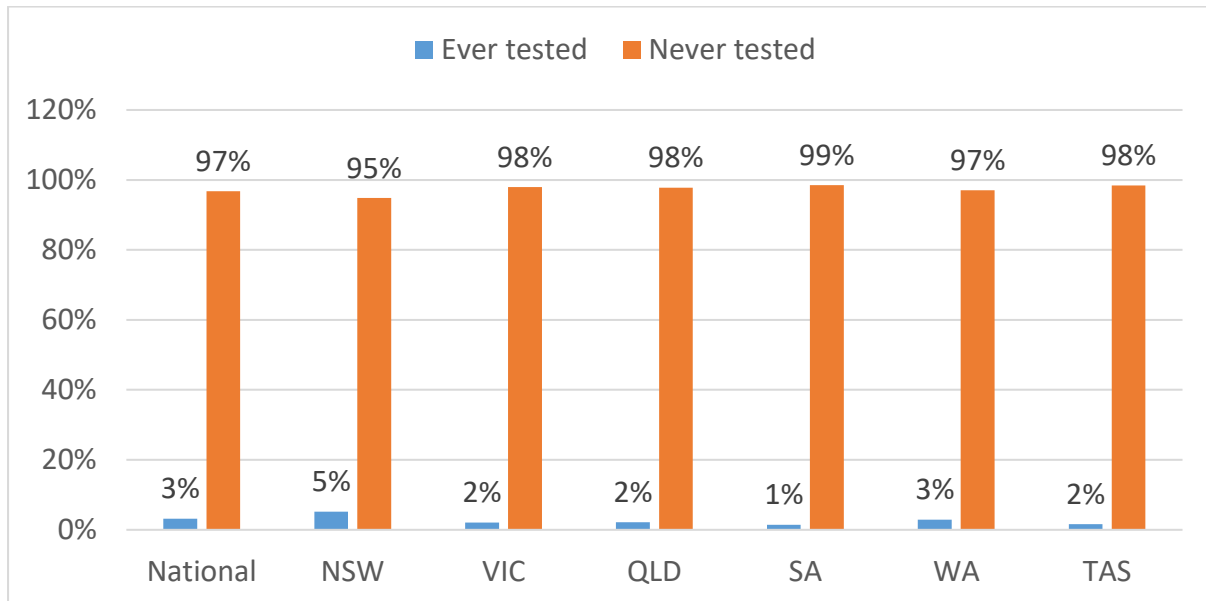


Figure 82: Fly chemical resistance test by state

Base: n = 2003



4.13 Wool Quality Assurance

Nationally, nearly one fifth of Merino producers are involved in wool quality assurance schemes (19%) (**Figure 83**). Victorian producers were significantly more likely to be involved in schemes (25%) while Western Australian producers were less likely to (10%).

Nationally, more than one third (37%) of producers are involved in SustainaWOOL (**Figure 84**). Western Australian producers were significantly more likely to be involved in PGG Wrightson Integrity Assured (13%) while South Australians were significantly less likely to be involved in SustainaWOOL (12%).

Figure 83: Wool Quality Assurance Scheme Involvement

Base: Merino producers n = 1203

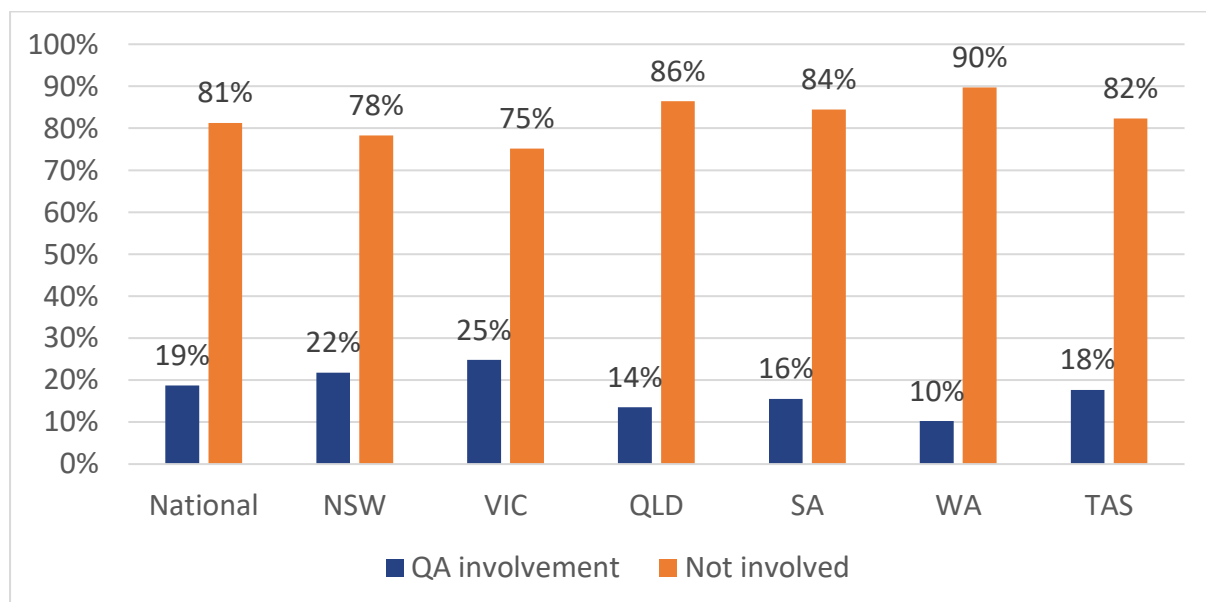
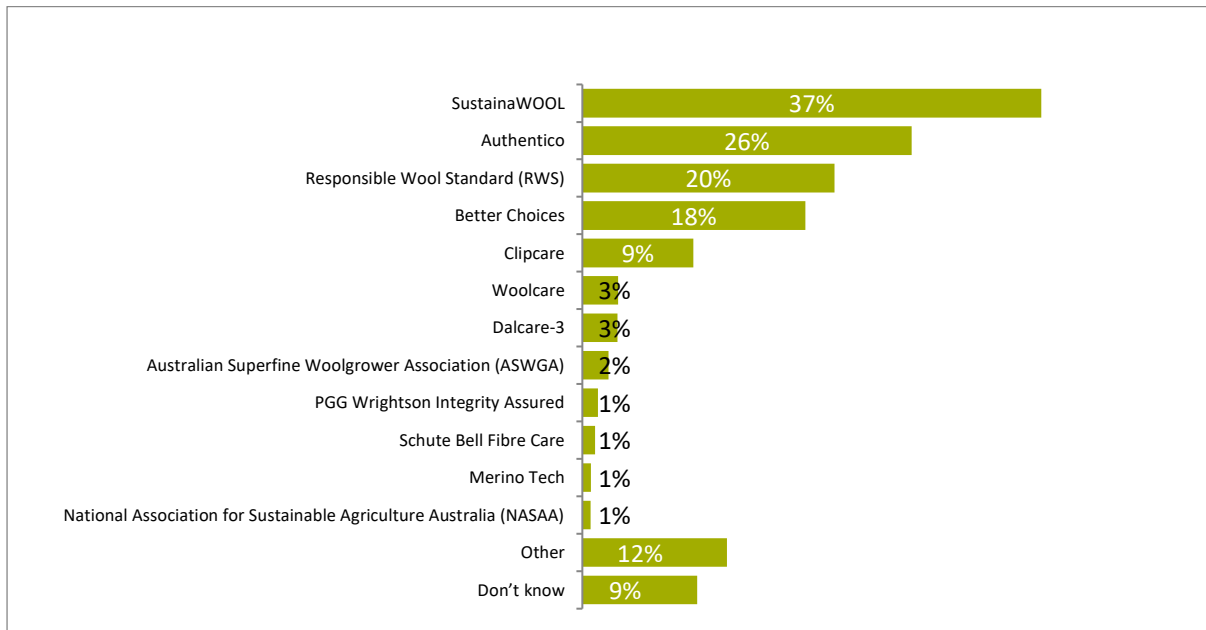


Figure 84: Quality assurance schemes producers are involved in

Base: Merino producers who are involved in QA schemes n = 268



4.14 Predators and Pests

4.14.1 Overview

On average, 78% of producers nationally reported problems with predators, with average losses of 29 sheep each year (**Figure 85**).

The most relevant predators vary significantly by state, but there was no significant variance between breeds (**Figure 86**). Queensland producers were more likely to report issues with wild dogs (69%). Pigs were most likely to be problematic in Queensland and New South Wales (28% and 21%, respectively). Foxes were more likely to be reported in Victoria (96%) and South Australia (95%). Birds were common in Tasmania and Western Australia (98% and 65% respectively).

The most common method of wild dog control nationally is poison or bait (59%) (**Figure 87**). Queensland producers were significantly more likely to use fences (56%) when compared to other states.

Producers most commonly control pigs by shooting them (87%). Traps (60%) and poison or bait (43%) are also popular (**Figure 88**).

Shooting foxes is the most common control method used (71% nationally) (**Figure 89**). There are significant differences between states with poison significantly more likely to be used in New South Wales (74%) and by Merino producers (63%). Western Australian producers are more likely to shoot (83%), Queensland producers more likely to use fences (23%) while non-Merino producers are more likely to use guardian animals (12%).

Most producers do not control birds (81% nationally) (**Figure 90**). New South Wales producers were significantly more likely than other states to shoot birds (22%).

Figure 85: Problems with predators

Base: n = 2003

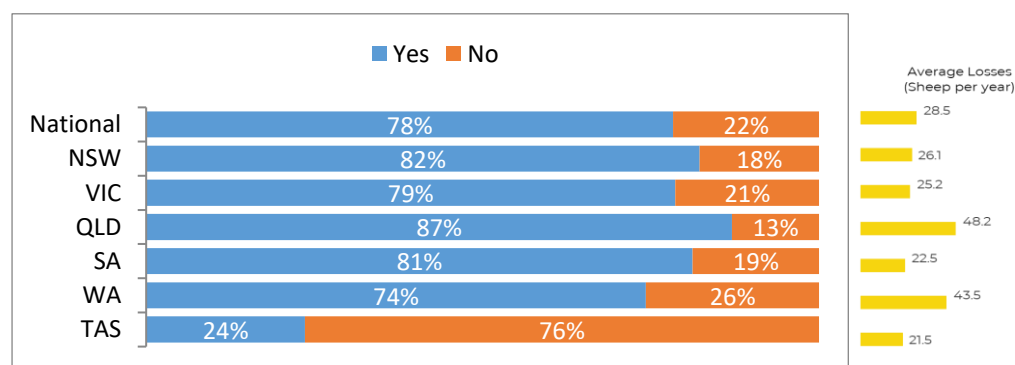


Figure 86: Most relevant predators by state

Base: Producers who reported problems with predators n = 1578

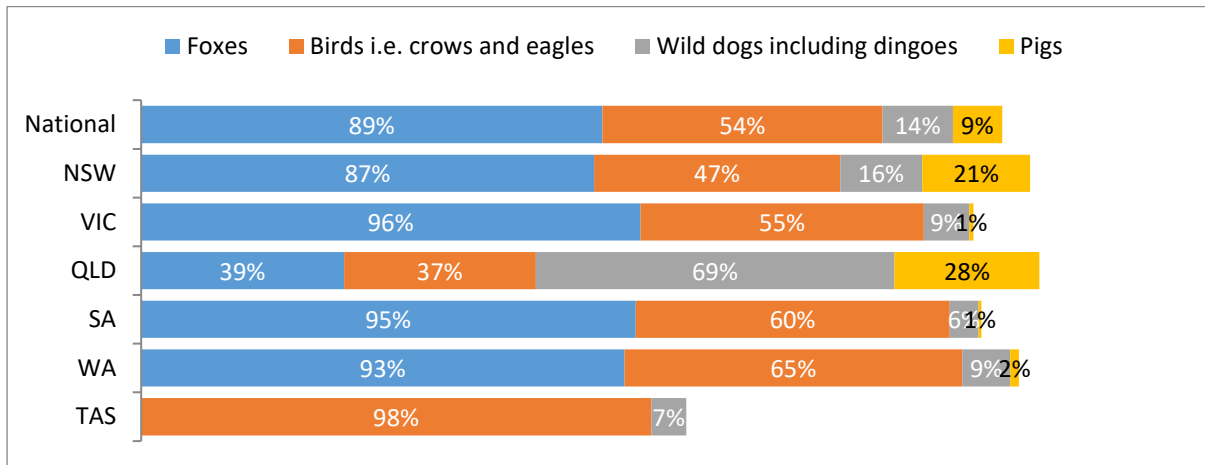


Figure 87: Wild dog control by state

Base: Producers who reported problems with wild dogs n = 212

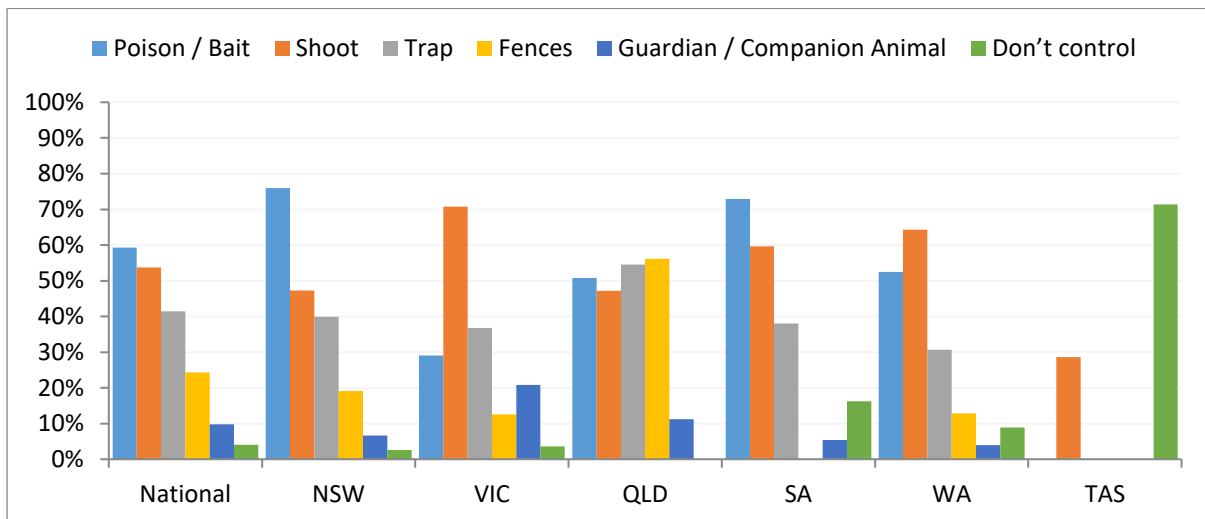


Figure 88: Pig control by state

Base: n = 175

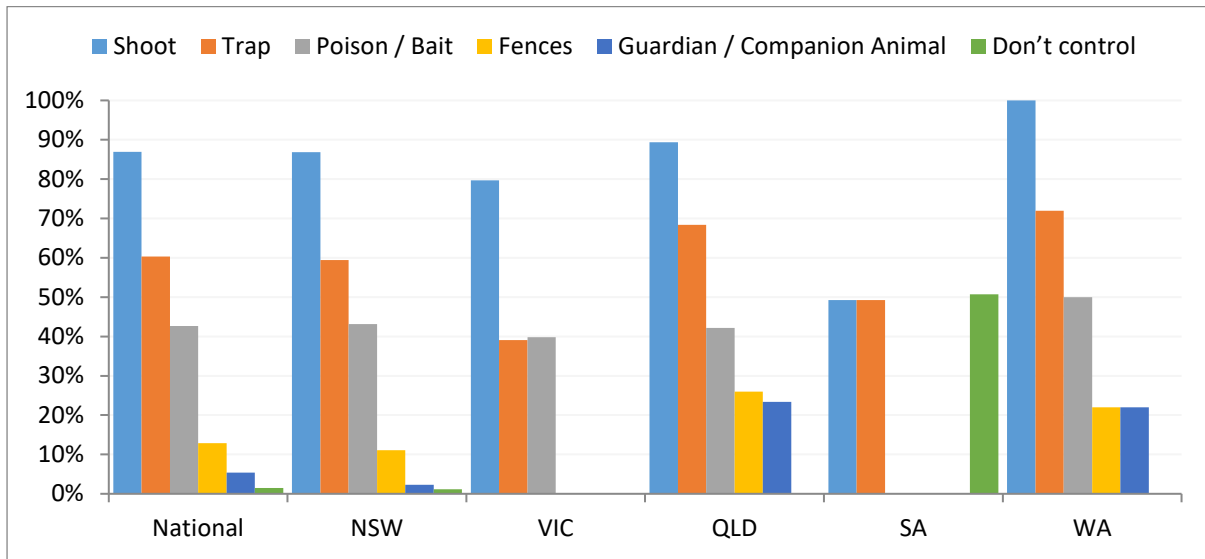


Figure 89: Fox control by state

Base: Producers who reported problems with foxes n = 1385

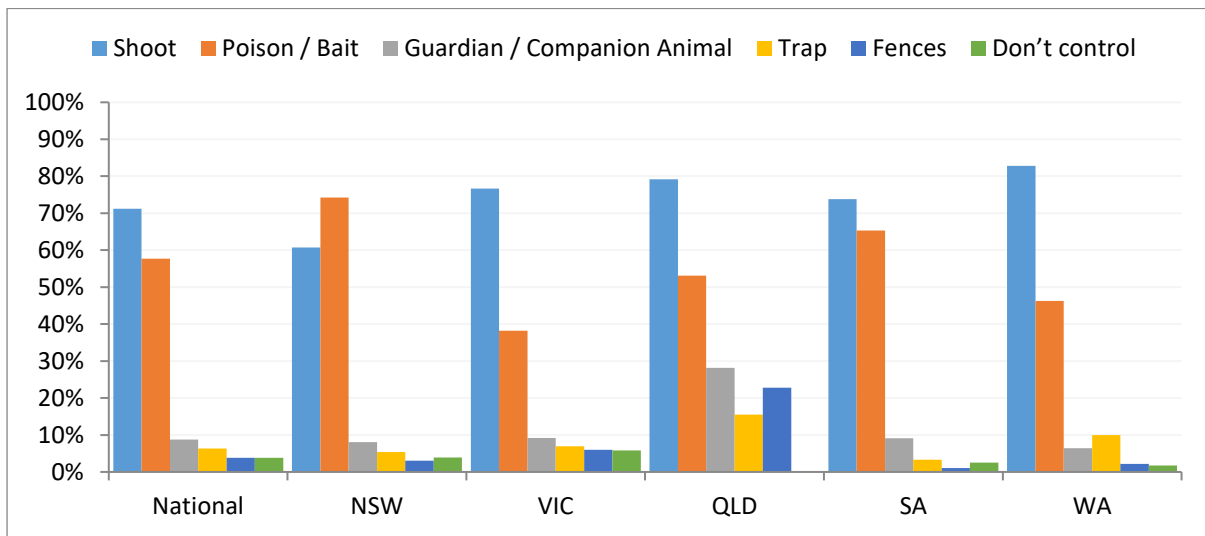
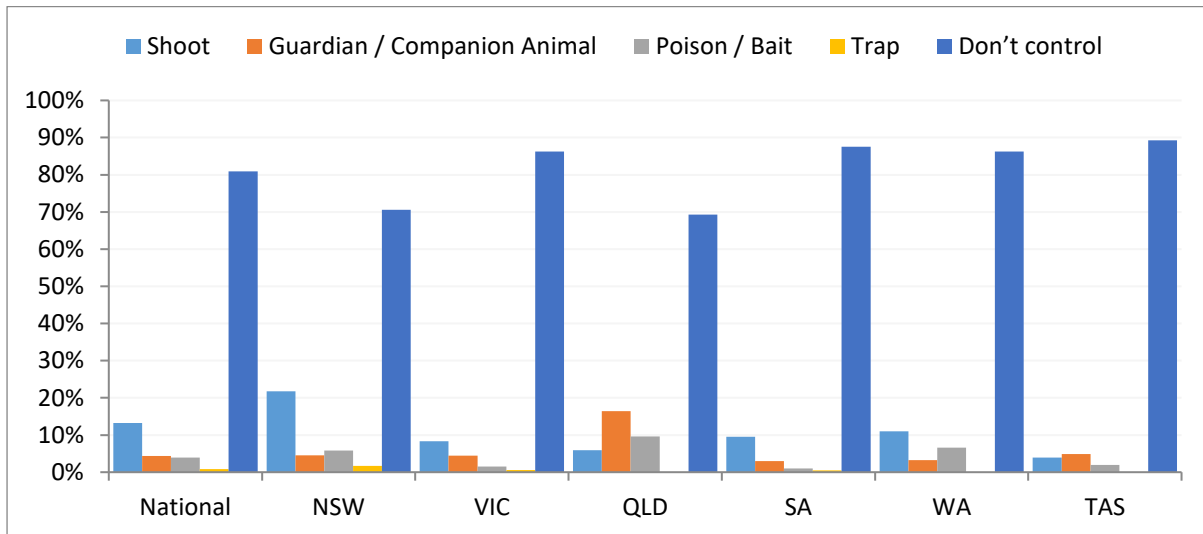


Figure 90: Bird control by state

Base: Producers who reported problems with birds n = 874



4.14.2 Management strategies

Almost half of producers nationally have a predator management strategy for their properties (44%) (**Figure 91**). Queensland and New South Wales producers were significantly more likely to have a strategy (71% and 50% respectively), while Victorians were significantly less likely to (35%).

More than half of these producers nationally have a predator management strategy for just their properties (54%) with the balance having a strategy just for their property (**Figure 92**). Of those with a strategy (either alone or collaboratively), the majority have acted on it (68%) (**Figure 93**).

One quarter of producers nationally have an insect management strategy (25%) (**Figure 94**). There were no significant differences between breeds of sheep, but Queensland producers were significantly more likely than other states to have an insect management plan (50%).

Figure 91: Property predatory management strategy

Base: Producers who reported problems with predators n = 1578

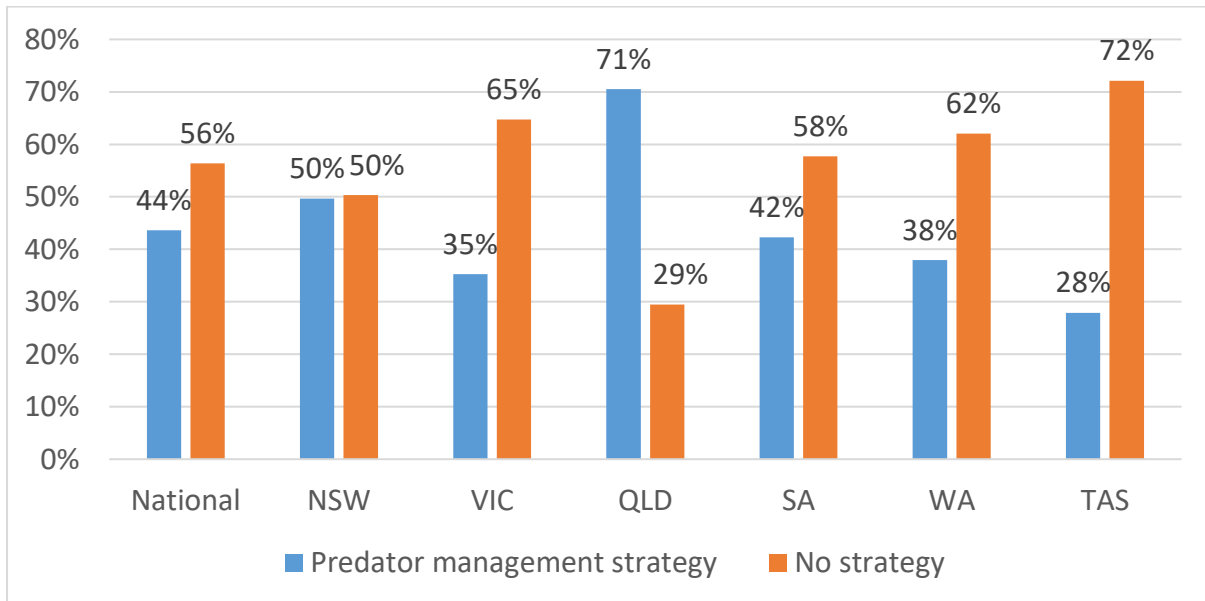


Figure 92: Collaborative or property only predator management

Base: Producers who reported problems with predators and had a predator strategy n = 708

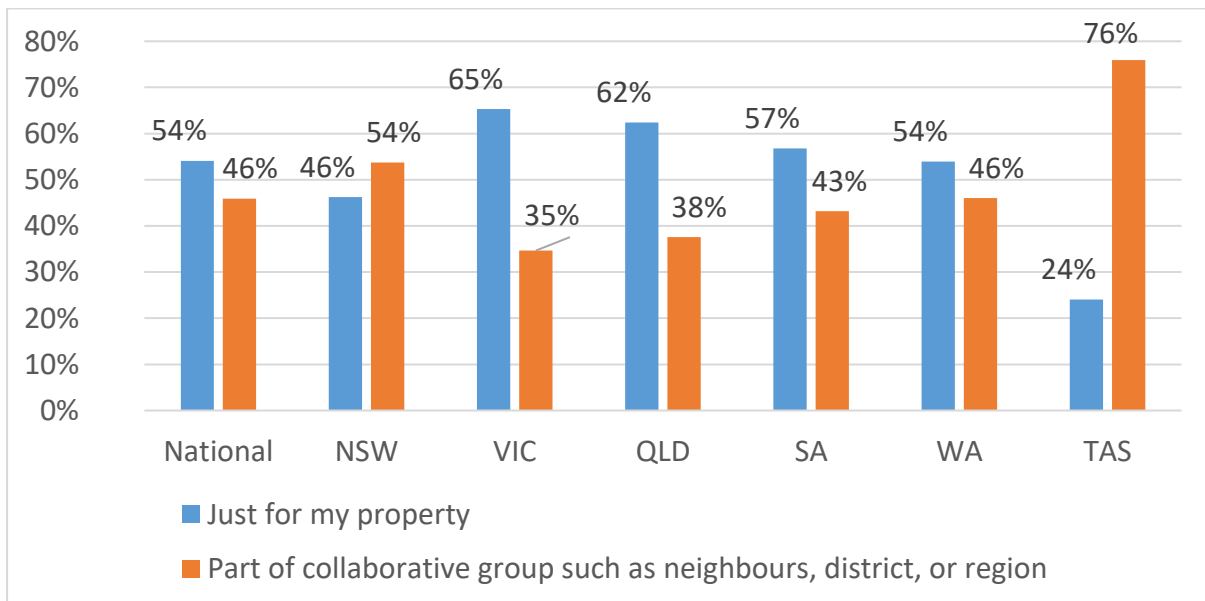


Figure 93: Action taken on predator management strategies

Base: Producers who reported problems with predators and a predator strategy n = 708

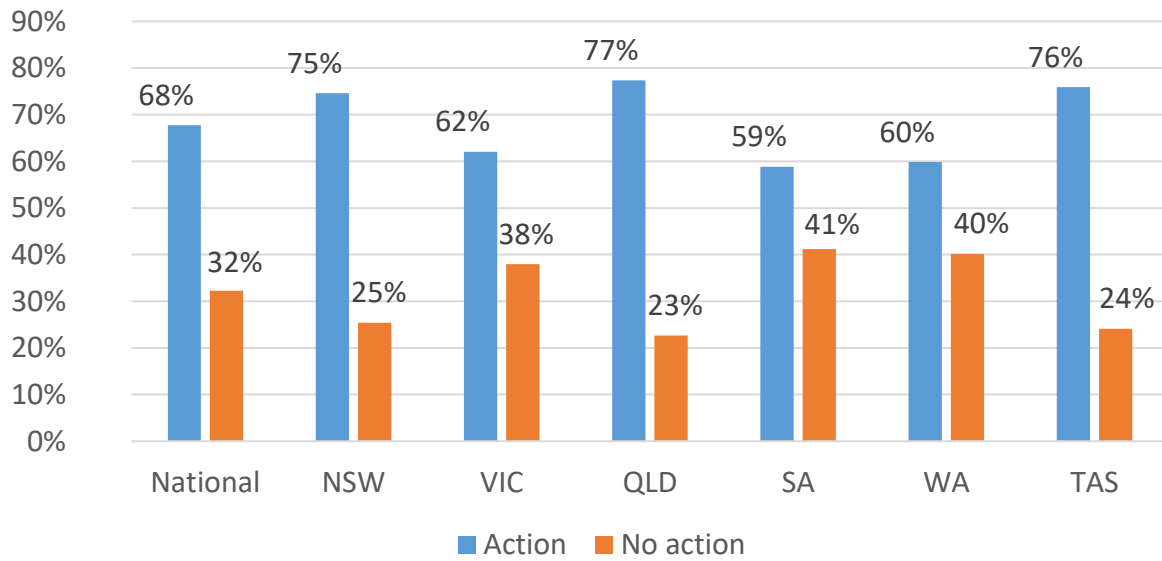
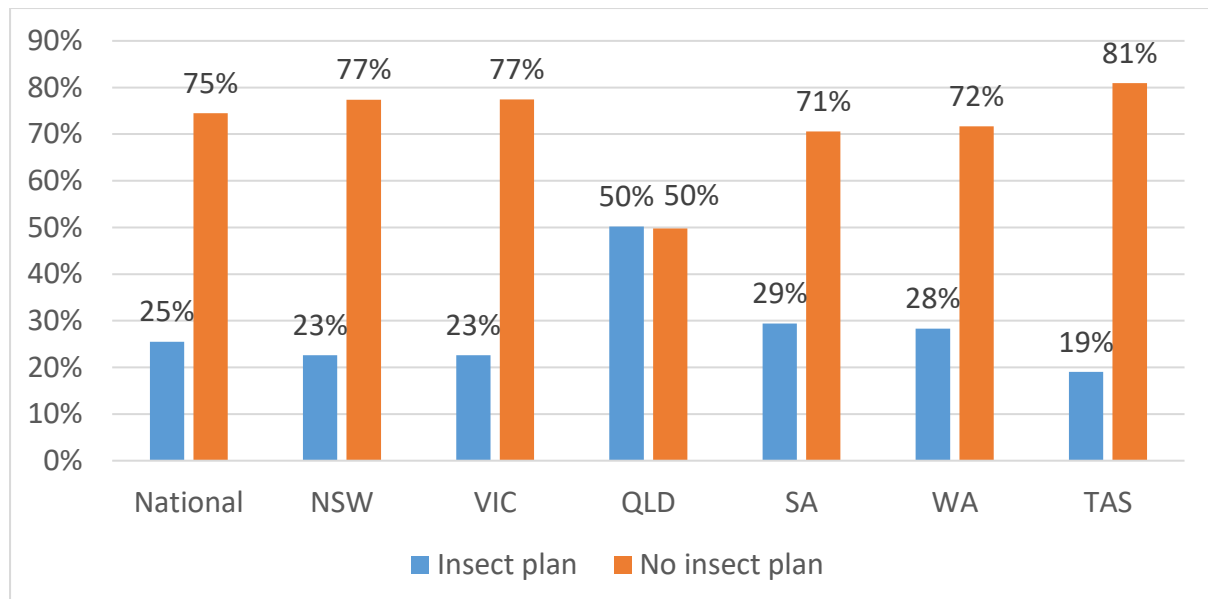


Figure 94: Insect management plans on farm

Base: n = 2003



4.15 Renewable energy

Half (50%) of producers generate and use renewable energy (**Figure 95**). A further 11% of producers stated that they use renewable energy bought from their energy retailer with 43% not generating or buying any renewable energy. Tasmanian producers were significantly more likely to use renewable energy from a retailer (34%). There were no significant differences between other states or Merino and non-Merino producers. Producers were allowed to select multiple responses and may do a combination of the responses across their business.

Where producers who generate their own renewable energy, the majority (83%) have solar without batteries (**Figure 96**). Slightly over a fifth (19%) generated solar with a battery. Solar without batteries was significantly more popular amongst Queensland producers (97%) and Merino producers (88%) than other states or breeds.

Producers interviewed had generally not taken carbon accounting training study (91%) and did not measure their emissions (97%), however, 24% did implement carbon emissions measures. Victorian producers were significantly more likely to implement activities to reduce greenhouse gases (32%). There were no other significant differences.

Producers who did conduct emission reduction activities often selected more than one measure (**Figure 97**). Almost two thirds of producers (61%) used carbon storage methods, but pasture management was also a popular technique (58%). Notably, Queensland producers used savanna burning management systems significantly more often than other states (24% compared to the national average of 2%). Western Australian producers were more likely to use pasture management (78% to 58% nationally).

Figure 95: Renewable energy generation and use

Base: All producers n = 2003

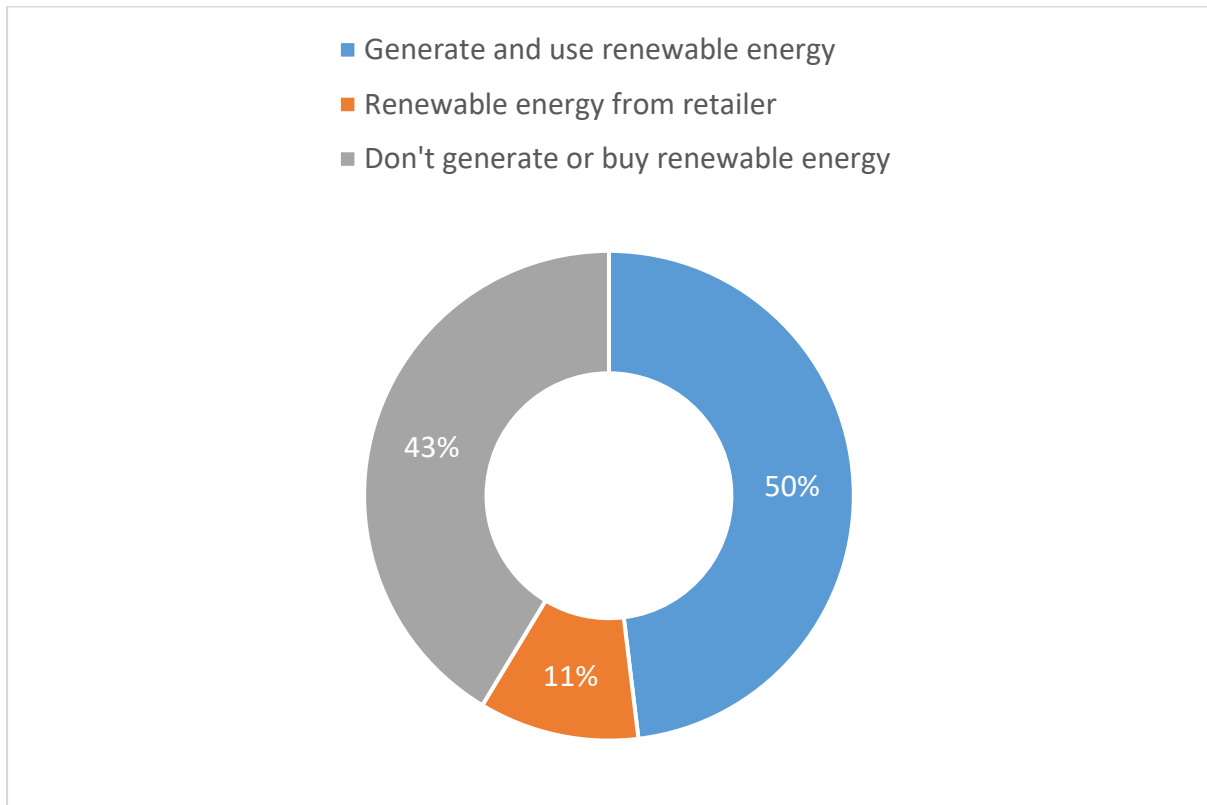
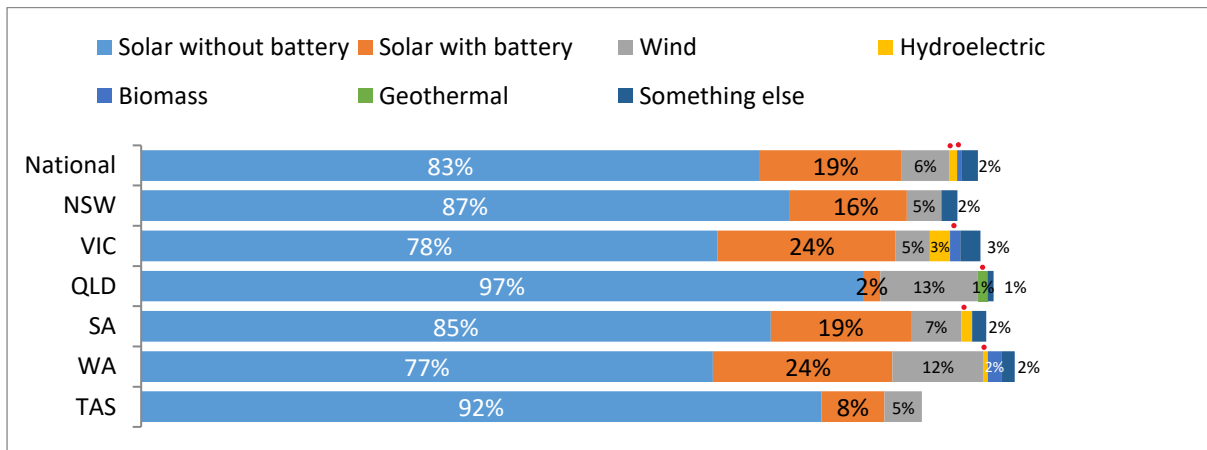


Figure 96: Renewable energy generation methods

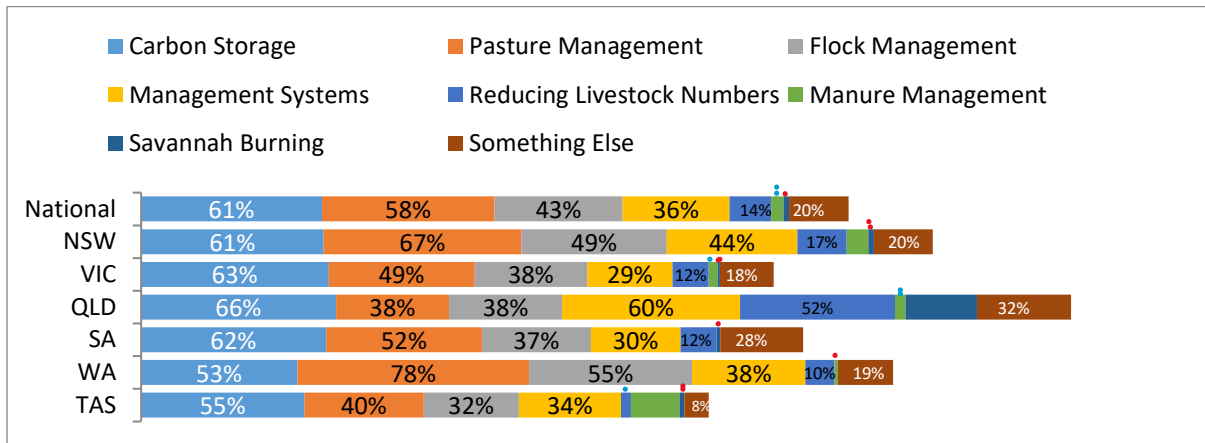
Base: Producers who generate their own renewable energy n = 962



• = 1%

Figure 97: Implementation of emissions reduction measures

Base: Producers who implement emissions reduction measures n = 468



• = 1% :2% • = 3% :4%

Table 4: Examples of emissions reduction measures provided in the survey

Carbon Storage	Pasture Management	Flock Management	Management Systems	Reducing Livestock Numbers	Manure Management	Savannah Burning
Tree planting	Grazing management	Increasing fertility	Stocking rates	Reducing overall livestock numbers	Manure stockpile aeration	Management of savannah burning
Dung Beetles	Earthworms	Decreasing average age	Improved nutrition			
Manure, plant debris and compost application	Grass species	Reducing proportion of unproductive animals	Improved rates of liveweight gain		Addition of urease inhibitors	
Planting of permanent pastures	Perennial pastures					

4.16 On-farm Issues and Succession

Almost one half (45%) of producers report no issues with general labour availability, and slightly over two fifths (41%) report no issues with shearer availability (**Figure 98**). For both shearers and general labour, the average rating given by producers was 5. Merino producers were less likely to report problems with general and shearer availability (35% for both labour types) compared to non-Merino (48% for both labour types).

The stage in succession planning is split fairly evenly across producers, with almost a third (29%) not having started this process yet (**Figure 99**). Victorian producers were significantly less likely to have a formal plan in place than other states (16%). Merino producers (23%) were less likely to say they have only commenced planning compared to non-Merino producers (35%) and were more likely to have a formal plan in place (25% to 18%, respectively).

Figure 98: Labour availability issues

Base: n = 2003

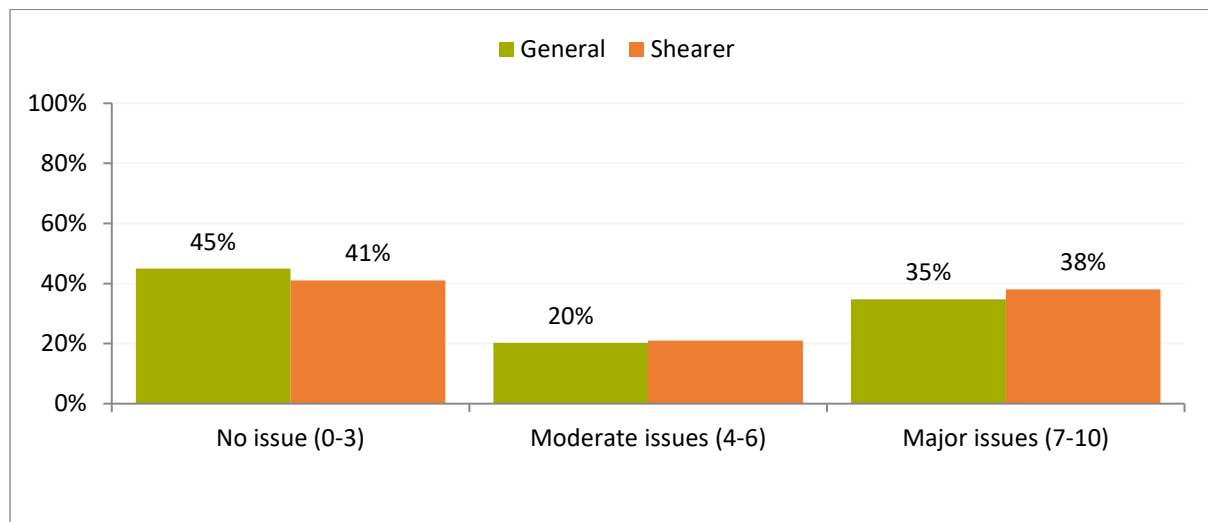
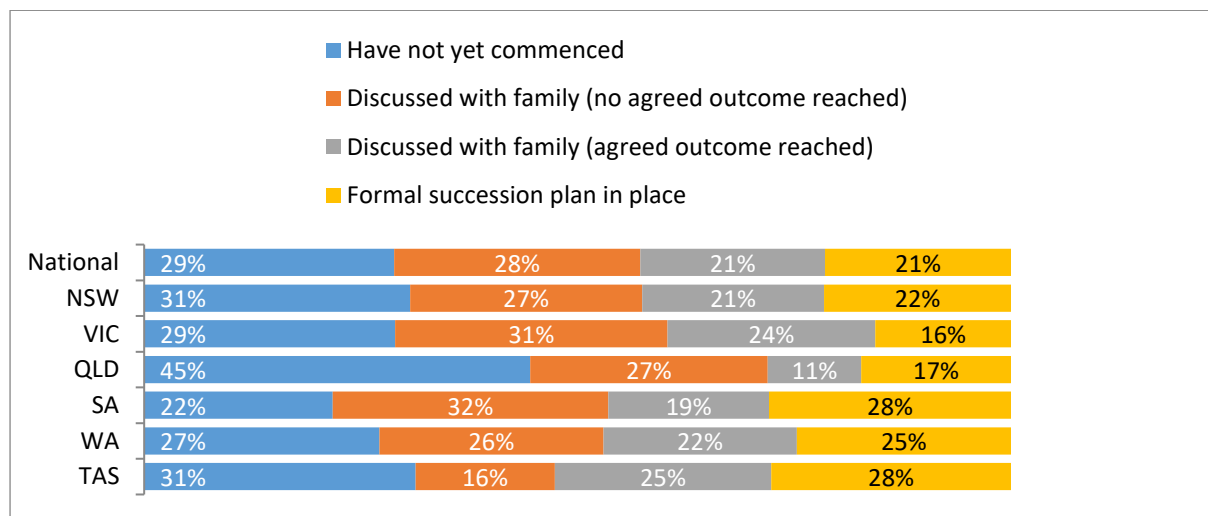


Figure 99: Succession planning by state

Base: n = 2003



4.17 Training and WHS

Nationally, around four fifths of producers (82%) report that they have completed chemical safety training (**Figure 100**). New South Wales (88%) and Merino producers (85%) were significantly more likely to have completed training. Western Australian (72%), Tasmanian (64%) and non-Merino (78%) producers were significantly less likely to have completed training.

Nationally, around three quarters of producers (77%) who have completed chemical safety courses report that they have ChemCERT accreditation or a current ChemCERT card (**Figure 101**). Western Australian (64%) and Tasmanian (41%) producers were significantly less likely to have completed training. Western Australian producers were significantly more likely than other states to report not knowing if they had certification (7%).

Nationally, 80% of producers encourage workers to identify safety concerns (**Figure 102**). Across states, there were significant differences when it came to roll bars. Victorian producers were significantly more likely to have roll bars (82%) with Queensland (40%) and Tasmanian (54%) producers less likely to have roll bars.

Figure 100: Attendance at chemical safety training courses

Base: All producers n = 2003

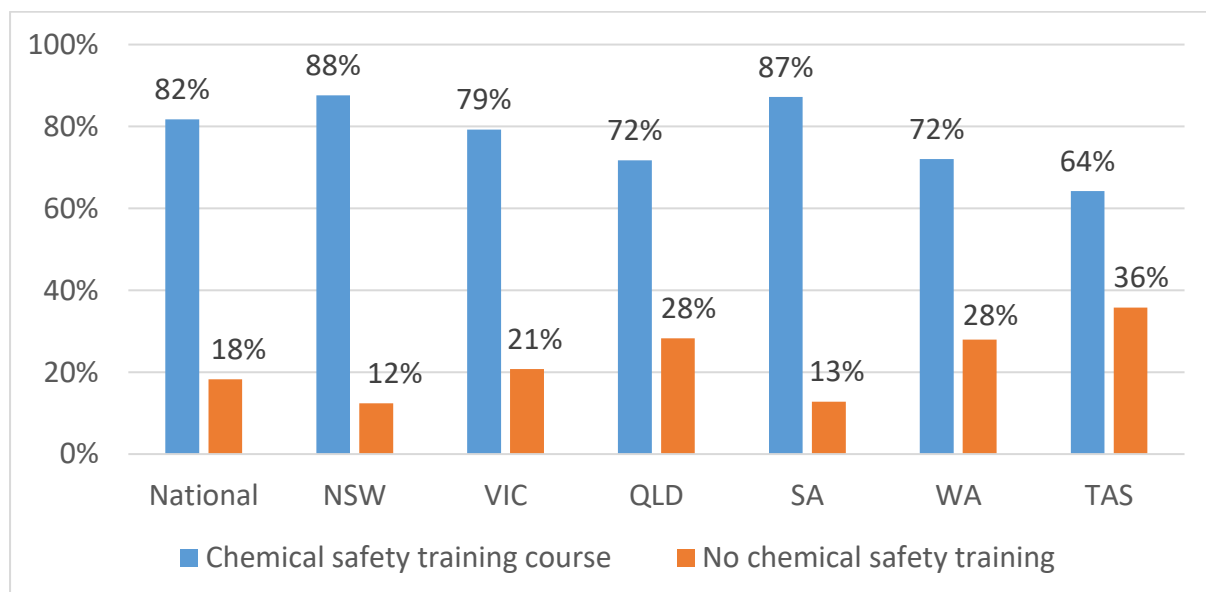
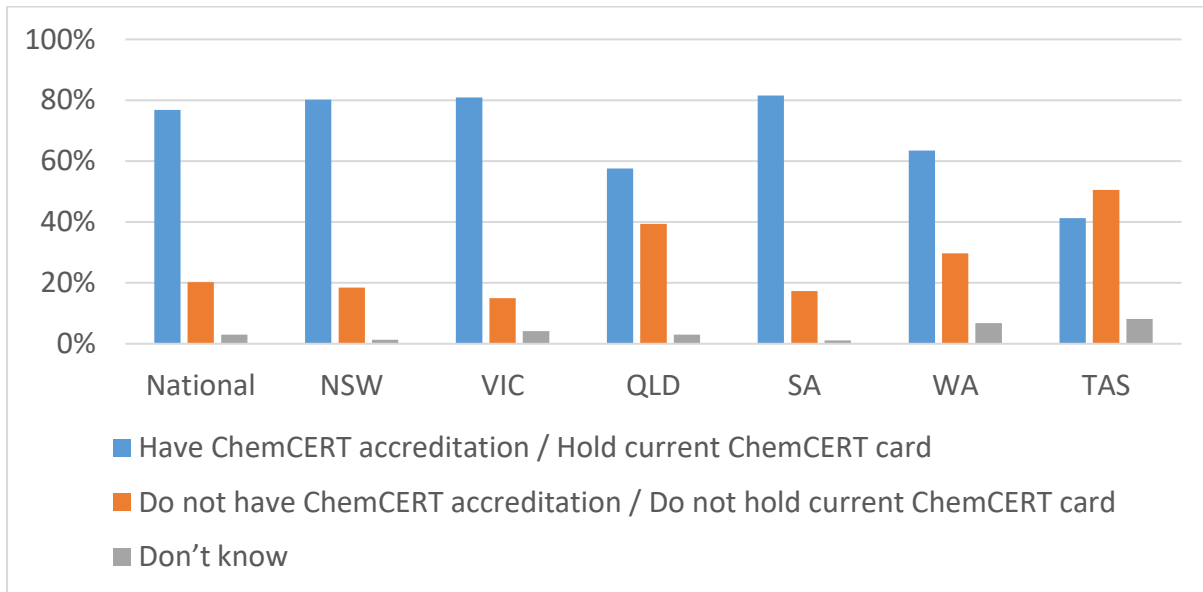
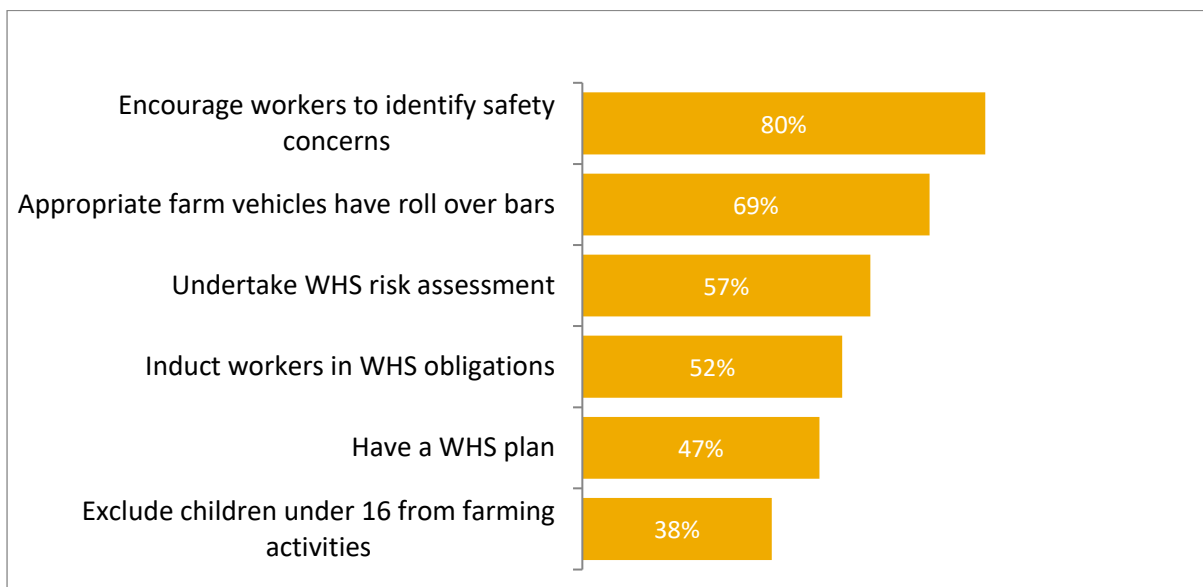


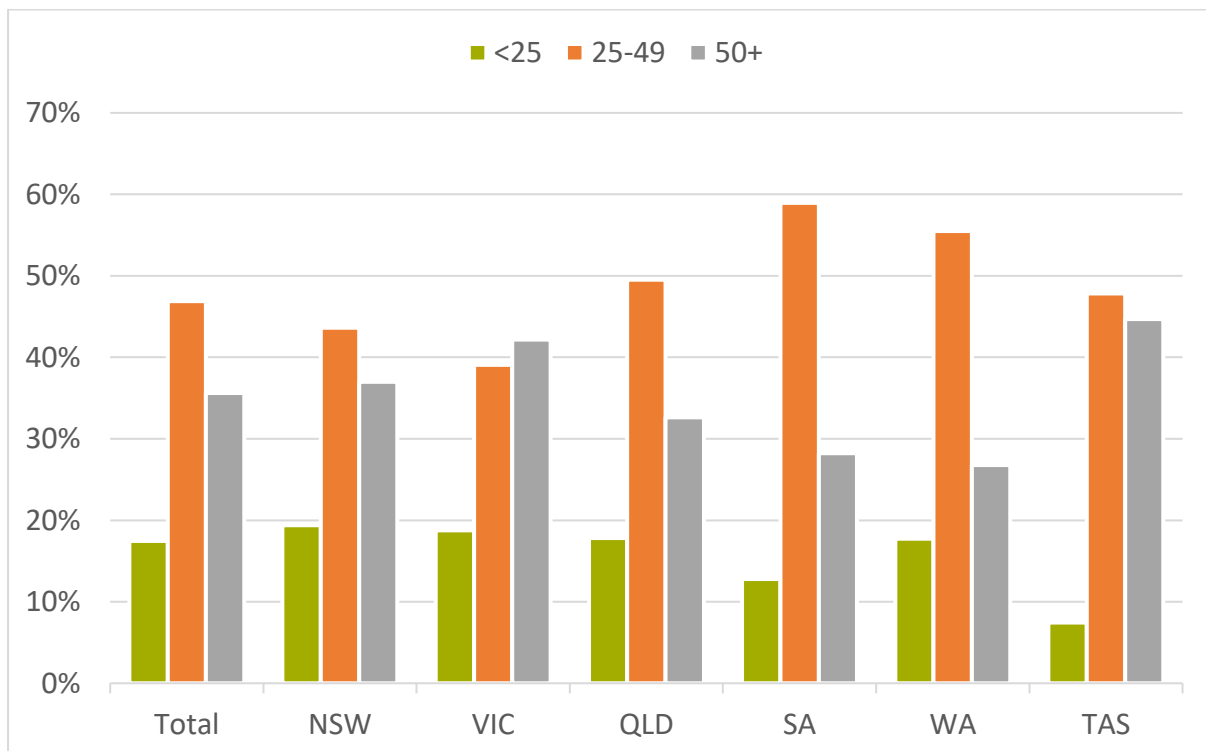
Figure 101: Chemical Accreditation Status*Base: Producers who have attended chemical safety training n = 1704***Figure 102: Work health and safety practices adopted by producers on farm***Base: n = 2003*

4.18 Final Demographics

On average, producers had been in farming 40.4 years. Nationally, the largest segment of interviewed producers was those who had been involved in farming from 25-49 years (47%) (**Figure 103**). Non-Merino producers were significantly more likely to have been farming 25 or fewer years (21%). South Australian and Western Australian producers were more likely to have been farming between 25-49 years (59% and 55% respectively). Victorian and Merino producers were significantly more likely to have been farming 50 or more years (42% and 39% respectively).

Figure 103: Years in farming

Base: n = 2003



5. Comparison with 2010 and 2016 results

Where relevant, comparisons have been made between the results from animal husbandry practice surveys conducted by MLA in 2010, 2016 and 2022. These results are shown in **Table 5** to **Table 8**.

Joining, Scanning and Weaning

The average joining period in 2022 is 10.9 weeks, nearly 2 weeks higher than the average age reported in 2016. The incidence of pregnancy scanning has declined from 50% in the 2016 survey to 42% in 2022. Among this group however, the use of scanning for dry, single and multiples has increased from 62% in 2016 to 69% in 2022. Average age of lambs at weaning was similar between the 2016 and 2022 surveys (15.2 and 16 weeks respectively).

Table 5: Scanning and weaning

	2010	2016	2022
Average joining period	-	9.1 weeks	10.9
Pregnancy scan	-	50%	42%
Of those scanning:			
Dry, single and multiple	-	62%	69%
Wet versus dry	-	38%	31%
Average weaning age	-	15.2 weeks	16 weeks

Castration

Following a shift away from using a cold knife / scalpel towards rings for castration between 2010 and 2016, rings have maintained widespread adoption in 2022 (98%).

Table 6: Castration method

Method	2010	2016	2022
Rings	89%	97%	98%
Cold knife / Scalpel	10%	3%	2%

Tail Docking

Use of rings for tail docking has increased from around one third of producers in 2010 and 2016 to over half of producers (52%) in 2022. Use of hot knife and cold knife for tail docking has continued to decline since 2010 with hot knife now used by 43% - 44% of producers and cold knife only used by 3% of producers.

Table 7: Tail docking method

Method	2010	2016	2022
Rings – ewe lambs	34%	36%	52%
Rings – male lambs			52%
Hot knife – ewe lambs	61%	58%	44%
Hot knife – male lambs			43%
Cold knife – ewe lambs	11%	6%	3%
Cold knife – male lambs			3%
Shears – ewe lambs	1%	-	1%
Shears – male lambs			1%

Predators

The incidence of sheep producers having a problem with predators has remained stable between 2016 and 2022 (80% and 78% respectively). Foxes remain the primary predator in 2022 being cited by 9 out of 10 of these producers, a level consistent with 2016. The incidence of predatory birds now stands at 54% in 2022, up from 43% in 2016. Problems with pigs have increased from 7% in the 2010 survey to 14% in 2022.

Table 8: Predators

	2010	2016	2022
Problem with predators	93%	80%	78%
Foxes	88%	90%	89%
Crows	19%	43%	54%
Eagles / Hawks	21%		
Dingoes	3%	14%	14%
Wild dogs	7%		
Pigs	7%	12%	14%

6. Conclusion and recommendations

6.1 Conclusions

The objective of this research was to track key metrics and practices that underline the sustainability frameworks for sheep industry to help guide MLA's investment and project planning and provide transparency of production to consumer markets domestic and internationally. The conclusion from the research is that sheep producers are adopting a range of practices and behaviours that contribute, to different degrees, towards the sustainability of the Australian sheep industry. These include:

1. Sheep husbandry practices such as scanning, joining, tail docking, castration, mulesing, weaning, vaccination, drenching and shearing;
2. Management strategies and standards related to predators, insect pests, animal welfare, succession planning, chemical training and WHS; and
3. Environmental strategies including renewable energy, carbon accounting and emissions measurement and reduction.

While the researchers cannot conclude whether the adoption of relevant behaviours and strategies identified in this survey are at an acceptable level to meet the sheep industry's specific sustainability objectives, the research has provided the benchmark and tracking data to guide MLA's and AWI's investment and project planning initiatives targeted at sheep producers. For some specific animal husbandry practices however such as adoption of pain management, its contribution towards sustainability is being limited by the inappropriate use of pain management products.

6.2 Recommendations

1. Explore the understanding and use of different types of pain management products

The research has identified that some sheep producers are using inappropriate pain management products for the specific animal husbandry practice. This could reflect a lack of understanding of the specific pain management product needed for that practice or that multiple animal husbandry practices are being conducted at the same time with the product appropriate for one practice but not the other. Further quantitative or qualitative research should be considered to explore this issue in more detail and provide further guidance for the communication and extension strategies needed

2. Consider streamlining questions involving ewe lambs and male lambs

Questions for some animal husbandry practices such as tail docking and mulesing were asked separately for ewe lambs and male lambs. While there is merit in this, it can lead to some challenges where a single metric for all lambs is needed for the Sustainability Framework as averaging across ewe lambs and male lambs is required to create a single metric. Separate measurement of ewe lambs and male lambs also means that comparisons with previous industry surveys where a single metric for all lambs was collected is not possible. Further industry discussion is recommended to decide on the preferred method to measure these practices.

3. Introduce new sources for data collection

The last comprehensive sheep industry animal husbandry practices survey was conducted by MLA for the 2016 year (reported in 2018). A gap in any tracking survey is warranted given the significant investment required to collect the data, the time needed to develop, update, and implement strategies, and for producers to make the desired change. There are benefits however in the industry conducting smaller scale surveys to track change for key metrics to allow fine tuning of strategies. These include adding some key Sheep Sustainability Framework questions to other surveys conducted by MLA and AWI or to omnibus surveys and panels of sheep producers that are regularly in field in the industry

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

It is recommended to repeat the comprehensive, large scale survey every two years rather than the current 4 - 6 years (2010, 2016, 2022). This will provide a more accurate assessment of change across different groups of sheep producers and better guidance for MLA's strategy refinement. The timing of any repeat survey however should consider other sheep producer surveys that are conducted by MLA and AWI throughout the year to minimise any overlap, reduce respondent burden and improve response rates. The online response rate for the 2022 sheep industry survey was significantly lower than the equivalent 2022 beef industry survey. This is likely partly due to MLA's sheep producer members being more frequently surveyed than beef producers. The lower online response rates from sheep producers for the 2022 study meant that an additional investment from MLA and AWI was needed to conduct a larger scale CATI survey to reach the final sample of 2,003 sheep producers. This could be minimised in the future by more closely managing the timing of MLA and AWI sheep producer surveys.

5. Expand the profile and regularly update MLA's Member database

The 2022 survey has identified some significant differences in practices based on demography such as Merino and Non-Merino producers and producers with small, medium, and large flock sizes. The effectiveness of communication and extension activities could be enhanced by targeting specific demographic groups within the industry. This could be achieved by adding more fields to the MLA Member database (to be populated over time) that record the sheep enterprise type and flock size of members. While these variables change over time, if they are regularly updated through MLA correspondence and surveys, they will provide a useful means of identifying and targeting particular groups or segments for communication.

It is also recommended that MLA continue to clean and update their member database. Over 2,000 of the telephone numbers on the MLA database that were dialled for the CATI survey were disconnected and it is estimated that around 15% - 20% of emails to members bounced. Ensuring that the MLA database is up to date will improve response rates for future surveys.

Appendices

Sampling

Table 9: State and flock size quotas and samples

State	100 – 499 head		500 – 1,999 head		2,000 + head		Total	
	Quota	Sample	Quota	Sample	Quota	Sample	Quota	Sample
NSW	294	124	212	327	205	281	711	732
VIC	273	90	175	252	120	177	568	519
QLD	54	14	13	23	18	50	85	87
SA	98	39	110	149	90	125	298	313
WA	80	35	63	70	115	166	258	271
TAS	50	14	15	27	15	40	80	81
Total	849	316	588	848	563	839	2,000	2,003

Table 10: Weighted versus unweighted results

Question	Weighted Results	Unweighted Results
Q2.1 Percentage horned sires	13.5%	15.5%
Q3.1 Weeks joining	10.9%	9.4%
Q3.2 Pregnancy scanning	42%	51%
Q4.1 Percentage ewes tail docked	90%	91%
Q4.11 Pain management for docking	44%	52%
Q5.3 Pain management for castration	25%	28%
Q6.1 Mulesing ewe lambs	31%	39%
Q6.9 Ceased mulesing	37%	42%
Q7.1 Wean lambs	88%	91%
Q7.2 Weaning age in weeks	16.0	15.7
Q7.3 Weaning percentage maiden ewes	86.7%	87.3%
Q7.4 Weaning percentage maiden ewes	104.6%	104.6%
Q8.1 Vaccination	91%	92%
Q8.3 Pre-lambing vaccination	65%	68%
Q9.1 Annual drenches	2.2	2.1
Q9.3 Worm egg count	35%	42%
Q9.5 Drench resistance test	33%	38%
Q10.1 Ewes lost before joining	2.6%	2.7%
Q11.0 Sedate rams for shearing	60%	68%
Q12.1 Wool QA involvement	19%	22%
Q13.1 Predator problems	78%	79%
Q13.5 Predator strategy	44%	45%
Q14.3 Carbon training	9%	10%
Q16.2 ChemCERT training	77%	79%

Table 11: CATI statistics

CATI Item	Number
Total unique numbers called	18,012
Interviews	1,043
Refusals	1,519
Disconnected numbers	2,097
Business/fax numbers	55
Ineligible (via screener questions)	405
Ineligible (quota full)	3,785
Duplicate Numbers	30
Language/deaf/drunk/senile	116
Others - Total	744
<i>Number called more than 6 times</i>	<i>(664)</i>
<i>Deceased</i>	<i>(2)</i>
<i>Cold Call remove</i>	<i>(11)</i>
<i>Link Clicked (Online Survey Attempted)</i>	<i>(67)</i>
Not available - Total	8,218
<i>Answer machine</i>	<i>(4,854)</i>
<i>Call back</i>	<i>(329)</i>
<i>No reply/engaged</i>	<i>(2,965)</i>
<i>Away for duration</i>	<i>(70)</i>

Table 12: 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	9	12	14	16	17	18	19	19	20	20
50	6	8	10	11	12	13	14	13	14	14
75	5	7	8	9	10	10	11	11	11	11
100	4	6	7	8	9	9	10	10	10	10
200	3	4	5	6	6	6	7	7	7	7
300	3	4	4	5	5	5	6	6	6	6
400	2	3	4	4	4	5	5	5	5	5
500	2	3	3	3	4	4	4	4	4	4
600	2	2	3	3	3	4	4	4	4	4
700	2	2	3	3	3	3	4	4	4	4
800	2	2	2	3	3	3	3	3	3	3
900	1	2	2	3	3	3	3	3	3	3
1,200	1	2	2	2	2	3	3	3	3	3
2,000	1	1	1	2	2	2	2	2	2	2

*Based on 95% confidence level

As a guide to interpretation, a survey result of 30% from a sample of 2,003 respondents (eg National) would have a margin of error of 2 percentage points, that is, you are 95% confident that the true answer would lie between 28% and 32%. A result of 30% from a sample of 313 respondents (eg South Australia) would have a higher error of plus / minus 5%.

Survey questions

	Are you the primary / joint decision maker regarding sheep husbandry practices on your property?		
	Yes	1	CONTINUE
	No	2	ASK TO SPEAK WITH APPROPRIATE PERSON
	Don't know	3	

Section 1: Demographic Screeners

S1	Which state is your main sheep enterprise located?			CHECK QUOTA
		NSW	1	
		VIC	2	
		QLD	3	
		SA	4	
		WA	5	
		TAS	6	
	NT	7		

S2	What is the postcode of your main sheep enterprise?
	Postcode <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>

S3	To make sure we are interviewing a representative cross section of producers, over the last 3 full financial years, what percentage of your gross farm income, that is, only income from your property, came from the following activities? <i>STOP WHEN TOTAL REACHES 100%</i>	Record %	
	Beef Cattle		
	Sheep for wool and / or mutton		
	Lambs for meat		
	Lambs for wool		
	Grains		
	Sugar cane		
	Other crops		
	Other livestock		

TO CONTINUE, RESPONDENT MUST HAVE SHEEP OR LAMB INCOME i.e., IF SHEEP OR LAMB ZERO AT S3, THANK AND CLOSE

S4	Which of the following breeds comprise your sheep flock? Please select all that apply SHOW. MULTIPLE		
	Merino Horn	1	
	Merino Poll	2	
	Merino Dohne (<i>pronounced Doo-nee</i>)	3	
	South African Meat Merino (SAMM)	4	
Breeds other than Merino and Merino Dohne	5	ALLOCATE TO NON-MERINO SAMPLE (CODE 'NON-MERINO')	

S5	ASK IF CODE MERINO AT S4 In 2021, how many maiden and mixed age merino ewes did you join to <u>merino</u> rams?		
	Maiden merino ewes		ALLOCATE TO MERINO SAMPLE (CODE 'MERINO')
	Mixed age merino ewes		
	(AUTO SUM) Total merino breeding ewes		
	None	00	ALLOCATE TO NON-MERINO SAMPLE (CODE 'NON-MERINO')

QUOTA SUMMARY

MERINO SAMPLE: JOINS MAIDEN AND MIXED AGE EWES TO MERINO RAMS AT S5 (N = 1,200)

NON-MERINO SAMPLE: CODES 4 AND 5 AT S4 OR CODE 00 AT S5 (N = 800)

IF RESPONDENT QUALIFIES FOR BOTH MERINO AND NON-MERINO, ALLOCATE TO LOWEST QUOTA

ASSIGN TOTAL NUMBER OF MERINO BREEDING EWES AT S5 TO THE FOLLOWING CATEGORIES

S6	250 or less	
	251 – 500	
	501 – 1,000	
	1,001 – 2,000	
	2,000 +	

S7	As at 30 April 2022, approximately how many sheep were in your flock, including breeding and dry ewes, lambs, wethers and rams? RECORD NUMBER	
	Number	

IF TOTAL AT S7 IS LESS THAN 100, THANK AND CLOSE

CODE TOTAL AT S7 TO THE FOLLOWING CATEGORIES

S8	100 - 499	1	
----	-----------	---	--

	500 – 999	2	CHECK STATE FLOCK SIZE QUOTAS
	1,000 – 1,999	3	
	2,000 – 2,999	4	
	3,000 +	5	

INSTRUCTION FOR MERINO SAMPLE:

This survey relates only to your merino sheep enterprise, not other sheep enterprises that you may have. Please think only of your merino enterprise when answering the questions

INSTRUCTION FOR NON-MERINO SAMPLE:

This survey relates only to your non-merino sheep enterprise, not any merino sheep enterprise that you may have. Please think only of your non-merino enterprise when answering the questions

Section 2: Flock Demographics

Firstly, we would like to ask some questions on the characteristics of your (INSERT MERINO OR NON-MERINO FROM S4) flock.

2.1	What percent of your sires are horned and what percent are polled?	%
	Horned	
	Polled	

2.2	ASK IF CODE MERINO AT S4	
	What is your average adult merino ewe micron? SINGLE RESPONSE	
	Less than 15	1
	15	2
	16	3
	17	4
	18	5
	19	6
	20	7
	21	8
	22	9
	23	10
	24	11
Greater than 24	12	

2.3	Which of the following best describes your average mixed age ewe body wrinkle? SHOW. SINGLE	
	Low (Sc1)	1
	Medium (Sc2)	2
	High (Sc3 or above)	3

Section 3: Joining / Scanning

We'd like to ask some questions about joining and scanning your (INSERT MERINO OR NON-MERINO FROM S4/S5) sheep

3.1	How many weeks do you join your ewes to your rams? IF ALL YEAR JOINING, ENTER "52"						
							Number of weeks

3.2	Do you pregnancy scan your ewes? SHOW. SINGLE		
		Yes	1
		No	2

ASK 3.3 – 3.4 IF CODE 1 AT 3.2

3.3	Which of the following do you scan for? SHOW. SINGLE		
		Wet versus dry (pregnant or not pregnant)	1
		Dry, single and multiple fetuses	2

3.4	How many days after rams in do you scan?						
							days

3.5	Do you manage twin lambs separately? SINGLE		
		Yes	1
		No	2

Section 4: Tail Docking

Thinking now about tail docking in your (INSERT MERINO OR NON-MERINO FROM S4/S5) sheep operation

4.1	Do you tail dock your ewes? SHOW. SINGLE		
		Yes	1
		No	2
			CONTINUE
			GO TO 4.5

4.2	ASK IF CODE 1 AT 4.2 What method do you use to tail dock ewes? SHOW. MULTIPLE. RANDOMISE		
		Cold knife	1
		Hot knife	2
		Rings	3
		Shears	4
		Other (Please specify)	98

4.3	ASK FOR CODES 1 – 4 SELECTED AT 4.2 Why do you use (SHOW METHOD SELECTED AT 4.2) to tail dock your ewes? SHOW. MULTIPLE. RANDOMISE		
		Better / preferable method, suits my program / operation	1
		Bloodless / seals the wound	2
		Clean / Neat	3
		Contractor preferred method	4
		Cost effective	5
		Easy to use	6
		Effective	7
		Efficient	8
		Less fly strike	9
		Less infection	10
		Less stress / farm to animals / recovery	11
		Operator safety	12
		Quick	13
		Reliable	14
		Other (Please specify)	98

4.4	At what length do you dock ewe lambs' tails? SHOW. SINGLE		
		1 joint	1
		2 joints	2
		3 joints	3
		4 joints	4
		Other (Please specify)	98

4.5	Why did you choose this tail length for your ewes? SHOW. MULTIPLE. RANDOMISE	
	Allow tail movement / flick away flies / help prevent breech strike	1
	Farm tradition	2
	For specific health reasons such as prolapse, nerve damage, arthritis	3
	Industry standard / best practice	4
	Keeps the area clean	5
	Length decided by contractor	6
	Prefer a longer tail / aesthetic reasons	7
	Protect the genital area	8
	Provide sun protection / prevent skin cancers	9
	Satisfactory length / easy to manage	10
	Suits our operation	11
	Other (Please specify)	98

4.6	Do you tail dock your male lambs? SHOW. SINGLE		
	Yes	1	CONTINUE
	No	2	IF CODE 2 AT BOTH 4.1 AND 4.6, GO TO 5.1 IF CODE 2 AT 4.6 BUT CODE 1 AT 4.1, GO TO 4.11

4.7	ASK IF CODE 1 AT 4.6 What method do you use to tail dock male lambs? SHOW. MULTIPLE. RANDOMISE	
	Cold knife	1
	Hot knife	2
	Rings	3
	Shears	4
	Other (Please specify)	98

4.8	ASK FOR CODES 1 – 4 SELECTED AT 4.7 Why do you use (SHOW METHOD SELECTED AT 4.7) to tail dock your male lambs? SHOW. MULTIPLE. RANDOMISE	
	Better / preferable method, suits my program / operation	1
	Bloodless / seals the wound	2
	Clean / Neat	3
	Contractor preferred method	4
	Cost effective	5
	Easy to use	6
	Effective	7
	Efficient	8
	Less fly strike	9
	Less infection	10
	Less stress / farm to animals / recovery	11
	Operator safety	12

	Quick	13
	Reliable	14
	Other (Please specify)	98

4.9	At what length do you dock male lambs' tails? SHOW. SINGLE	
	1 joint	1
	2 joints	2
	3 joints	3
	4 joints	4
	Other (Please specify)	8

4.10	Why did you choose this tail length for your male lambs? SHOW. MULTIPLE. RANDOMISE	
	Allow tail movement / flick away flies / help prevent breech strike	1
	Farm tradition	2
	For specific health reasons such as prolapse, nerve damage, arthritis	3
	Industry standard / best practice	4
	Keeps the area clean	5
	Length decided by contractor	6
	Prefer a longer tail / aesthetic reasons	7
	Protect the genital area	8
	Provide sun protection / prevent skin cancers	9
	Satisfactory length / easy to manage	10
	Suits our operation	11
	Other (Please specify)	98

4.11	ASK IF CODE 1 AT 4.1 or 4.6 Did you use any products for pain management for tail docking your ewes or male lambs in 2021?	
	Yes	1
	No	2

4.1	ASK IF CODE 1 AT 4.11	
2	What type of product/s did you use? Examples of product types are shown in brackets SHOW. MULTIPLE	
	Anaesthetic injection at the surgery site (e.g., Numnuts)	1
	Anaesthetic and antiseptic spray at the surgery site (e.g., Tri-Solfen)	2
	Analgesic / pain killing injection (e.g., Meloxicam)	3
	Analgesic / pain killing oral gel (e.g., Buccalgesic)	4
	Other (Please specify)	98

4.1 3	ASK FOR CODES 1 – 4 AT 4.12 Why did you use this product? SHOW. MULTIPLE. RANDOMISE	
	Availability / unaware of other products	1
	Easy to apply	2
	Effective product	3
	Fast recovery / promotes healing / minimal bleeding	4
	Have always used it	5
	Improved animal health and welfare	6
	Industry standard	7
	It works / reduces pain	8
	Lambs quick to mother-up following treatment	9
	Lasts longer	10
	Recommended by retailer / contractor/ stock agent	11
	Recommended by vet	12
	Other (Please specify)	98

4.1 4	ASK IF CODE 2 AT 4.11 Why didn't you use pain management? SHOW. MULTIPLE. RANDOMISE	
	Not necessary	1
	Quick procedure / not practical	2
	Vet hasn't suggested it	3
	Added stress / time	4
	Too expensive	5
	Don't know what to use	6
	No reason / have not considered it	7
	Nothing readily available	8
	Other (Please specify)	98
	Don't know	99

Section 5: Castration

We now like to ask you some questions about castration in your (INSERT MERINO OR NON-MERINO FROM S4/S5) sheep operation.

5.1	Do you castrate your male lambs? SHOW. SINGLE		
		Yes	1
		No	2
			CONTINUE GO TO SECTION 6

5.2	What method do you use to castrate male lambs? SHOW. MULTIPLE		
		Cold knife	1
		Rings	2
		Shears / Knife	3
		Other (Please specify)	8

5.3	Did you use any products for pain management for castrating your male lambs in 2021?		
		Yes	1
		No	2

5.4	ASK IF CODE 1 AT 5.3 What type of product/s did you use? Examples of product types are shown in brackets SHOW. MULTIPLE		
		Anaesthetic injection at the surgery site (e.g., Numnuts)	1
		Anaesthetic and antiseptic spray at the surgery site (e.g., Tri-Solfen)	2
		Analgesic / pain killing injection (e.g., Meloxicam)	3
		Analgesic / pain killing oral gel (e.g., Buccalgescic)	4
		Other (Please specify)	98

5.5	ASK FOR CODES 1 – 4 AT 5.4 Why did you use this product? SHOW. MULTIPLE. RANDOMISE	
	Availability / unaware of other products	1
	Easy to apply	2
	Effective product	3
	Fast recovery / promotes healing / minimal bleeding	4
	Have always used it	5
	Improved animal health and welfare	6
	Industry standard	7
	It works / reduces pain	8
	Lambs quick to mother-up following treatment	9
	Lasts longer	10
	Recommended by retailer / contractor/ stock agent	11
	Recommended by vet	12
	Other (Please specify)	98

5.6	ASK IF CODE 2 AT 5.3 Why didn't you use pain management? SHOW. MULTIPLE. RANDOMISE	
	Not necessary	1
	Quick procedure / not practical	2
	Vet hasn't suggested it	3
	Added stress / time	4
	Too expensive	5
	Don't know what to use	6
	No reason / have not considered it	7
	Nothing readily available	8
	Other (Please specify)	98
	Don't know	99

Section 6: Mulesing

Could you now please think about mulesing in your (INSERT MERINO OR NON-MERINO FROM S4/S5) sheep operation.

6.1	Did you mules your ewe lambs in 2021?		
		Yes	1
		No	2

6.2	Did you mules your male lambs in 2021? SHOW. SINGLE		
		Yes	1
		No	2
		CONTINUE IF CODE 2 AT BOTH 6.1 AND 6.2, GO TO 6.9 IF CODE 2 AT 6.1 BUT CODE 1 AT 6.1, CONTINUE	

6.3	Did you use any products for pain management for mulesing your lambs in 2021?		
		Yes	1
		No	2

6.4	ASK IF CODE 1 AT 6.3		
	What type of product/s did you use? Examples of product types are shown in brackets		
	SHOW. MULTIPLE		
		Anaesthetic injection at the surgery site (e.g., Numnuts)	1
		Anaesthetic and antiseptic spray at the surgery site (e.g., Tri-Solfen)	2
		Analgesic / pain killing injection (e.g., Meloxicam)	3
		Analgesic / pain killing oral gel (e.g., Buccalgesic)	4
	Other (Please specify)	98	

6.5	ASK FOR CODES 1 – 4 AT 6.4 Why did you use this product? SHOW. MULTIPLE. RANDOMISE	
	Availability / unaware of other products	1
	Easy to apply	2
	Effective product	3
	Fast recovery / promotes healing / minimal bleeding	4
	Have always used it	5
	Improved animal health and welfare	6
	Industry standard	7
	It works / reduces pain	8
	Lambs quick to mother-up following treatment	9
	Lasts longer	10
	Recommended by retailer / contractor/ stock agent	11
	Recommended by vet	12
	Other (Please specify)	98

6.6	ASK IF CODE 2 AT 6.3 Why didn't you use pain management? SHOW. MULTIPLE. RANDOMISE	
	Not necessary	1
	Quick procedure / not practical	2
	Vet hasn't suggested it	3
	Added stress / time	4
	Too expensive	5
	Don't know what to use	6
	No reason / have not considered it	7
	Nothing readily available	8
	Other (Please specify)	98
	Don't know	99

ASK 6.7 – 6.8 IF CODE 1 AT 6.1 OR 6.2

6.7	How likely are you to cease mulesing in the next 5 years? SHOW. SINGLE	
	Very unlikely	1
	Unlikely	2
	Can say either way	3
	Likely	4
	Very likely	5

Section 7: Weaning

We would now like to ask you some questions about weaning in your (INSERT MERINO OR NON-MERINO FROM S4/S5) operation.

7.1	Do you wean lambs in your sheep operation?	Yes	1
		No	2

ASK 7.2 – 7.4 IF CODE 1 AT 7.1

7.2	What is the average age of lambs being weaned, in weeks?	Age in weeks		

7.3	Over the last 10 years, what is your lamb weaning percentage for maiden ewes joined? (Or: Of every 100 maiden ewes that you joined, how many lambs did you wean?)	Number / percent		

7.4	Over the last 10 years, what is your lamb weaning percentage for mature ewes joined? (Or: Of every 100 mature ewes that you joined, how many lambs did you wean?)	Number / percent		

Section 8: Vaccination

We would like to capture your use of vaccines in your (INSERT MERINO OR NON-MERINO FROM S4/S5) flock.

8.1	Do you vaccinate any sheep in your flock?		
		Yes	1
		No	2
			CONTINUE GO TO SECTION 9

ASK 8.2 – 8.6 IF CODE 1 AT 8.1

8.2	What percent of your entire flock receives at least one vaccination of any type of vaccine? (Or: Of every 100 sheep that you have on your property, how many have received a vaccine?)							
								Number / percent

8.3	Do you do a pre-lambing vaccination?		
		Yes	1
		No	2

8.4	Do you vaccinate your ewe lambs at lamb marking? SHOW. SINGLE		
		Yes	1
		No	2

8.5	Do you vaccinate your lambs at weaning?		
		Yes	1
		No	2

8.6	Which disease of sheep would you rank number 1 for causing the most sheep production loss on your farm? Which disease would be number 2? Which disease would be number 3?		
			Don't know
		Disease 1	99
		Disease 2	99
		Disease 3	99

IF CODE 99 TO DISEASE 1, GO TO 9.1. IF CODE 99 TO DISEASE 1, GO TO 9.1

Section 9: Drenching

Could you please now think about drenching in your (INSERT MERINO OR NON-MERINO FROM S4/S5) sheep operation.

9.1	How many times in a normal year do you drench your mixed age ewes?					
	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> </tr> </table> Times per year					

9.2	How many times in a normal year do you drench your young ewes from weaning to joining?					
	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> </tr> </table> Times per year					

9.3	Did you do any faecal egg counts on any of your sheep in 2021?		
	Yes	1	
	No	2	

9.4	ASK 1 IF CODE 1 AT 9.3 How many times in a normal year do you typically test for worms by performing a faecal egg count in your sheep?					
	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> </tr> </table> Times per year					

9.5	Have you ever done a drench resistance test?		
	Yes	1	
	No	2	

9.6	ASK IF CODE 1 AT 9.5 How often do you do a drench resistance test? SHOW. SINGLE		
		Every year	1
		Every 2 years	2
		Every 3 years	3
		Every 4 years	4
		Every 5 years	5
		Less frequent than every 5 years	6
		Other (please specify)	98

9.7	There are a number of online parasite management information resources available to producers. Which of the following websites have you heard of? SHOW. MULTIPLE		
	ParaBoss	1	CONTINUE
	WormBoss	2	
	LiceBoss	3	
	FlyBoss	4	
	None	0	GO TO SECTION 10

9.8	ASK IF ANY WEBSITE SELECTED AT 9.7 Which of the following websites have you visited? SHOW WEBSITES SELECTED AT 9.7. MULTIPLE		
	ParaBoss	1	GO TO SECTION 10
	WormBoss	2	CONTINUE
	LiceBoss	3	
	FlyBoss	4	
	None	0	GO TO SECTION 10

9.9	ASK 9.8 FOR EACH WEBSITE (CODE 2, 3 OR 4) SELECTED AT 9.8 How many times did you visit (INSERT WEBSITE AT 9.8) website in 2021?						
		<table border="1"> <tr> <td></td> <td></td> <td></td> <td>Times per year</td> </tr> </table>				Times per year	
			Times per year				

9.1 0	ASK IF CODE 2, 3 OR 4 SELECTED AT 9.9 Thinking about any of the information you found on any of the websites you visited, which one statement best describes you? SHOW. SINGLE	
	I used the information to make decisions and change some of my practices	1
	I have used the information to plan for the future. The information has not changed any of my practices yet	2
	I have not used the information to make decisions, plan for the future or change any of my practices	3

Section 10: Mortality and Euthanasia

Thinking now about livestock mortality and euthanasia in your (INSERT MERINO OR NON-MERINO FROM S4/S5) flock.

10.1	Of the ewes that you wean, what percentage would you lose before the next joining? (Or: Of every 100 ewes that you wean, how many do you lose before the next joining?)					
	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="padding: 0 10px;">Number / percent</td> </tr> </table>					Number / percent
				Number / percent		

10.2	What is your annual adult ewe mortality percentage rate? (Or: Of every 100 adult ewes on your property, how many do you lose on average each year?)					
	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td style="padding: 0 10px;">Number / percent</td> </tr> </table>					Number / percent
				Number / percent		

10.3	The industry has developed the Australian Animal Welfare Standards and Guidelines for Sheep. Which of the following best describes your knowledge of these standards and guidelines? SHOW. SINGLE		
	I am aware of these but have not read them	1	CONTINUE
	I am aware of these and have read them	2	CONTINUE
	I am not aware of these	3	GO TO SECTION 11

10.4	The Australian Animal Welfare Standards and Guidelines for Sheep include specific standards and guidelines for the Humane Killing of Sheep. Which of the following best describes your knowledge of the specific standards and guidelines for the Humane Killing of Sheep? SHOW. SINGLE		
	I am aware of these but have not read them	1	
	I am aware of these and have read them	2	
	I am not aware of these	3	

Section 11: Shearing and Flystrike

We would like to ask some questions on shearing and flystrike in your (INSERT MERINO OR NON-MERINO FROM S4/S5) sheep flock.

11.0	Do you sedate your rams for shearing?	
	Yes	1
	No	2
	Not applicable / no rams	0

11.1	Have you ever done a fly chemical resistance test?	
	Yes	1
	No	2

ONLY ASK SECTION 12 IF 'MERINO' AT S4

Section 12: Wool QA

Thinking now about wool quality assurance in your (INSERT MERINO) sheep operation.

12.1	Are you involved in any quality assurance schemes involving wool?	
	Yes	1
	No	2

12.2	Which quality assurance schemes are you involved in? SHOW. MULTIPLE. RANDOMISE	
	Australian Certified Organic (ACO)	1
	Australian Superfine Woolgrower Association (ASWGA)	2
	Authentico	3
	Better Choices	4
	BioClip	5
	Clipcare	6
	Dalcare-3	7
	Demeter Biodynamic Agriculture Australia (DBAA)	8
	EU Eco label	9
	Merino Tech	10
	National Association for Sustainable Agriculture Australia (NASAA)	11
	PGG Wrightson Integrity Assured	12
	Responsible Wool Standard (RWS)	13
	Schute Bell Fibre Care	14
	Southern Cross Certified	15
	SustainaWOOL	16
	Traprock QMS/TIMS	17
	USA Certification Requirements	18
	Woolcare	19
Other (Please specify)	98	
Don't know	99	

Section 13: Predators and Pests

We would like to ask you some questions about predators and pests in your sheep operation.

13.1	Do you have a problem with predators on your property? SHOW. SINGLE		
		Yes	1
		No	2
			CONTINUE GO TO SECTION 14

13.2	How many sheep did you lose to predators in 2021?	
		number

13.3	What are the 2 most relevant predators on your property? SHOW. ALLOW A MAXIMUM OF 2 RESPONSES. RANDOMISE		
		Wild dogs including dingoes	1
		Pigs	2
		Foxes	3
		Birds i.e., crows and eagles	4

13.4	How do you control (SHOW PREDATOR SELECTED AT)? REPEAT FOR EACH PREDATOR SELECTED AT 13.3 SHOW. MULTIPLE. RANDOMISE		
		Poison / Bait	1
		Shoot	2
		Trap	3
		Fences	4
		Guardian / Companion Animal	5
		Don't control	0

13.5	Do you have a predator management strategy and plan for your property? SHOW. SINGLE		
		Yes	1
		No	2

ASK 13.6 – 13.7 IF CODE 1 AT 13.5

13.6	Is this predator management strategy and plan just for your property or is it part of a collaborative group such as neighbours, district, or region? SHOW. SINGLE		
		Just for my property	1
		Part of collaborative group such as neighbours, district, or region	2

13.7	Have you ever used or acted on your predator management plan for your property or as part of a collaborative group? SHOW. SINGLE		
		Yes	1
		No	2

13.8	Do you have a pest (insect) management plan for your property? SHOW. SINGLE		
		Yes	1
		No	2

Section 14: Renewable Energy

Turning now to the topic of renewable energy.

14.1	Which of the following best describes your use of renewable energy on your farm? SHOW. MULTIPLE		
		I use renewable energy that I generate myself	1
		I use renewable energy from my energy retailer	2
		I don't generate or buy any renewable energy	3

14.2	ASK IF CODE 1 AT 14.1 Which of the following types of renewable energy do you generate and use on your farm? SHOW. MULTIPLE.		
		Solar without battery	1
		Solar with battery	2
		Wind	3
		Geothermal	4
		Biomass	5
		Hydroelectric	6
		Something else (Please specify)	98

14.3	Have you undertaken any carbon neutral or carbon accounting training? SHOW. SINGLE		
		Yes	1
		No	2

14.4	Do you measure the net greenhouse gas emissions produced in your operation using carbon accounting or another process? SHOW. SINGLE		
		Yes	1
		No	2

14.5	Have you implemented any activities to reduce your greenhouse gases while producing livestock? SHOW. SINGLE		
		Yes	1
		No	2

14.6	ASK IF CODE 1 AT 14.5 Which of the following activities have you implemented? SHOW. MULTIPLE. RANDOMISE	
	Carbon storage (manure, plant debris and composts applied to the soil, permanent planting of pastures, tree planting, dung beetles)	1
	Flock management (increasing fertility, decreasing average age, reducing proportion of unproductive animals)	2
	Management systems (stocking rates, improved nutrition/rates of liveweight gain) ‘	3
	Manure management (manure stockpile aeration, adding urease inhibitors)	4
	Pasture management (grazing management, earthworms, grass species, legumes, perennial pastures)	5
	Reducing livestock numbers overall	6
	Savanna burning management	7
	Something else (Please specify)	98

Section 15: On-farm Issues / Succession

We would like to capture your thoughts on some other issues related to your farm.

15.1	How much of an issue is the availability of general labour for your sheep operation? Please rate using a scale of 1 to 10 where 1 is No issue at all and 10 is a Major issue SHOW. SINGLE										
	No issue at all										Major issue
	1	2	3	4	5	6	7	8	9	10	

15.2	How much of an issue is the availability of shearers for your sheep operation? Please rate using a scale of 1 to 10 where 1 is No issue at all and 10 is a Major issue SHOW. SINGLE										
	No issue at all										Major issue
	1	2	3	4	5	6	7	8	9	10	

15.5	Which of the following best describes the stage you are at in relation to succession planning for your property? SHOW. SINGLE									
	Have not yet commenced									1
	Discussed with family (no agreed outcome reached)									2
	Discussed with family (agreed outcome reached)									3
	Formal succession plan in place									4

Section 16: Training and WHS

Please now consider the topic of training and workplace health and safety.

16.1	Have you done any chemical safety training courses? SHOW. SINGLE		
		Yes	1
		No	2

16.2	ASK IF CODE 1 AT 16.1 Do you have ChemCERT accreditation or hold a current ChemCERT card? SHOW. SINGLE		
		Yes	1
		No	2
		Don't know	9

16.3	Do you have, or are you doing, any of the following in regard to Workplace Health and Safety (WHS) on your farm? SHOW. SINGLE		
		Yes	No
	Have a WHS plan	1	2
	Undertake WHS risk assessment	1	2
	Induct workers in WHS obligations	1	2
	Encourage workers to identify safety concerns	1	2
	Exclude children under 16 from farming activities	1	2
	Appropriate farm vehicles have roll over bars	1	2

Section 17: Final Demographics

Finally, just a few demographic and attitudinal questions to make sure we have collected the views of a broad cross section of producers.

17.1	For each of the following statements, please indicate whether you Strongly disagree, Somewhat disagree, Neither agree nor disagree, Somewhat agree or Strongly agree SHOW. RANDOMISE	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Don't know / Not Applicable
	I am prepared to borrow heavily to finance increasing the size of my farm	1	2	3	4	5	9
	I actively seek the information. I am constantly on the lookout for new information that can help me improve my livestock operation.	1	2	3	4	5	9
	I know what works and what doesn't on my farm. I see no need to change.	1	2	3	4	5	9
	Farming is a business, just like any other business.	1	2	3	4	5	9
	I am prepared to borrow heavily to finance diversifying my farming activities.	1	2	3	4	5	9
	I feel financially constrained in my business.	1	2	3	4	5	9
	I hope to pass on my farm to my children when I retire.	1	2	3	4	5	9
	I adjust my farm management strategy according to the market environment.	1	2	3	4	5	9

17.2	How many years have you been involved with farming?	
		years

17.3	What is the highest level of education you have achieved? SHOW. SINGLE	
	Year 9 or less	1
	Year 10 - 11	2
	School Leaving Certificate (e.g., HSC)	3
	TAFE	4
	Tertiary Graduate	5
	Postgraduate	6
	Prefer not to say	99

17.4	Finally for classification purposes, into which of the following age groups you fall? SHOW. SINGLE ANSWER ONLY.	
	18 – 24	1
	25 – 34	2
	35 – 44	3
	45 – 54	4
	55 – 65	5
	65 and over	6
	Refused	88

17.5	What is your gender? SHOW. SINGLE	
	Male	1
	Female	2
	Prefer not to identify	3
	Other	4

THANK AND CLOSE