

# FINAL REPORT



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## 2021 AWI Merino Husbandry Practices Survey



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## Abstract

The 2021 AWI Merino Husbandry Practices Survey reports on the Merino specific results from a broader AWI/MLA funded survey (“Project Proof”) of 2,003 sheep producers (1,203 Merino and 800 Non-Merino producers), undertaken to inform the Sheep Sustainability Framework (SSF).

The SSF 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. Project Proof was designed to enable regular tracking of sheep Merino producers’ attitudes and behaviours via survey-based methodologies to help ensure that progress against these themes can be measured and that industry initiatives to drive change can be developed and adapted.

The Merino specific results (reported as the 2021 AWI Merino Husbandry Practices Survey) is an update to the 2017 AWI Merino Husbandry Practices Survey, allowing for tracking of change in Merino producers’ animal husbandry practices over time.

An online and telephone survey of 1,203 Merino producers was conducted in May to July 2022 and respondents were asked about their 2021 practices. The research identified that Merino 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 and flock size. Recommendations have been made on further research into pain management, how to better collect data and measure some variables, and how Merino producers can be better targeted by further profiling. The industry will benefit from the research as it will help guide AWI in identifying key on-farm sustainability priorities for future industry levy investment.

### **Comment from Australian Wool Innovation**

For more detailed analysis on the trends in mulesing, tail docking and castration practices of Australian woolgrowers, including an interpretation of the results from this survey, a discussion on the associations between the respondent’s demographics and their husbandry practices and a comparison of these results with other relevant woolgrower surveys and the National Wool Declaration (NWD) data, see the related AWI Final Report ON-00829 PO4500016401.

- Colvin, A. (2022). Trends in mulesing, tail docking and castration practices of Australian woolgrowers: Results of the 2021 AWI Merino Husbandry Practices Survey. AWI Final Report ON-00829 PO4500016401. Available at [www.wool.com/flystrikelatest](http://www.wool.com/flystrikelatest) under Woolgrower Surveys.

## Executive summary

### Background

The 2021 AWI Merino Husbandry Practices Survey is an update to the 2017 AWI Merino Husbandry Practices Survey, allowing for tracking of change in Merino producers' animal husbandry practices over time. Regular tracking of Merino producers' attitudes and behaviours via survey-based methodologies helps ensure that progress in adoption of animal husbandry practices can be measured and that industry initiatives to drive change can be identified, developed and adapted.

### Objectives

The primary objective was to track key metrics and practices, benchmarked in the 2017 AWI Merino Husbandry Practices Survey, to help guide AWI's on-going 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 1,203 Merino producers in May to July 2022. A mixed methodology was employed involving a 29-minute Online survey with 505 Merino producers and a 25-minute survey with 698 Merino producers via Computer Assisted Telephone Interviews (CATI). Merino producers were incentivised to participate in the survey through a prize draw. Producer contact details were sourced from MLA's member database, whereas in the 2017 AWI Merino Husbandry Practices survey, an external commercial sheep producer database was used. The different databases used should be considered when comparing results between the two surveys.

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. As the results are based on a survey, they are subject to margins of error and should be viewed as the midpoint of the likely range, rather than a single value. For example, based on the national sample of 1,203 Merino producers, 52% of Merino producers mules their ewe lambs. This result has a margin of error of +/- 2.7% at a 95% confidence level so the national result of 52% has a range of between 49.3% and 54.7%.

### Results

The overwhelming majority of Merino producers (78%) had flocks comprised of pure-bred Merino Poll with 36% having pure-bred Merino Horn, 7% Merino Dohne, 1% SAMM and 22% with breeds other than Merino and Merino Dohne (from multiple breeds selected).

All 1,203 producers in the Merino sample had to join maiden or mixed age Merino ewes to Merino rams in 2021 to qualify for the Merino survey. Across Australia, Merino producers joined an average of 399 Merino maiden ewes and 1,009 Merino mixed ewes to Merino rams.

Nationally, one quarter of all Merino producers (25%) ran 250 or fewer Merino breeding ewes. 17% ran 251 - 500, and 23% between 501 – 1,000. 17% of Merino producers ran between 1,001 – 2,000 Merino breeding ewes and 18% ran over 2,000.

The majority of Merino producers (76%) use polled sires.

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

Slightly over half of Merino producers state that their mixed age ewes have low body wrinkle (54%), with 44% saying that their flocks have on average a medium body wrinkle and 3% saying their flocks have a high body wrinkle.

One quarter of Merino producers nationally (24%) join ewes to rams for eight weeks or longer with an average 8.9 weeks.

Nationally, 44% of Merino producers pregnancy scan their ewes. Of these, around two thirds (67%) sought to find out if the ewe was dry or had single or multiple foetuses. One third (33%) wanted to know if the ewe was simply wet or dry. Merino producers scanned on average 68 days after rams in. Around 1 in 3 Merino producers manage their twin lambs separately (30%).

At the national level, 95% of Merino producers tail dock their ewes and 97% of Merino producers tail dock their male lambs.

Hot knife was the most common technique (58%) used for tail docking ewe lambs followed by rings (36%). When tail docking male lambs, hot knife was the most common technique (58%) used followed by rings (35%).

Nationally, more than half of Merino producers who tail dock ewe lambs, dock them to two joints (51%). Three joints is the next most common choice at 37%. Likewise, more than half of Merino producers who tail dock male lambs dock them to two joints (55%). Three joints is the next most common choice at 32%. The most common reasons cited for choosing a particular tail length for ewe lambs were to protect the genital area (51%) and to provide sun protection (48%). For male lambs, the reasons were that it would allow tail movement (37%) and to provide sun protection (35%).

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 (63%). 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%).

The most common reasons cited for using rings to dock ewe lambs was that it is easy (45%), bloodless (34%) and clean or neat (31%). For male lambs, the most common reasons cited for using rings was that it is easy (37%), bloodless (32%) and clean or neat (31%).

When using cold knife on ewe lambs, Merino producers said it was effective (33%), efficient (32%) and quick (31%) and for male lambs, Merino producers state that it is effective (36%) and efficient (32%).

Nationally, 60% of Merino producers use pain management at tail docking across all methods. Adoption of pain management for ewe lambs however varies by tail docking method. When tail docking ewe lambs, fewer Merino producers use pain management for rings (25%). Merino producers are split on using pain management for cold knife (55%) whereas pain management is used by almost four fifths of Merino producers for hot knife (80%) and shears (83%). For male lambs, Merino producers who use rings were less likely to use pain management when tail docking (25%). Merino producers who tail dock using hot knife and shears are much more likely to use pain management (80% and 65%, respectively).

Anaesthetic and antiseptic spray at the site is the primary type of pain management for tail docking. Nationally, it is used by 84% of Merino producers who use pain management products at tail docking. Analgesic oral gel (10%) and anaesthetic injection at the site (6%) were the next most frequent pain management types used.

The most common reasons cited for choosing anaesthetic injections were improved animal health and welfare (57%) and to reduce pain (51%).

Merino producers using anaesthetic and antiseptic spray at the surgery site cited effective pain reduction (55%), fast recovery (48%) and improvement in animal health and welfare (42%) as the primary reasons for use.

Merino producers said they chose analgesic injections due to effective pain reduction (61%), improved welfare (60%) and it is longer lasting (57%).

The most common reasons cited for choosing analgesic oral gel were improved animal health and welfare (57%), pain reduction (49%), and swift mothering up (43%).

When asked why they don't use pain management at tail docking, Merino producers said that they don't consider it necessary (50%). 25% of Merino producers cited no particular reason with 17% claiming it was not practical or a quick procedure.

Virtually all Merino producers castrate their male lambs (98% nationally), and rubber rings were by far the most common technique (97%) used nationally.

30% of Merino producers use pain management when castrating male lambs. Use of pain management varies by castration method and is highest for shears (78%) and lowest for rings (29%).

Anaesthetic and antiseptic spray at the site is the primary type of pain management for castration (59%). Merino producers who chose anaesthetic and antiseptic spray said that it provided effective pain reduction (49%), had a fast recovery (34%) and improved animal health and welfare (31%).

The most common reasons cited for choosing anaesthetic injections for castration were that it reduces pain (61%), improves animal health and welfare (59%) and lambs quickly mother-up afterwards (48%).

Merino producers who chose analgesic injections said they improve animal health and welfare (72%) and had effective pain reduction (65%).

The most common reasons Merino producers cited for choosing analgesic oral gel were improved animal health and welfare (64%) and pain reduction (63%).

The main barrier to the use of pain management for castration is that it is not considered necessary (43%). 28% of Merino producers cited no particular reason with 17% stating it was not practical or a quick procedure.

At the national level, 52% of Merino producers mulesed their ewe lambs in 2021 and 44% of Merino producers mulesed their male lambs. This practice is much more prevalent in larger flock sizes. For example, 70% of Merino producers with a total flock size of 2000+ reported mulesing their ewe lambs in 2021, compared to only 19% of Merino producers with a flock size of 100 – 499.

The majority of Merino producers who mules use pain management (92%). Most Merino producers who use pain management products at mulesing (96%) use an anaesthetic and antiseptic spray (Tri-Solfen) at the surgery site.

Effectiveness (56%) and fast recovery (51%) were the primary reasons for choosing Tri-Solfen for mulesing.

Merino producers that reported using analgesic injections at mulesing, stated their reasons as effective pain reduction (72%) and fast recovery (53%), while analgesic oral gel offered pain reduction (74%) and improved animal health and welfare (57%).

The main barrier to the use of pain management for mulesing is that it is not considered necessary (35%). 22% of Merino producers cited no particular reason with 15% stating it was too expensive.

Across Australia, of Merino 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 if required were flystrike chemicals (47%), more crutching (45%) and breeding for resistance (41%).

At the national level, nearly two thirds (60%) of Merino producers who did not mules in 2021 have ceased mulesing with the other 40% having never mulesed. On average, Merino 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 (39%), animal ethics (26%) and industry/consumer pressure (23%).

93% of Merino producers interviewed wean lambs in their operations. 70% of Merino producers interviewed wean lambs between 9 and 16 weeks, with an average of 15.7 weeks.

Maiden ewes are more likely to have a weaning percentage between 81-90 percent (27%). Mature ewes (33%) were more likely to have weaning percentages 110% or greater.

9 out of 10 Merino producers vaccinate at least some sheep in their flock. Nationally, an average of 66% of Merino producers vaccinate pre-lambing, 97% at marking and 74% at weaning. Across Australia, 49% of producers vaccinate their flock at all stages.

Slightly over two thirds (68%) of Merino producers drench mixed age ewes two times or fewer. Similarly, slightly over two thirds (65%) of Merino producers drench young ewes two times or fewer.

Nationally, an average of 37% of Merino producers conducted a Worm Egg Count in 2021. For the Merino producers who did test, the average number of tests for worm egg counts annually tested was 4.3.

1 in 3 Merino producers have done a drench resistance test at some stage (37%). Drench resistance tests are done very infrequently with over a third of Merino producers who do test (36%) doing them once every 5 years or longer.

WormBoss has the highest awareness level of the four parasite management websites considered (64%). WormBoss also has the highest visitation level of the four parasite management websites (53%).

In 2021, on average, Merino producers visited WormBoss 2.2 times, LiceBoss 1.2 times, and FlyBoss 1.5 times. Merino producers who had used one of the websites had used the information to make decisions and change their practices in 52% of cases, with 33% saying they have used the information to plan but have not yet implemented their knowledge and 13% saying they have not used the information at all.

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

The majority of Merino producers (86%) 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 (58%).

2 out of 3 Merino producers (63%) sedate their rams for shearing.

Very few Merino producers have ever done a fly chemical resistance test (4%).

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

Across Australia, 78% of Merino producers report problems with predators and lose 36 sheep on average annually due to predation. Foxes are the number one predator (87%) followed by birds (53%) and wild dogs (15%).

Shooting foxes is the most common control method used (72% nationally) with poison or bait (61%) for wild dogs and shooting for pig control (86%). Traps (57%) and poison or bait (39%) are also frequently used for pigs. Conversely, most Merino producers do not control birds (82% nationally).

Of Merino producers who reported problems with predators, almost half (43%) have a predator management strategy. These strategies were split with around half being part of a collaborative group strategy (47%) or just for the producer's property (53%). Of Merino producers who have a strategy, the majority (72%) have acted on it.

One quarter of Merino producers nationally have an insect management strategy (26%).

Half (52%) of Merino producers generate and use renewable energy. A further 11% of Merino producers stated that they use renewable energy bought from their energy retailer with 40% not generating or buying any renewable energy.

Of the Merino producers who generate their own renewable energy, the vast majority (88%) have solar without batteries. Slightly under a fifth (16%) generated solar with a battery.

Merino producers interviewed had generally not taken carbon accounting training study (90%) and did not measure their emissions (96%), however, 24% did implement carbon emissions measures.

Merino producers who did conduct emission reduction activities often selected more than one measure. Almost two thirds of Merino producers (63%) used carbon storage methods, but pasture management was also a popular technique (60%).

Over one third (39%) of Merino producers report no issues with general labour availability, and slightly fewer (35%) report no issues with shearer availability. Over one third of Merino producers however report a more major availability issue with general labour (40%) or shearers (42%).

Merino producers are at different stages in the succession planning process with 25% nationally having a formal succession plan in place but 23% not having commenced the planning process yet.

Nationally, around four fifths of Merino producers (85%) report that they have completed chemical safety training. Around three quarters of Merino producers (78%) 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 Merino producers take is to encourage workers to identify safety concerns (82%).

## **Benefits to industry**

The benefits to industry of this research are that it has demonstrated that Merino 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 AWI in investment and planning to continue to improve the sustainability of Merino 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. Expand the profile of MLA's Member database
4. Compare the results from this survey with results from previous surveys and other sources of similar data.



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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's 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's 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 Merino 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, AWI and others have sort to construct a robust and integrated tracking system to measure key metrics and trends over time.

More specifically, the 2021 AWI Merino Husbandry Practices Survey allows industry to track changes in Merino producers' animal husbandry practices over time. When compared to the results from similar previous surveys, including the 2017 AWI Merino Husbandry Practices Survey, this ensures industry can measure changes in progress in adoption of animal husbandry and on-farm practices and identify opportunities for investment in industry research, development and extension initiatives to drive continuous improvement.

## 2. Project objectives

The primary objective of Project Proof 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.

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 previous surveys conducted by 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), 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 AWI and 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 1,203 Merino producers was interviewed for this study, as part of the larger overall sample of 2,003 that covered both Merino producers (n = 1,203) and non-Merino producers (n = 800). The Merino sample was designed to achieve national results with a margin of error of +/- 2.7% with a 95% confidence level. The Merino sample size was also consistent with AWI's 2017 Merino Animal Husbandry Practices Survey.

The total sample of 2,003 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 5** 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 in the Merino sample 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 6** 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.

In the 2017 AWI Merino Husbandry Practices Survey, an external commercial database of sheep producers was used to contact Merino producers whereas MLA’s member database was used for the current survey. Although both databases would share many of the same Merino producers, the different sources should be considered when comparing results between the surveys.

### **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 to achieve a total sample of 2,000 including 1,200 Merino producers and 800 non-Merino producers.

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 1,203 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 Merino sample by methodology is shown in **Table 1**.

**Table 1: Sample methodology**

<b>Methodology</b>	<b>Merino</b>
<b>Online</b>	<b>505</b>
Unique link	449
Generic link	56
<b>CATI</b>	<b>698</b>
<b>Total</b>	<b>1,203</b>

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 7** in the Appendix.

In the 2017 AWI Merino Husbandry Practices Survey, all data was collected via CATI whereas in the current survey, a mixed Online / CATI methodology was employed. The different methodologies should be considered when comparing results between the two surveys.



### 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 8** in the Appendix. The main statistically significant differences in results between states and flock size are also highlighted throughout this report.

## 4. Sheep results and discussion

### 4.1. Background to the analysis

This section presents the results and discussion summarising the current practices of Australian Merino producers. Results are presented at the national and state level with differences between flock sizes highlighted where relevant.

### 4.2. Producer demographics

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

The sample represents Merino producers from New South Wales (34%), Victoria (22%), Queensland (4%), South Australia (21%), Western Australia (17%), and Tasmania (2%) (**Figure 1**).

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

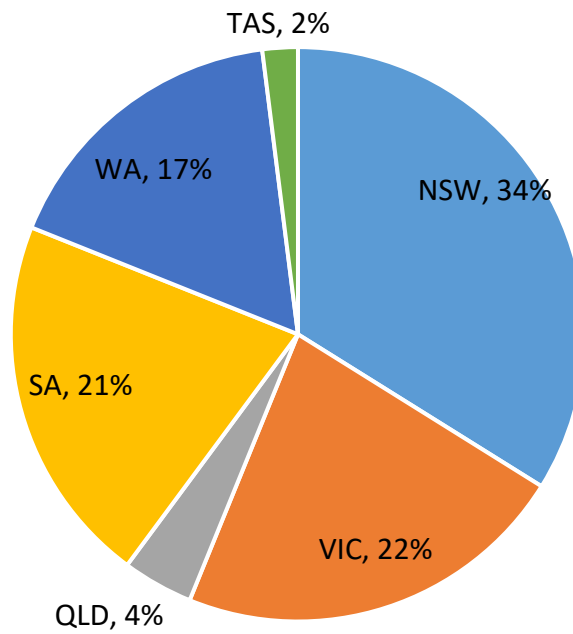
A quarter (26%) of Merino producers interviewed are tertiary educated (**Figure 6**).

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

The majority (82%) of Merino producers identified as male. Almost one fifth (18%) identified themselves as female. Less than one percent (here rounded to 0%) preferred an unspecified alternative gender (**Figure 8**).

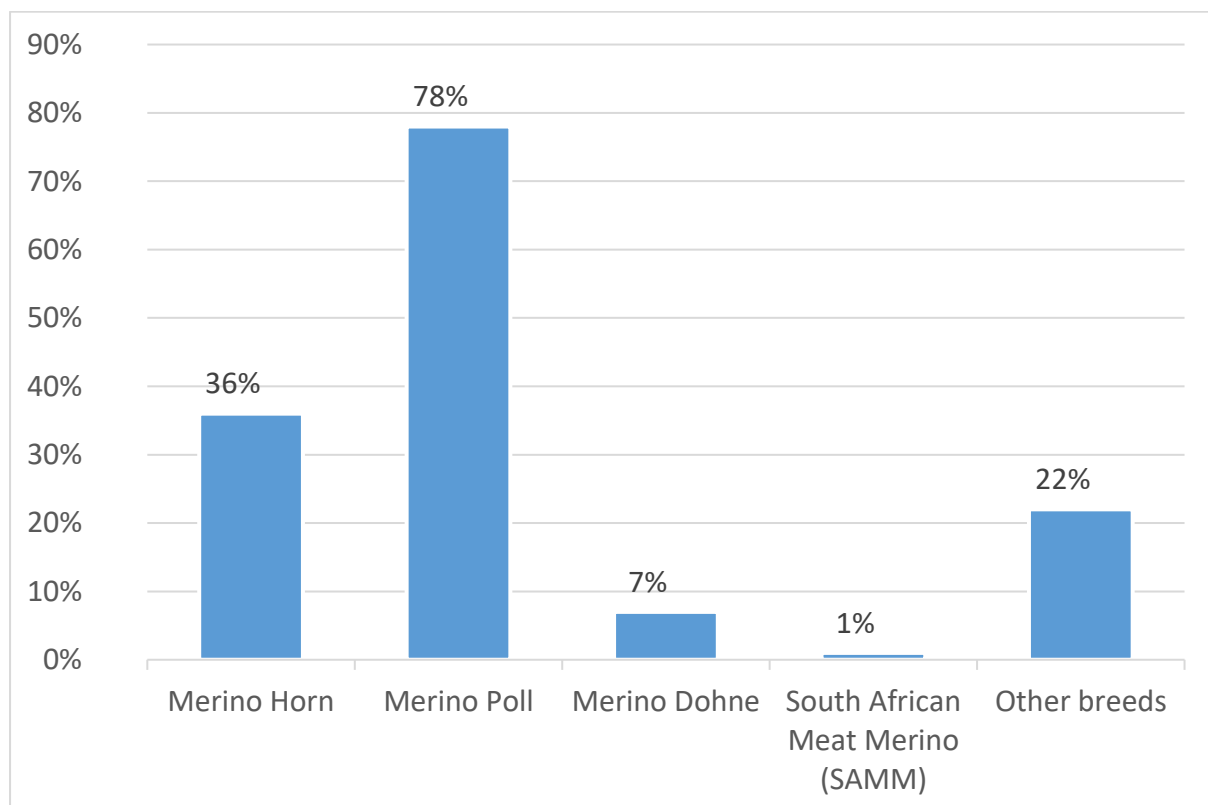
**Figure 1: Respondent demographic by state**

Base: All Merino producers n = 1,203



**Figure 2: Respondent demographics by sheep breed**

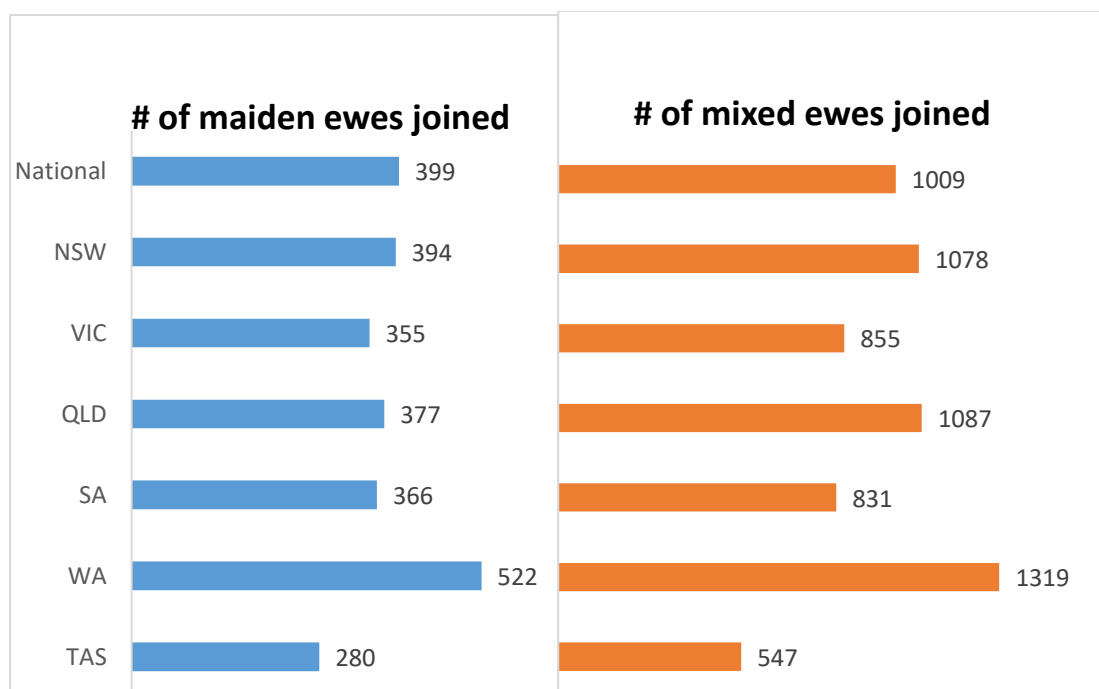
Base: All Merino producers n = 1,203



*N.B. Respondents can select multiple breeds of sheep*

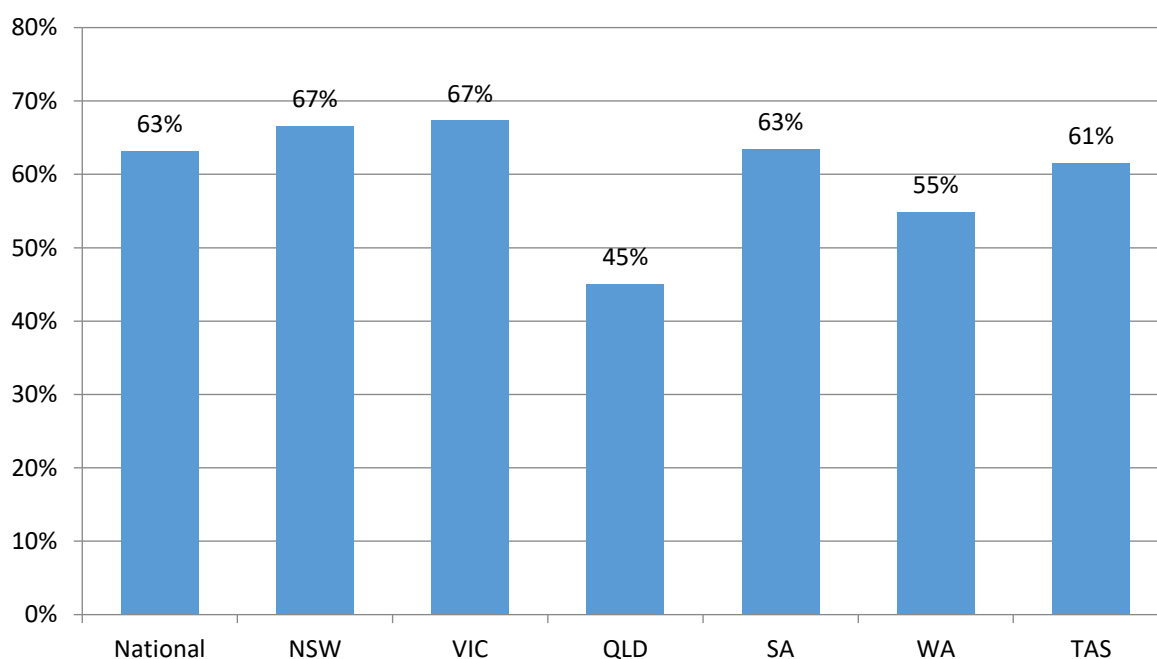
**Figure 3: Number of maiden ewes and mixed ewes joined**

Base: All Merino producers n = 1,203



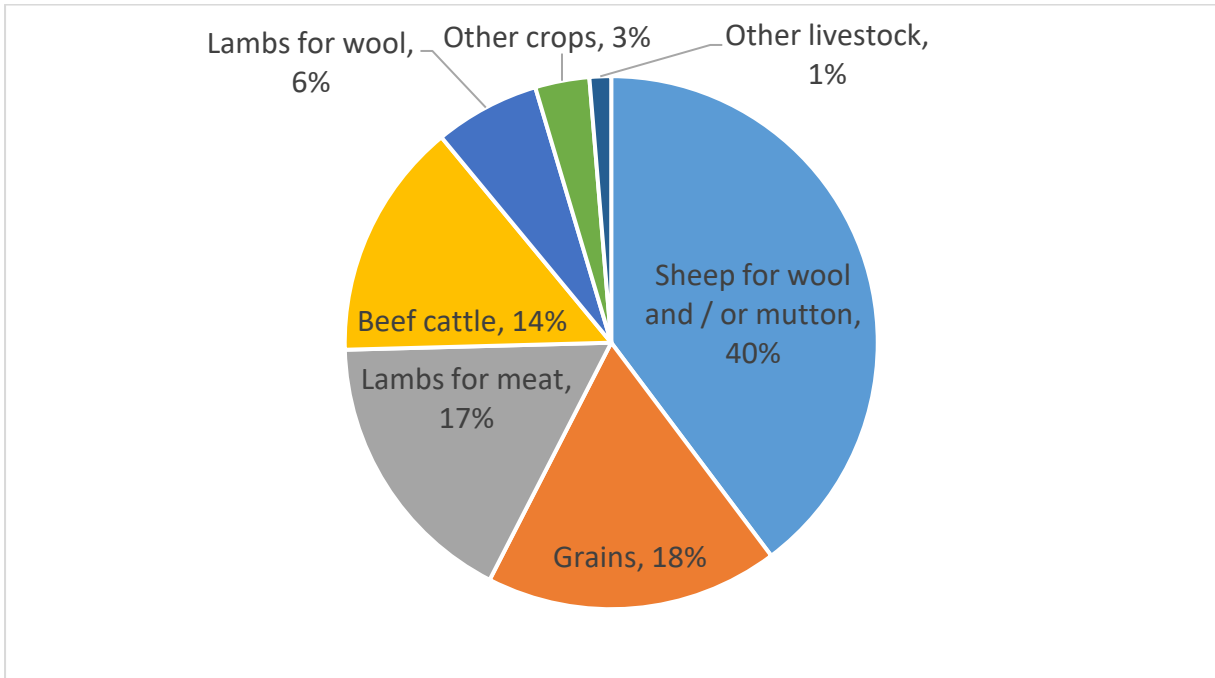
**Figure 4: Percentage of gross farm income from sheep by state**

Base: All Merino producers n = 1,203



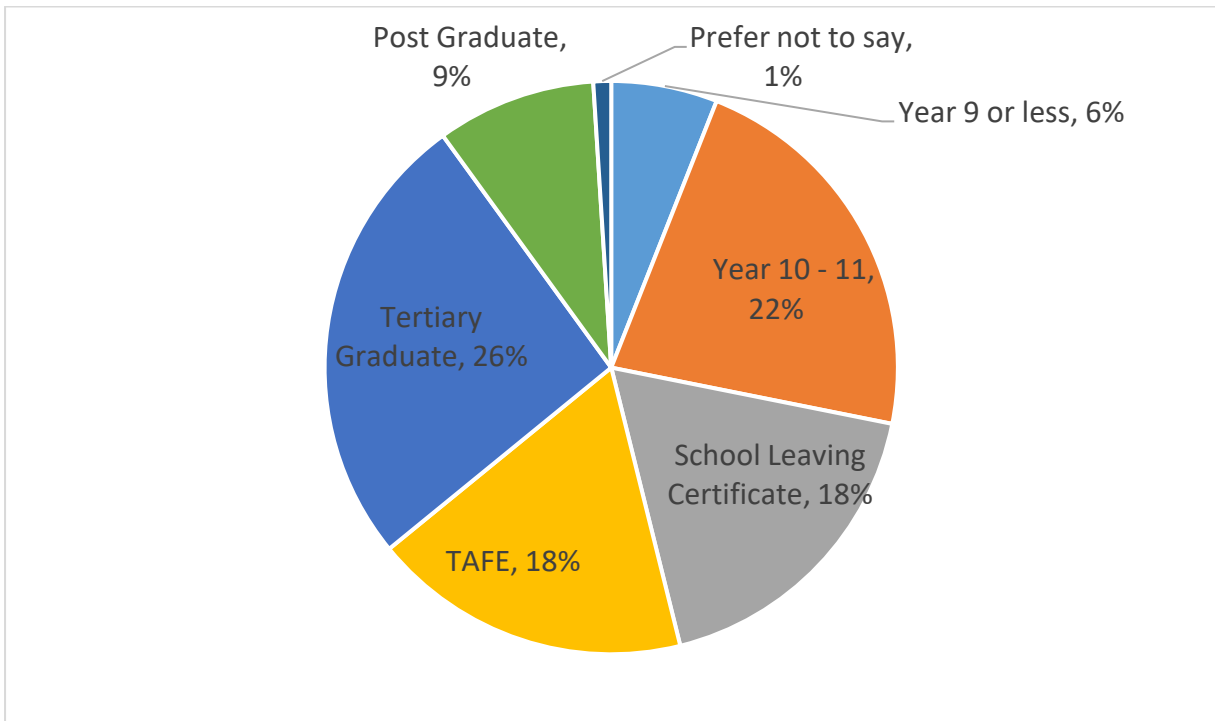
**Figure 5: Percentage of gross farm income nationally**

Base: All Merino producers n = 1,203



**Figure 6: Respondent demographic by education**

Base: All Merino producers n = 1,203



**Figure 7: Respondent demographic by age**

Base: All Merino producers n = 1,203

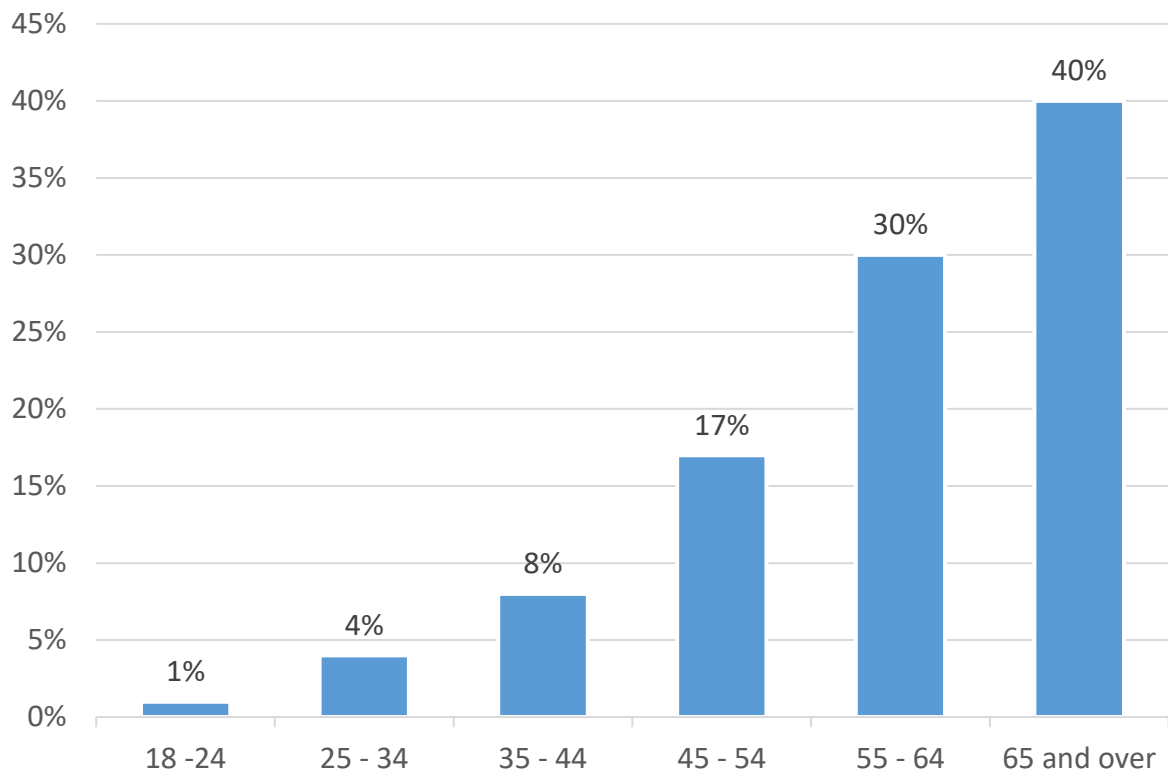
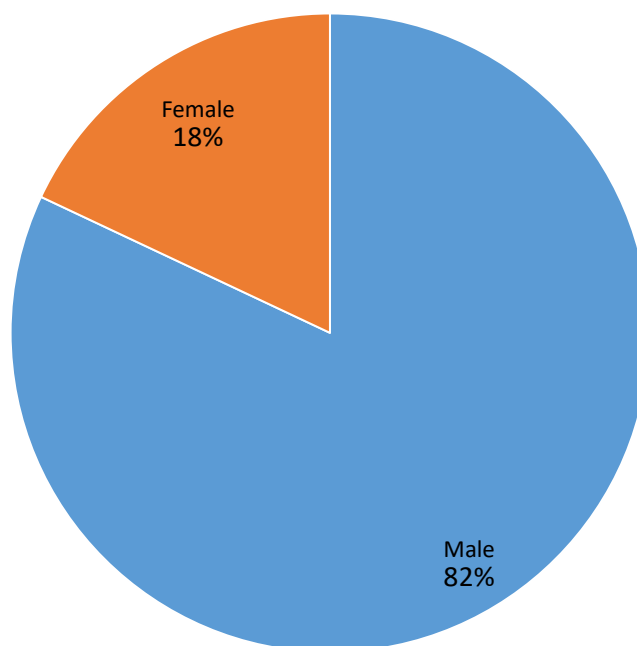


Figure 8: Respondent demographics by gender

Base: All Merino producers n = 1,203



### 4.3. Flock demographics

Nationally, one third of Merino producers (29%) ran between 100 and 499 sheep while 11% ran 500 - 999 sheep, and 24% between 1,000 – 1,999 sheep. 8% of Merino producers ran between 2,000 – 2,999 sheep, and 28% ran 3,000 or more sheep (**Figure 9**).

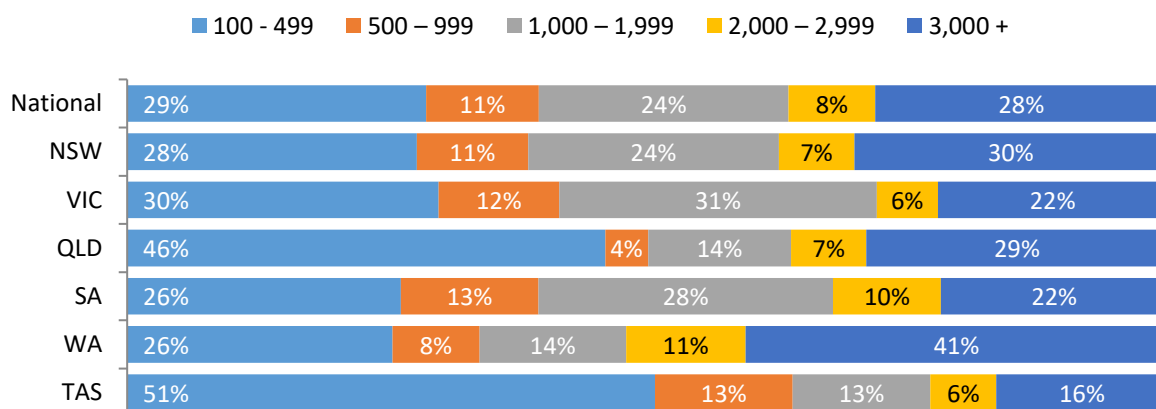
At the national level, 76% of Merino producers use polled sires, with horned sheep making up 22% of the sire percentage (**Figure 10**).

Almost one quarter of Merino producers nationally (24%) report an average adult Merino ewe micron of 19 (**Figure 11**). Only 3% of Merino producers report a micron of 22 or higher, with 2% reporting 15 micron or less.

Nationally, slightly over half of Merino producers state that their mixed age ewes have low body wrinkle (54%), with 44% saying that their flocks have on average a medium body wrinkle and 3% saying their flocks have a high body wrinkle (**Figure 12**).

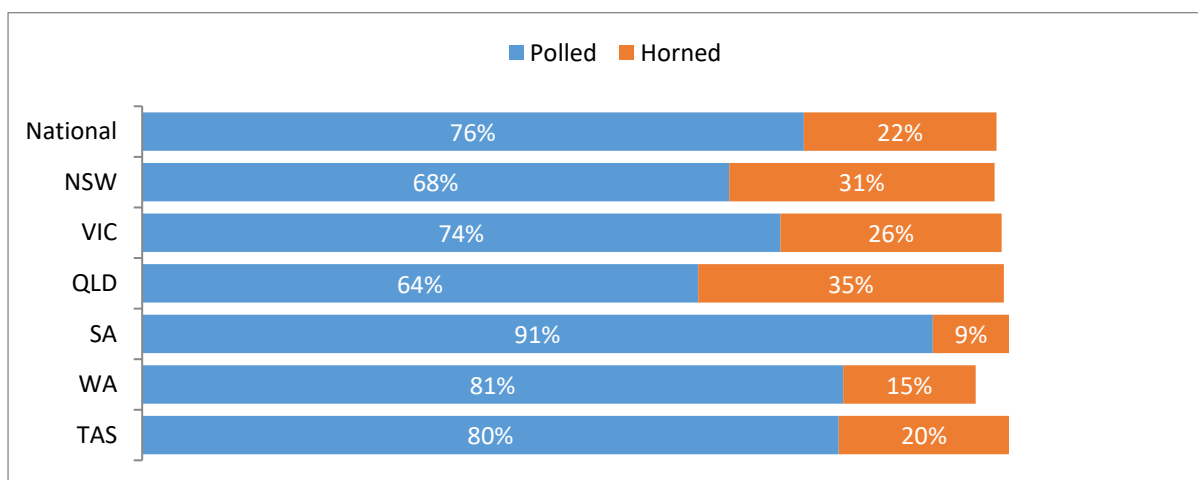
**Figure 9: Respondent demographic by total flock size**

Base: All Merino producers n = 1,203



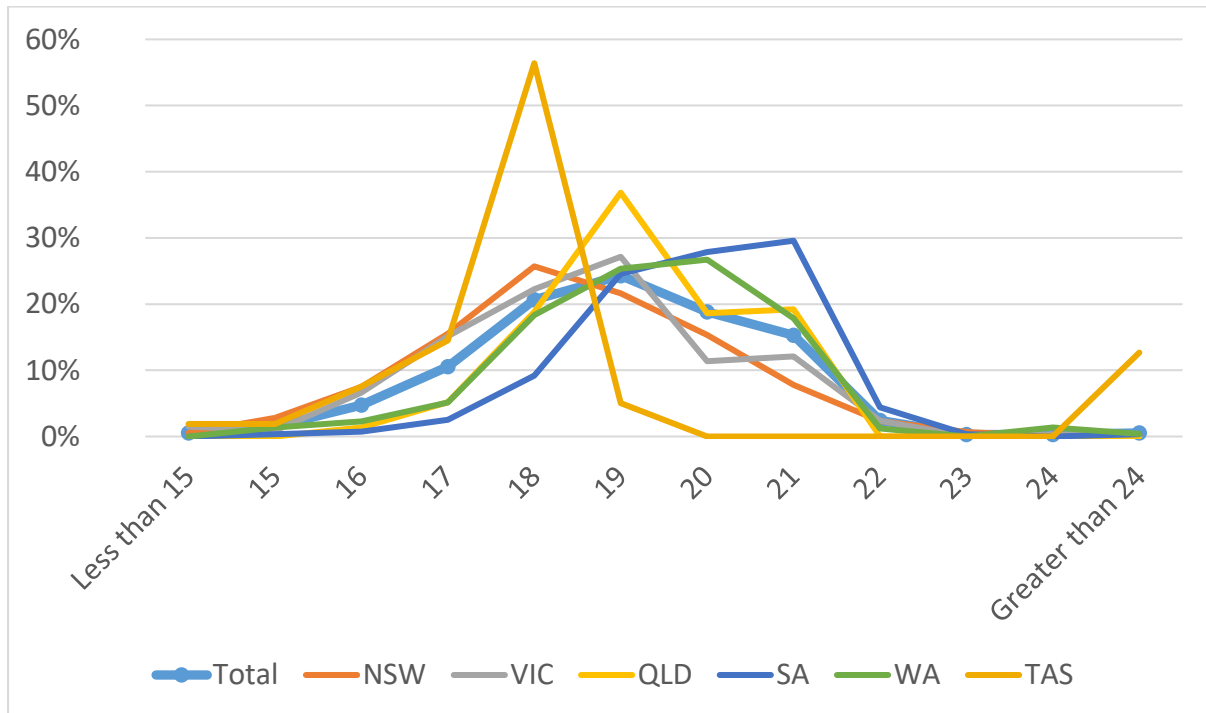
**Figure 10: Polled or horned sire percentage**

Base: All Merino producers n = 1,203



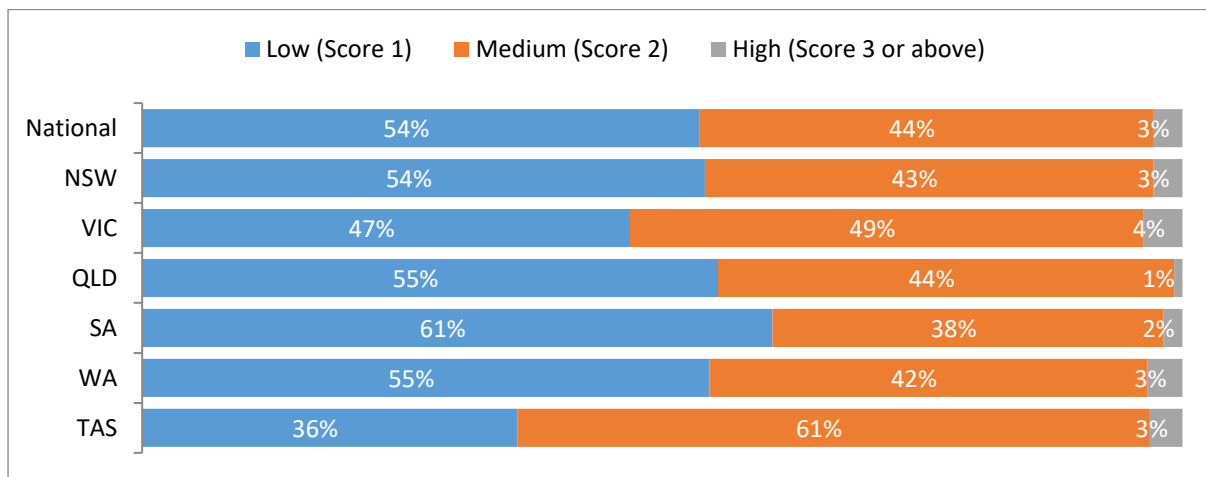
**Figure 11: Average adult merino ewe micron**

Base: n = 1,203



**Figure 12: Average mixed age ewe body wrinkle**

Base: n = 1,203





### 4.4. Joining and scanning

Nationally, Merino producers join their ewes to rams for an average of 8.9 weeks with almost one quarter (24%) joining ewes to rams for eight weeks or longer (**Figure 13**). New South Wales Merino producers were significantly more likely to join for between five and six weeks (40%), while South Australians are more likely to join for 8+ weeks (24%).

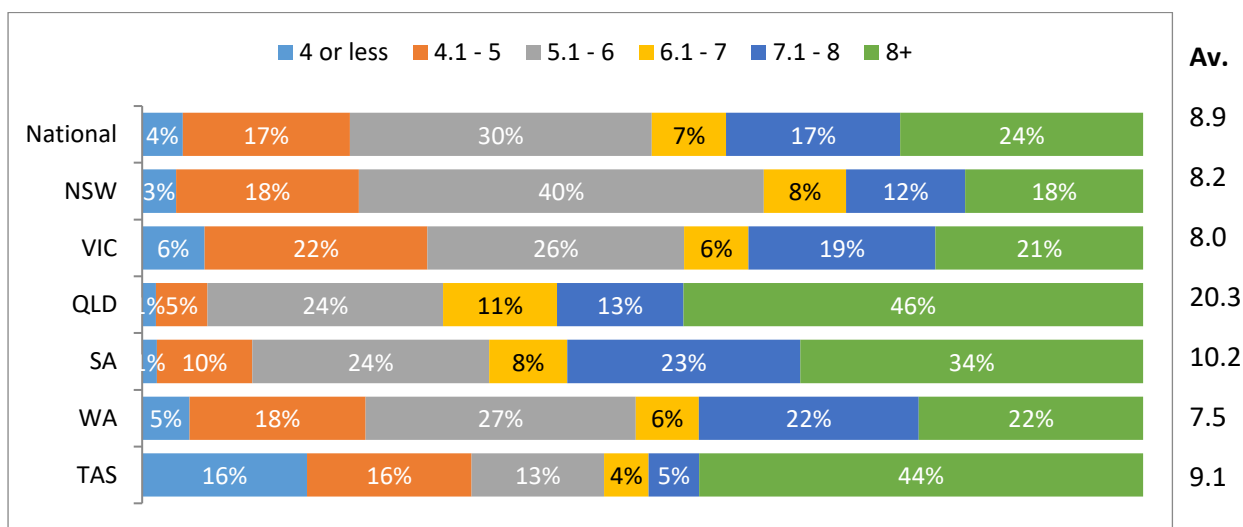
Merino producers were divided about pregnancy scanning, with 56% of Merino producers nationally stating they do not conduct pregnancy scanning (**Figure 14**). Merino producers in Victoria were significantly more likely than Merino producers in other states to pregnancy scan (52%). Queensland Merino producers were significantly less likely to scan (23%). Over 2 in 3 Merino producers (67%) scanned for dry, single and multiple fetuses. One third (33%) wanted to know if the ewe was simply wet or dry. (**Figure 15**).

Nationally, Merino producers scanned on average 68 days after rams in. (**Figure 16**).

Around one third of Merino producers manage twin lambs separately (30%) (**Figure 17**). Queensland and Tasmanian Merino producers were significantly less likely than other states to manage twins separately (12% and 10%, respectively). Victorian Merino producers were significantly more likely to manage twines separately (39%).

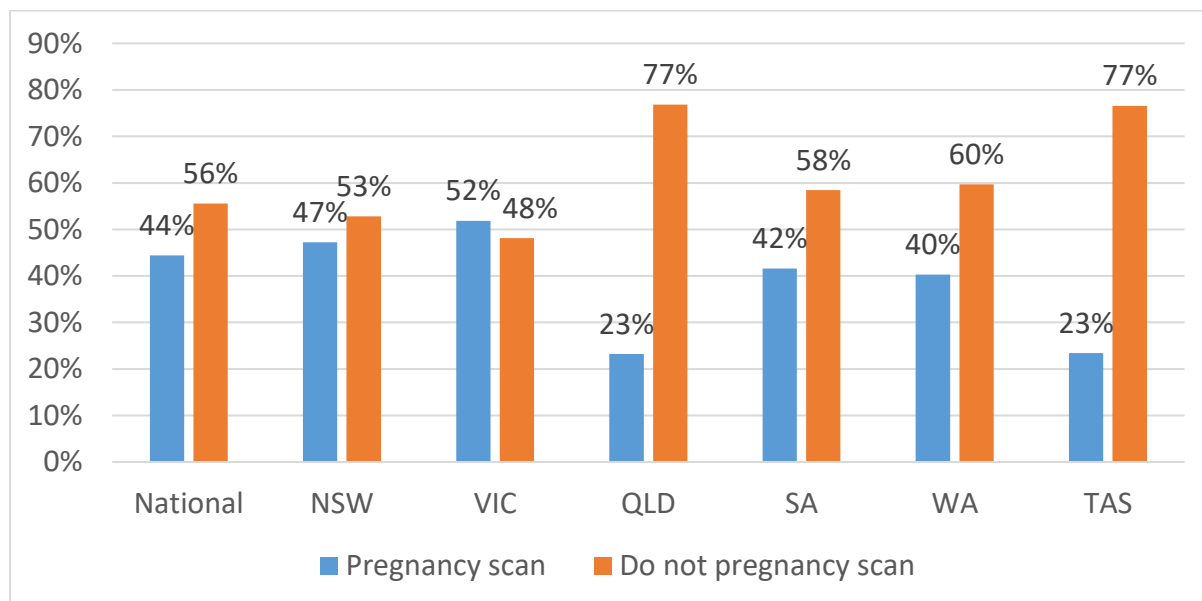
**Figure 13: Joining period in weeks**

Base: All Merino producers n = 1,203



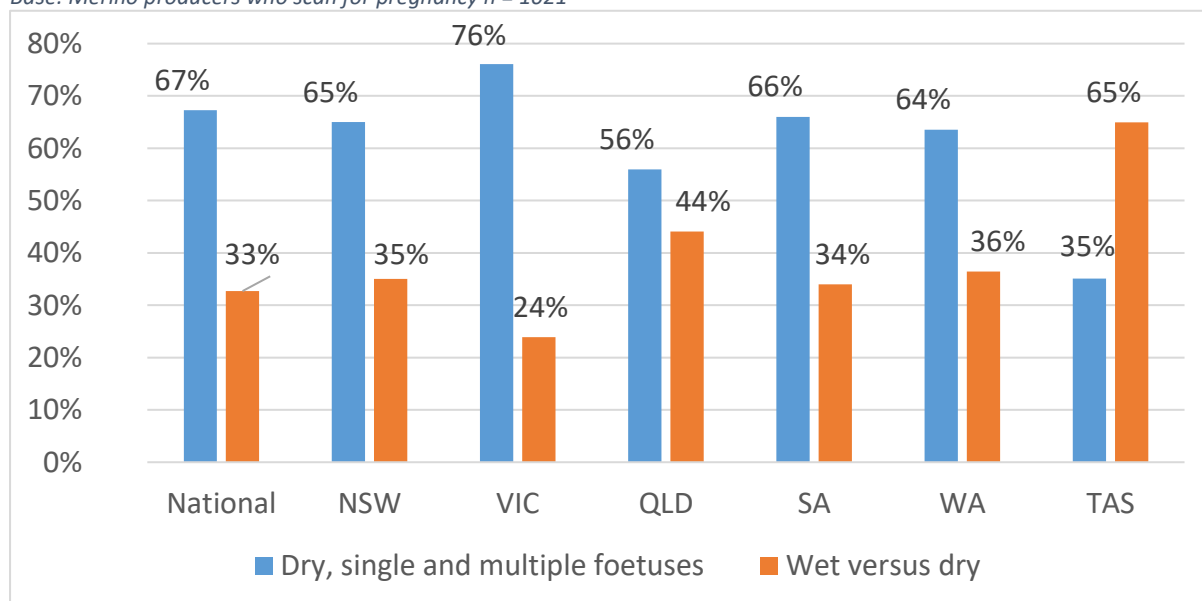
**Figure 14: Pregnancy scanning of ewes**

Base: n = 1,203



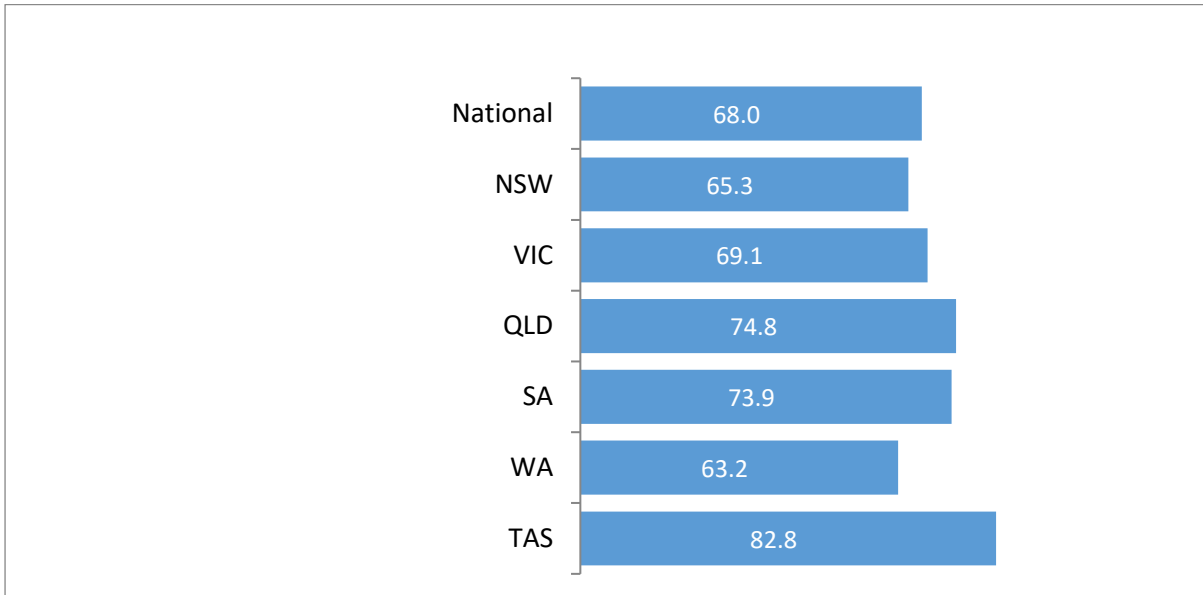
**Figure 15: Scanning for dry, single and multiple foetuses**

Base: Merino producers who scan for pregnancy n = 1021



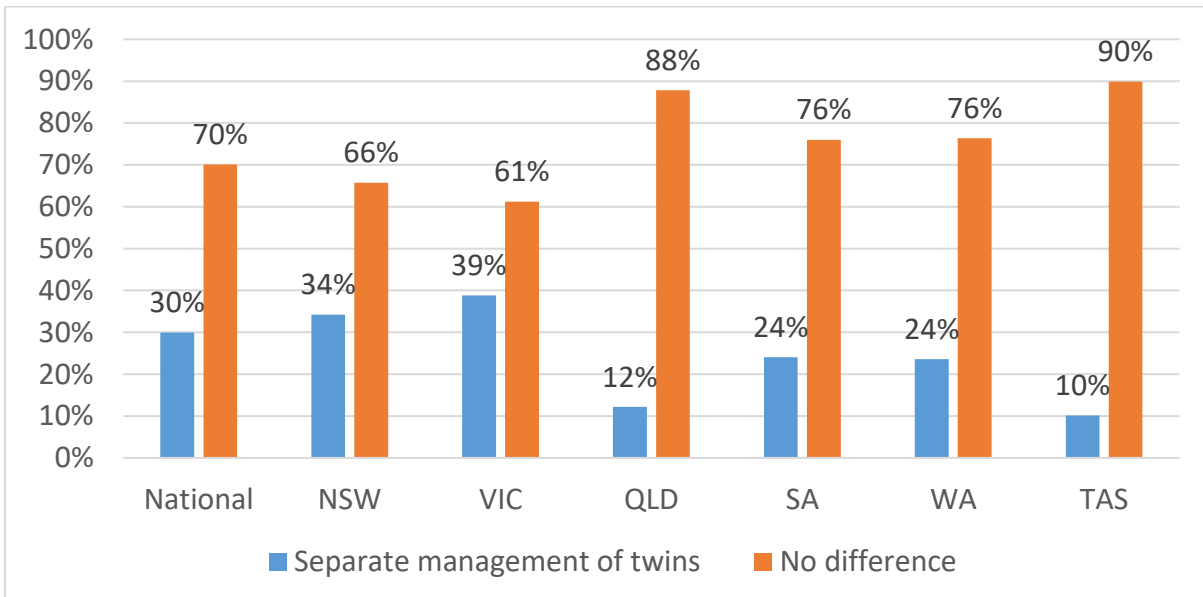
**Figure 16: Number of Days after Rams in when Scans are Performed**

Base: Merino producers who pregnancy scan n = 612



**Figure 17: Separate management of twin lambs**

Base: n = 1,203



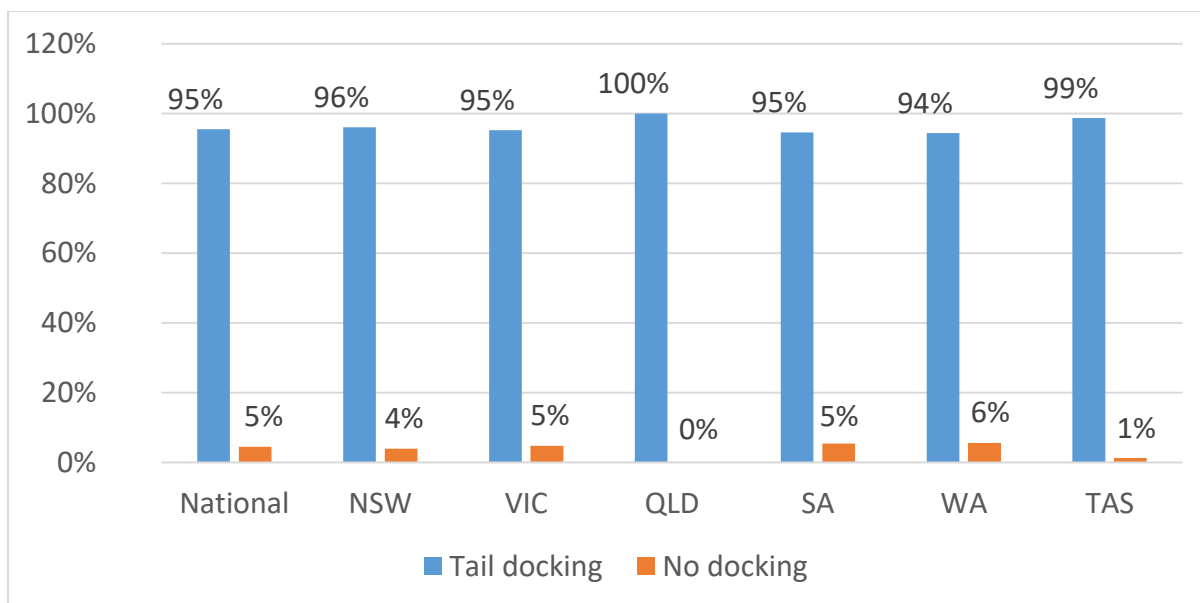
## 4.5. Tail docking

### 4.5.1. Overview

At the National level, 95% of Merino producers tail dock their ewes (**Figure 18:** ). Similarly, 97% of Merino producers tail dock their male lambs (**Figure 19**).

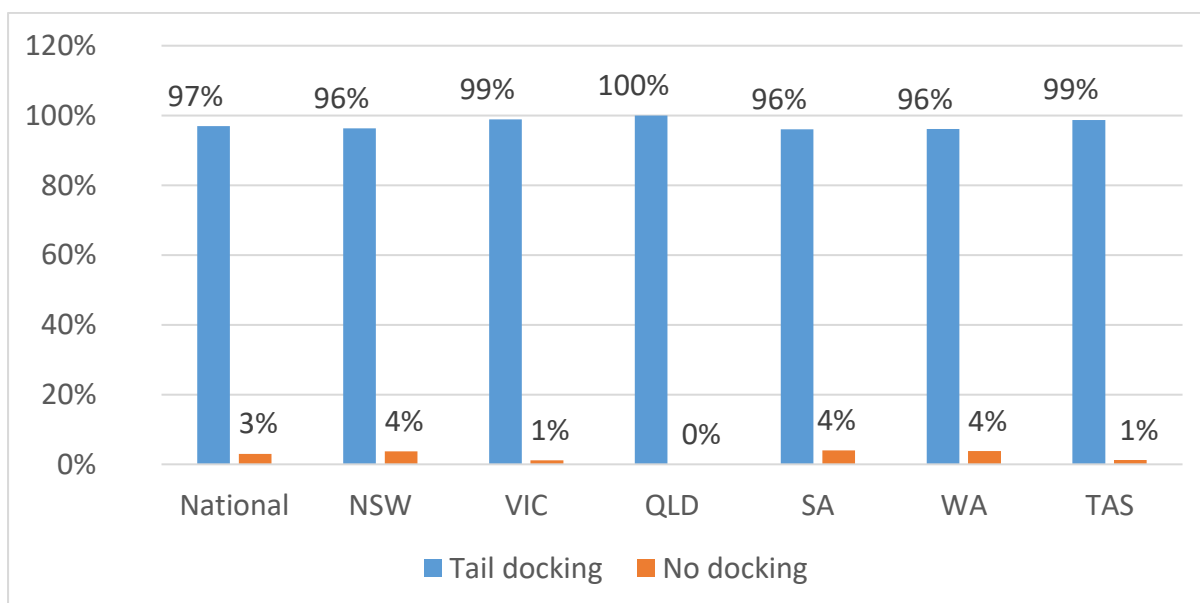
**Figure 18: Tail docking of ewes**

Base: All Merino producers n = 1,203



**Figure 19: Tail docking of male lambs**

Base: All Merino producers n = 1,203



#### 4.5.2. Docking methods

Hot knife was the most common technique (58%) used for tail docking of ewe lambs followed by rings (36%) (**Figure 20**). There was a significant state effect for tail docking method. Rubber rings were significantly more commonly used in New South Wales (44%) and Tasmania (71%). South Australians were significantly more likely to use hot knife (78%) and Queenslanders were significantly more likely to use cold knife (14%) and shears (6%).

As with ewe lambs, when tail docking male lambs, hot knife was the most common technique (58%) followed by rings (35%) (**Figure 21**). There was a significant state effect for tail docking method. Rubber rings were significantly more commonly used in New South Wales (45%) and Tasmania (71%). Cold knife was significantly more common in Queensland (14%). Hot knife was more common in South Australia (77%) and Western Australia (68%). Queensland Merino producers were also more likely to use shears (15%).

The most common reasons cited for using rings to tail dock ewe lambs was that it is easy (45%), bloodless (34%) and clean or neat (31%) (**Figure 22**). Queensland Merino producers were significantly less likely to cite rings as a reliable (1%) method less prone to flystrike (1%). Victorian Merino producers were significantly more likely to nominate alternative reasons (30%).

The most common reasons cited for using rings to tail dock male lambs was that it is easy (37%), bloodless (32%) and clean and neat (31%) (**Figure 23**).

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 (63%) (**Figure 24**).

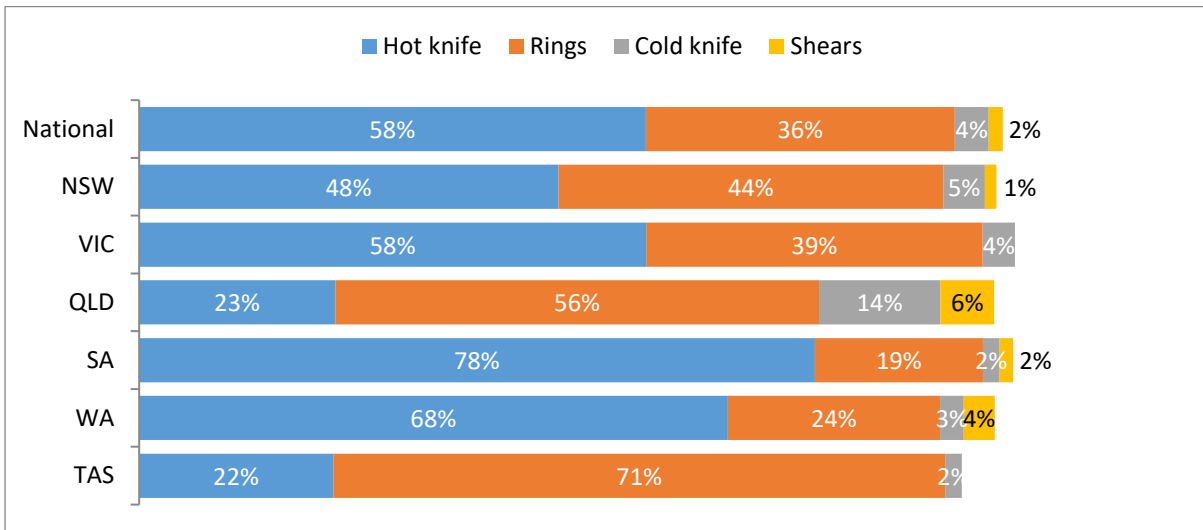
Nationally, the most common reasons cited for using a hot knife to tail dock male lambs were that it is bloodless or seals the wound (61%) and less stressful (38%) (**Figure 25**). Victorian Merino producers were less likely than other states to say that hot knife was bloodless (47%).

At the national level, the most common reasons cited for using a cold knife to dock ewe lambs was that it is effective (33%), efficient (32%) and quick (31%) (**Figure 26**). There was no significant difference in reasons for using cold knife between states. Reasons given for using the cold knife on male lambs were that it is effective (36%) and efficient (32%) (**Figure 27**).

Less fly strike (31%) and contractor preference (28%) are the main reasons for using shears for tail docking ewe lambs (**Figure 28**). The most common reasons cited for using shears to tail dock male lambs were that they were a better method (35%), that it is clean and neat (32%) and the contractor preferred method (31%) (**Figure 29**).

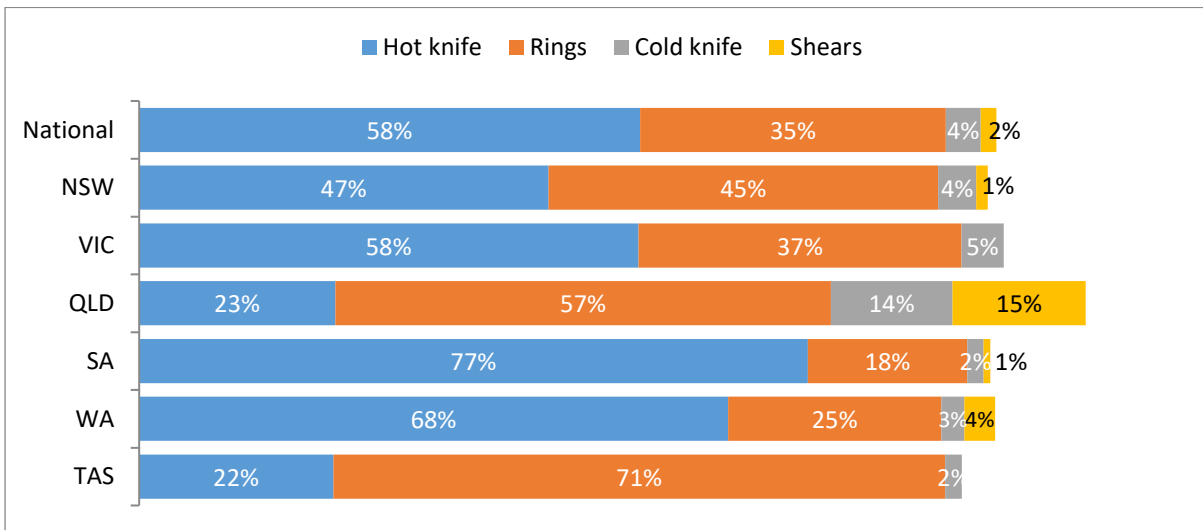
**Figure 20: Method for tail docking ewes**

Base: Merino producers who tail dock ewes n = 1,156



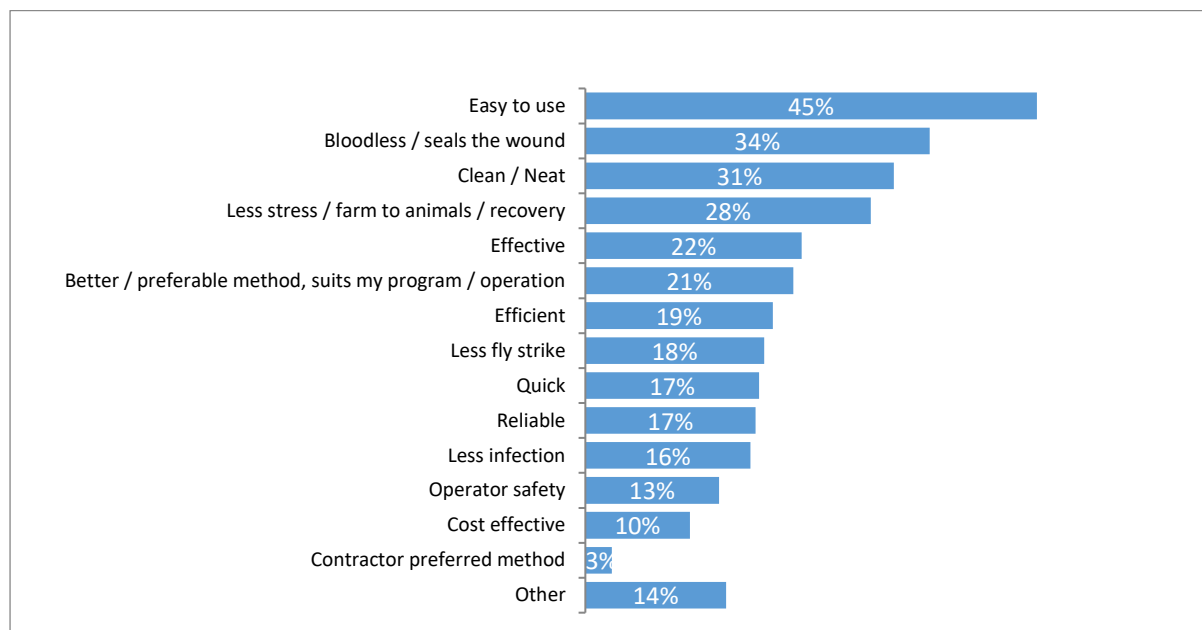
**Figure 21: Method for tail docking male lambs**

Base: Merino producers who tail dock male lambs n = 1,174



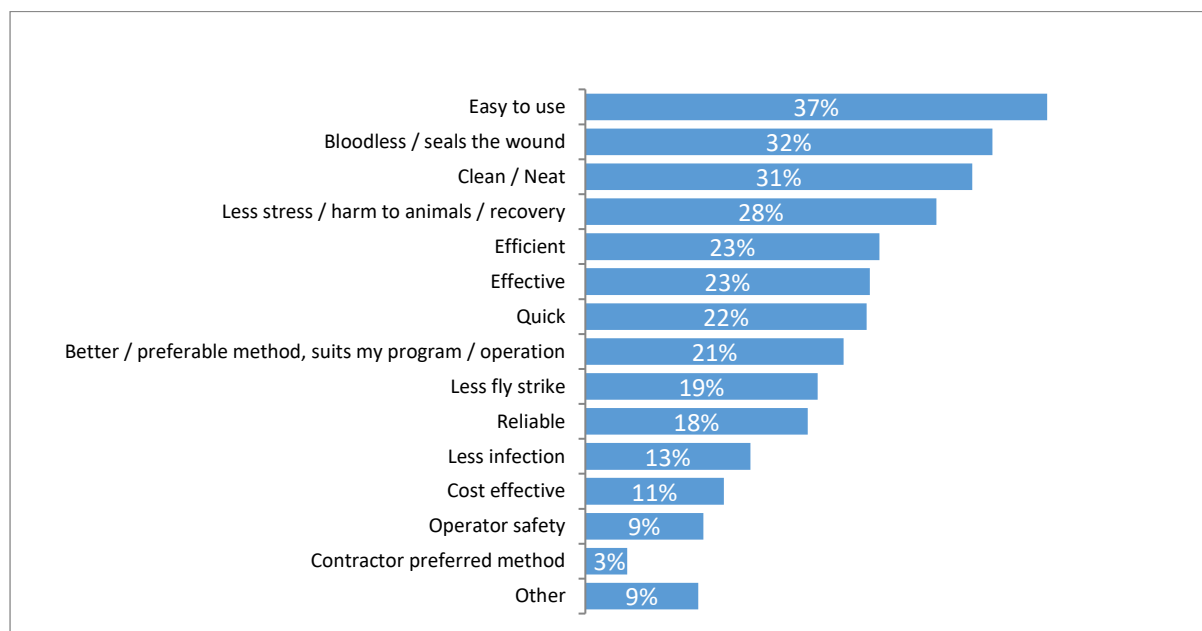
**Figure 22: Reason for using rings to tail dock ewes**

Base: Merino producers who tail dock ewes using rings n = 324



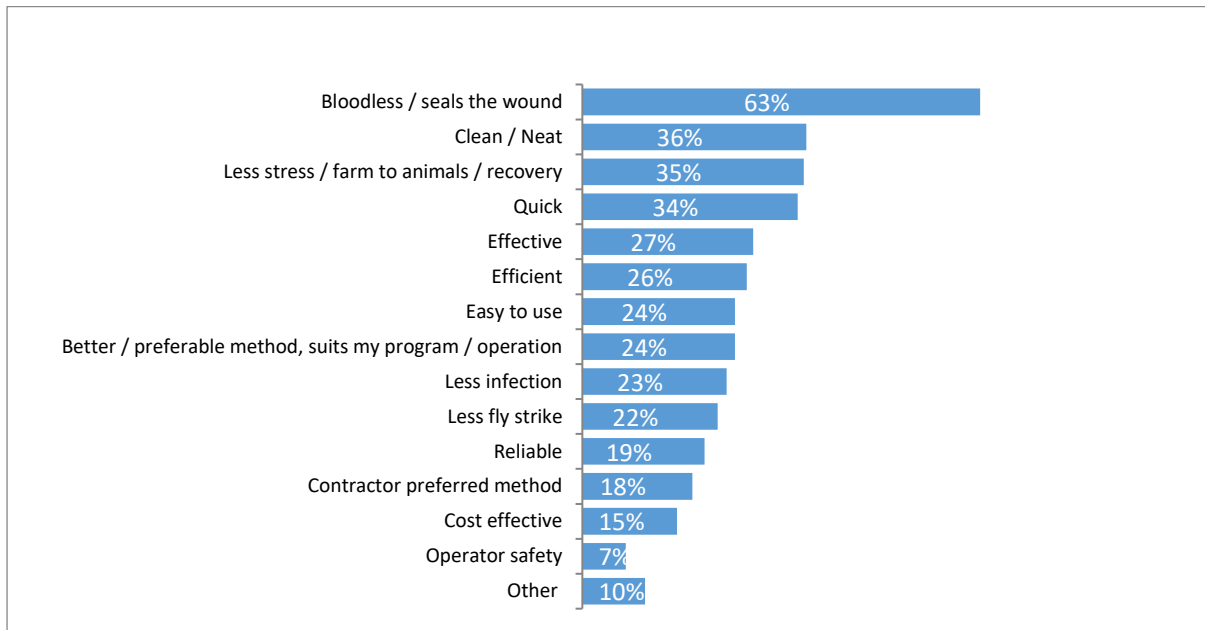
**Figure 23: Reason for using rings to tail dock male lambs**

Base: Merino producers who tail dock male lambs using rings n = 338



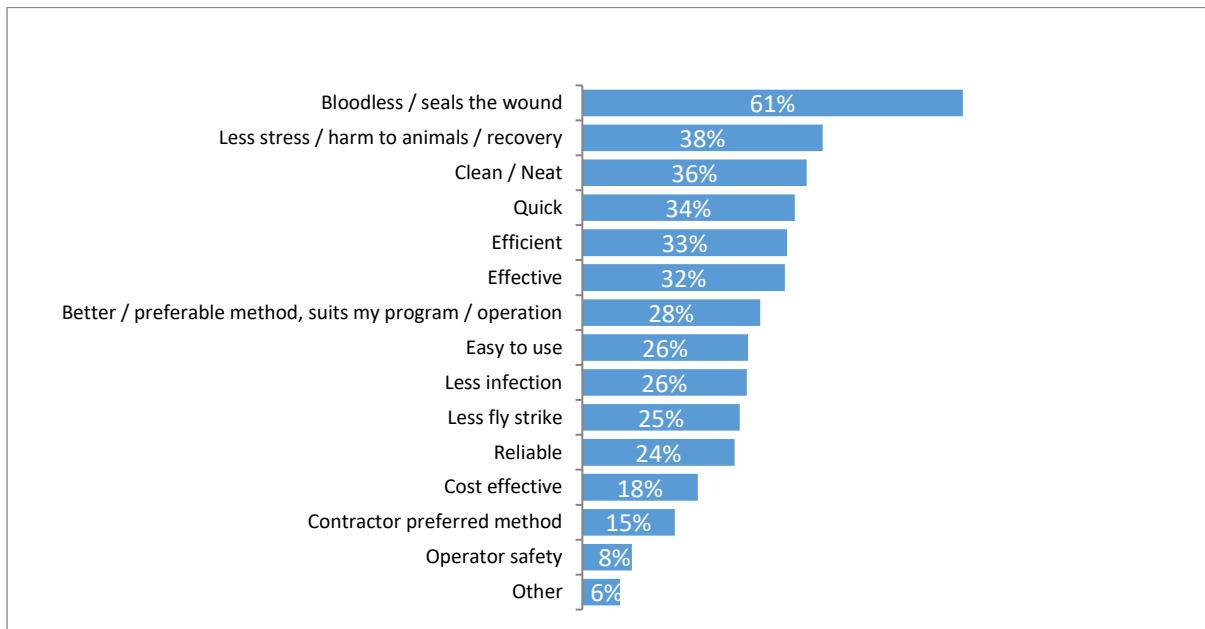
**Figure 24: Reasons for using hot knife on ewe lambs**

Base: Merino producers who tail dock ewes using hot knives n = 745



**Figure 25: Reason for using hot knife to tail dock male lambs**

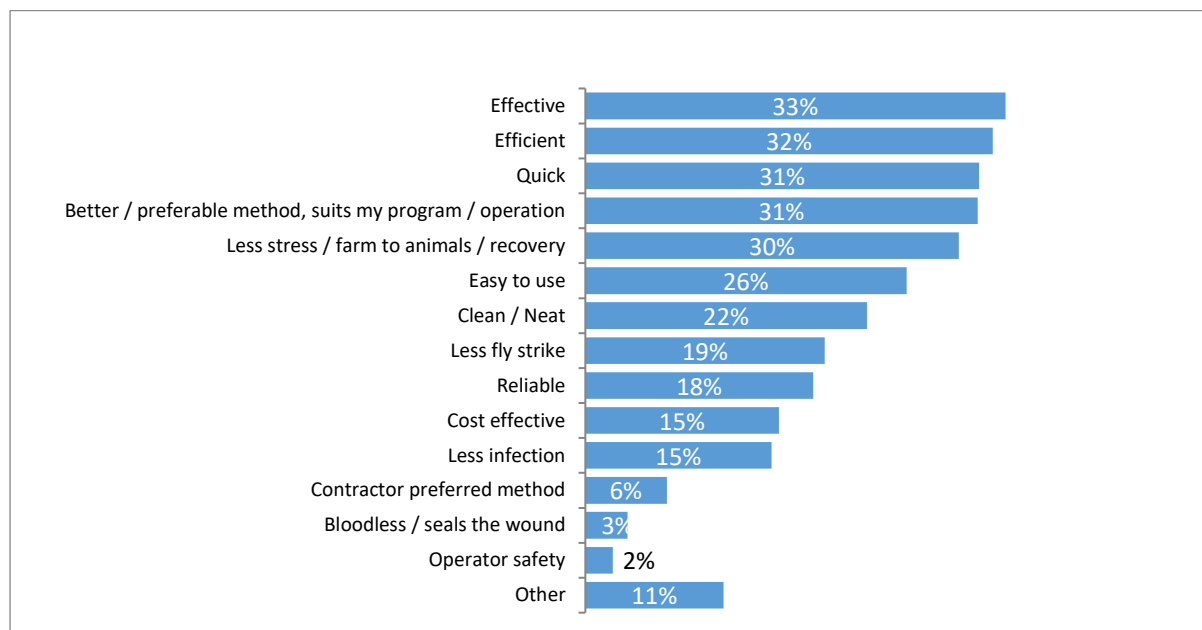
Base: Merino producers who tail dock male lambs using hot knives n = 745





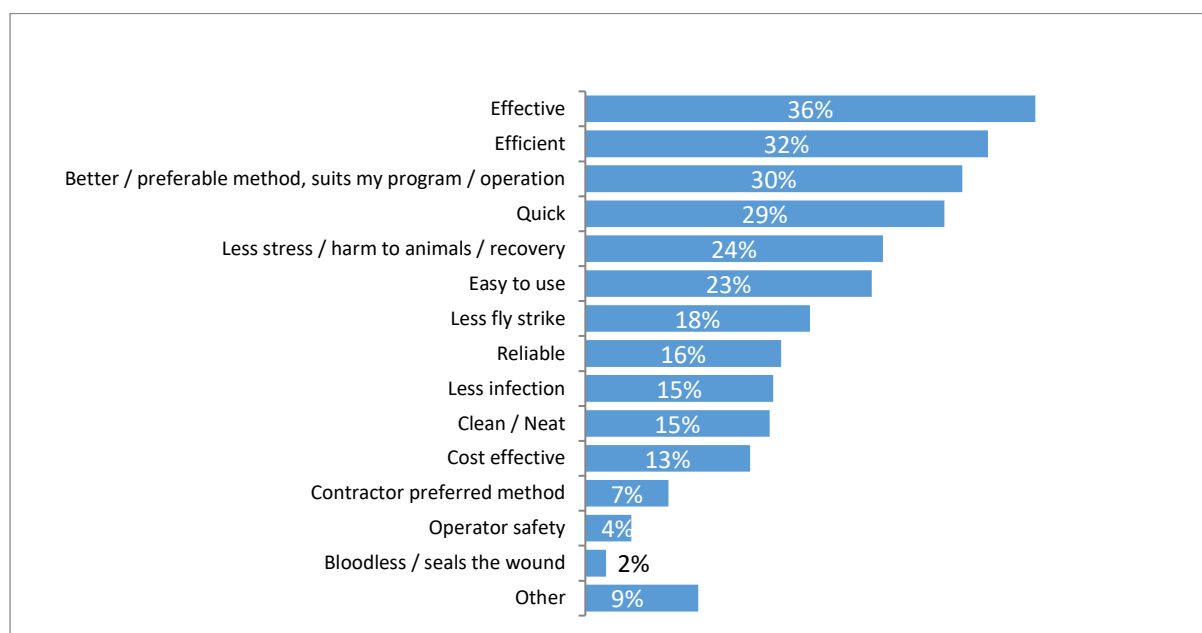
**Figure 26: Reasons for using cold knife to tail dock ewe lambs**

Base: Merino producers who tail dock ewes using cold knife n = 56



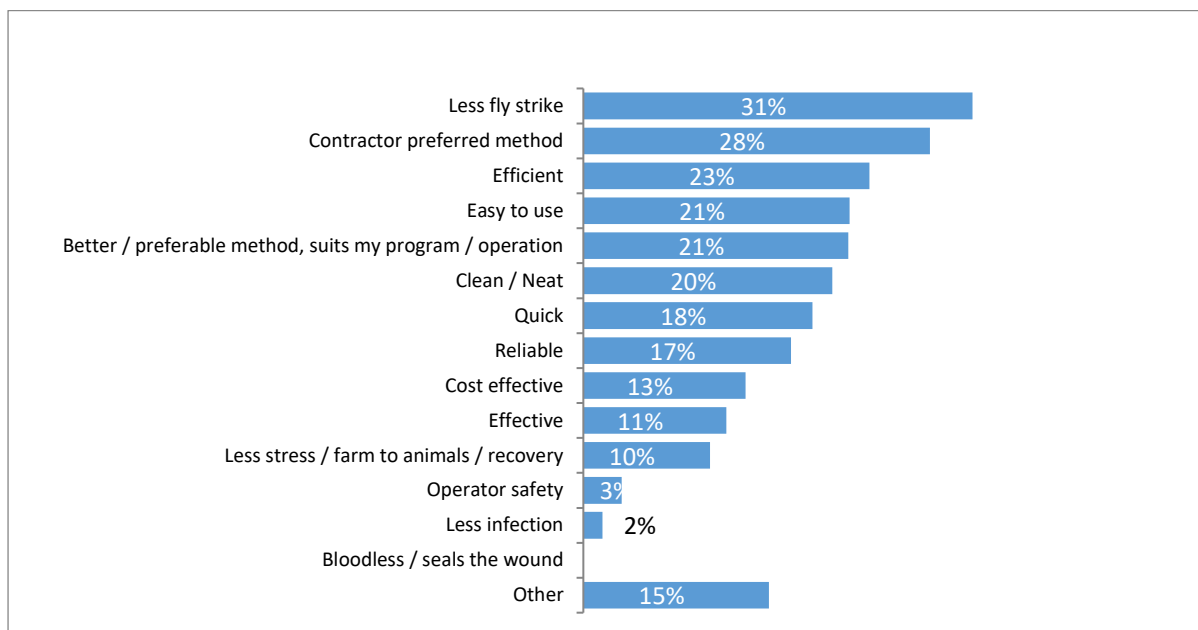
**Figure 27: Reasons for using cold knife to tail dock male lambs**

Base: Merino producers who tail dock male lambs using cold knives n = 55



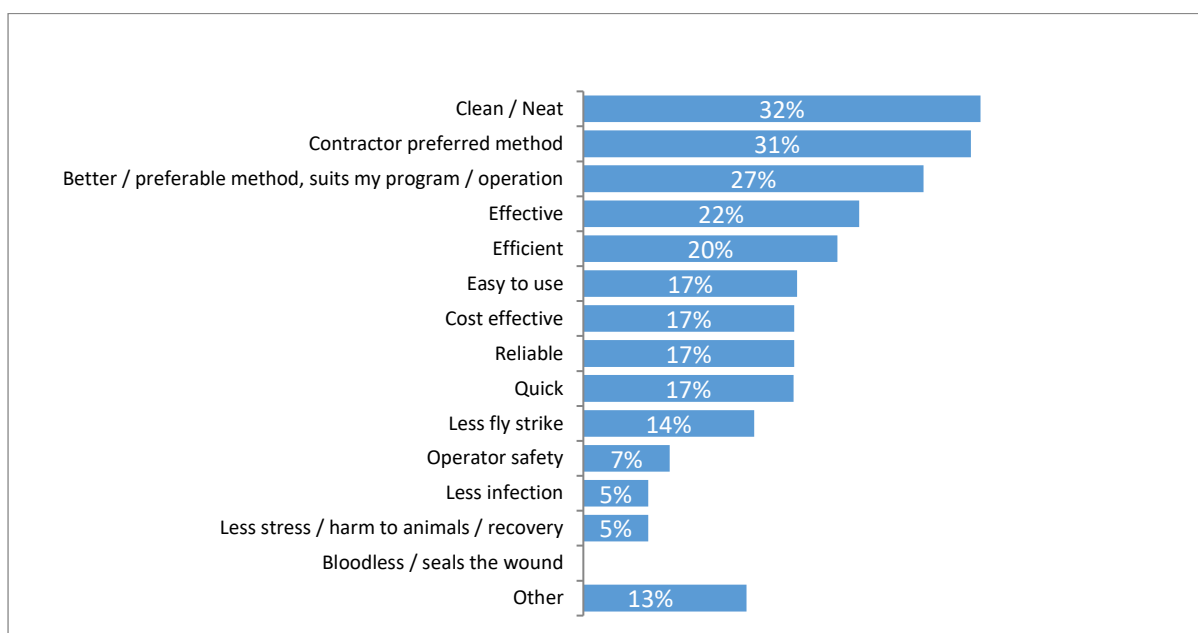
**Figure 28: Reasons for using shears to tail dock ewe lambs**

Base: Merino producers who tail dock ewes using shears n = 24



**Figure 29: Reasons for using shears to tail dock male lambs**

Base: Merino producers who tail dock male lambs using shears n = 23



### 4.5.3. Tail length

Nationally, more than half of Merino producers who tail dock ewe lambs, dock tails to two joints (51%) (**Figure 30**). Three joints is the next most common choice at 37%. This is largely consistent across states, although South Australian Merino producers were significantly more likely to dock at two joints (66%) and Western Australians were significantly less likely to dock at two joints (35%).

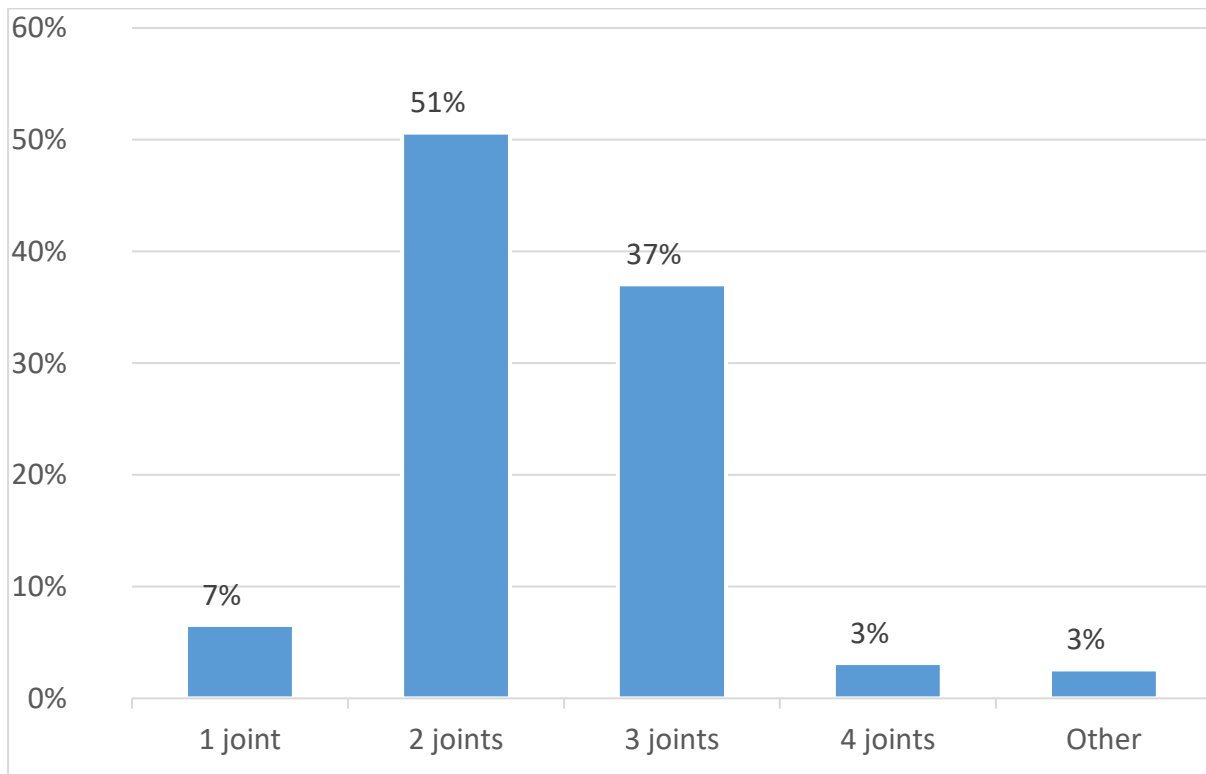
Nationally, more than half of Merino producers who tail dock male lambs dock them to two joints (55%). Three joints is the next most common choice at 32%. (**Figure 31**).

The most common reasons cited for choosing a particular tail length when docking ewe lambs were to protect the genital area (51%) and to provide sun protection (48%) (**Figure 32**). Queensland Merino producers were significantly less likely to cite specific health concerns (2%) and Tasmanians were significantly more likely to state they preferred a longer tail (27%).

When docking male lambs, Merino producers selected a particular tail length to allow tail movement (37%) and to provide sun protection (35%) (**Figure 33**). Queensland Merino producers were significantly less likely to cite specific health reasons (2%). South Australians were more likely to cite satisfactory length (30%) and less likely to give an alternative reason (1%). Tasmanian Merino producers were more likely to prefer a longer tail (26%) and less likely to cite sun protection (12%) and that it suits the operation (3%).

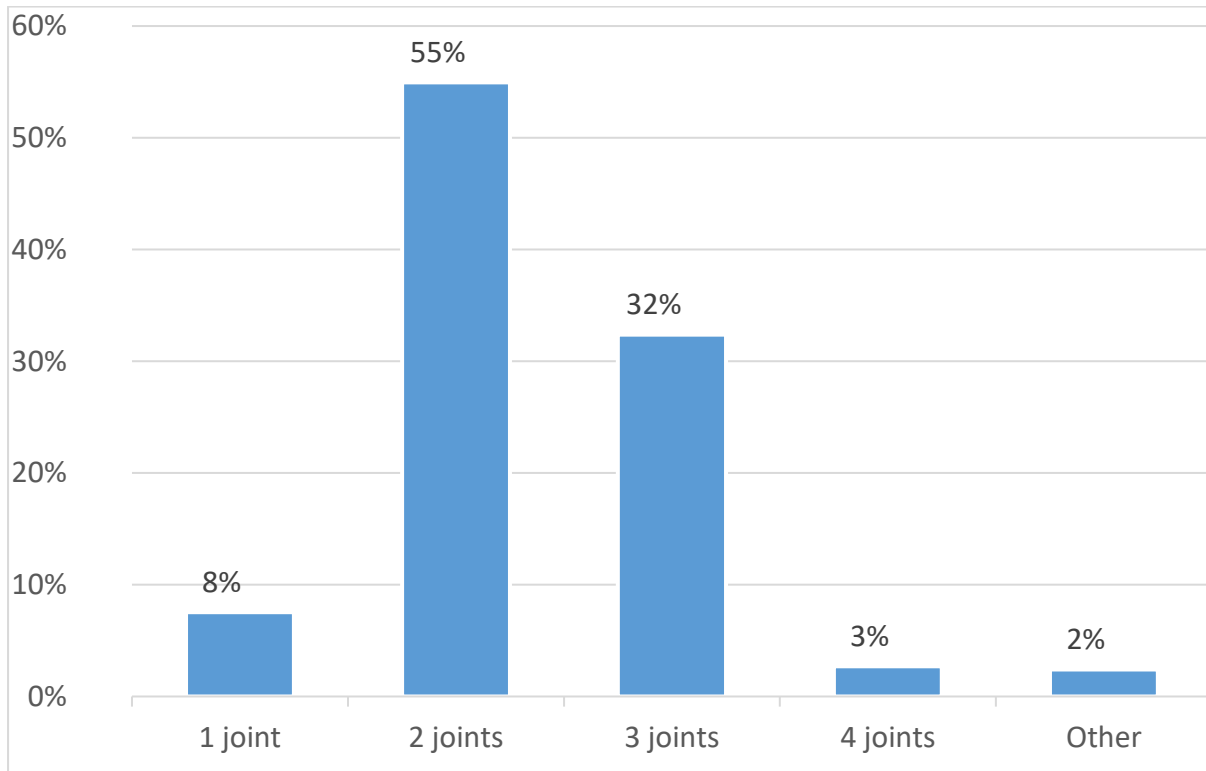
**Figure 30: Length of docked ewe lamb tails**

Base: Merino producers who dock ewe lamb tails n = 1,156



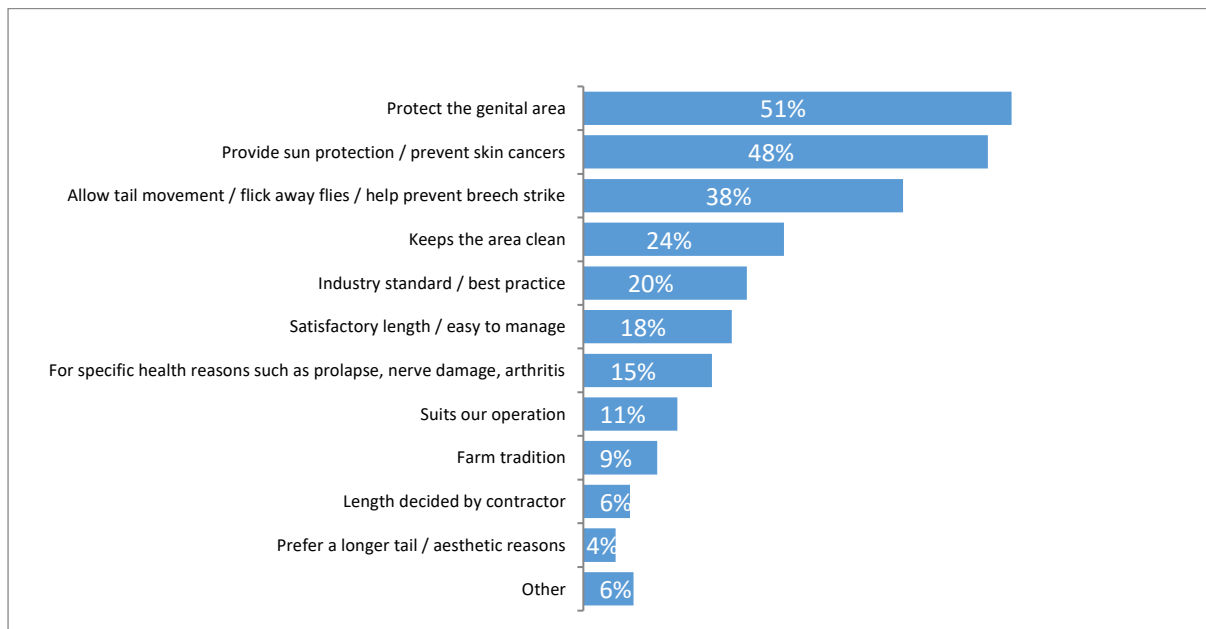
**Figure 31: Length of docked male lamb tails**

Base: Merino producers who tail dock male lambs n = 1,174



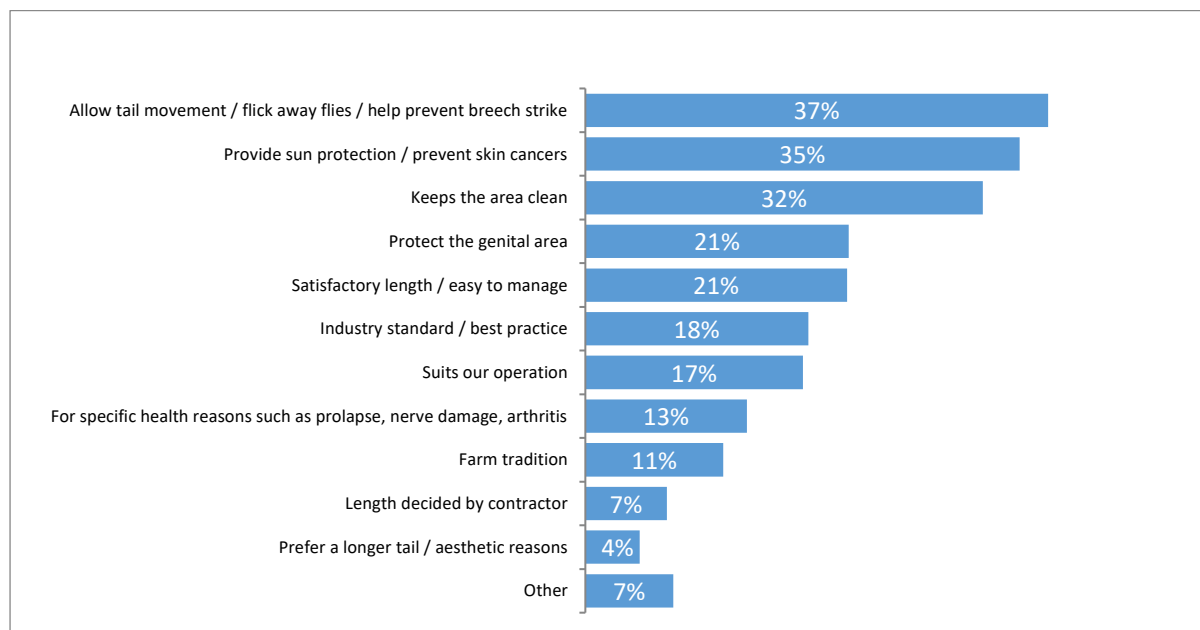
**Figure 32: Reason for length of docked ewe lamb tails**

Base: Merino producers who dock ewe lamb tails n = 1,156



**Figure 33: Reason for length of docked male lamb tails**

Base: Merino producers who dock male lamb tails n = 1,174



#### 4.5.4. Pain management

Nationally, 60% of Merino producers use pain management at lamb tail docking (**Figure 34**). Pain management is significantly less likely to be used in Tasmania and NSW (24% and 52%, respectively). Merino producers in South Australia were significantly more likely to use pain management (70%).

Nationally, Merino producers who use rings were less likely to use pain management when tail docking ewe lambs (25%) (**Figure 35**). Merino producers who tail dock using cold knife, hot knife and shears are much more likely to use pain management (55%, 80% and 83%, respectively).

Adoption of pain management for male lambs also varies by tail docking method and is highest for hot knife (80%) and lowest for rings (25%) (**Figure 36**).

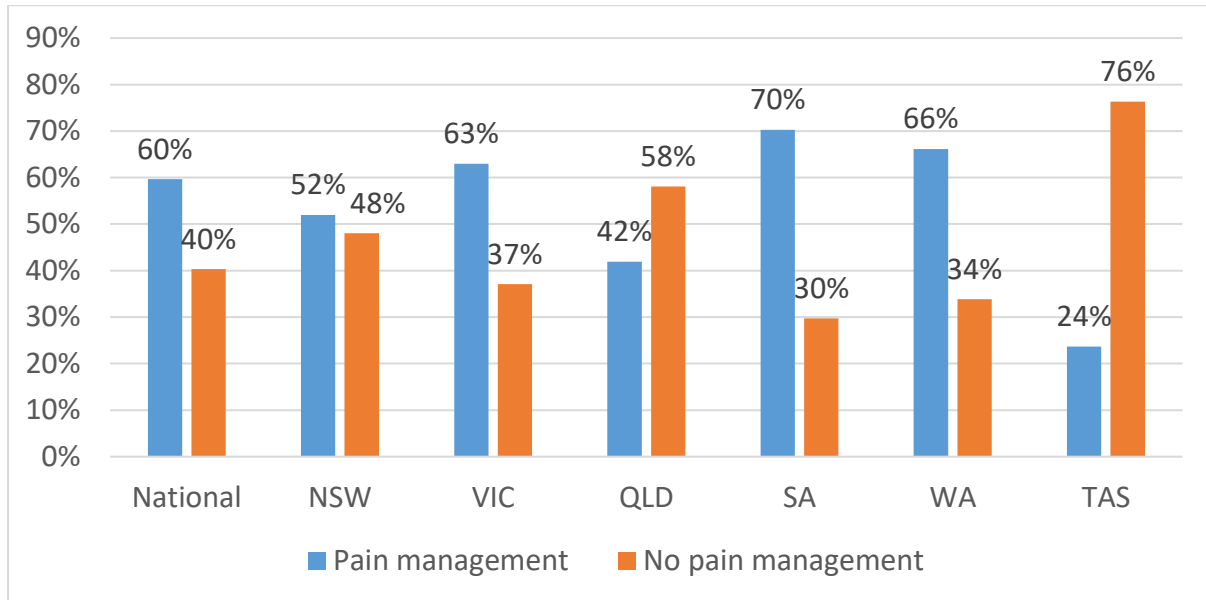
Anaesthetic and antiseptic spray at the site was by far the most commonly used pain management method (**Figure 37**). Nationally, it is used by 84% of Merino producers who use pain management products at tail docking. Analgesic oral gel and anaesthetic injection at the site were the second most popular pain relief (each 10%). Western Australian Merino producers were more likely to use other products (8%) and less likely to use analgesic injections (1%).

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 Merino producers as to the appropriate pain management type needed for tail docking. It is also possible that some Merino 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.

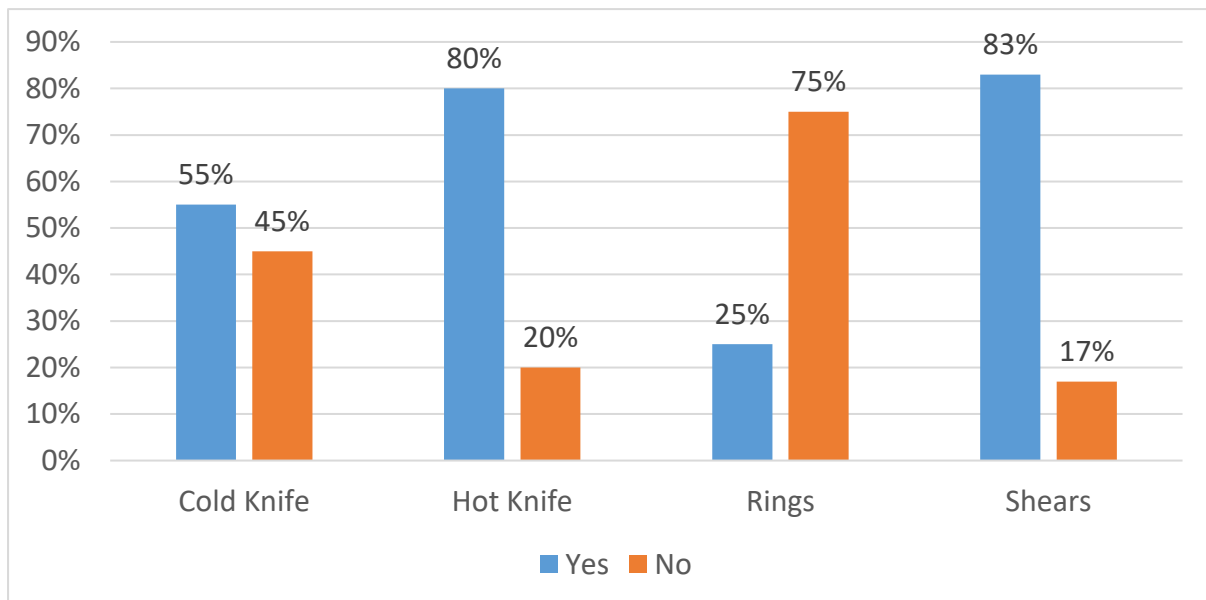
**Figure 34: Use of pain management for tail docking of lambs**

Base: Merino producers who tail docked ewe or male lambs n = 1,174



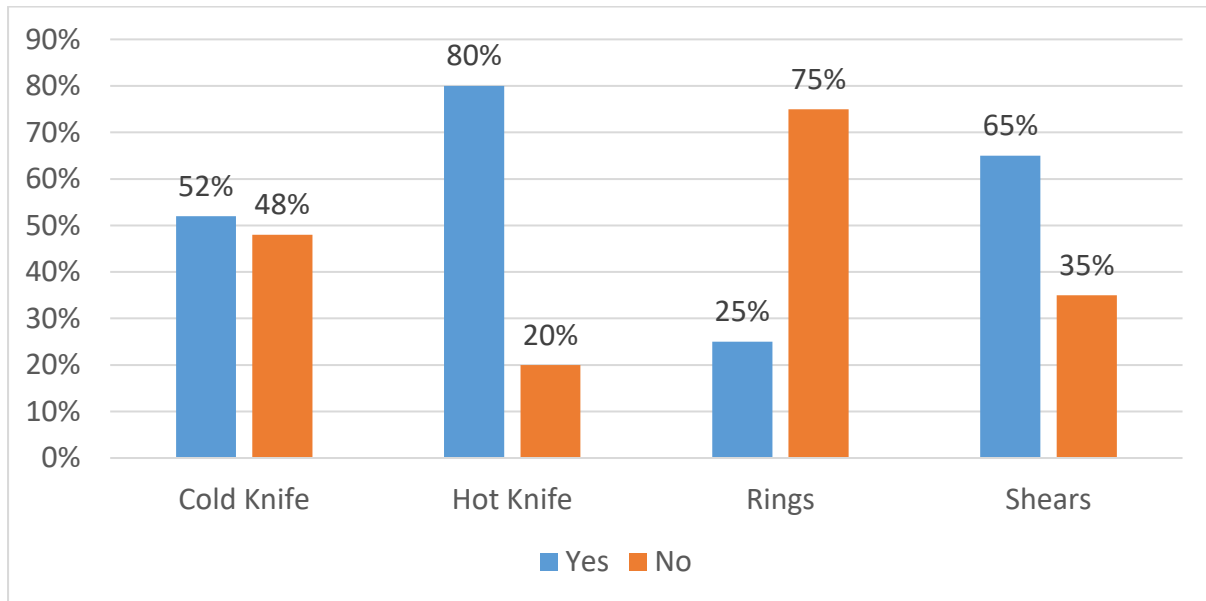
**Figure 35: Use of pain management for tail docking by docking method for ewe lambs**

Base: n = 1,174



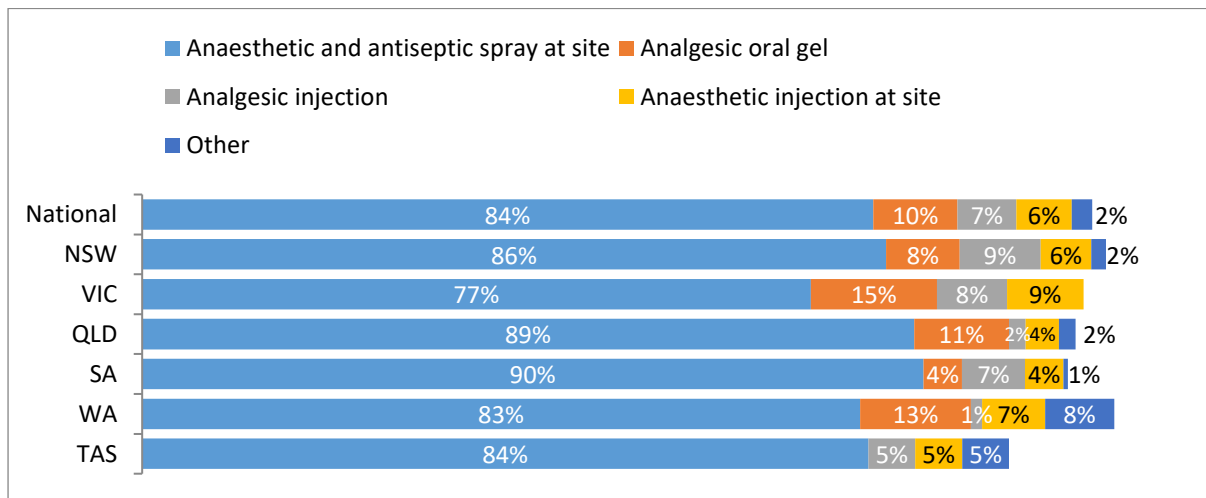
**Figure 36: Use of pain management for tail docking by docking method for male lambs**

Base: n = 1,174



**Figure 37: Use of pain management at tail docking**

Base: n = 784



**Table 2: Method for tail docking ewe lambs by pain management method**

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 = 324) 25% use pain management (n = 101)	58%*	19%	23%	5%
Hot Knife (n = 745) 80% use pain management (n = 612)	89%	9%	3%*	7%
Cold Knife (n = 56) 55% use pain management (n = 35)	100%	3%	-	8%
Shears (n = 24) 65% use pain management (n = 19)	95%	5%	-	5%

\*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

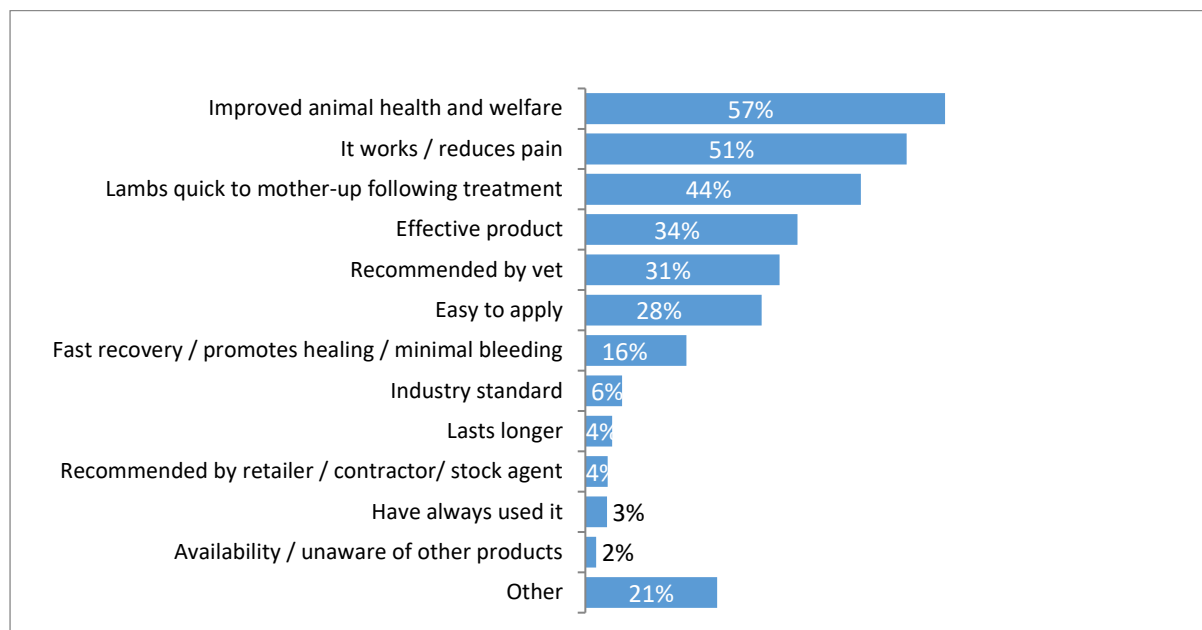
The most common reasons cited for choosing anaesthetic injections at tail docking of lambs were improved animal health and welfare (57%), and to reduce pain (51%) (**Figure 38**). For anaesthetic and antiseptic spray at the surgery site (e.g., Tri-Solfen), the most common reasons cited were effective pain reduction (55%), fast recovery (48%) and to improve animal health and welfare (42%) (**Figure 39**). Merino producers who chose analgesic injections said they were effective for pain reduction (61%), improved welfare (60%) and it were longer lasting (57%) (**Figure 40**). The most common reasons cited for choosing analgesic oral gel were improved animal health and welfare (57%), pain reduction (49%), and swift mothering-up (43%) (**Figure 41**).

The most common reason given for not using pain management is that Merino producers don't consider it necessary (50%). 25% of Merino producers cited no particular reason with 17% claiming it was not practical or a quick procedure (**Figure 42**).



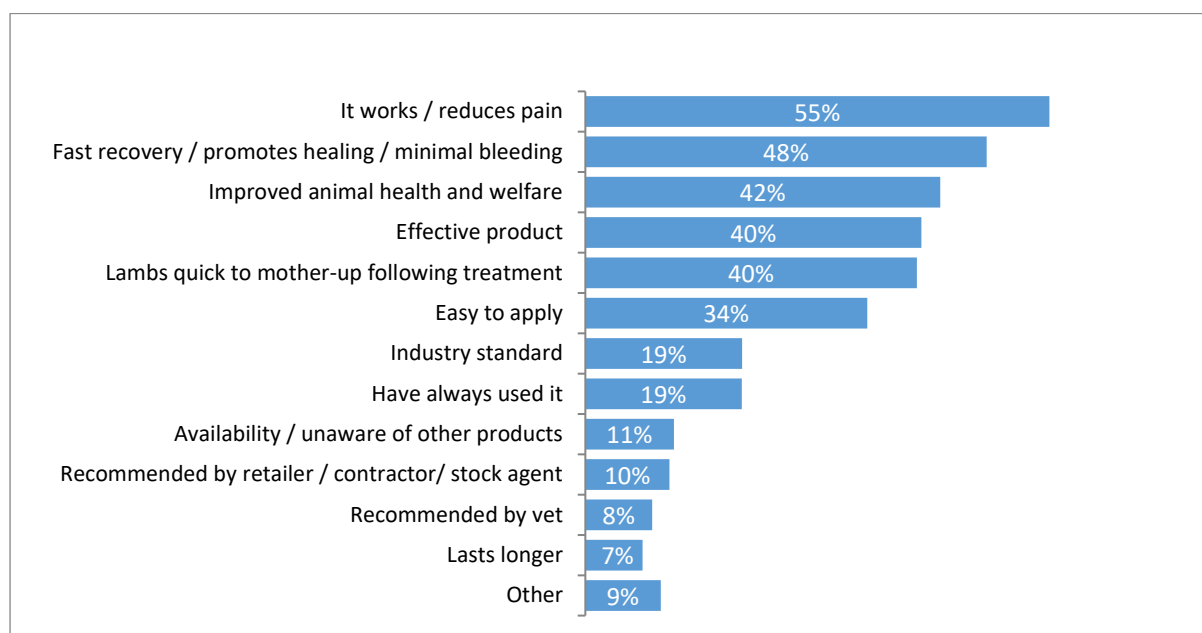
**Figure 38: Reason for using anaesthetic injection at surgery site**

Base: n = 49



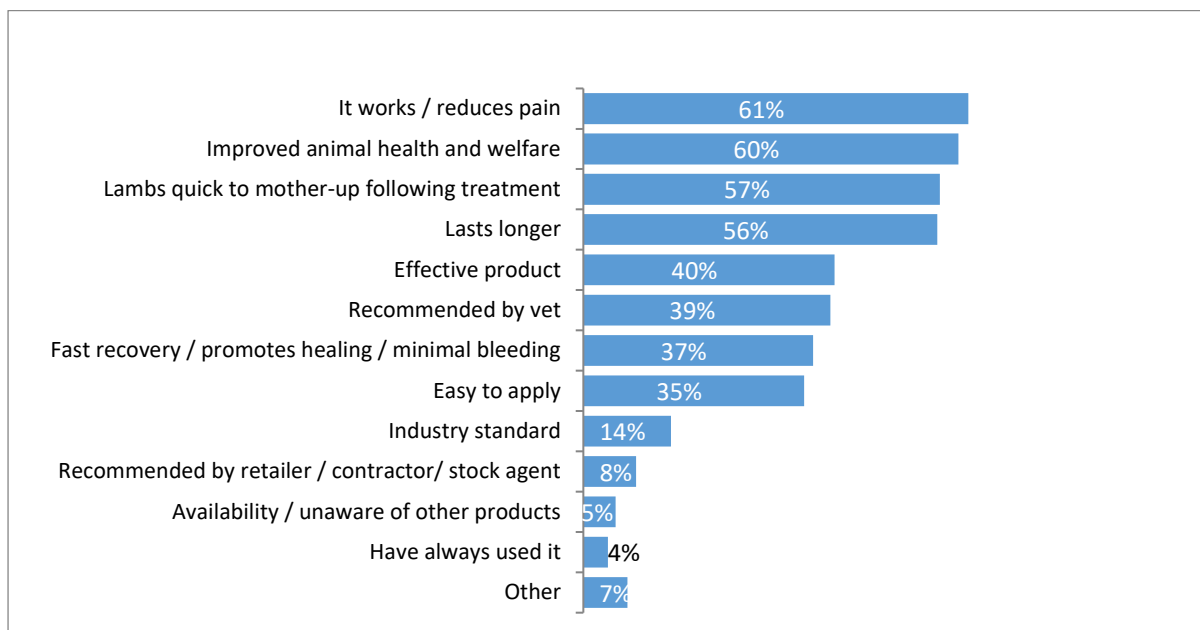
**Figure 39: Reason for using anaesthetic and antiseptic spray**

Base: n = 676



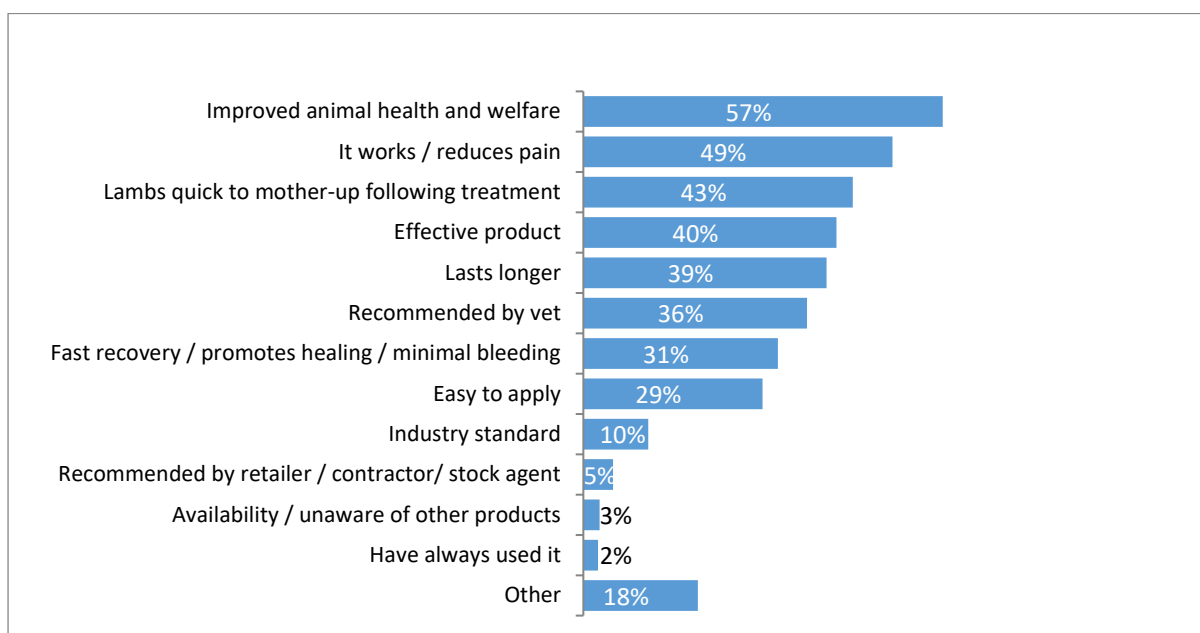
**Figure 40: Reason for using analgesic injection**

Base: n = 55



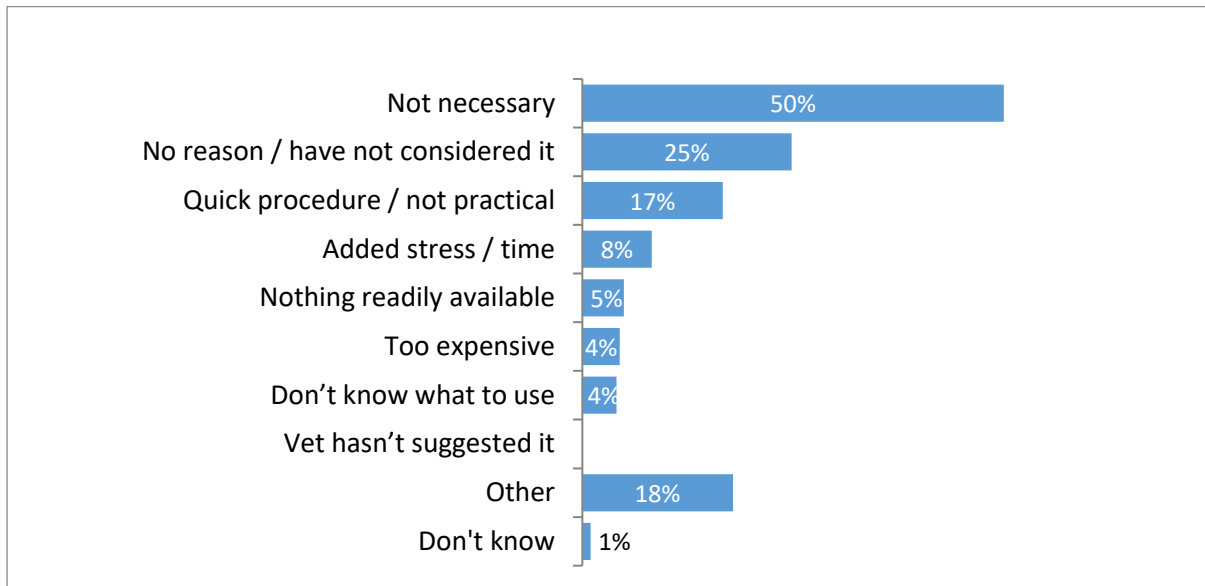
**Figure 41: Reason for using analgesic oral gel**

Base: n = 72



**Figure 42: Reasons against using pain management for tail docking**

Base: n = 398



## 4.6. Castration

### 4.6.1. Overview

At the national level, 98% of Merino producers castrate their male lambs (**Figure 43**).

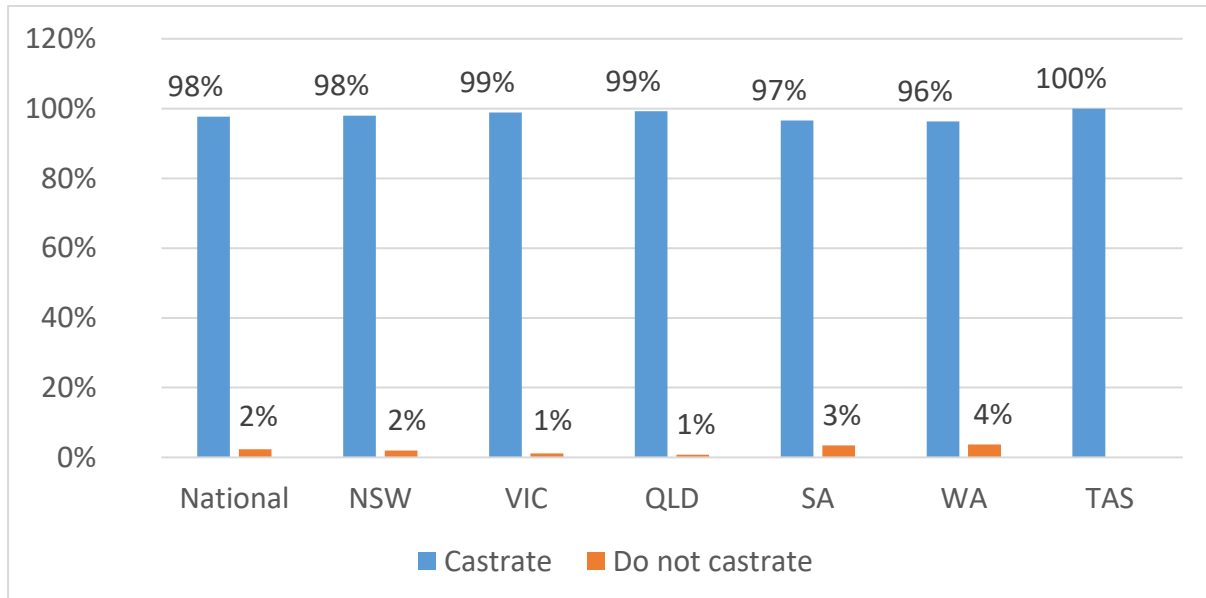
Rubber rings were by far the most common technique (97%) used for castration of male lambs nationally (**Figure 44**). Queensland Merino producers were significantly more likely to nominate an alternative method (9%) compared to other states. New South Wales Merino producers were significantly less likely to use rings (95%).

Nationally, 30% of Merino producers used pain management in 2021 when castrating male lambs (**Figure 45**).

Use of pain management is lowest for rings at 29% (**Figure 46**).

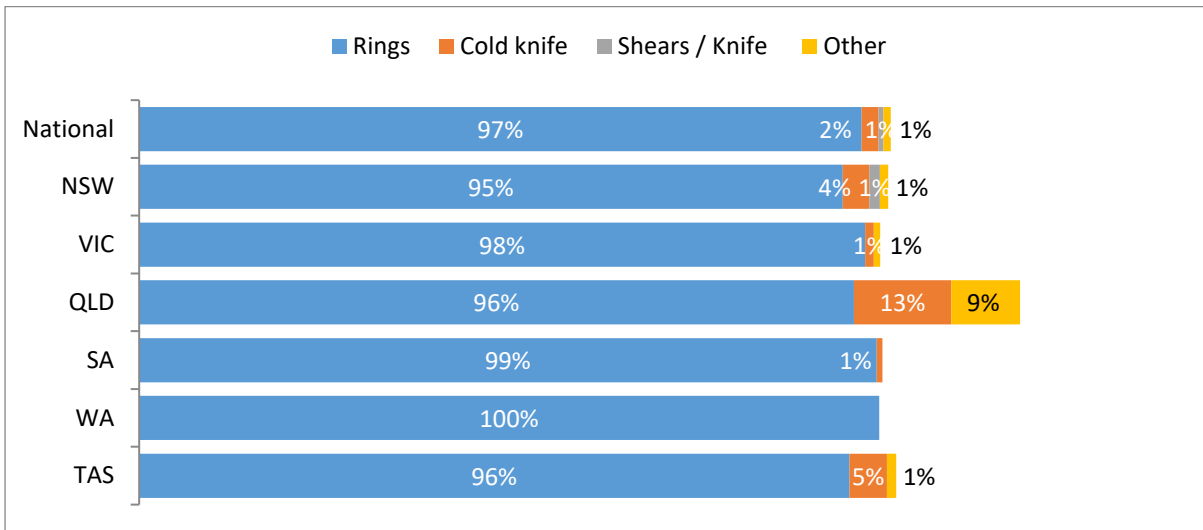
**Figure 43: Castration of male lambs**

Base: n = 1,203



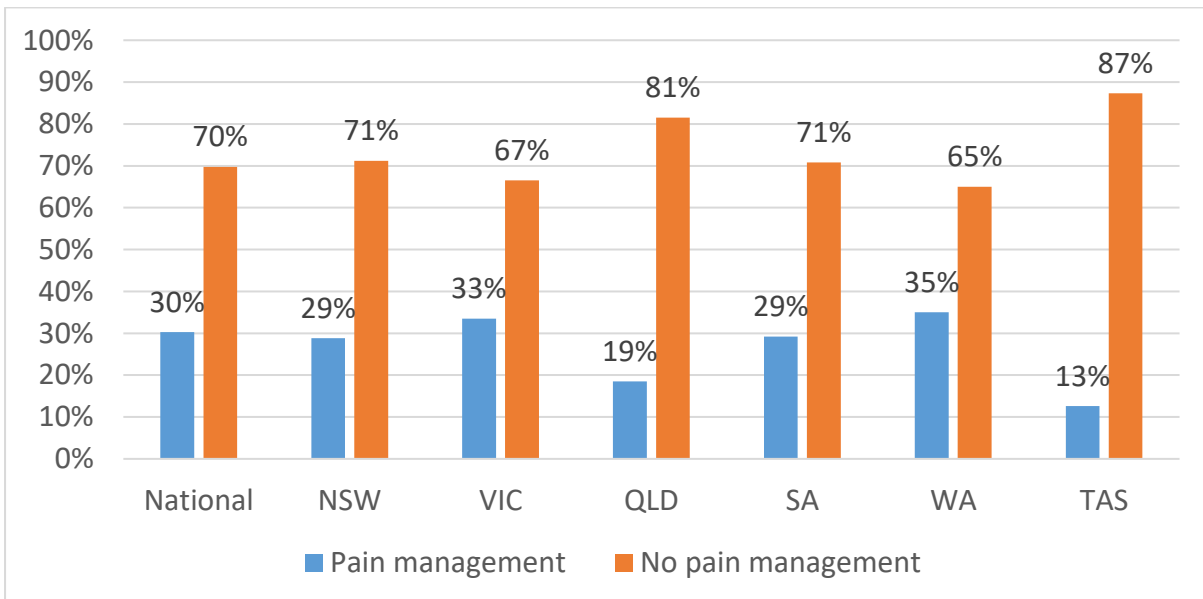
**Figure 44: Lamb castration methods by state**

Base: Merino producers who castrate male lambs n = 1,177



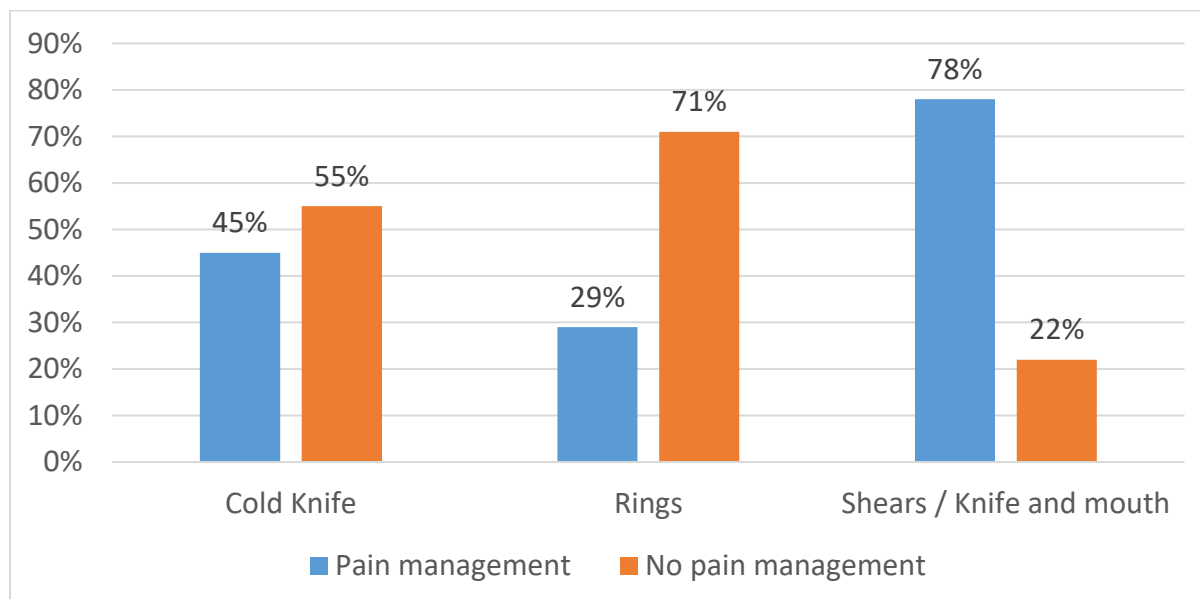
**Figure 45: Use of pain management for castrating male lambs in 2021**

Base: Merino producers who castrated male lambs in 2021 n = 1,177



**Figure 46: Use of pain management by castration type**

Base: Merino producers who castrated male lambs n = 1,177



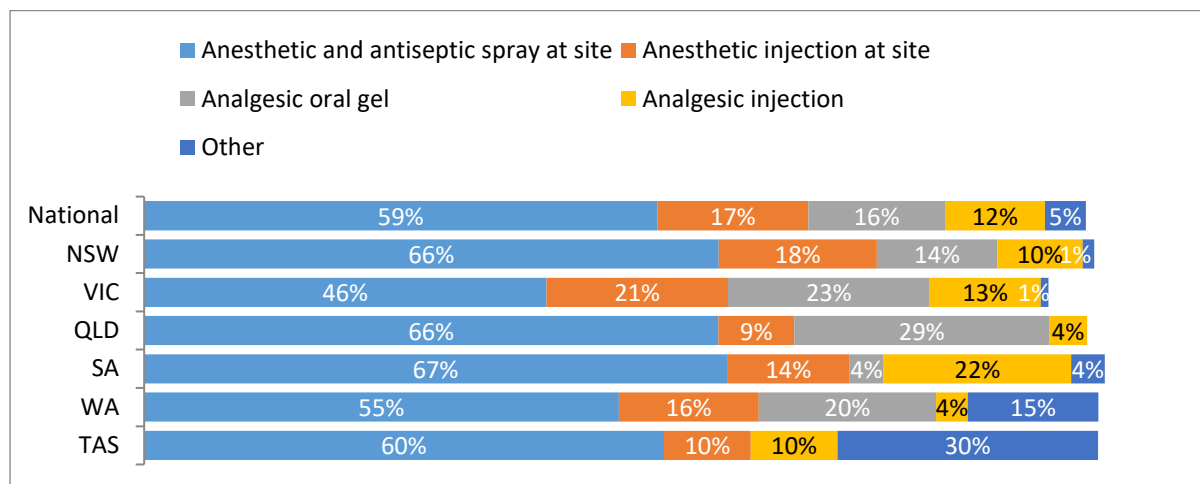
#### 4.6.2. Pain management method

Anaesthetic and antiseptic spray at the site is the primary type of pain management for castration (**Figure 47**). Slightly less than two thirds of Merino producers who use pain management products at castration (59%) use anaesthetic and antiseptic spray at the surgery site. There was some variation between states with Tasmanian (30%) and Western Australian (15%) Merino producers more likely to use other methods. South Australians were less likely to use analgesic oral gel (4%).

The specific type of pain management for each method of castration is presented at **Table 3**, those 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 47: Types of pain management products used at castration**

Base: Merino producers who castrate male lambs using pain management products n = 394

**Table 3: Pain management 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=1,134) 29% use pain management (n = 367)	58%*	16%	18%	12%
Cold Knife (n = 31) 45% use pain management (n = 16)	93%	7%	6%*	-
Shears / Knife (n = 9) 78% use pain management (n = 7)	85%	29%	-	-

\* Inappropriate pain management method

#### 4.6.3. Rationale for pain management method

The most common reasons cited for choosing anaesthetic injections were that it improves animal health and welfare (72%) and effectively reduces pain (65%) (**Figure 48**).

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 49**).

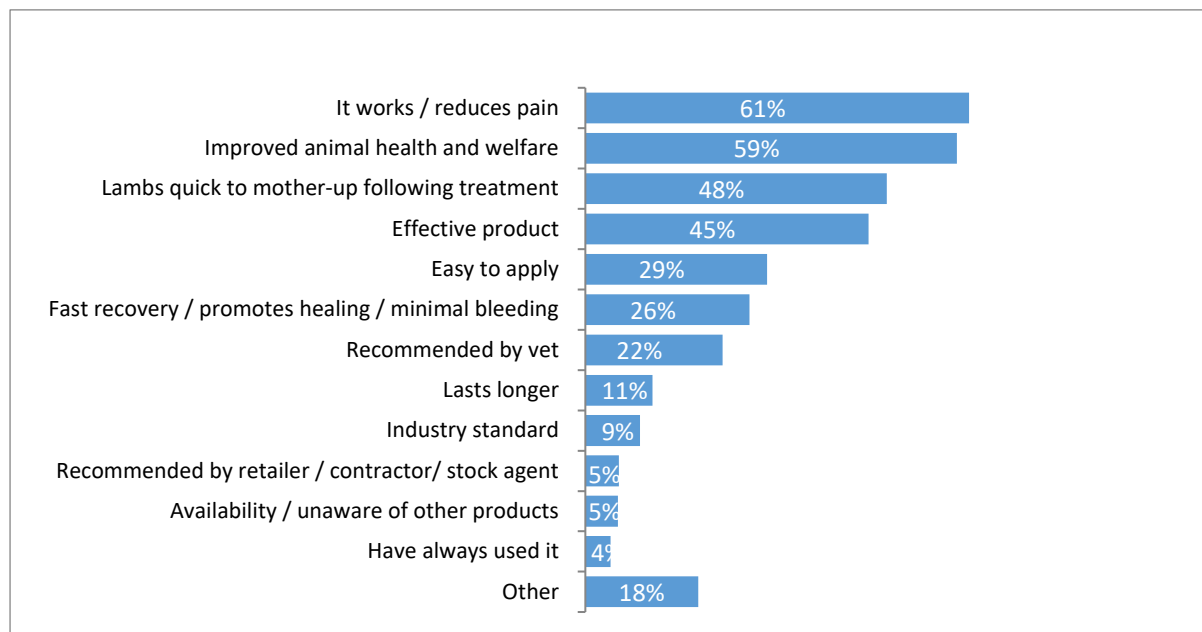
The most common reasons cited for choosing analgesic injections were effective pain reduction (61%) to improve animal health and welfare (59%) and lambs mother-up quickly afterwards (48%) (**Figure 50**).

The most common reasons cited for choosing analgesic oral gel were improved animal health and welfare (64%) and pain reduction (63%) (**Figure 51**).

The most common reason given for not using pain management is that Merino producers do not consider it necessary (43%) (**Figure 52**). 28% of Merino producers cited no particular reason with 17% stating it was not practical or a quick procedure.

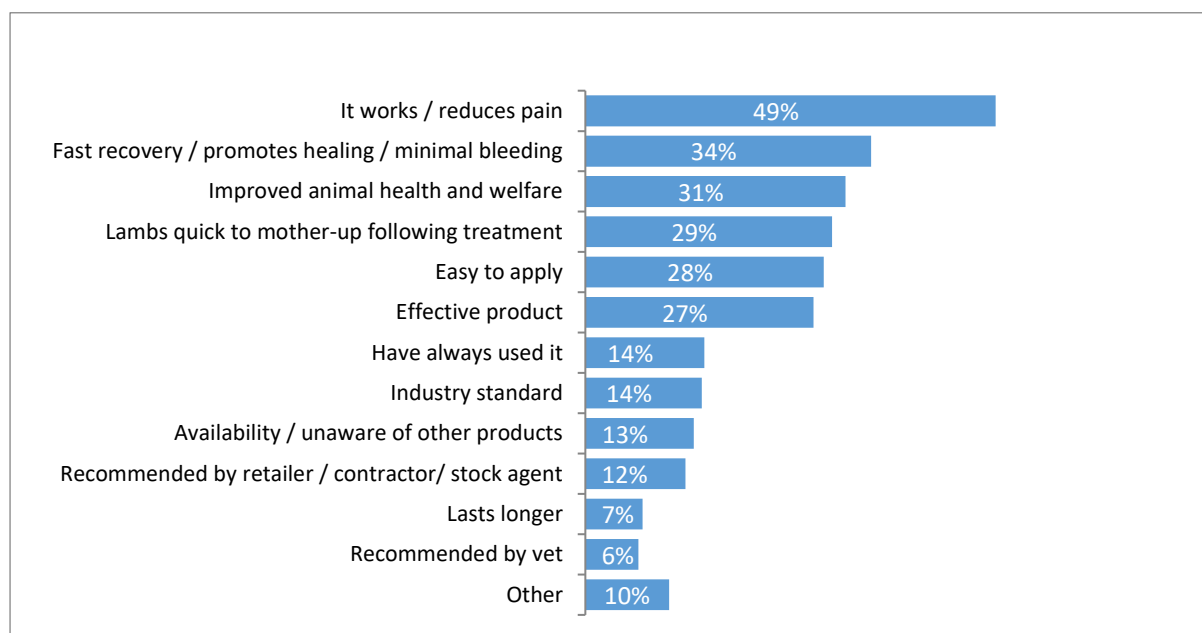
**Figure 48: Reason for using anaesthetic injection to castrate lambs**

Base: Merino producers who castrate lambs using anaesthetic injection n = 70



**Figure 49: Reasons for using anaesthetic and antiseptic spray at castration**

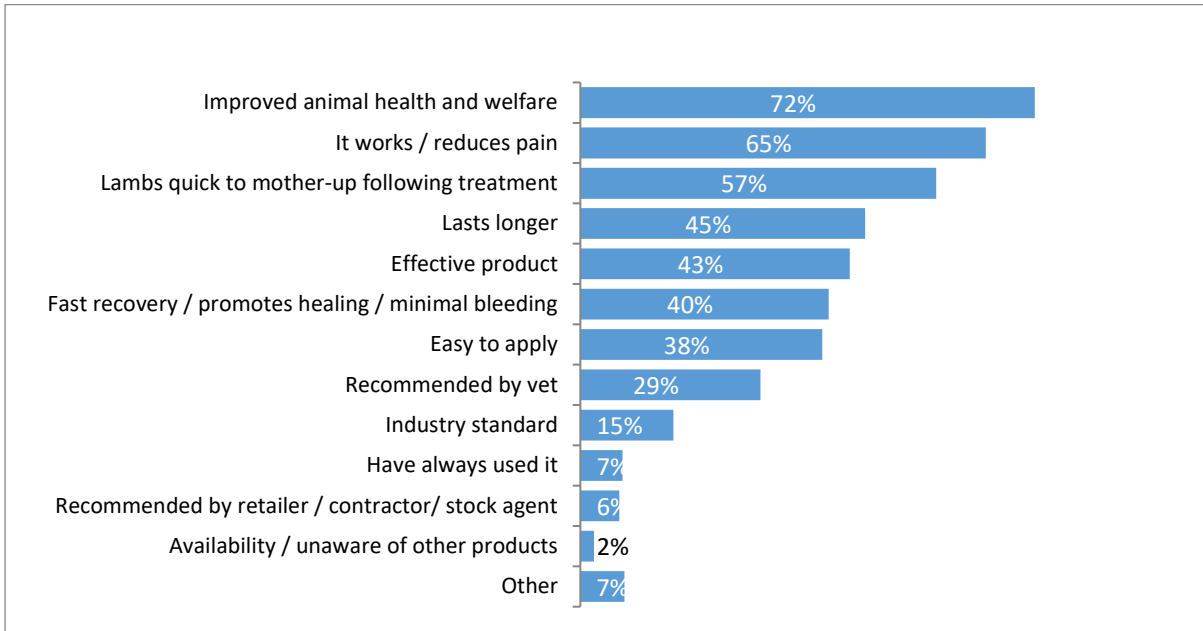
Base: Merino producers who castrate lambs using anaesthetic and antiseptic spray n = 240





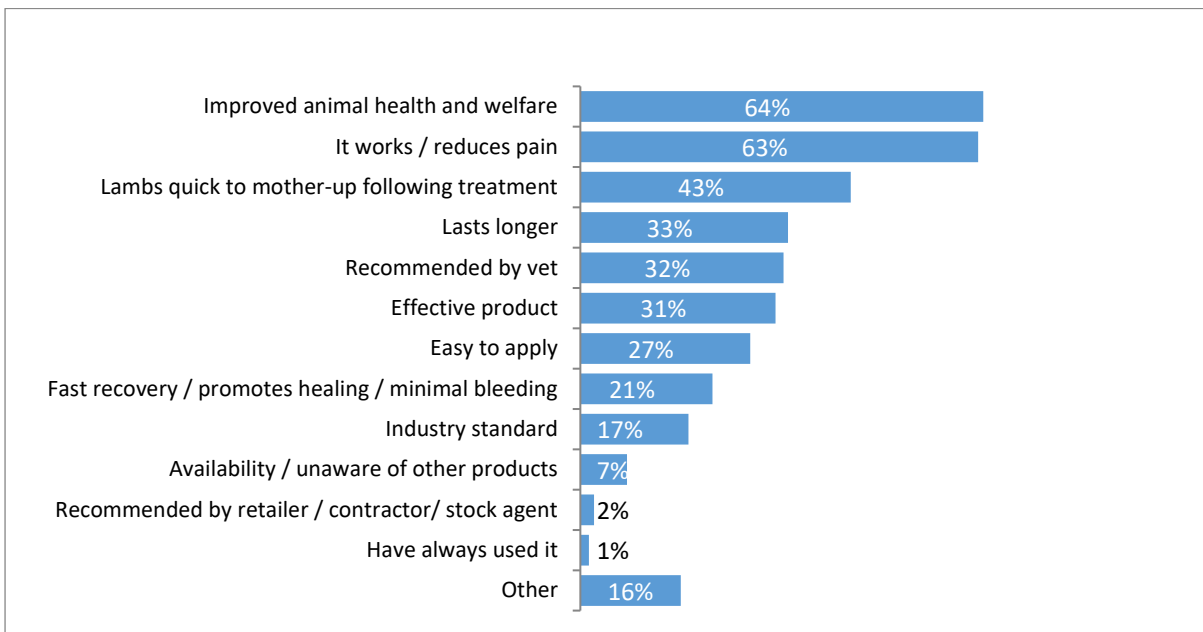
**Figure 50: Reason for choosing analgesic injection at castration**

Base: Merino producers who castrate lambs using analgesic injection n = 46



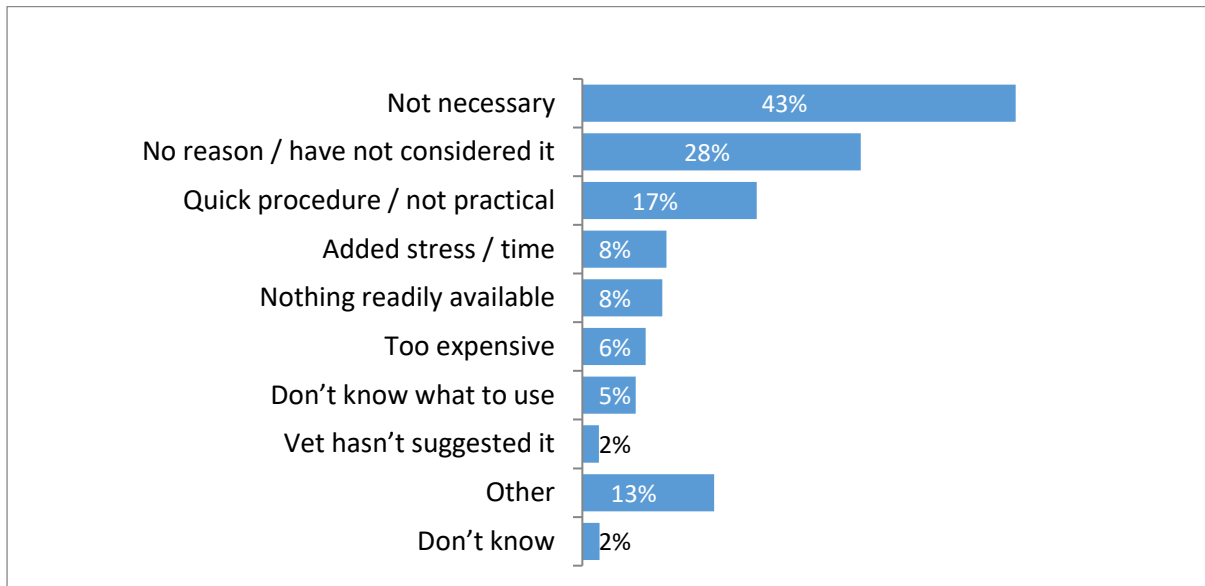
**Figure 51: Reason for using analgesic oral gel at castration**

Base: Merino producers who castrate lambs using analgesic gel n = 60



**Figure 52: Reason not to use pain management for castration**

Base: Merino producers who did not use pain management products during castration n = 783



## 4.7. Mulesing

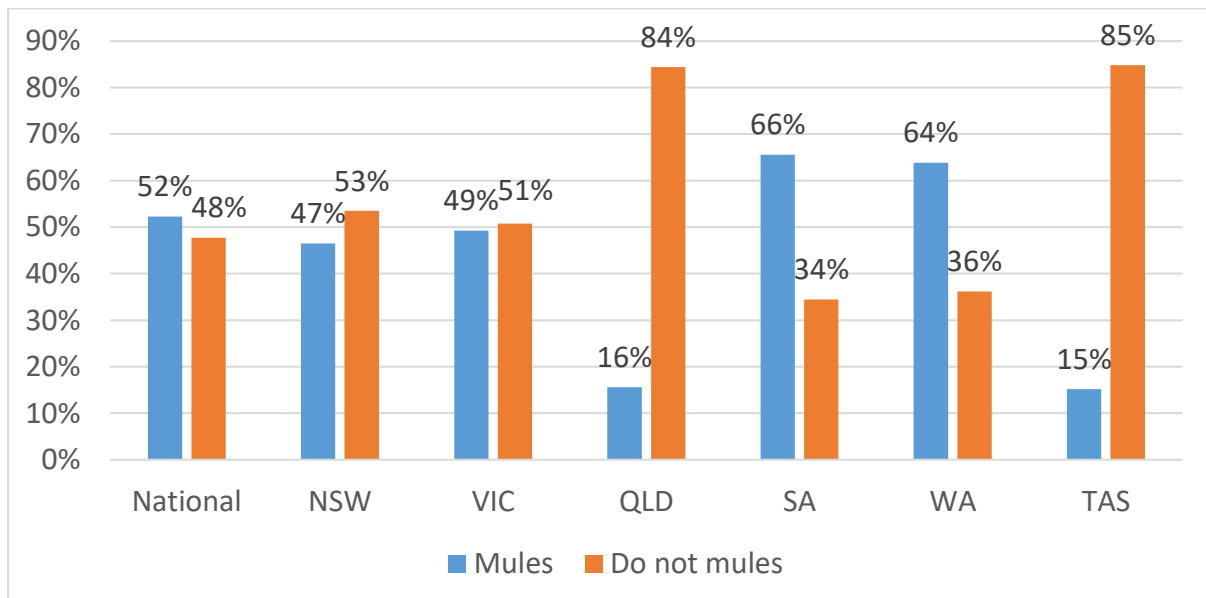
### 4.7.1. Overview

At the national level, 52% of Merino producers mulesed their ewe lambs in 2021 (**Figure 53**). Merino producers vary significantly across states, with mulesing less frequent in Tasmania, Queensland and New South Wales (15%, 16% and 47% respectively). South Australian and Western Australian Merino producers were significantly more likely to mules (66% and 64% respectively).

At the national level, 44% of Merino producers mulesed their male lambs in 2021 (**Figure 54**). Merino producers vary significantly across states, with mulesing less frequent in New South Wales, Queensland, and Tasmania (36%, 9%, and 14% respectively). South Australian and Western Australian Merino producers were significantly more likely to mules (53% and 59% respectively).

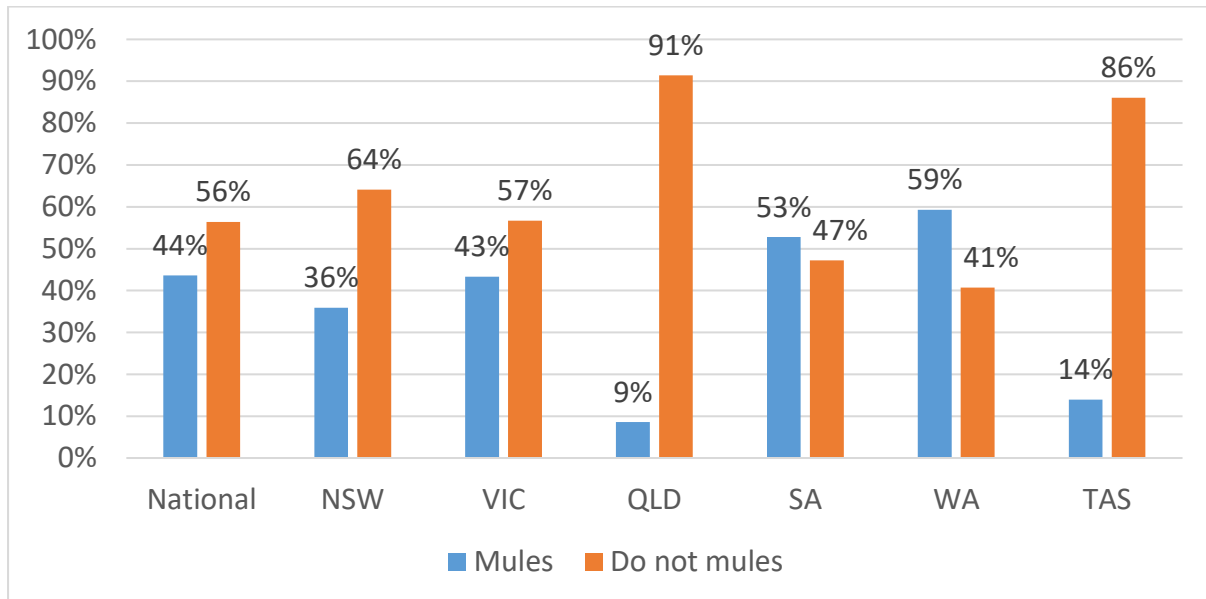
**Figure 53: Mulesing of ewe lambs in 2021**

Base: n = 1,203



**Figure 54: Mulesing of male lambs in 2021**

Base: n = 1,203

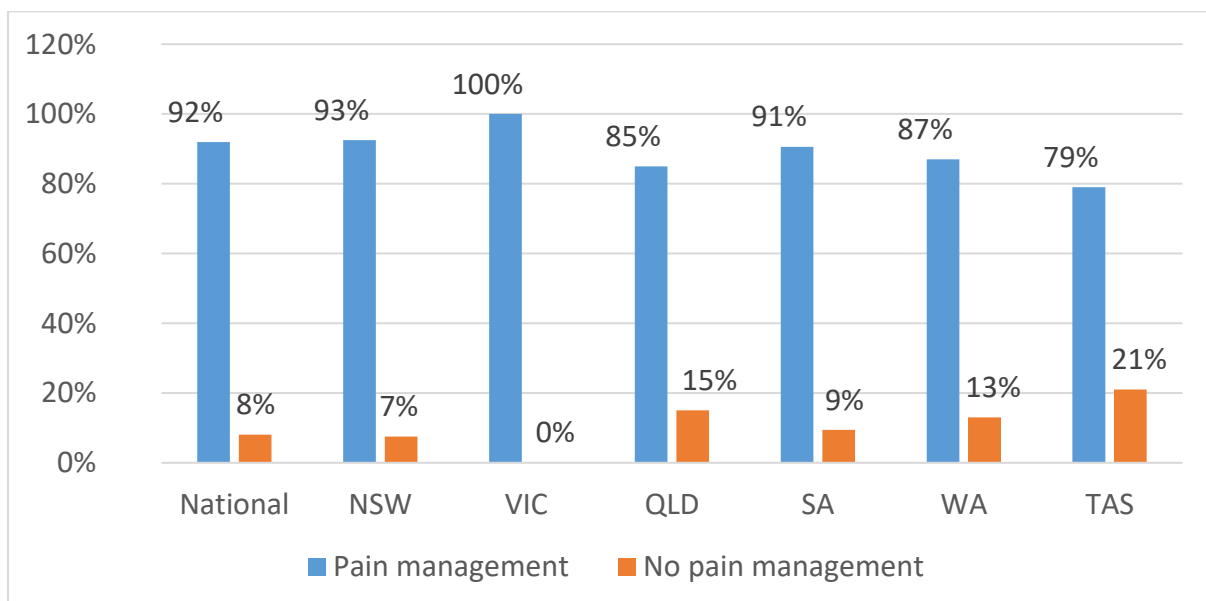


**4.7.2.Pain management method**

Across Australia, the majority of Merino producers who mules use pain management (92%) (Figure 55). There was a significant difference between Victoria (100%) and other states. Nationally, of Merino producers who use pain management products at mulesing, virtually all (96%) use anaesthetic and antiseptic spray at the surgery site (Figure 56).

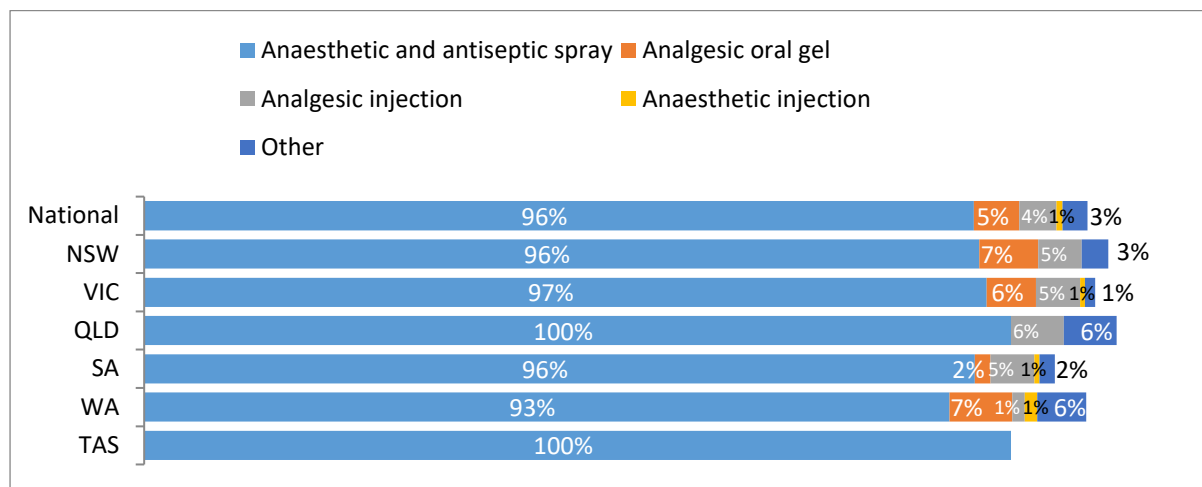
**Figure 55: Use of pain management at mulesing in 2021**

Base: Merino producers who mulesed lambs n = 722



**Figure 56: Types of pain management used at mulesing**

Base: Merino producers who mules lambs using pain management products n = 675



#### 4.7.3. Rationale for pain management method

The most common reasons cited for choosing anaesthetic and antiseptic spray were effective pain reduction (56%) and fast recovery (51%) (**Figure 57**). South Australian Merino producers were significantly more likely to say this product is easy to apply (53%) and Victorians were less likely to cite improve animal health (29%).

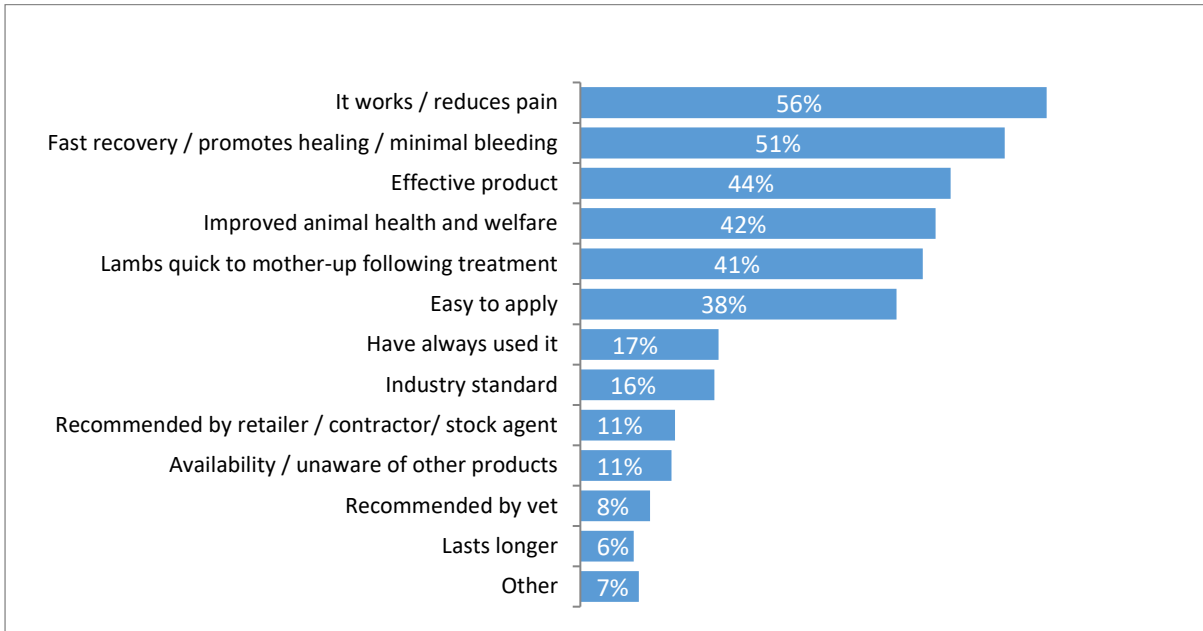
Where Merino producers choose analgesic injections, they stated that they provided effective pain reduction (72%) and fast recovery (53%) (**Figure 58**).

The most common reasons cited for choosing analgesic oral gel were pain reduction (74%) and improved animal health and welfare (57%) (**Figure 59**).

When Merino producers did not use pain management it was largely because they do not consider it necessary (35%) (**Figure 60**). 22% of Merino producers cited no particular reason with 15% stating it was too expensive.

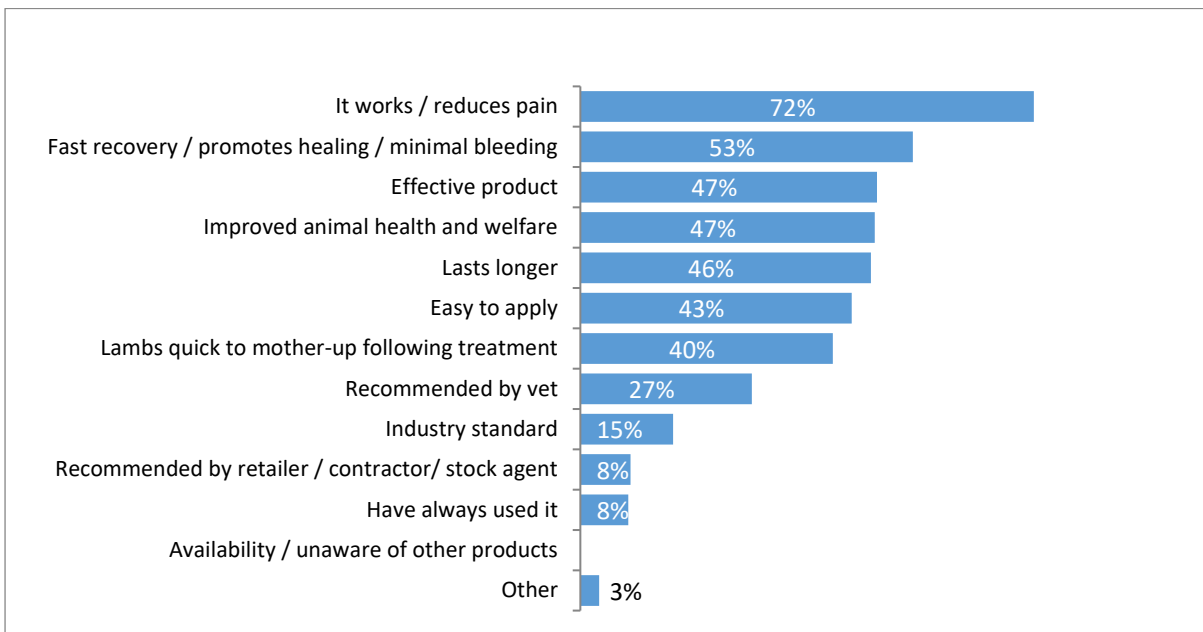
**Figure 57: Reason for using anaesthetic and antiseptic spray**

Base: Merino producers who mules lambs using anaesthetic and antiseptic spray n = 649



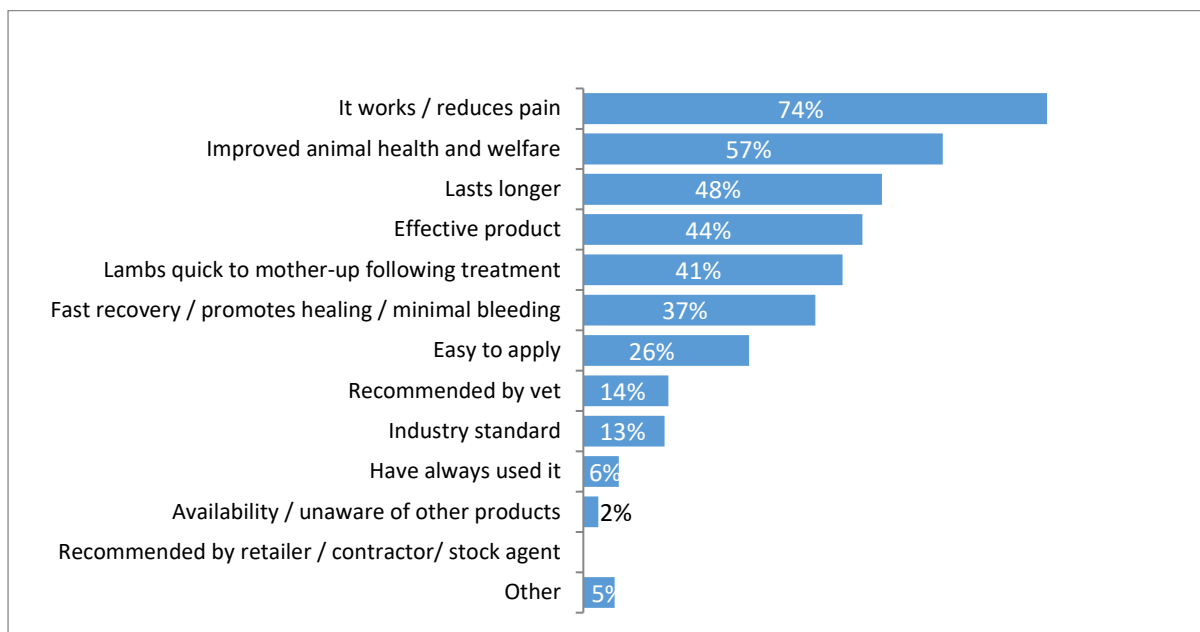
**Figure 58: Reason for using analgesic injection**

Base: Merino producers who mules lambs using analgesic injection n = 29



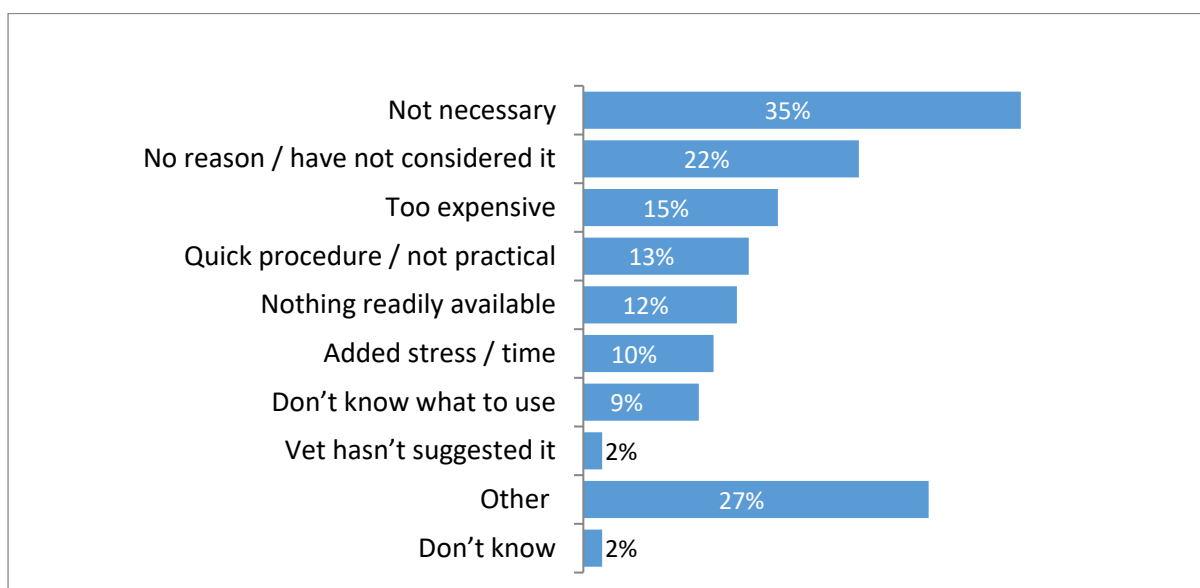
**Figure 59: Reason for using analgesic gel**

Base: Merino producers who mules lambs using analgesic gel n = 38



**Figure 60: Reason for not using pain management at mulesing**

Base: Merino producers who did not use pain management products during mulesing n = 50



#### 4.7.4. Mulesing cessation

At the national level, of Merino producers who mulesed in 2021, more than half of Merino producers said they were unlikely or very unlikely to cease mulesing (60%) (**Figure 61**).

If mulesing was no longer an option, the most common alternative to mulesing that producers would do is increased use of flystrike chemicals (47%) followed by increased crutching (45%) and

breeding resistant sheep (41%) (**Figure 62**). New South Wales Merino producers were significantly more likely to say that they would shift to a cattle enterprise (24%).

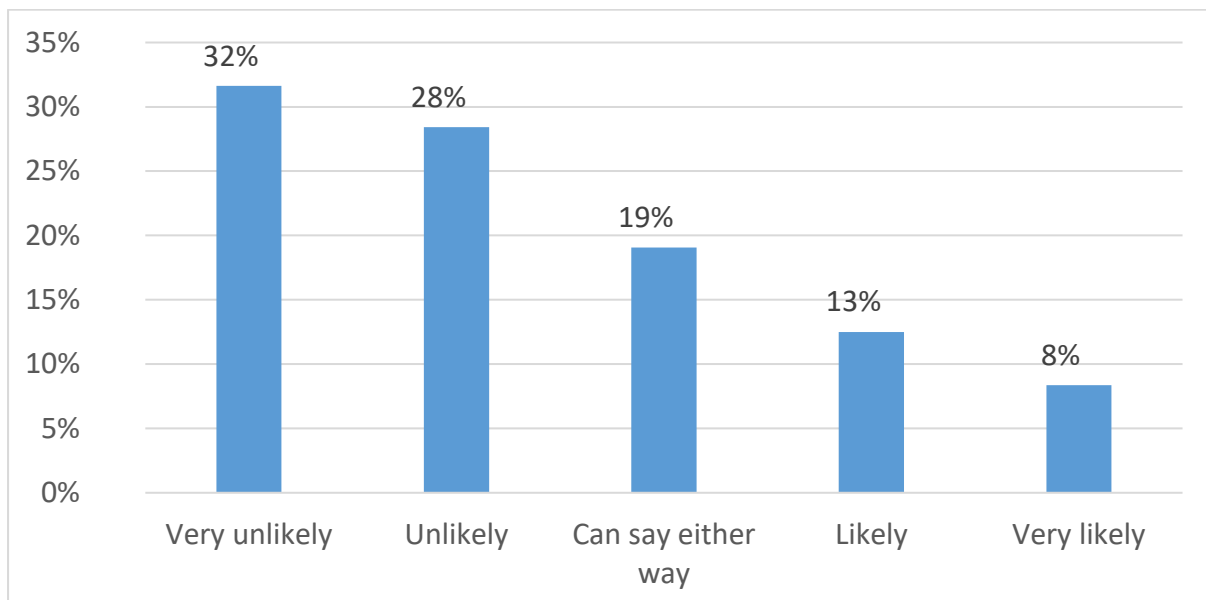
At the national level, of Merino producers who did not mules in 2021, nearly two thirds (60%) of Merino producers have ceased mulesing, with Tasmanians significantly more likely than other states to have never mulesed (75%). (**Figure 63**).

Nationally and on average, Merino producers who had ceased mulesing were most likely to have done so in 2012 (**Figure 64**). Queensland Merino producers were significantly more likely to have ceased mulesing later than other states, with an average cease year 2016. New South Wales Merino producers ceased mulesing in 2010 on average, Western Australian and Victorian Merino producers in 2012, South Australians in 2013 and Tasmanian Merino producers in 2015.

The most common reason given for ceasing mulesing is that Merino producers are breeding sheep with less body wrinkle (39%) (**Figure 65**). Queensland Merino producers were more likely to cite weather conditions (37%) while Victorians cite high sheep prices (12%).

**Figure 61: Likelihood to cease mulesing in the next five years**

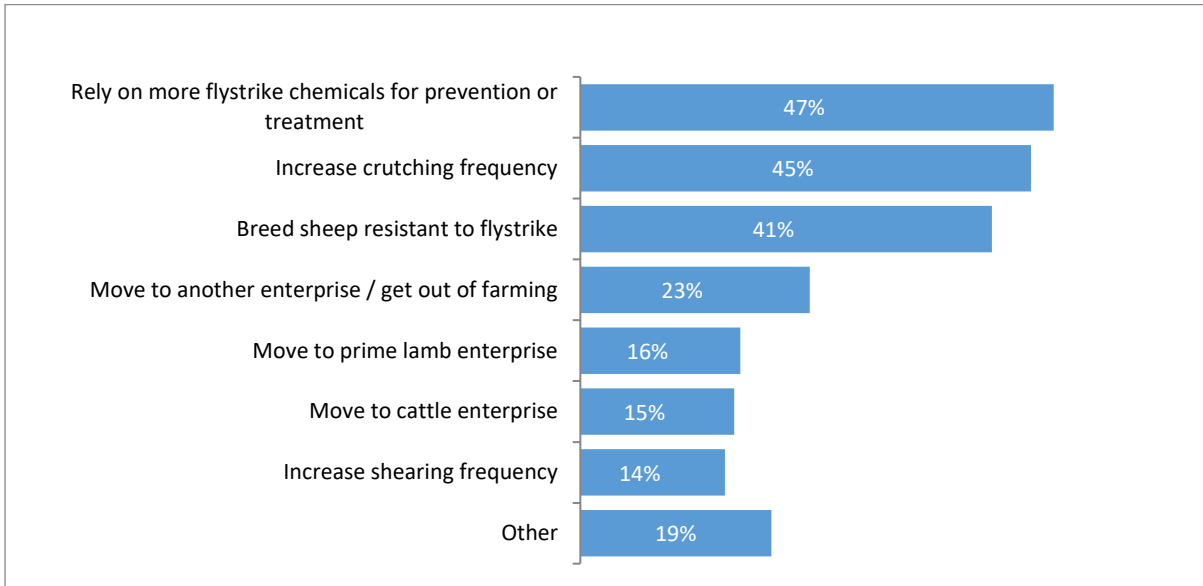
Base: Merino producers who mulesed lambs n = 722





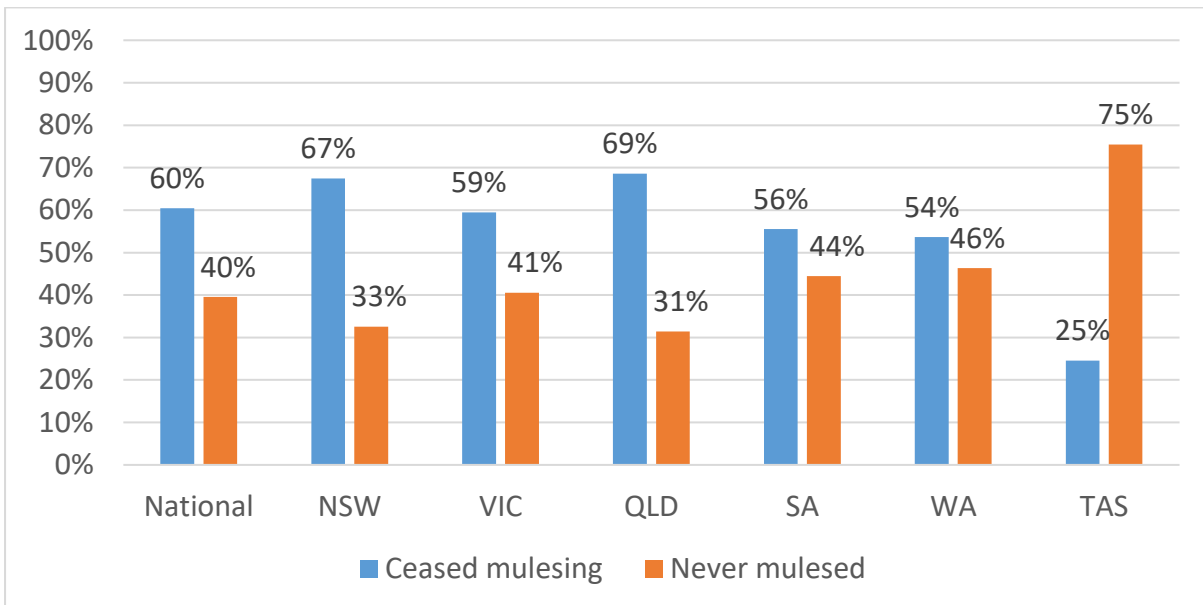
**Figure 62: Alternatives used if mulesing was no longer an option**

Base: Merino producers who mulesed lambs n = 722



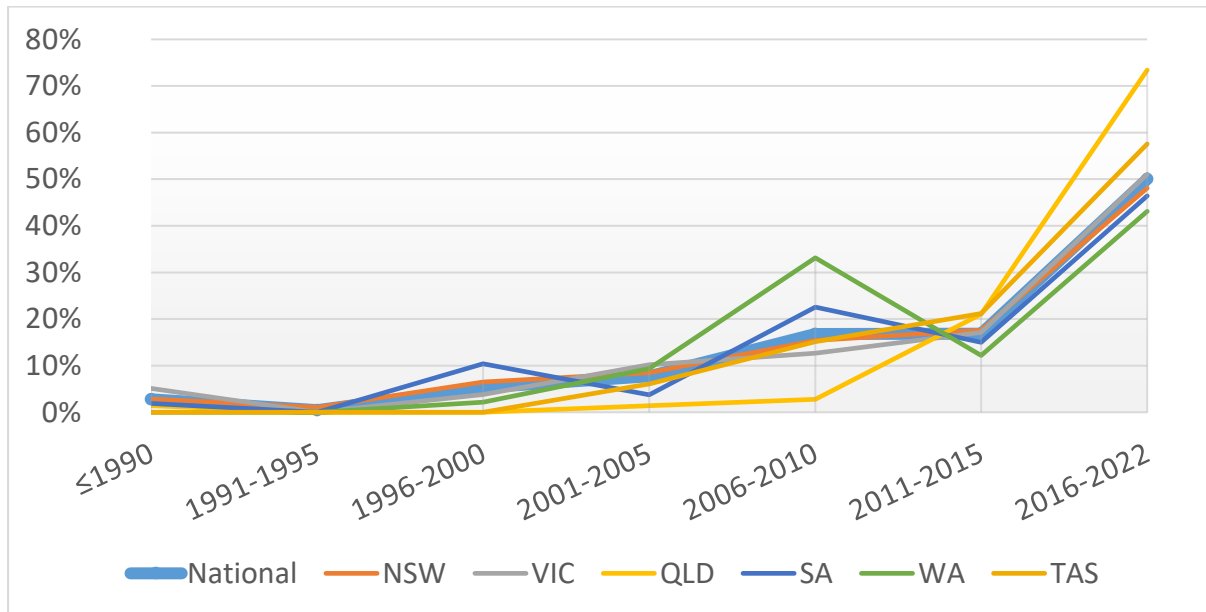
**Figure 63: Mulesing cessation**

Base: Merino producers who did not mules in 2021 n = 481



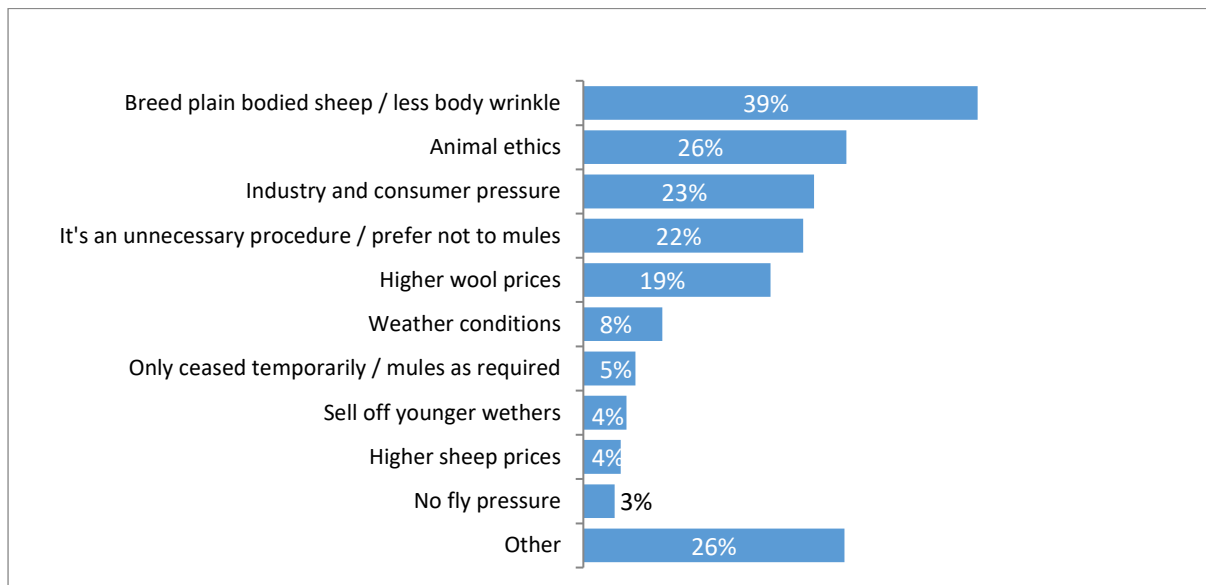
**Figure 64: Average mulesing cessation year**

Base: Merino producers who ceased mulesing lambs n = 327



**Figure 65: Reason for mulesing cessation**

Base: Merino producers who ceased mulesing lambs n = 327



### 4.8. Weaning

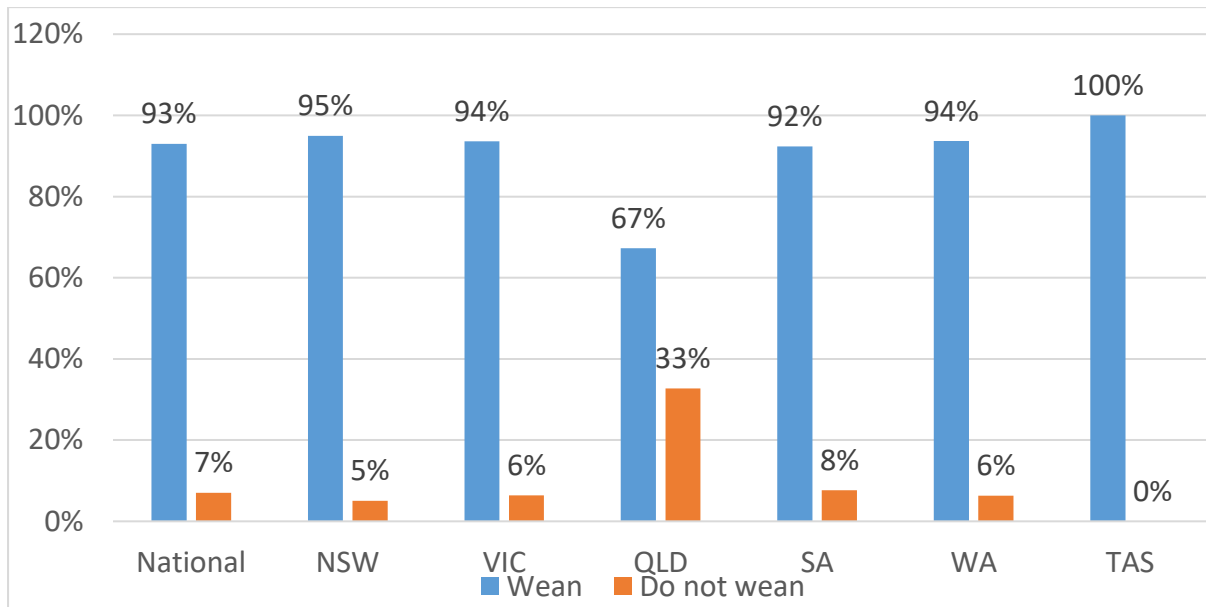
93% of Merino producers interviewed wean lambs in their operations. Queensland (67%) Merino producers were significantly less likely to wean lambs when compared to other states (**Figure 66**).

The average age of lambs being weaned nationally is 15.7 weeks with 70% of Merino producers interviewed weaning lambs between 9 and 16 weeks (**Figure 67**). Merino producers in Queensland were significantly less likely to wean between 9-12 weeks (9%).

Maiden ewes are more likely to have a weaning percentage between 81-90 weeks (27%) (**Figure 68**). On average, the weaning percentage for maiden ewes is 81.1%. Queensland Merino producers are more likely to have 50% or less (36%), South Australian 91-100 (26%). Mature ewes (30%) were more likely to have weaning percentages 91-100%, with an average of 96.4%. New South Wales (4%) and Queensland (8%) Merino producers were significantly more likely than other states to have weaning percentages for 61-70%. Queensland Merino producers were also more likely to have weaning percentages 50% or under (23%).

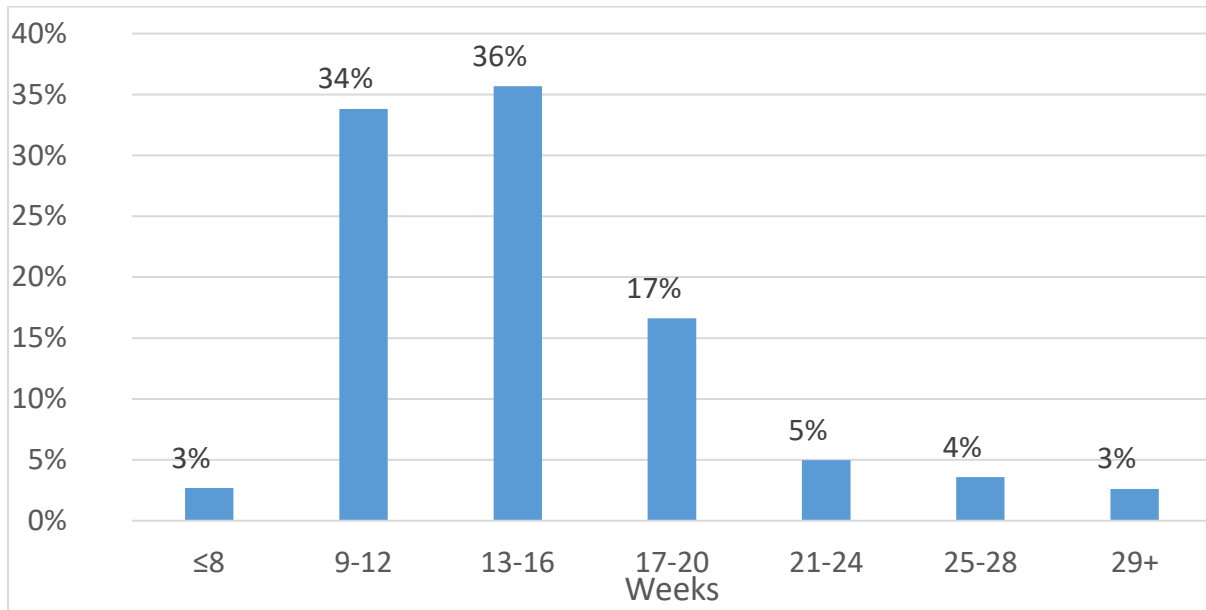
**Figure 66: Merino producers who wean lambs**

Base: n = 1,203



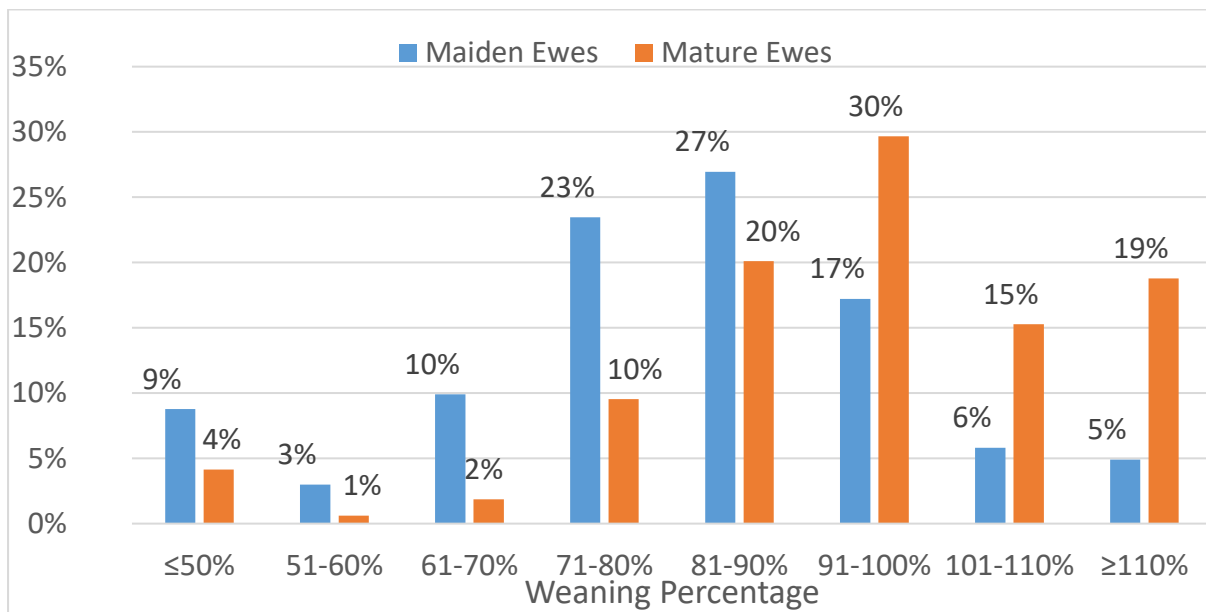
**Figure 67: Average lamb weaning age in weeks**

Base: Merino producers who wean lambs n = 1,147



**Figure 68: Weaning percentage for maiden ewes joined**

Base: Merino producers who wean lambs n = 1,147



### 4.9. Vaccination

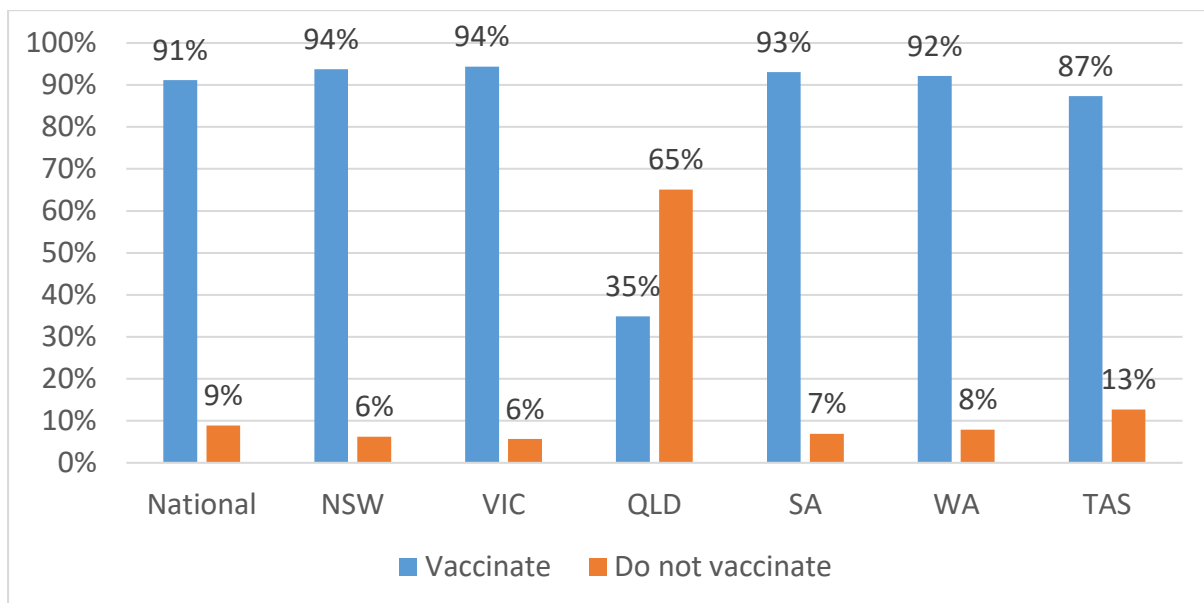
Nationally, an average of 91% of Merino producers vaccinate at least some of their flock. Queensland Merino producers were significantly less likely to vaccinate (35%) (**Figure 69**). Further questioning revealed that on average, 96% of Merino producers’ entire flocks receive at least one vaccination of any type of vaccine.

Nationally, an average of 66% of Merino producers vaccinate pre-lambing, 98% at marking and 74% at weaning (**Figure 70**). Of those who vaccinate pre-lambing, South Australians (77%) are significantly more likely to vaccinate, and Western Australians (44%) are significantly less likely. There were no significant differences at marking. At weaning, the only significant difference was between flock sizes, with flocks of 2,000 head or greater more likely to vaccinate (85%).

Across Australia, 49% of producers vaccinate their flock at all stages (**Figure 71**). Queensland producers were the least likely to vaccinate (65%), while Western Australian producers were more likely than other states to vaccinate at marking and weaning (27%) and at marking only (22%).

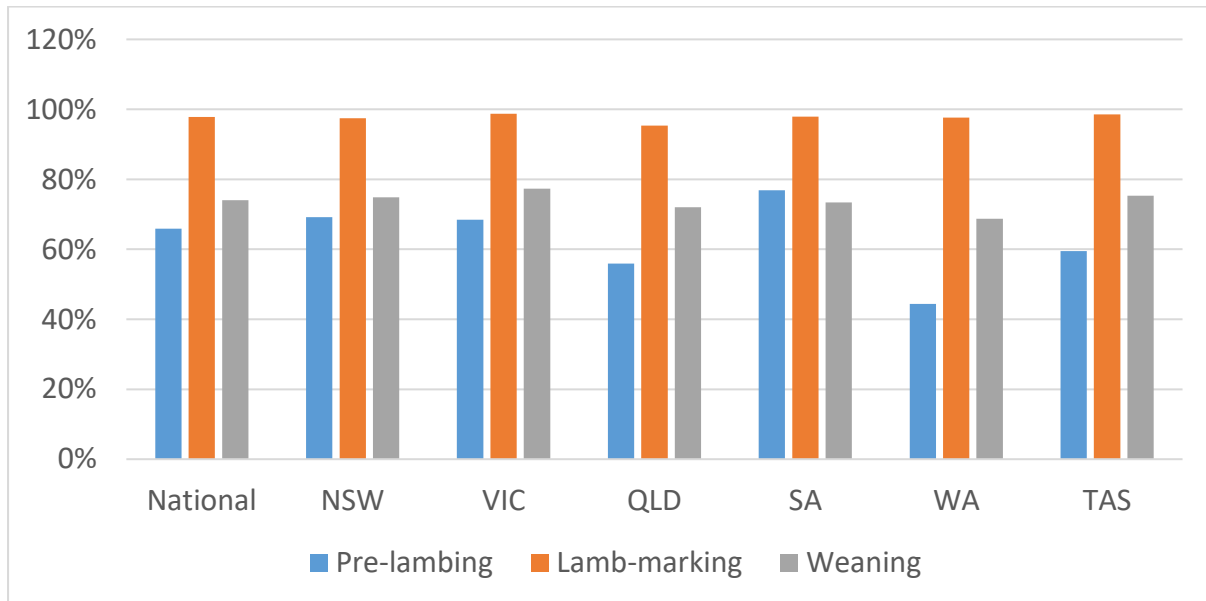
**Figure 69: Merino producers who vaccinate any sheep in flocks**

Base: n = 1,203



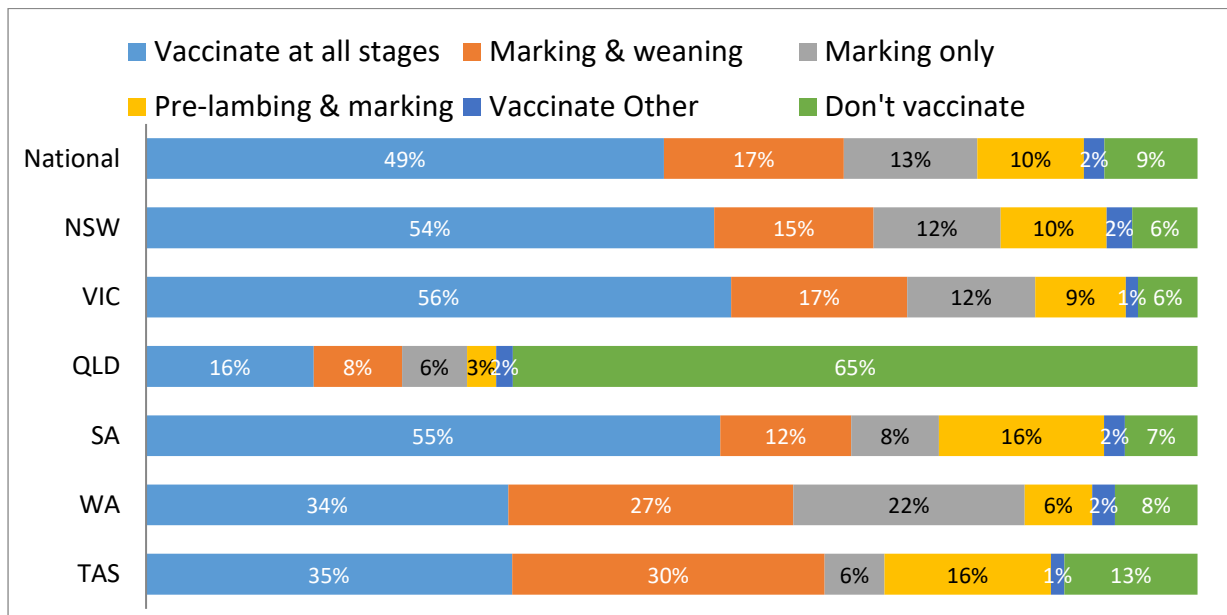
**Figure 70: Vaccination timings**

Base: Merino producers who vaccinate lambs n = 1,101



**Figure 71: Vaccination schedule for producers**

Base: n = 1,203



## 4.10. Drenching

Merino producers drench their mixed age ewes 2.1 times a year on average with slightly over two thirds (68%) of Merino producers drenching mixed age ewes two times or fewer (**Figure 72**). There were significant differences between states, with New South Wales Merino producers more likely to treat three or more times (49%) and South Australian Merino producers more likely to treat two or fewer times (94%), Victorians were more likely to treat three times (27%). Western Australians were more likely to treat once (44%).

Merino producers drench their young ewes 2.2 times a year on average from weaning to joining with slightly over two thirds (65%) of Merino producers drench young ewes two times or fewer (**Figure 73**). There were significant differences between states, with New South Wales Merino producers more likely to treat four or more times (33%) and South Australian Merino producers more likely to treat two or fewer times (86%), Tasmanians were more likely to treat three times (52%). Western Australians were more likely to treat once (32%).

Nationally, an average of 37% of Merino producers conducted a Worm Egg Count in 2021 (**Figure 74**). New South Wales and Victorian Merino producers were significantly more likely to do worm egg counts (48% and 45%, respectively) and Queensland (16%), South Australian (24%), Western Australian (28%) and Tasmanian (16%) Merino producers are less likely to do worm egg counts. Merino producers with flocks 2,000 head and greater were more likely to conduct Worm Egg Counts (55%) than smaller flocks of 100-499 (18%).

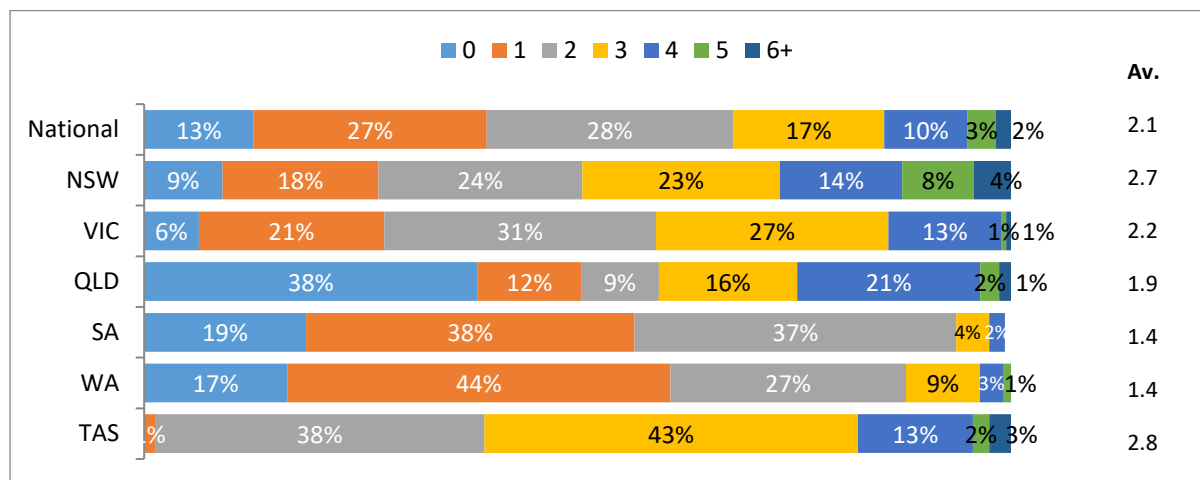
For the 37% of Merino producers testing, the average number of tests for worm egg counts annually tested was 4.3 (**Figure 75**). Nationally, one quarter (25%) of Merino producers perform one worm egg count per year, almost a quarter (22%) perform two and more than half (53%) conduct three or more worm egg counts annually. South Australian Merino producers were more likely to check one or fewer times (45%) when compared to other states.

Nationally, an average of 37% of Merino producers conducted a drench resistance test in 2021 (**Figure 76**). South Australian (28%) Merino producers are less likely to do drench resistance test. Merino producers with larger flocks (2,000 head or more) were significantly more likely than those with moderately sized flocks (500-1,999 head) to test for drench resistance (52% and 28% respectively).

Nationally, more than half of these Merino producers (58%) conducted a drench resistance test every five years or less frequently (**Figure 77**).

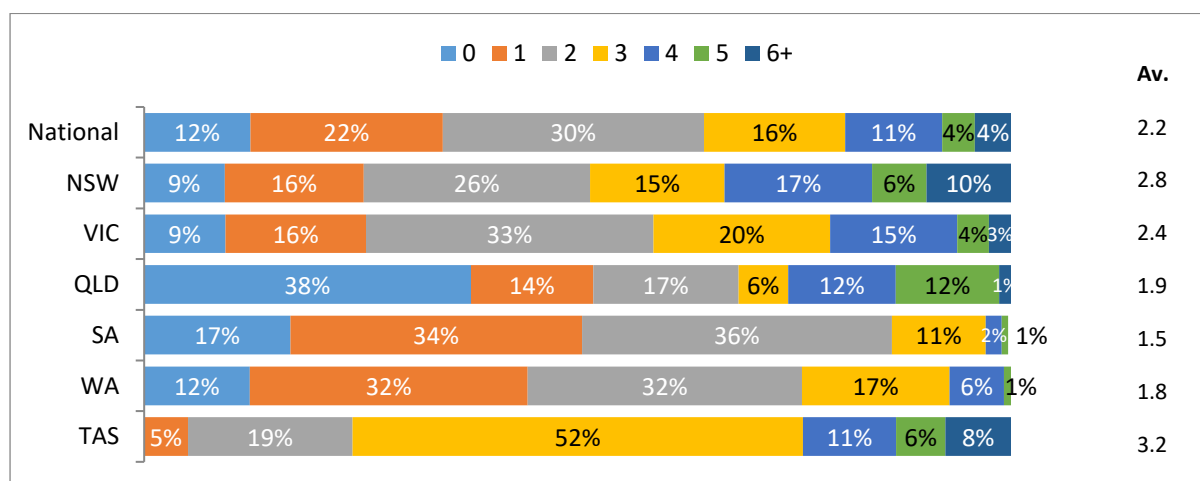
**Figure 72: Number of times mixed age ewes are drenched annually**

Base: n = 1,203



**Figure 73: Number of times young ewes are drenched annually**

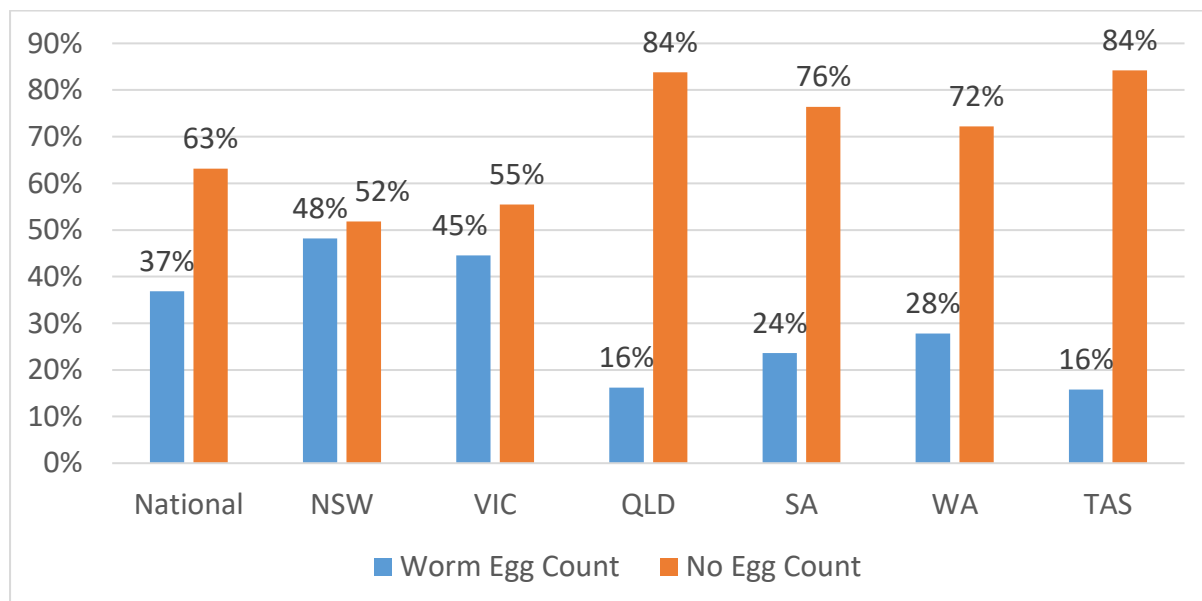
Base: n = 1,203





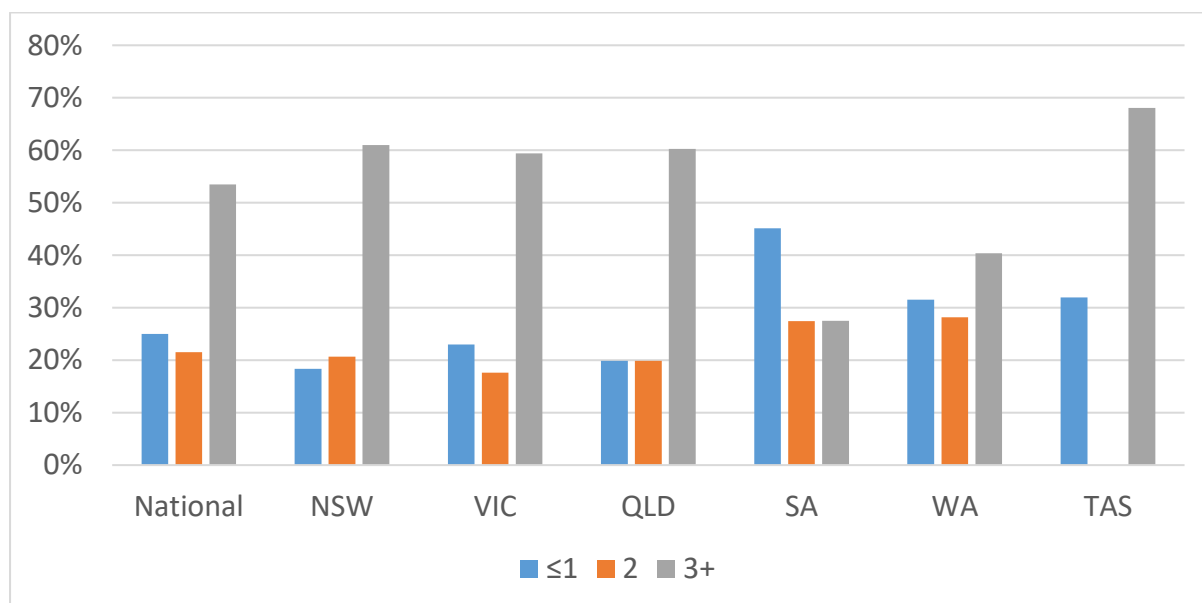
**Figure 74: Worm Egg Counts conducted in 2021**

Base: n = 1,203



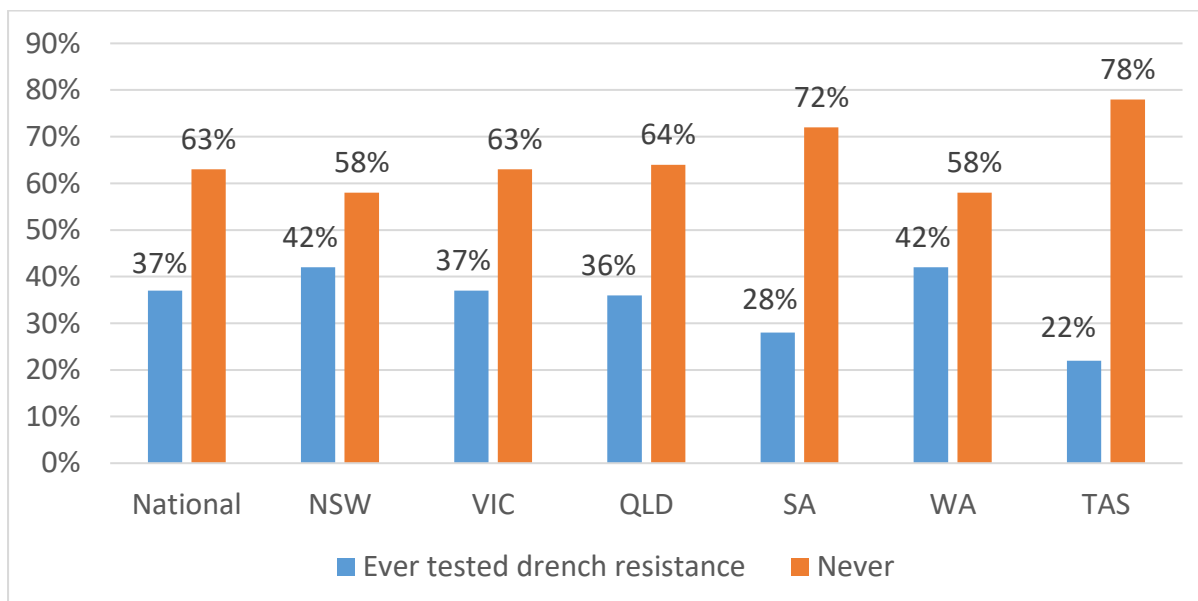
**Figure 75: Annual number of Worm Egg Count tests**

Base: Merino producers who are drenching and conducting WECs n = 509



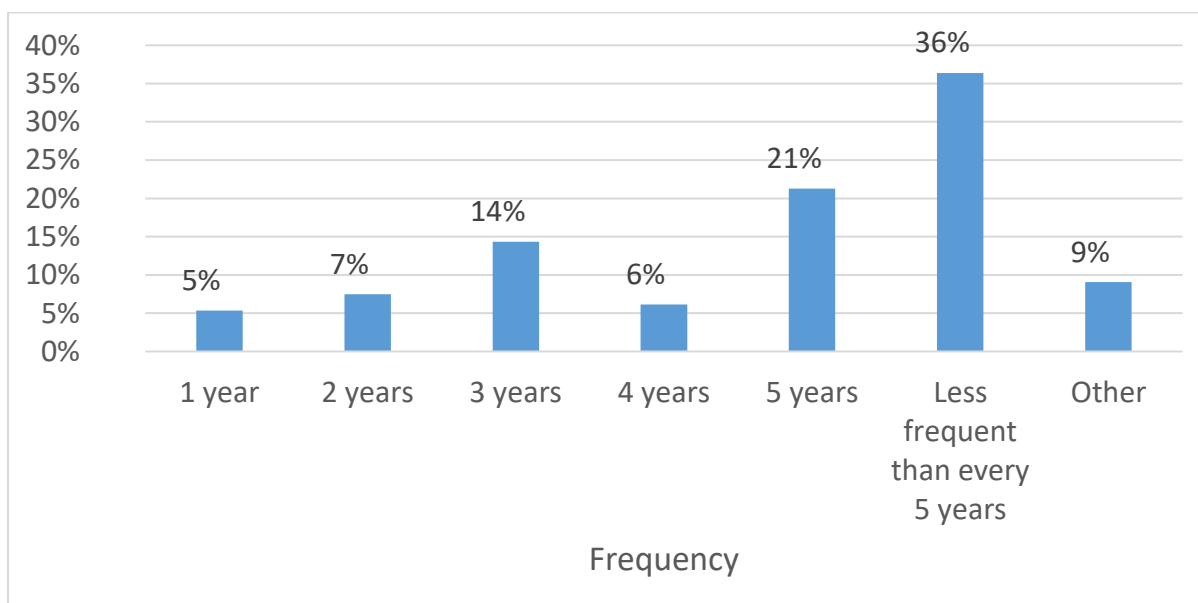
**Figure 76: Drench resistance testing**

Base: n = 1,203



**Figure 77: Frequency of drench resistance tests**

Base: Merino producers who conduct drench resistance testing n = 474



#### 4.10.1. Website awareness

When asked about their awareness of the parasite websites considered, WormBoss has the highest awareness nationally (64%). Across all websites, around one third (32%) of Merino producers had not heard of any of them (**Figure 78**). Western Australian Merino producers were significantly more likely than those in other states to have not heard of any of the websites (44%). Merino producers with flocks 2,000 head and greater were more likely to have heard of all websites (an average of 62%, with WormBoss the most well-known at 73% awareness).

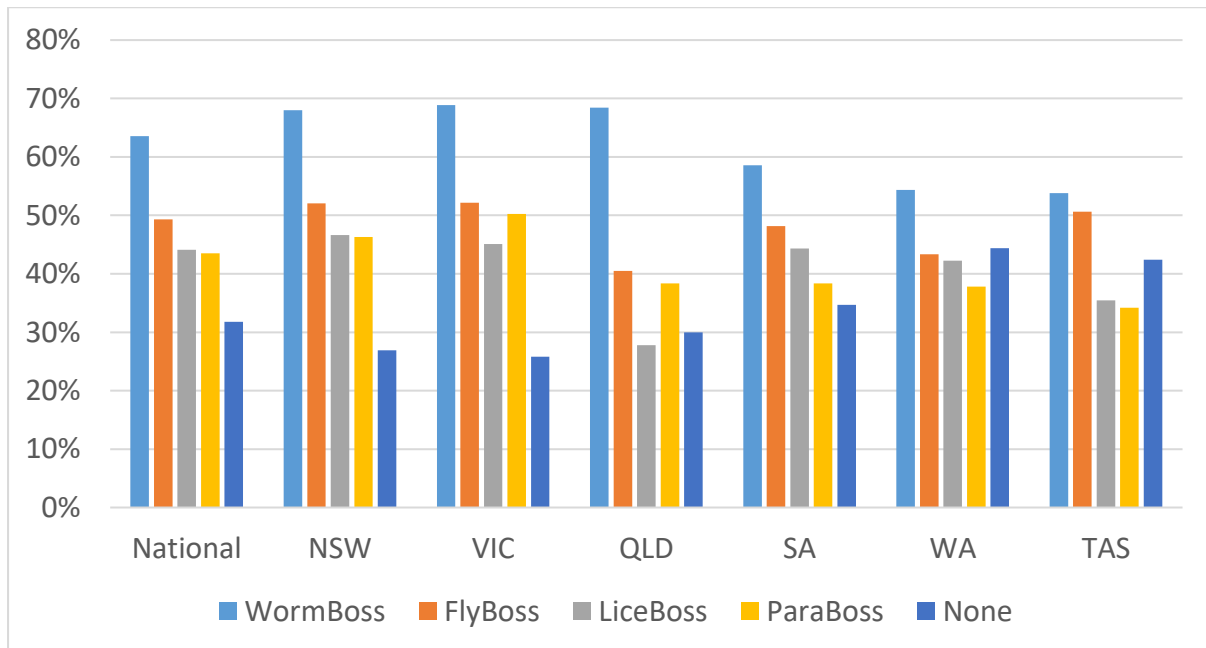
Where Merino producers were aware of one or more of the Boss websites, WormBoss was the most commonly visited (53%), followed by ParaBoss (31%), FlyBoss (36%), and LiceBoss (31%) (Figure 79). Merino producers in Western Australia were significantly more likely to have accessed LiceBoss than those in other states (46%). New South Wales Merino producers were less likely to not have accessed any of the Boss websites (30%). Merino producers with flocks 2,000 head and greater were more likely to have accessed all websites (an average of 52%, with WormBoss the most well-known at 63% awareness).

On average, Merino producers visited WormBoss 2.2 times, LiceBoss 1.2 times, and FlyBoss 1.5 times in 2021 (Figure 80).

There has been significant call to action from visiting the Boss websites. Merino producers who had used one of the websites had used the information to make decisions and change their practices in 52% of cases, with 35% saying they have used the information to plan but have not yet implemented their knowledge and 13% saying they have not used the information at all (Figure 81).

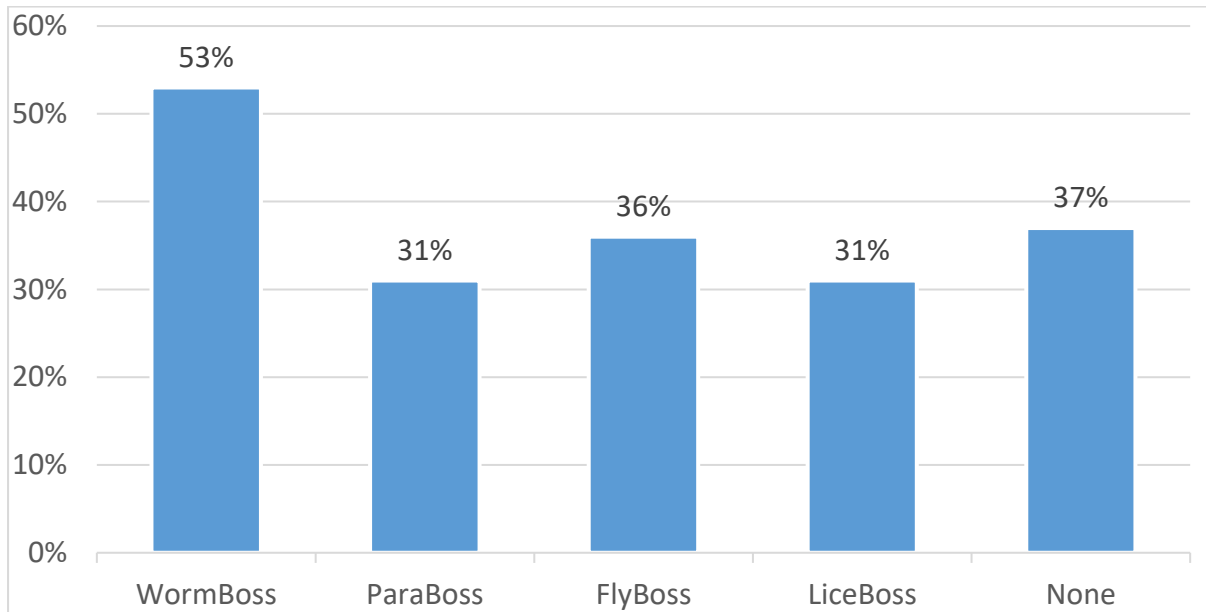
**Figure 78: Awareness of the Boss websites**

Base: n = 1,203



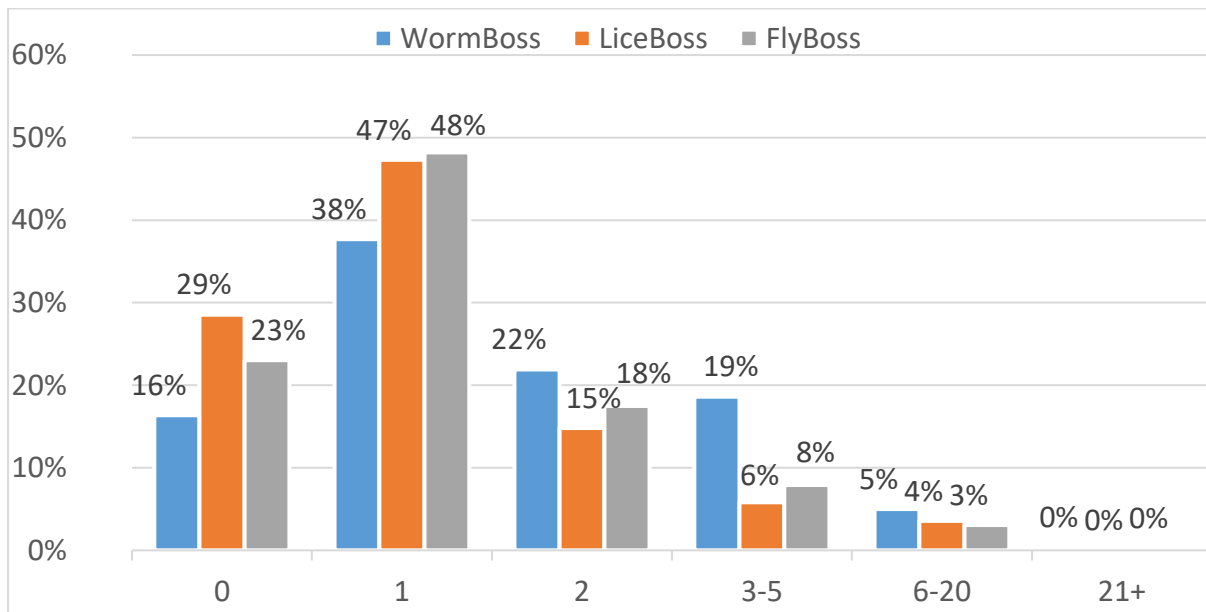
**Figure 79: Visitation of Boss websites**

Base: Merino producers who were aware of one or more Boss websites n = 856



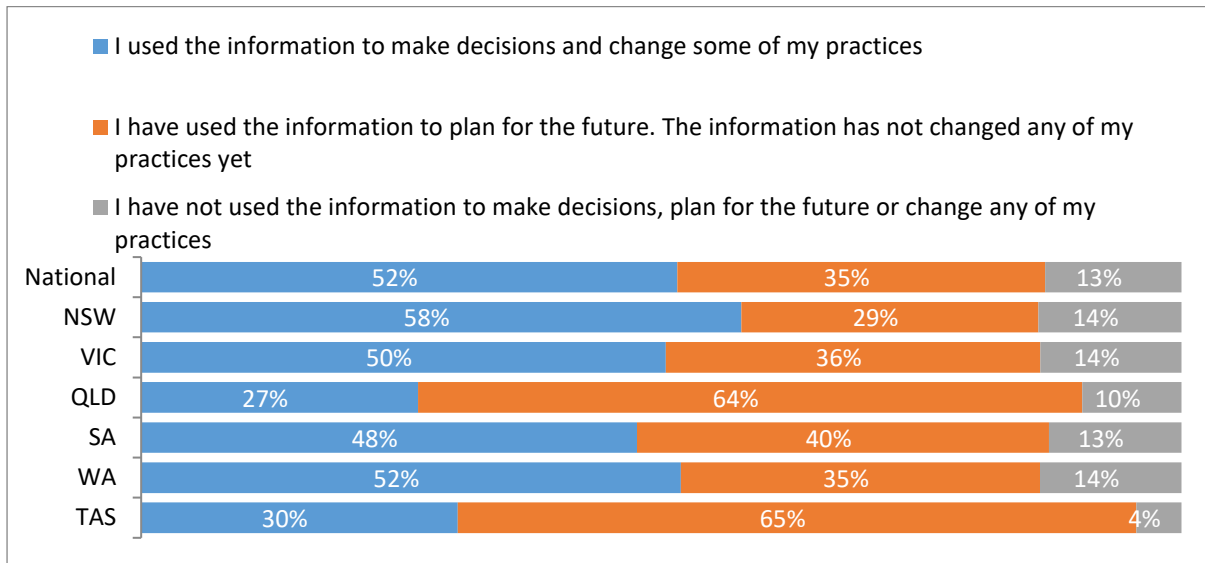
**Figure 80: Frequency of website visits**

Base: Merino producers who visited one or more Boss websites n = 460



**Figure 81: Action from visiting the Boss websites**

Base: Merino producers who were aware of and visited at least one Boss website n = 531



### 4.11. Mortality and euthanasia

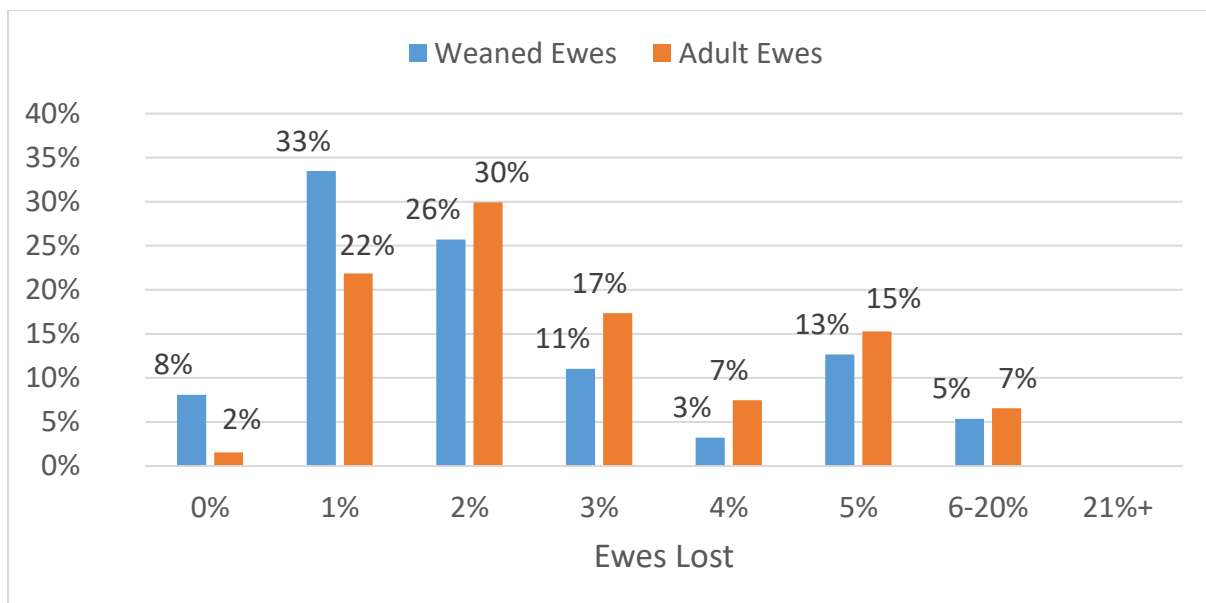
Nationally, the average weaned ewe mortality rate before joining was 2.7% with the adult ewe mortality rate at 3.0%. Slightly over two thirds of Merino producers (67%) lost 2% of fewer weaned ewes before joining (**Figure 82**). Queensland Merino producers were significantly more likely to have lost 21% or more of weaned ewes (9%). Merino producers were most likely to state they had adult ewe mortality of 2% or less (54%). Queensland Merino producers were significantly more likely to have lost 6-20% or more of weaned ewes (31%).

Nationally, the majority (86%) of Merino producers have at least heard of the Australian Animal Welfare Standards and Guidelines for sheep and almost two thirds (57%) have read them. 14% of Merino producers had not heard of them (**Figure 83**).

Of Merino producers who are aware of the broader Australian Animal Welfare Standards and Guidelines for Sheep, a majority (58%) are aware of and have read the specific standards and guidelines for the Humane Killing of Sheep. 11% were not aware of them (**Figure 84**).

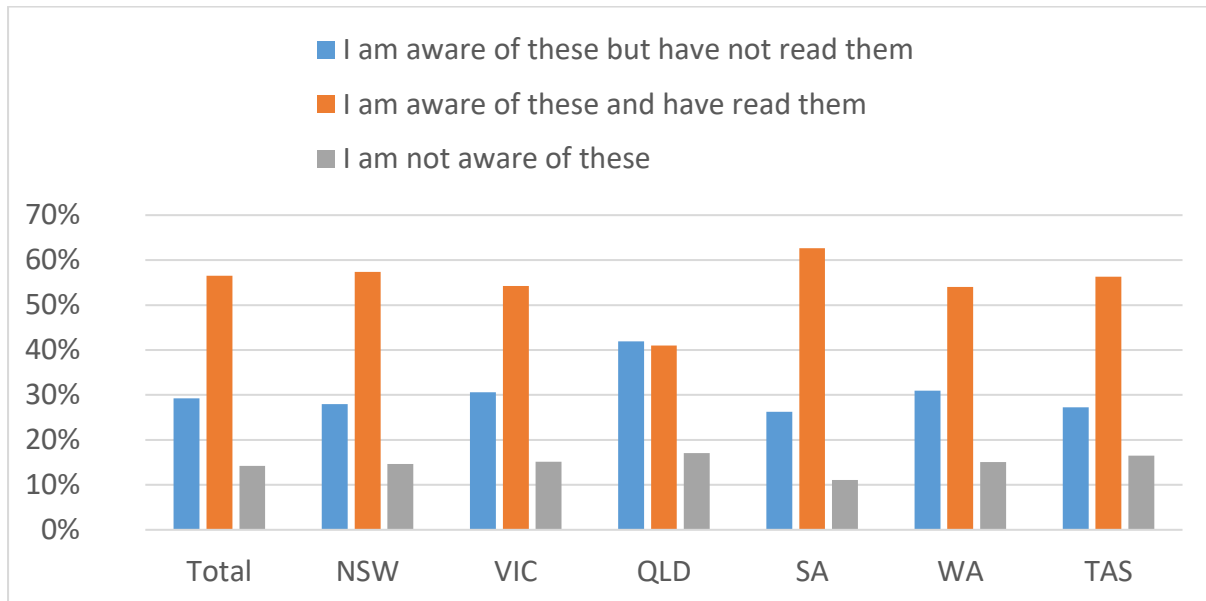
**Figure 82: Mortality of weaned ewes and adult ewes**

Base: All Merino producers n = 1,203



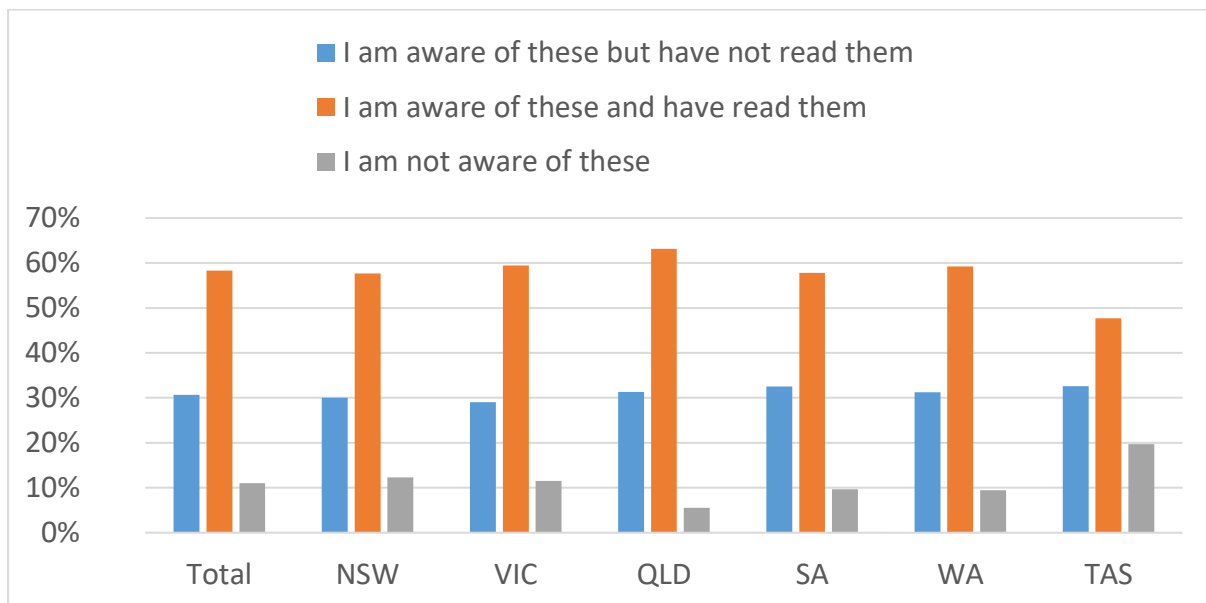
**Figure 83: Awareness of the Australian Animal Welfare Standards and Guidelines for Sheep**

Base: n = 1,203



**Figure 84: Humane killing of sheep guideline awareness**

Base: Merino producers who are aware of the animal welfare standards for sheep n = 1,042



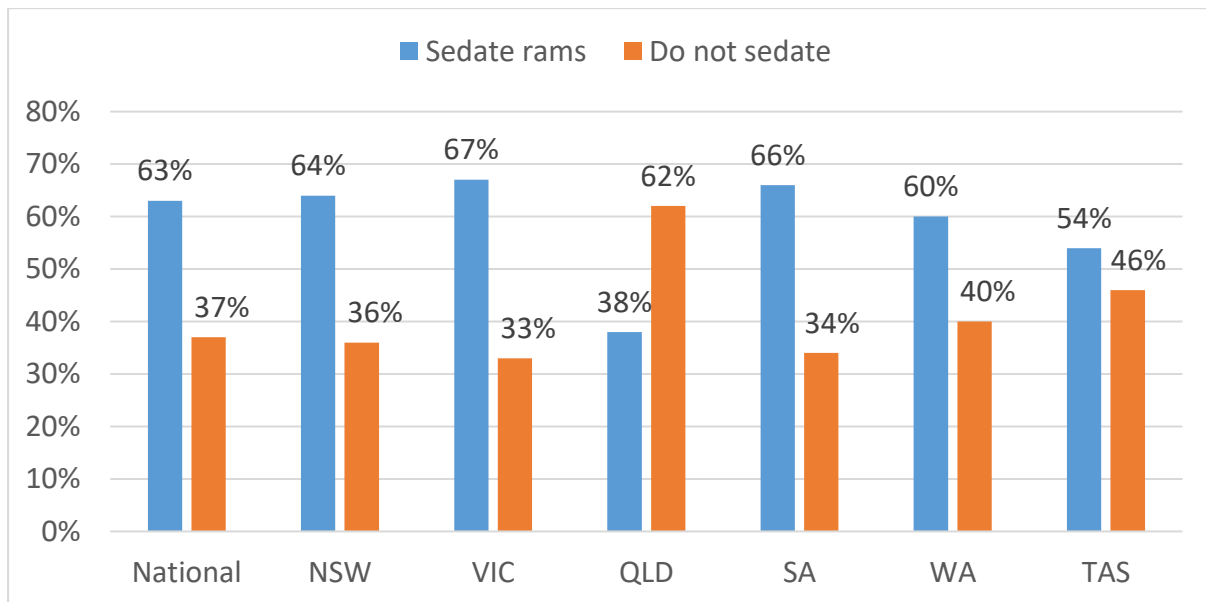
### 4.12. Shearing and flystrike

Nationally, two thirds of Merino producers (63%) sedate their rams for shearing (**Figure 85**). Queensland Merino producers were less likely to sedate rams for shearing compared to other states (38%). Merino producers with flocks less than or equal to 250 head were less likely to sedate rams (41%) compared to larger flock sizes (81% of Merino producers with 2,000 or more head).

Nationally, very few (4%) Merino producers have ever conducted a fly chemical resistance test (**Figure 86**). Merino producers with 2,000 or more head were significantly more likely to have conducted a chemical resistance test than Merino producers with smaller farms of less than or equal to 250 head (9% and 1% respectively).

**Figure 85: Ram sedation for shearing by state**

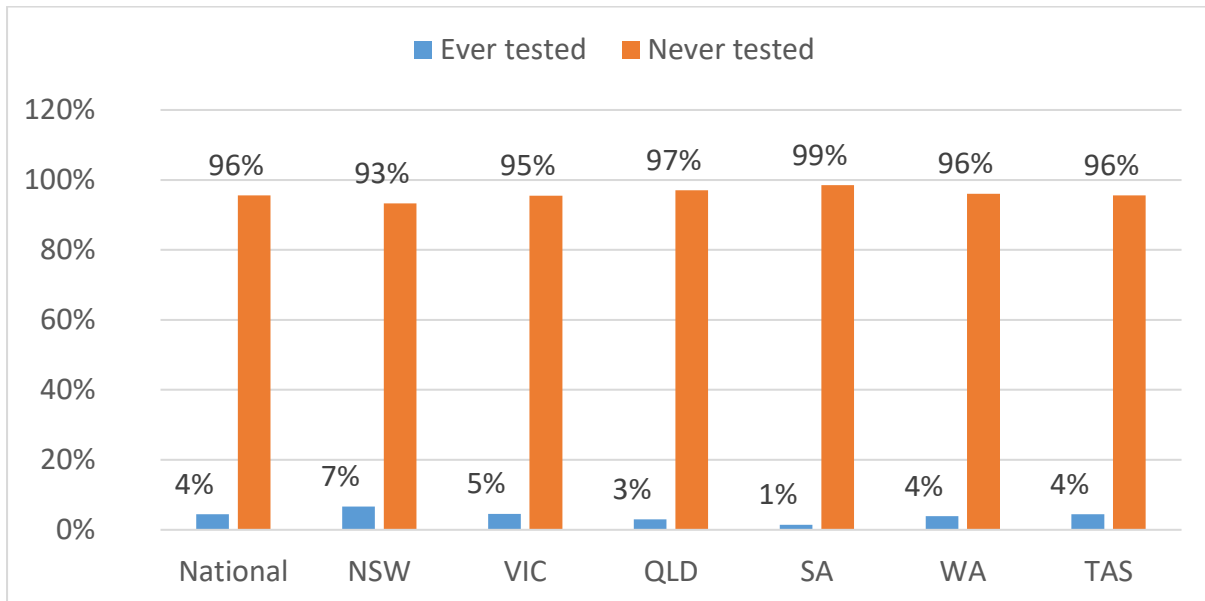
Base: Merino producers who shear rams n = 1,123





**Figure 86: Fly chemical resistance test by state**

Base: n = 1,203



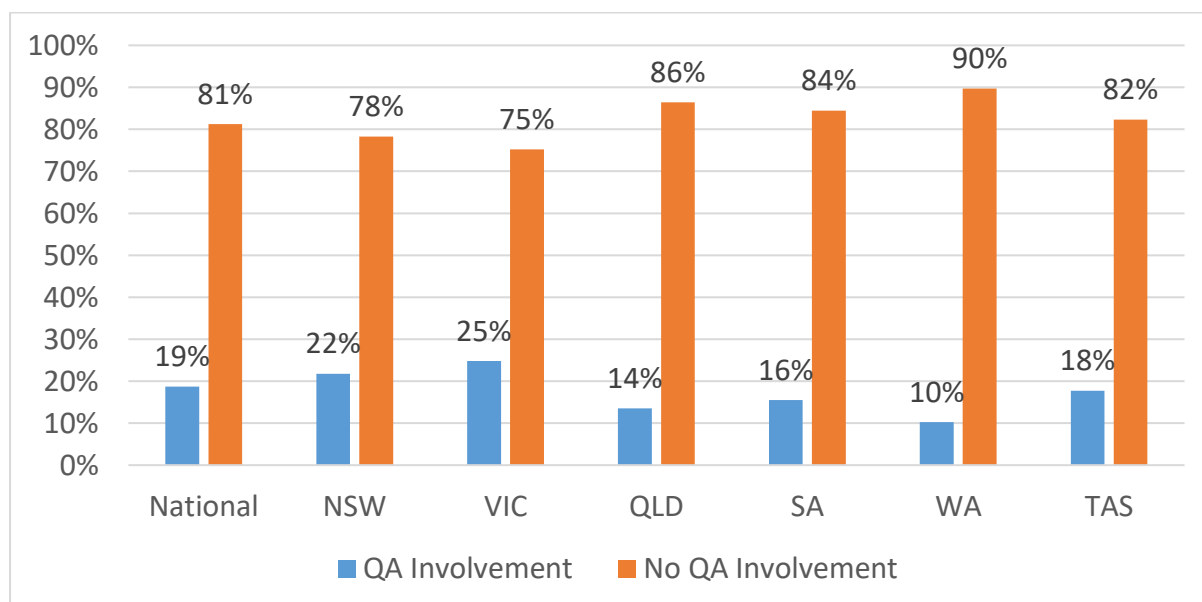
### 4.13. Wool quality assurance

Nationally, nearly one fifth of Merino producers are involved in wool quality assurance schemes (19%) (**Figure 87**). Victorian Merino producers were significantly more likely to be involved in schemes (25%) while Western Australian Merino producers were less likely to (10%).

Nationally, more than one third (37%) of Merino producers who use a QA scheme are involved in SustainaWOOL (**Figure 88**). Western Australian Merino 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%).

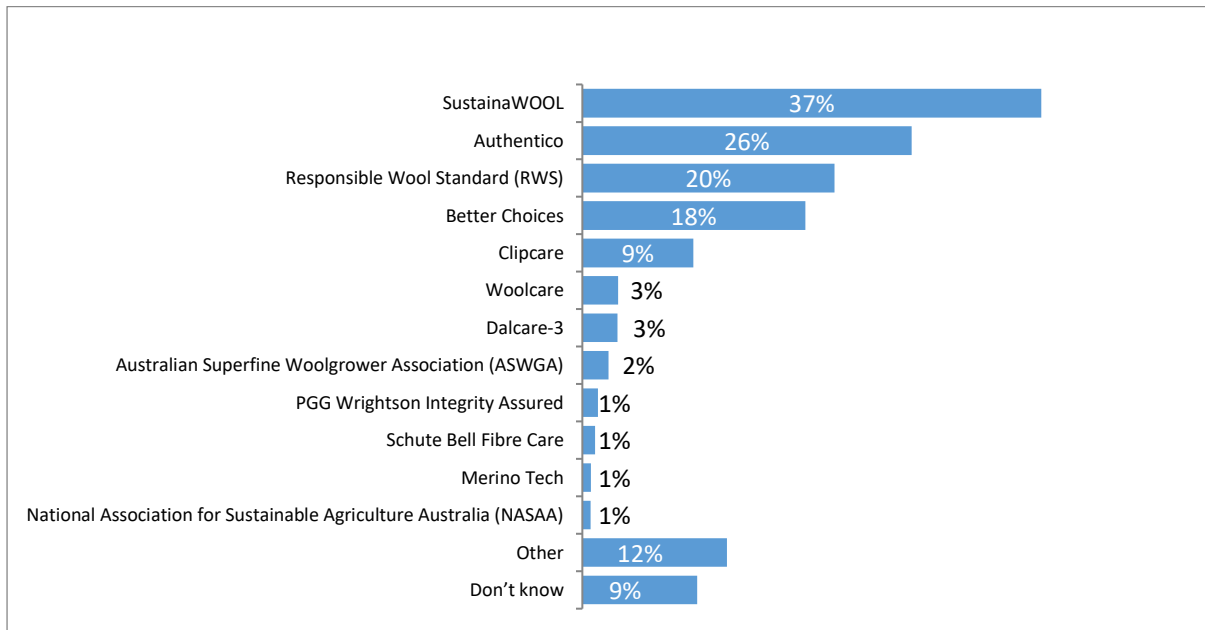
**Figure 87: Wool Quality Assurance Scheme Involvement**

Base: Merino producers n = 1,203



**Figure 88: Quality assurance schemes Merino producers are involved in**

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



## 4.14. Predators and pests

### 4.14.1. Predators

Around 4 out of 5 Merino producers nationally have a problem with predators (**Figure 89**). This level was consistent across states except for Tasmania where only 16% of Merino producers had a problem. Annual losses nationally were 36 head on average and were significantly lower in South Australia (23.4 head).

Most significant predators vary significantly by state (**Figure 90**). Queensland Merino producers were more likely to report issues with wild dogs (64%). Pigs were most likely to be problematic in Queensland and New South Wales (39% and 24%, respectively). Birds were a common problem in Tasmania and South Australia (98% and 63% respectively).

The most common method of wild dog control nationally is poison or bait (61%) (**Figure 91**). Queensland Merino producers were significantly more likely to use traps (93%) when compared to other states.

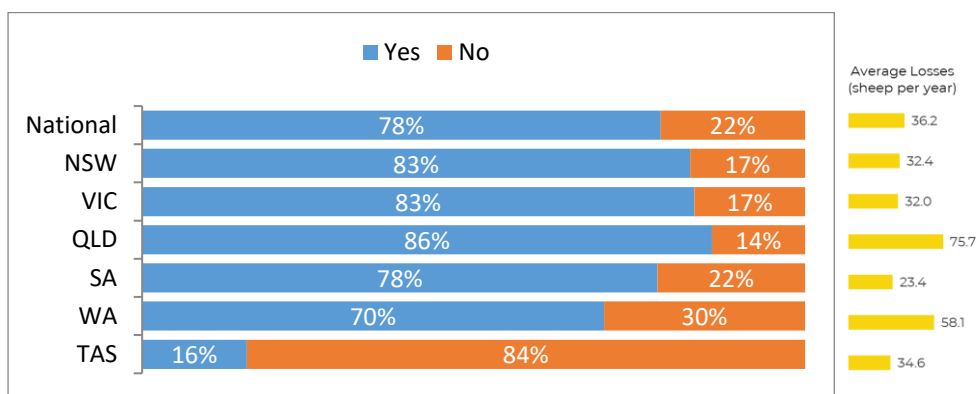
Merino producers most commonly control pigs by shooting them (86%). Traps (57%) and poison or bait (39%) are also popular (**Figure 92**). South Australian Merino producers were significantly less likely to control pigs than other states (51%).

Shooting foxes is the most common control method used (72% nationally) (**Figure 93**). There are significant differences between states with poison significantly more likely to be used in New South Wales (77%). Western Australian Merino producers are more likely to shoot (86%), and Queensland Merino producers more likely to use fences (30%).

Most Merino producers do not control birds (82% nationally) (**Figure 94**). New South Wales Merino producers were significantly less likely than other states to not control birds (70%).

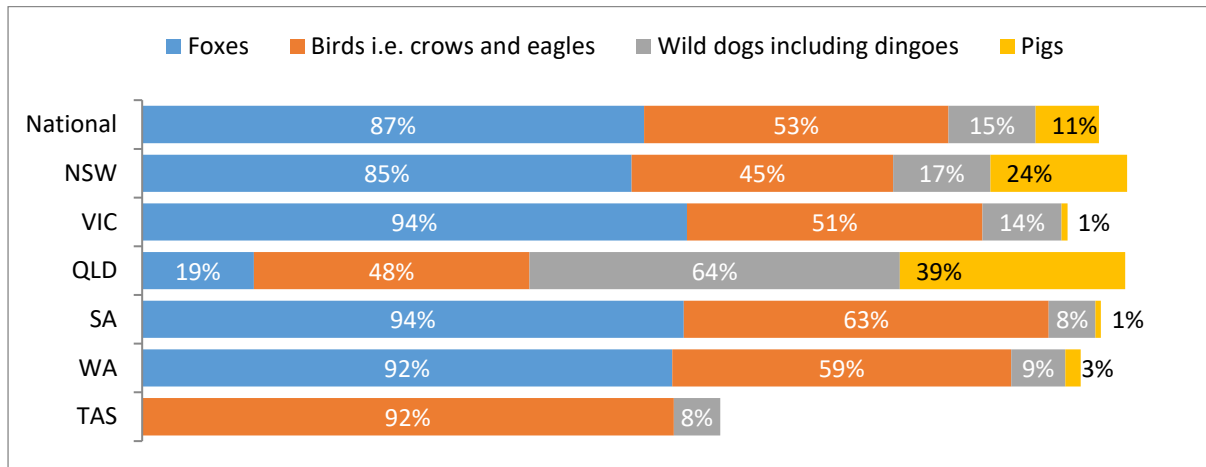
**Figure 89: Problems with predators**

Base: n = 1,203



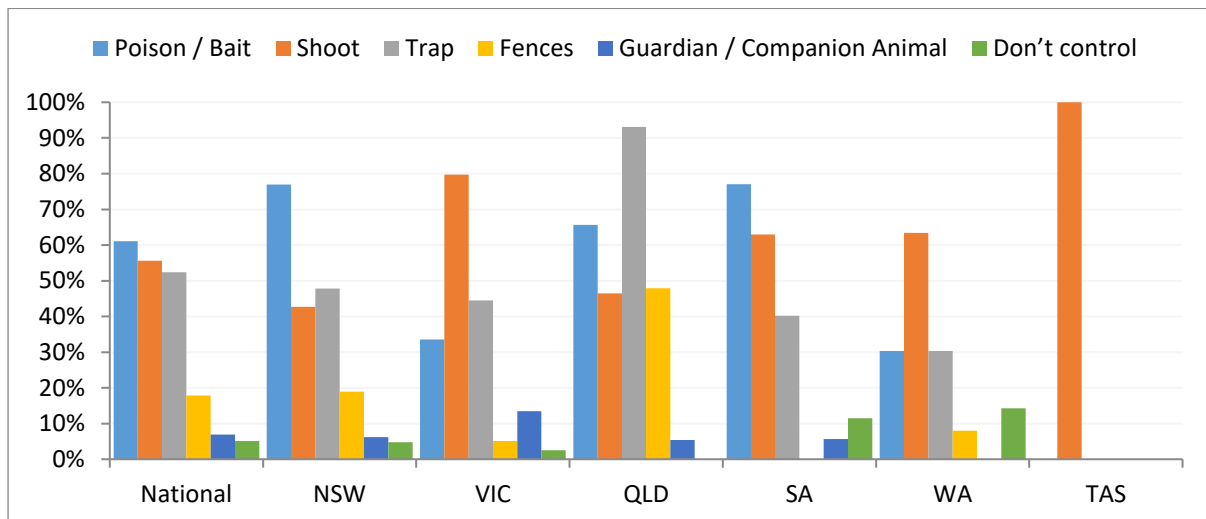
**Figure 90: Most relevant predators by state**

Base: Merino producers who reported problems with predators n = 952



**Figure 91: Wild dog control by state**

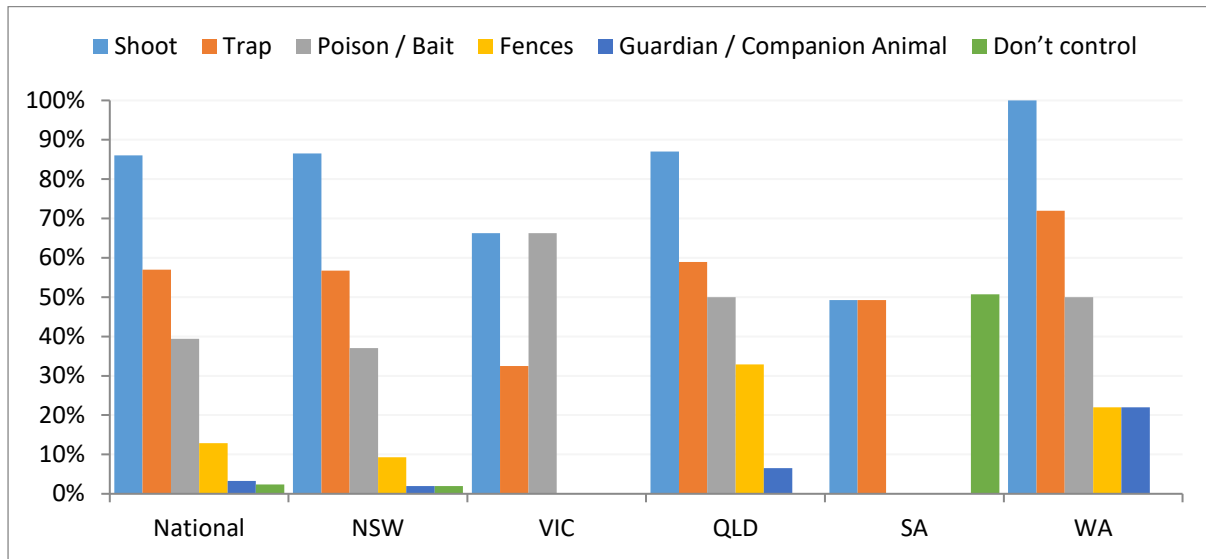
Base: Merino producers who reported problems with wild dogs n = 140



NB. South Australia, Western Australia and Tasmania had fewer than 20 respondents each

**Figure 92: Pig control by state**

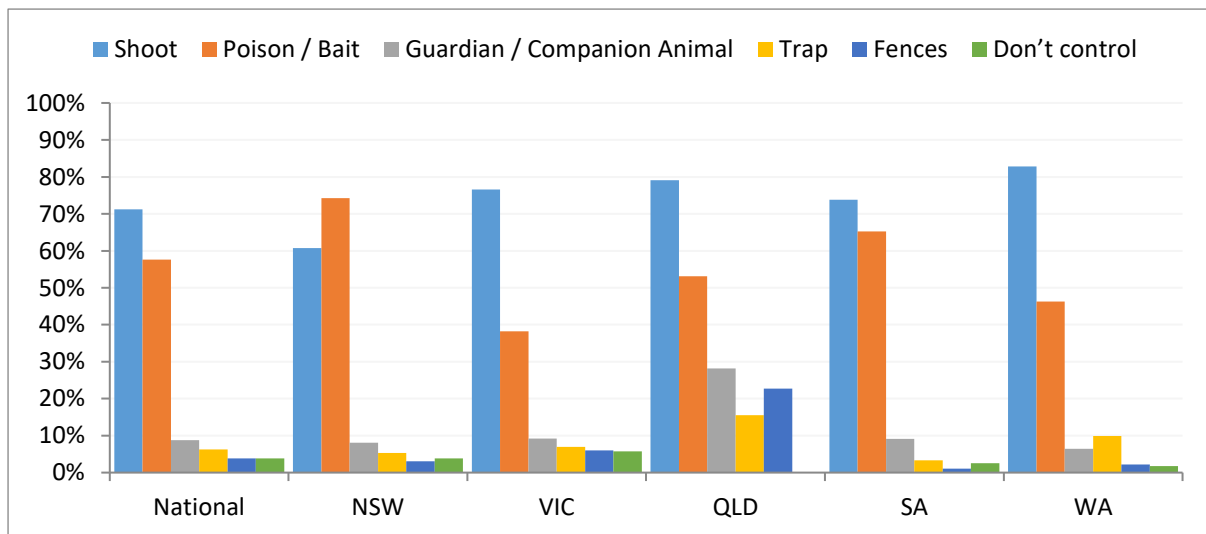
Base: n = 122



N.B. The data shown for Victoria, South Australia and Western Australia each come from fewer than five Merino producers.

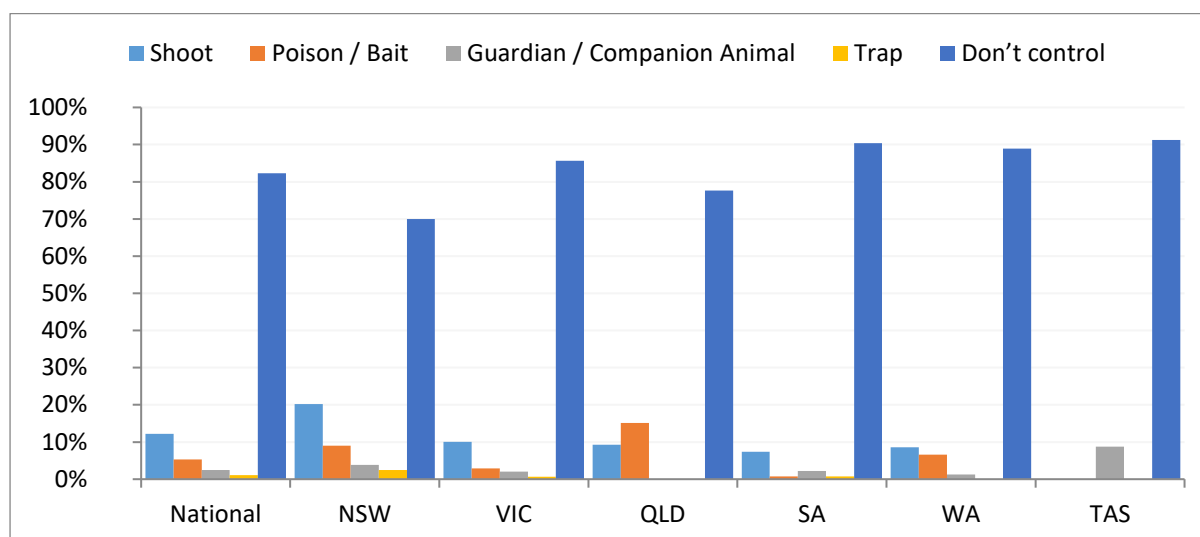
**Figure 93: Fox control by state**

Base: Merino producers who reported problems with foxes n = 1385



**Figure 94: Bird control by state**

Base: Merino producers who reported problems with birds n = 516



#### 4.14.2. Management strategies

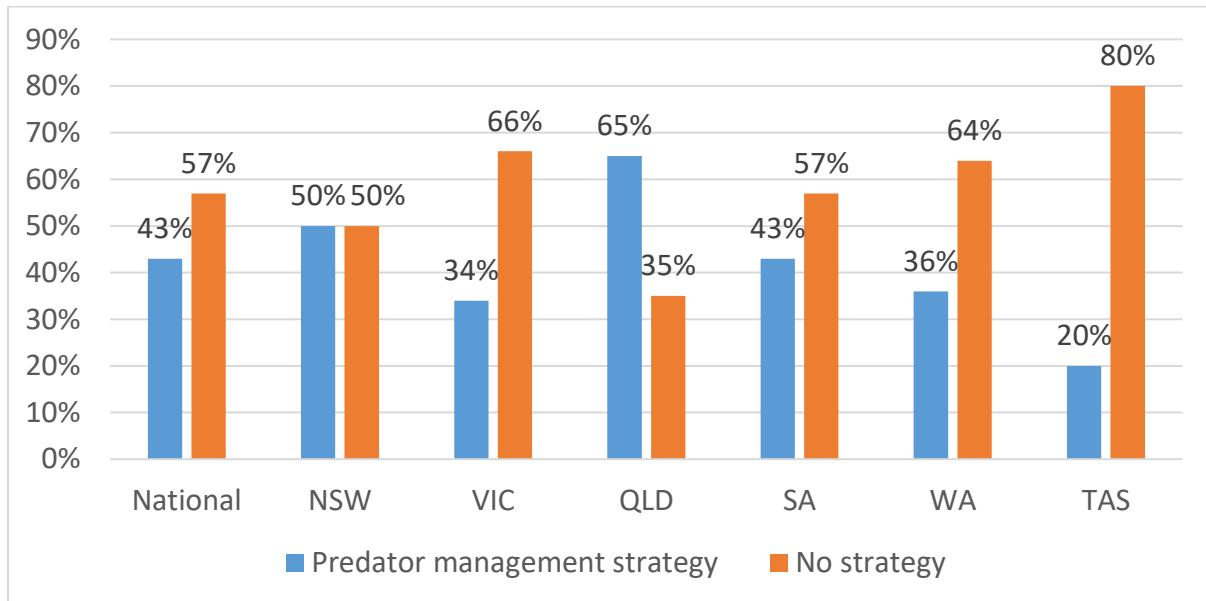
Almost half of Merino producers nationally have a predator management strategy for their properties (43%) (**Figure 95**). Merino producers with 2,000 or more head were significantly more likely to have a predator management strategy than to not have one (54% compared to 46%).

More than half of Merino producers nationally have a predator management strategy for just their properties (53%) with the balance having a strategy just for their property (**Figure 96**). Of those with a strategy (either also or collaboratively), the majority have acted on it (72%) (**Figure 97**).

One quarter of Merino producers nationally have an insect management strategy (26%) (**Figure 98**). Merino producers with 2,000 or more sheep were more likely than Merino producers with other flock sizes to have an insect management plan (37%).

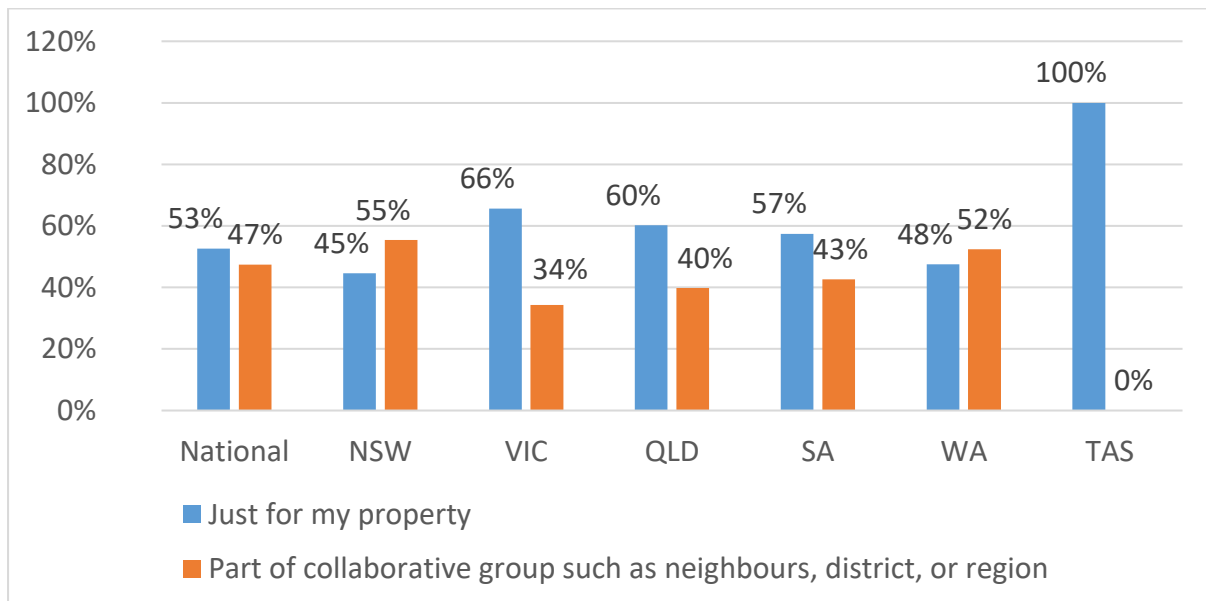
**Figure 95: Property predatory management strategy**

Base: Merino producers who reported problems with predators n = 952



**Figure 96: Collaborative or property only predator management**

Base: Merino producers who reported problems with predators and had a predator strategy n = 433

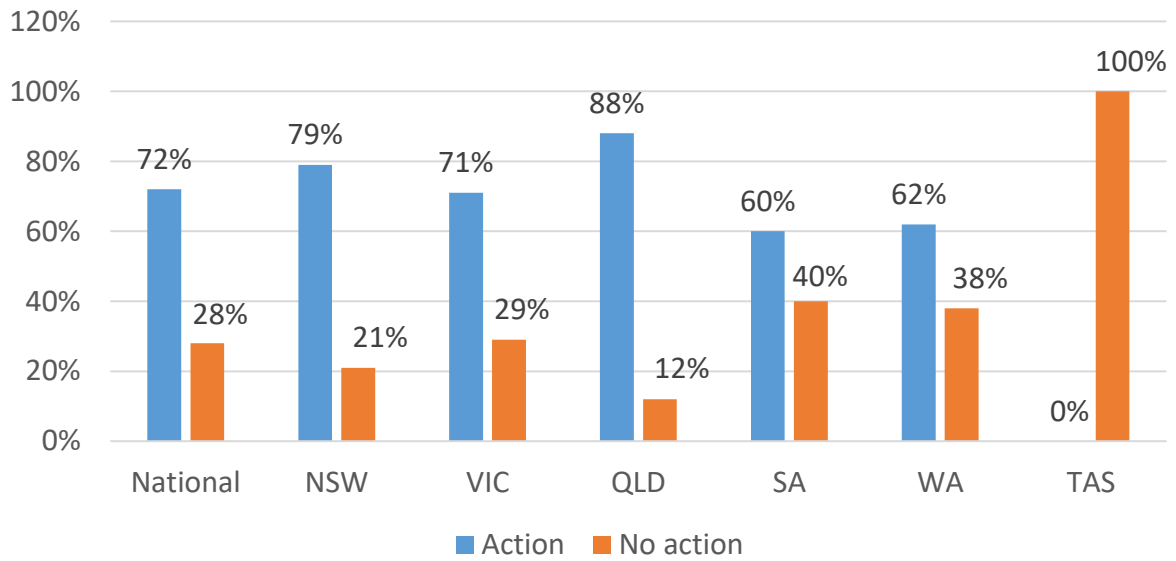


NB. Tasmania had few respondents (n=2)



**Figure 97: Action taken on predator management strategies**

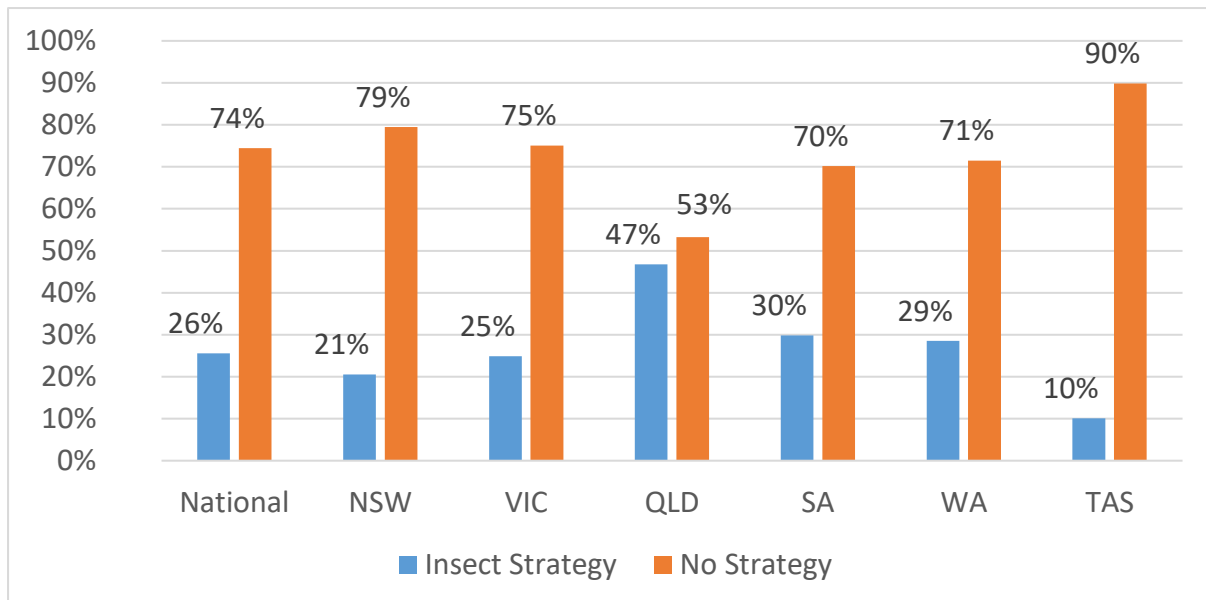
Base: Merino producers who reported problems with predators and a predator strategy n = 433



NB. Tasmania had few respondents (n=2)

**Figure 98: Insect management plans on farm**

Base: n = 1,203



### 4.15. Renewable energy

Around half (52%) of Merino producers generate and use renewable energy (**Figure 99**). A further 11% of Merino producers stated that they use renewable energy bought from their energy retailer with 40% not generating or buying any renewable energy. Tasmanian Merino producers were significantly more likely to use renewable energy from a retailer (40%) than other states. Merino producers were allowed to select multiple responses and may do a combination of the responses across their business.

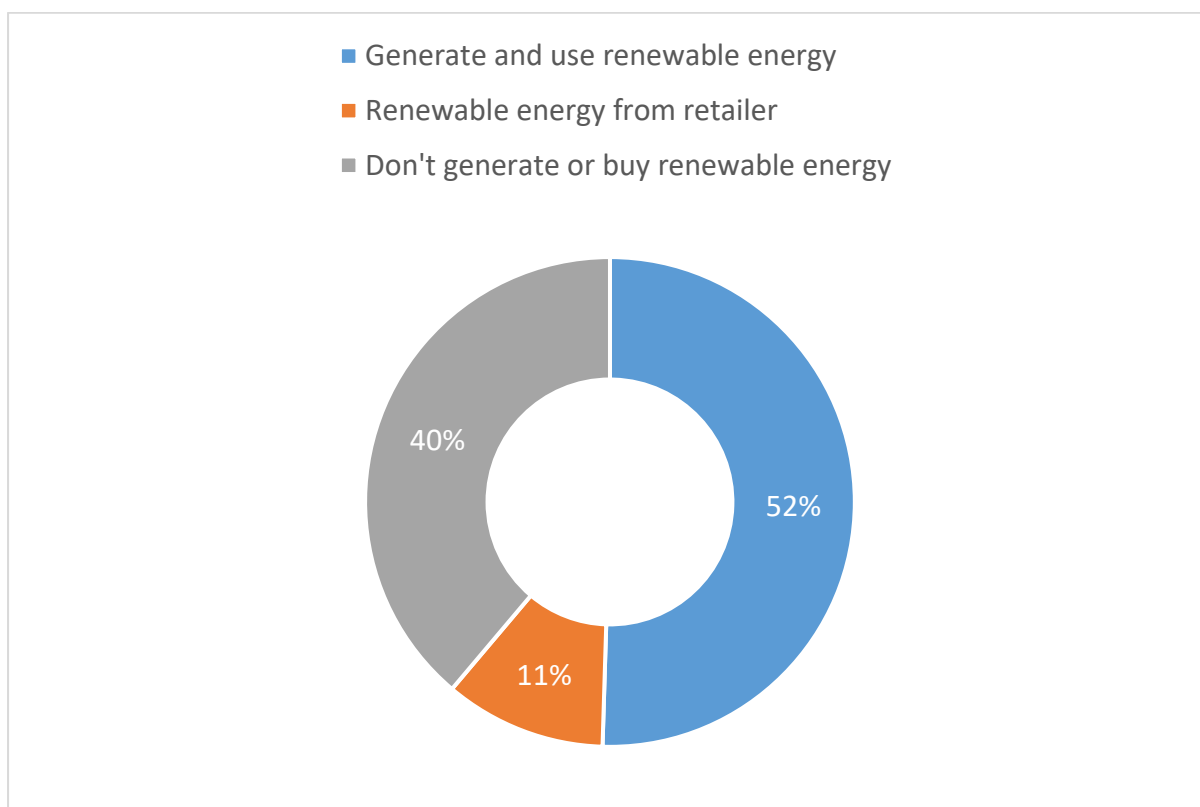
Where Merino producers who generate their own renewable energy, the majority (88%) have solar without batteries. Slightly under a fifth (16%) generated solar with a battery. (**Figure 100**).

Merino producers interviewed had generally not taken carbon accounting training study (90%) and did not measure their emissions (96%), however 24% did implement carbons emissions measures. Victorian Merino producers were significantly more likely to implement activities to reduce greenhouse gases (34%).

Merino producers who did conduct emission reduction activities often selected more than one measure (**Figure 101**). Almost two thirds of Merino producers (63%) used carbon storage methods, but pasture management was also a popular technique (60%). Notably, Queensland Merino producers used savanna burning management systems significantly more often than other states (56% compared to the national average of 3%).

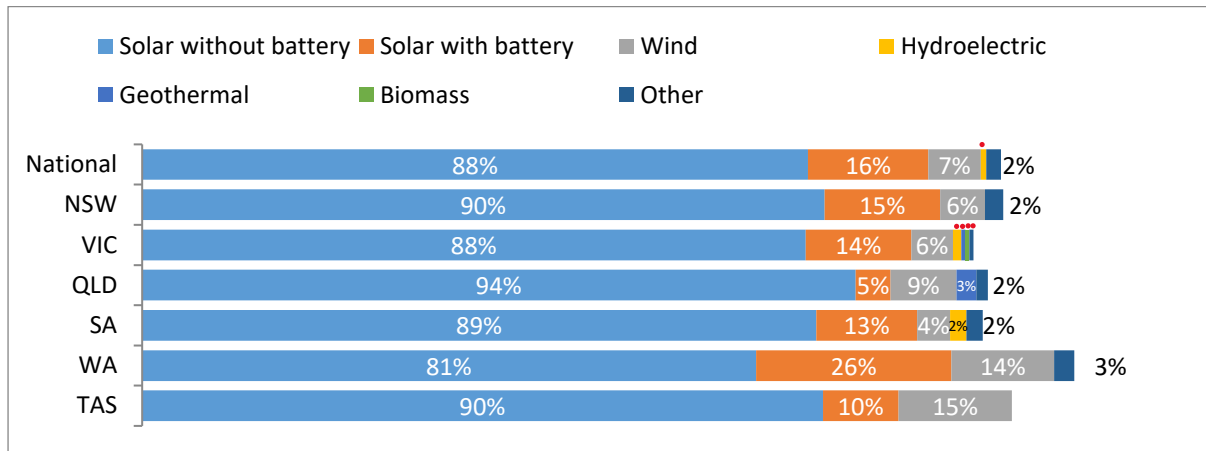
**Figure 99: Renewable energy generation and use**

Base: All Merino producers n = 1,203



**Figure 100: Renewable energy generation methods**

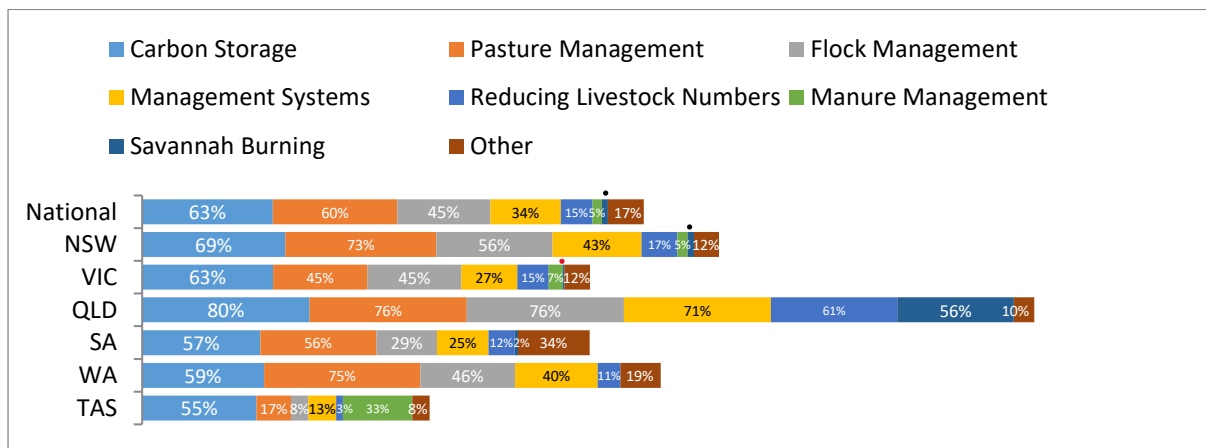
Base: Merino producers who generate their own renewable energy n = 613



• = 1%

**Figure 101: Implementation of emissions reduction measures**

Base: Merino producers who implement emissions reduction measures n = 278



NB. Small sample size for Queensland (n=10) •

• = 3% = 1%

**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		Addition of urease inhibitors	
Manure, plant debris and compost application	Grass species	Reducing proportion of unproductive animals	Improved rates of liveweight gain			
Planting of permanent pastures	Legumes					
	Perennial pastures					

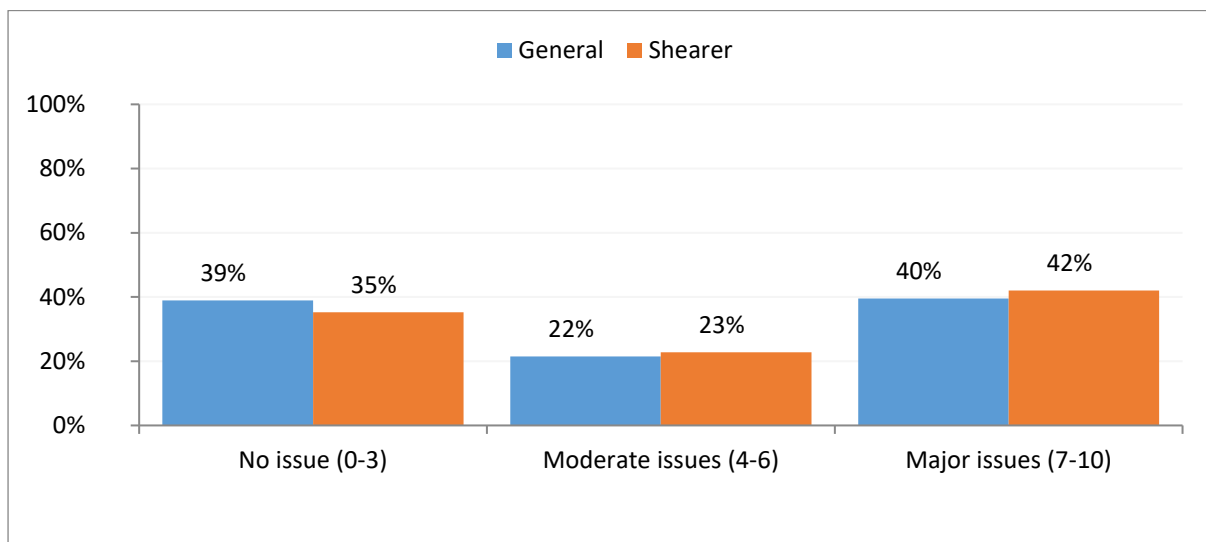
### 4.16. On-farm issues and succession

Over one third (39%) of Merino producers report no issues with general labour availability, and 35% report no issues with shearer availability (**Figure 102**). Slightly less than one quarter of Merino producers reported moderate difficulties with both general labour (22%) and shearers (23%). Major issues were reported by 40% of Merino producers for general labour availability and 42% for shearer availability. For shearers and general labour, the average availability issue rating given by Merino producers was 6 and 5 respectively, out of 10.

The stage in succession planning is split fairly evenly across Merino producers, with almost a quarter nationally (25%) not having started this process yet (**Figure 103**). 30% had discussed succession with their family and not yet reached an outcome, with an additional 22% having discussed and agreed on an outcome. 25% of Merino producers reported having a formal succession plan in place.

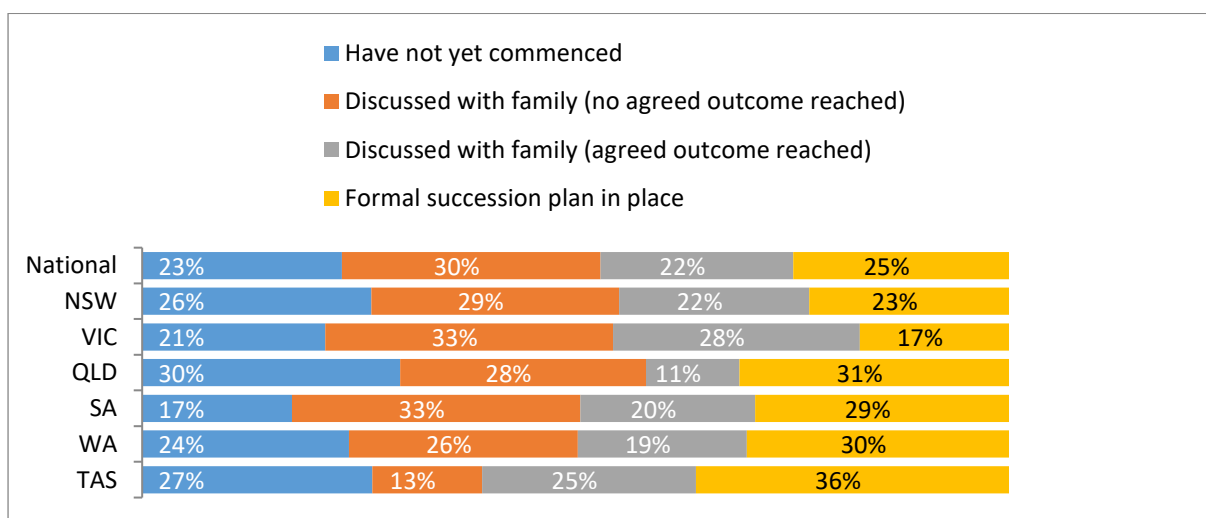
**Figure 102: Labour availability issues**

Base: n = 1,203



**Figure 103: Succession planning by state**

Base: n = 1,203



### 4.17. Training and WHS

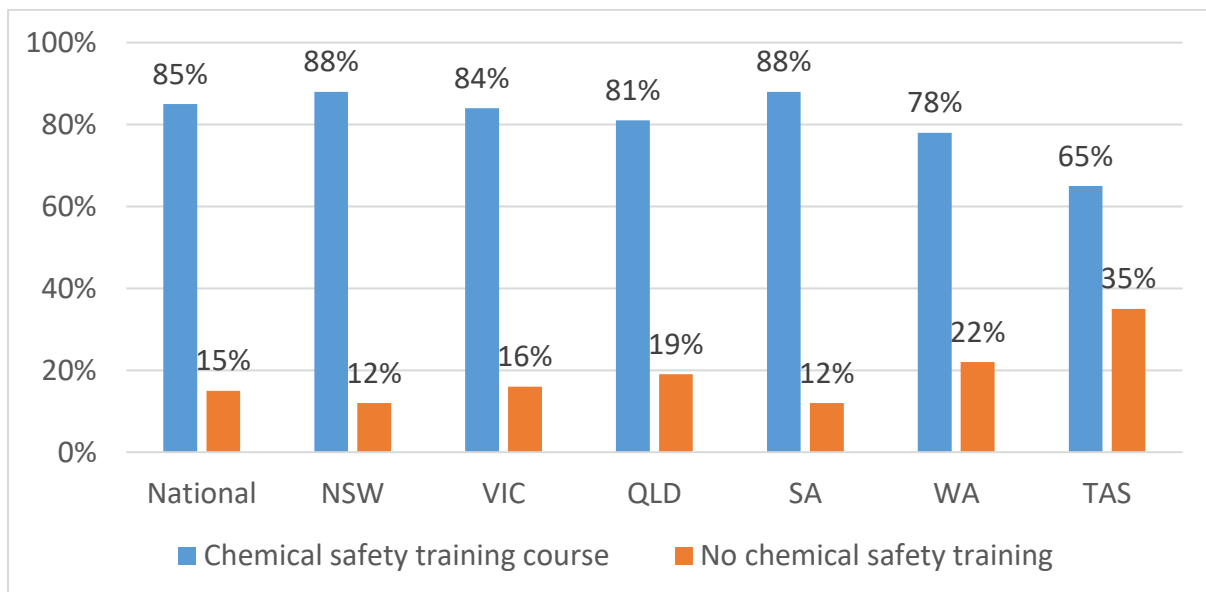
Nationally, over four fifths of Merino producers (85%) report that they have completed chemical safety training (**Figure 104**). Western Australian Merino producers were significantly less likely to have completed training (78%). Merino producers with flocks of 2,000 sheep or more were significantly more likely to have attained chemical safety accreditation compared to smaller flocks (92% and 77%, respectively).

Nationally, around three quarters of Merino producers (78%) who have completed chemical safety courses report that they have ChemCERT accreditation or a current ChemCERT card (**Figure 105**). Western Australian (65%) and Queensland (46%) Merino producers were significantly less likely to have completed training. Western Australian Merino producers were significantly more likely than other states to report not knowing if they had certification (8%).

Nationally, 82% of Merino producers encourage workers to identify safety concerns (**Figure 106**). Western Australian Merino producers were significantly less likely to have roll bars (57%) and Queensland Merino producers were significantly more likely to have a WHS plan (78%).

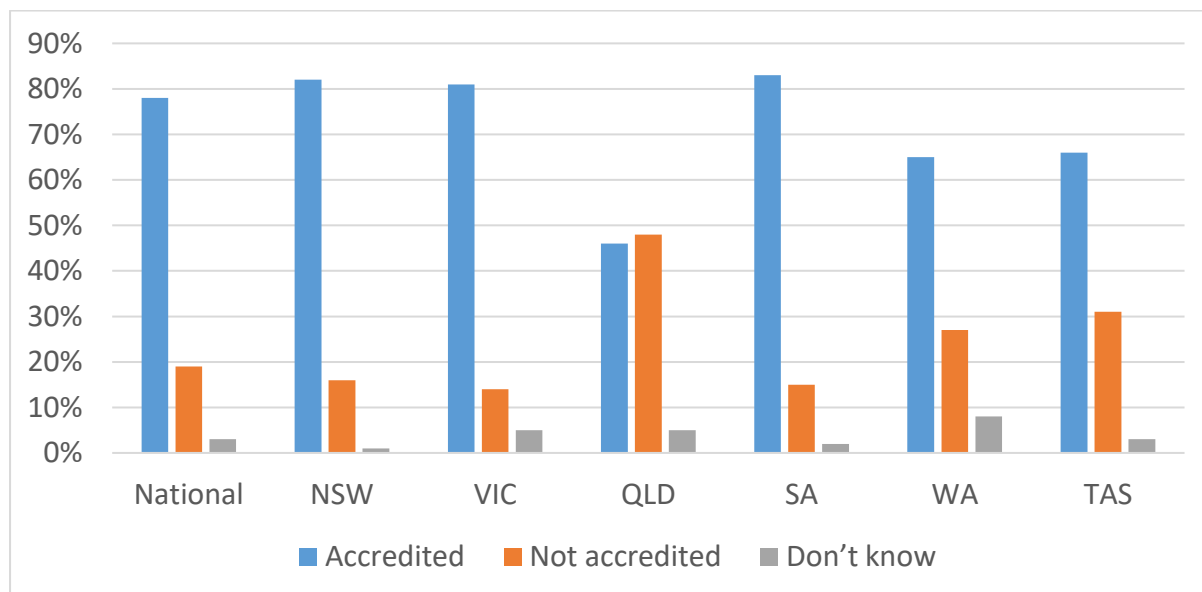
**Figure 104: Attendance at chemical safety training courses**

Base: All Merino producers n = 1,203



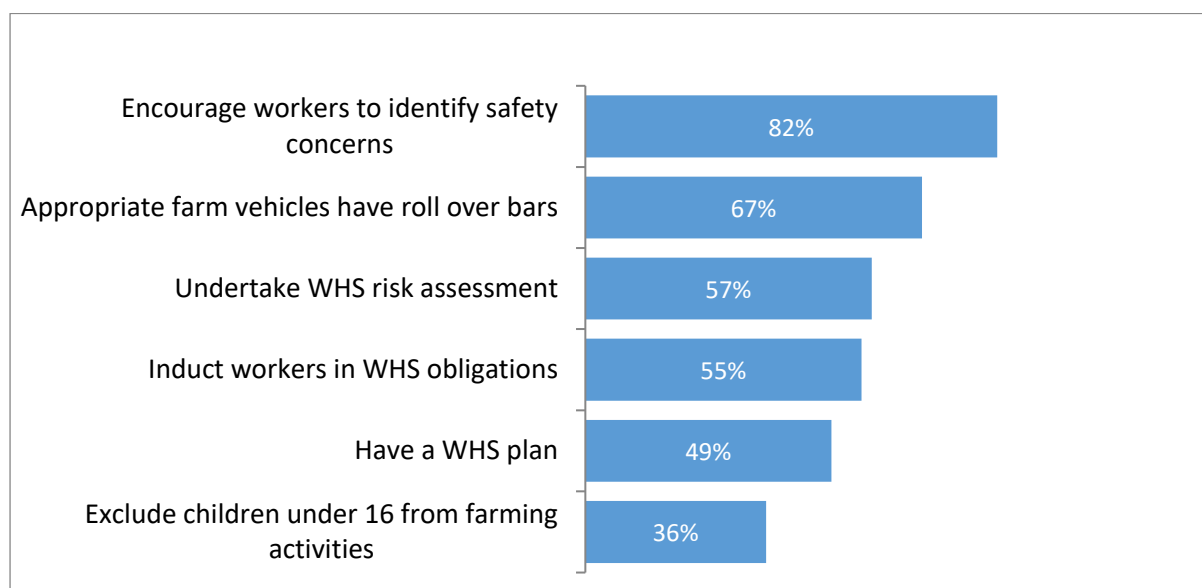
**Figure 105: Chemical Accreditation Status**

Base: Merino producers who have attended chemical safety training n = 1,038



**Figure 106: Work health and safety practices adopted by producers on farm**

Base: n = 1,203

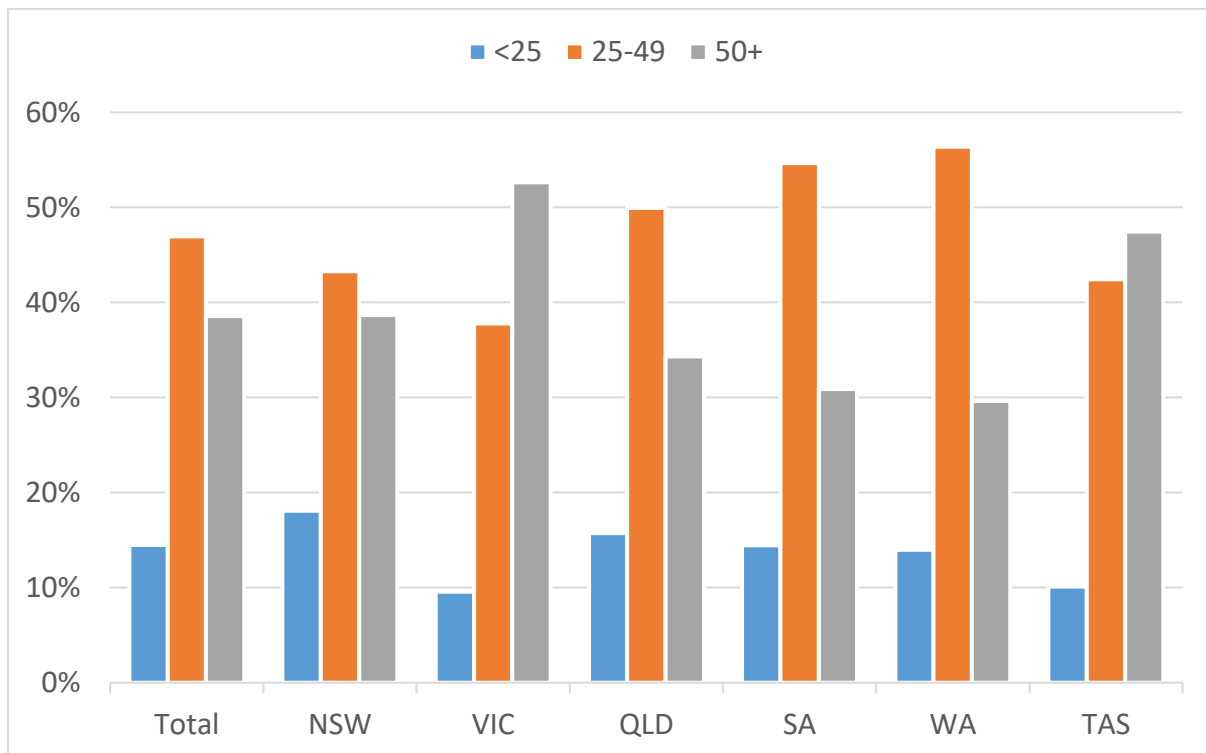


### 4.18. Final demographics

On average, Merino producers had been in farming 41.9 years. Nationally, the largest years of farming segment of Merino producers were those who had been involved in farming from 25-49 years (47%) (**Figure 107**). Western Australian Merino producers were more likely to have been farming between 25-49 years (56%). Victorian Merino producers were significantly more likely to have been farming 50 or more years (53%).

**Figure 107: Years in farming**

Base: n = 1,203



## 5. Conclusion and recommendations

### 5.1. Conclusions

The conclusion from the research is that Merino sheep producers are adopting a range of practices and behaviours that contribute 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, quality assurance, 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 AWI's investment and project planning initiatives targeted at Merino producers.

### 5.2. Recommendations

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

The research has identified that some Merino 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, 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. Expand the profile of MLA's Member database

Project Proof 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.

### 4. Compare the results from this survey with results from previous surveys and other sources of similar data

AWI regularly tracks key measures through industry surveys and also has access to a range of other industry data sources. There is merit in AWI comparing the results of this survey with previous surveys and data sources to identify longitudinal change and assess the impact of AWI's strategies and programs to drive change in the behaviour and attitudes of Merino producers.

## Appendices

### Sampling

*Table 5: State and flock size quotas and samples (Total Sheep sample)*

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 6: Weighted versus unweighted results (Merino sample)*

Question	Weighted Results	Unweighted Results
Q2.1 Percentage horned sires	22.2%	23.8%
Q3.1 Weeks joining	8.9	8.0
Q3.2 Pregnancy scanning	44%	51%
Q4.1 Percentage ewes tail docked	95%	96%
Q4.11 Pain management for docking	60%	66%
Q5.3 Pain management for castration	30%	33%
Q6.1 Mulesing ewe lambs	52%	60%
Q6.9 Ceased mulesing	60%	68%
Q7.1 Wean lambs	93%	95%
Q7.2 Weaning age in weeks	15.7	15.4
Q7.3 Weaning percentage maiden ewes	81.1%	82.8%
Q7.4 Weaning percentage maiden ewes	96.4%	97.2%
Q8.1 Vaccination	91%	92%
Q8.3 Pre-lambing vaccination	66%	67%
Q9.1 Annual drenches	2.1	2.1
Q9.3 Worm egg count	37%	42%
Q9.5 Drench resistance test	37%	39%
Q10.1 Ewes lost before joining	2.7%	2.8%
Q11.0 Sedate rams for shearing	63%	70%
Q12.1 Wool QA involvement	19%	22%
Q13.1 Predator problems	78%	79%
Q13.5 Predator strategy	43%	45%
Q14.3 Carbon training	10%	11%
Q16.2 ChemCERT training	78%	80%

**Table 7: CATI statistics (Total Sheep sample)**

<b>CATI Item</b>	<b>Number</b>
Total unique numbers called	<b>18,012</b>
Interviews	<b>1,043</b>
Refusals	<b>1,519</b>
Disconnected numbers	<b>2,097</b>
Business/fax numbers	<b>55</b>
Ineligible (via screener questions)	<b>405</b>
Ineligible (quota full)	<b>3,785</b>
Duplicate Numbers	<b>30</b>
Language/deaf/drunk/senile	<b>116</b>
Others - Total	<b>744</b>
<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	<b>8,218</b>
<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 8: 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%
<b>25</b>	9	12	14	16	17	18	19	19	20	20
<b>50</b>	6	8	10	11	12	13	14	13	14	14
<b>75</b>	5	7	8	9	10	10	11	11	11	11
<b>100</b>	4	6	7	8	9	9	10	10	10	10
<b>200</b>	3	4	5	6	6	6	7	7	7	7
<b>300</b>	3	4	4	5	5	5	6	6	6	6
<b>400</b>	2	3	4	4	4	5	5	5	5	5
<b>500</b>	2	3	3	3	4	4	4	4	4	4
<b>600</b>	2	2	3	3	3	4	4	4	4	4
<b>700</b>	2	2	3	3	3	3	4	4	4	4
<b>800</b>	2	2	2	3	3	3	3	3	3	3
<b>900</b>	1	2	2	3	3	3	3	3	3	3
<b>1,200</b>	1	2	2	2	2	3	3	3	3	3
<b>2,000</b>	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 1,200 respondents (eg national) would have a margin of error of 3 percentage points, that is, you are 95% confident that the true answer would lie between 27% and 33%. A result of 30% from a sample of 224 respondents (eg South Australia) would have a higher error of plus / minus 6%.

## Survey questions

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

### Section 1: Demographic Screeners

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

S2	What is the postcode of your main sheep enterprise?
	<b>Postcode</b> <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	<b>ALLOCATE TO NON-MERINO SAMPLE (CODE 'NON-MERINO')</b>	

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		<b>ALLOCATE TO MERINO SAMPLE (CODE 'MERINO')</b>
	Mixed age merino ewes		
	(AUTO SUM) Total merino breeding ewes		<b>ALLOCATE TO NON-MERINO SAMPLE (CODE 'NON-MERINO')</b>
None	00		

## 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	<b>CHECK STATE FLOCK SIZE QUOTAS</b>
	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 foetuses	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
			<b>CONTINUE</b>
			<b>GO TO 4.5</b>

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	<b>CONTINUE</b>
	No	2	<b>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</b>

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	<b>CONTINUE</b>
	No	2	<b>GO TO SECTION 6</b>

5.2	What method do you use to castrate male lambs? SHOW. MULTIPLE		
	Cold knife	1	
	Rings	2	
	Shears / Knife and mouth	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., Buccalgesic)	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
		<b>CONTINUE</b> <b>IF CODE 2 AT BOTH 6.1 AND 6.2, GO TO 6.9</b> <b>IF CODE 2 AT 6.1 BUT CODE 1 AT 6.1, CONTINUE</b>	

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., Buccalgescic)	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

6.8	If mulesing was no longer an option, which of the following would you do? SHOW. MULTIPLE. RANDOMISE	
	Breed sheep resistant to flystrike	1
	Increase crutching frequency	2
	Increase shearing frequency	3
	Move to another enterprise / get out of farming	4
	Move to sheep enterprise	5
	Move to prime lamb enterprise	6
	Rely on more flystrike chemicals for prevention or treatment	7
	Other (Please specify)	98

6.9	ASK IF CODE 2 AT 6.1 <u>AND</u> 6.2 Have you ceased mulesing your ewe and male lambs or did you never mules them? SHOW. SINGLE	
	Ceased mulesing	1
	Never mulesed	2

ASK 6.10 – 6.11 IF CODE 1 AT 6.9

6.10	What year did you cease mulesing?							
		<table border="1" style="display: inline-table; vertical-align: middle;"> <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="width: 20px; height: 20px;"></td> <td style="width: 20px; height: 20px;"></td> <td>Year</td> </tr> </table>						
						Year		

6.11	Why did you cease mulesing? SHOW. MULTIPLE. RANDOMISE	
	Animal ethics	1
	Higher wool prices	2
	Breed plain bodied sheep / less body wrinkle	3
	Higher sheep prices	4
	Industry and consumer pressure	5
	It's an unnecessary procedure / prefer not to mules	6
	No fly pressure	7
	Only ceased temporarily / mules as required	8
	Sell off younger wethers	9
	Weather conditions	10
		Other (Please specify)

## 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?	<table border="1" style="display: inline-table;"> <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> 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?)	<table border="1" style="display: inline-table;"> <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> 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?)	<table border="1" style="display: inline-table;"> <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> 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
			<b>CONTINUE GO TO SECTION 9</b>

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					
<table border="1" style="margin-left: auto; margin-right: auto;"> <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="width: 20px; height: 20px;"></td> </tr> </table>													

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; margin-left: auto;"> <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; margin-left: auto;"> <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; margin-left: auto;"> <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	<b>CONTINUE</b>
	WormBoss	2	
	LiceBoss	3	
	FlyBoss	4	
	None	0	<b>GO TO SECTION 10</b>

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	<b>GO TO SECTION 10</b>
	WormBoss	2	<b>CONTINUE</b>
	LiceBoss	3	
	FlyBoss	4	
	None	0	<b>GO TO SECTION 10</b>

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?	
		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?)	Number / percent				
	<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>					

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?)	Number / percent				
	<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>					

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	<b>CONTINUE</b>
	I am aware of these and have read them	2	<b>CONTINUE</b>
	I am not aware of these	3	<b>GO TO SECTION 11</b>

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	<b>CONTINUE GO TO SECTION 14</b>
	No	2	

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 Merino 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