FINAL REPORT

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2023 AWI Merino Husbandry Practices Survey

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Abstract

The 2023 AWI Merino Husbandry Practices Survey reports on the Merino specific results from a broader AWI/MLA funded survey ("National Sheep Producer Survey") of 1,268 sheep producers (809 Merino and 459 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, and a more comprehensive survey was conducted in 2021 to track previous metrics and establish benchmarks for new SSF metrics. The National Sheep Producer Practices Survey was designed to enable regular tracking of Merino and non-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 2023 AWI Merino Husbandry Practices Survey) is an update to the 2021 AWI Merino Husbandry Practices Survey, tracking changes in Merino producers' animal husbandry practices over time.

An online and telephone survey of 809 Merino producers was conducted in February to May 2024 and respondents were asked about their 2023 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. 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.

Executive summary

Background

The 2023 AWI Merino Husbandry Practices Survey is an update to the 2021 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 and tracked in the 2021 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 809 Merino producers in February to May 2024. A mixed methodology was employed involving a 26-minute survey with 483 Merino producers responding Online and 326 Merino producers responding via Computer Assisted Telephone Interviews (CATI). Merino producers were incentivised to participate in the survey through a prize draw. As in 2021, 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 2021 and 2023 surveys and the 2017 survey.

The sample was stratified, and results weighted by state and flock size categories based on the latest population 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 809 Merino producers, 50% of Merino producers pregnancy scan their ewes. This result has a margin of error of +/- 3% at a 95% confidence level so the national result of 50% has a range of between 47% and 53%.

Results

The overwhelming majority of Merino producers (81%) had flocks comprised of pure-bred Merino Poll with 36% having pure-bred Merino Horn, 7% Merino Dohne, 2% SAMM and 26% with breeds other than Merino and Merino Dohne (from multiple breeds selected).

All 809 producers in the Merino sample had to join maiden or mixed age Merino ewes to Merino rams in 2023 to qualify for the Merino survey. Across Australia, Merino producers joined an average of 512 Merino maiden ewes and 1,148 Merino mixed ewes to Merino rams.

Nationally, 14% of all Merino producers ran 250 or fewer Merino breeding ewes, 19% ran 251 - 500, 24% ran 501 – 1,000, 22% ran 1,001 – 2,000 and 21% ran over 2,000 Merino breeding ewes.

The majority of Merino producers (77%) use polled sires.

Almost one quarter of Merino producers nationally (26%) report an average adult Merino ewe micron of 19. Only 4% of Merino producers report a micron of 22 or higher, with 1% reporting 15 micron or less.

Slightly over half of Merino producers state that their mixed age ewes have low body wrinkle (53%), with 44% saying that their flocks have on average a medium body wrinkle and 3% saying their flocks have a high body wrinkle.

Over one quarter of Merino producers nationally (19%) join ewes to rams for eight weeks or longer with an average of 7.8 weeks.

Nationally, 50% 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 69 days after rams in. Around 1 in 3 Merino producers manage their twin lambs separately (36%).

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

Hot knife was the most common technique (66%) used for tail docking ewe lambs followed by rings (30%). When tail docking male lambs, hot knife was the most common technique (66%) used followed by rings (31%).

Nationally, almost half of Merino producers who tail dock ewe lambs, dock them to three joints (48%). Two joints is the next most common choice at 42%. Likewise, nearly half of Merino producers who tail dock male lambs dock them to two joints (47%). Three joints is the next most common choice at 43%. The most common reasons cited for choosing a particular tail length for ewe lambs were to protect the genital area (59%) and to provide sun protection (53%). For male lambs, the reasons were that it would allow tail movement (41%) and to provide sun protection (38%).

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 (74%). For male lambs, the most common reasons cited for using a hot knife were that it is bloodless or seals the wound (69%) and clean and neat (41%).

The most common reasons cited for using rings to dock ewe lambs was that it is easy (61%), bloodless (47%) and was a preferable method for their operation (44%). For male lambs, the most common reasons cited for using rings was that it is easy (61%), and bloodless (49%).

When using cold knife on ewe lambs, Merino producers said it was quick (59%), effective (53%) and clean or neat (52%) and for male lambs, Merino producers state that it is efficient (66%) and effective (58%).

Producers used shears to dock ewe lambs because it was clean or neat (70%) and quick (70%). On male lambs, shears are used because they are quick (60%), clean or neat (53%) and efficient (53%).

Nationally, 70% of Merino producers use pain management on ewes 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 (37%). The majority of Merino producers use pain management for cold knife (81%) whereas pain management is used by almost four fifths of Merino producers for hot knife (86%) and shears (89%). Across docking methods, 69% of producers use pain management for male lambs. Merino producers who

use rings were less likely to use pain management when tail docking (35%). Merino producers who tail dock using cold knife, hot knife and shears are much more likely to use pain management (84%, 84% and 84%, respectively).

There are two different types of pain relief available for sheep for alleviating pain from mulesing, tail docking and or castration. These are the fast acting, short lasting local anaesthestic products, and the slow acting, longer-lasting analgesic products.Anaesthetic and antiseptic spray (e.g. Tri-Solfen) at the site is the primary type of pain management for tail docking. Nationally, it is used by 78% of Merino producers who use pain management products at tail docking. Analgesic oral gel (veterinary prescribed e.g. Buccalgesic and non-veterinary prescribed e.g. Butec both 9%) and analgesic injection (e.g. Meloxicam, 13%) were the next most frequent pain management types used.

The most common reasons cited for choosing anaesthetic injections were to reduce pain (75%) and improved animal health and welfare (74%).

Merino producers using anaesthetic and antiseptic spray (e.g. Tri-Solfen) at the surgery site cited improvement in animal health and welfare (88%), ease of application (74%) and pain reduction (72%) as the primary reasons for use.

Merino producers said they chose analgesic injections (e.g. Meloxicam) due to improved welfare (81%) and it reduces pain (73%).

The most common reasons cited for choosing veterinary prescribed analgesic oral gel (e.g. Buccalgesic) were improved animal health and welfare (83%), it lasts longer (69%), and it reduces pain (68%). Non-veterinary prescribed oral gel (e.g. Butec) was chosen as it reduces pain (63%) and is easy to apply (54%).

When asked why they do not use pain management at tail docking, Merino producers said that they did not consider it necessary (46%). 32% of Merino producers said it was not practical for the quick procedure with 26% claiming it was too expensive.

Virtually all Merino producers castrate their male lambs (98% nationally), and rubber rings were by far the most common technique (98%) used nationally. The primary reasons for castration were to prevent unwanted pregnancies (83%) and to meet market requirements (52%).

47% of Merino producers use pain management when castrating male lambs. Use of pain management for rings is 46%.

Anaesthetic and antiseptic spray at the site (e.g. Tri-Solfen) is the primary type of pain management for castration (52%). Merino producers who chose anaesthetic and antiseptic spray said that it provided effective pain reduction (52%), was easy to apply (43%) and lambs are quick to mother up following treatment (40%).

The most common reasons cited for choosing anaesthetic injections for castration (e.g. Numnuts) were that it improves animal health and welfare (73%), reduces pain, and lambs quickly mother-up afterwards (63%).

Merino producers who chose analgesic injections said they improve animal health and welfare (67%) and had effective pain reduction (62%).

The most common reasons Merino producers cited for choosing veterinary prescribed analgesic oral gel were improved animal health and welfare (75%) and pain reduction (72%). Reasons to use non-

veterinary prescribed oral gel are to reduce pain (64%) and to improve animal health and welfare (63%).

The main barrier to the use of pain management for castration is that it is not considered necessary (44%), with 30% of Merino producers stating it was not practical or a quick procedure.

At the national level, in 2023 58% of Merino producers mulesed their ewe lambs and 49% of Merino producers mulesed their male lambs. This practice is much more prevalent in larger flock sizes. For example, 69% of Merino producers with a total flock size of 2,000+ reported mulesing their ewe lambs in 2023, compared to only 31% of Merino producers with a flock size of 250 or fewer.

Nationally Merino producers mules lambs to reduce the risk of flystrike (98%) and to provide easier access for shearers (50%). The majority of Merino producers who mules use pain management (ewes and male lambs both 94%). Most Merino producers who use pain management products at mulesing (93%) use an anaesthetic and antiseptic spray (Tri-Solfen) at the surgery site.

Effectiveness (64%) and fast recovery (57%) were the primary reasons for choosing anaesthetic and antiseptic spray (e.g. Tri-Solfen) for mulesing.

Merino producers that reported using analgesic injections (e.g. Meloxicam) at mulesing, stated their reasons as pain reduction (76%) and improved animal health and welfare (66%). Veterinary prescribed analgesic oral gel (e.g. Buccalgesic) offered efficacy (70%) and pain reduction (64%), while non-veterinary prescribed analgesic oral gel (e.g. Butec) improved animal health and welfare (76%), lambs were quick to mother up (67%) and it reduced pain (62%).

The main barriers to the use of pain management for mulesing is that it is not considered necessary (33%), was not practical for the quick procedure (32%) and was too expensive (31%).

Across Australia, of Merino producers who mulesed in 2023, 24% said they were likely or very likely to cease mulesing in the next 5 years. The top three alternatives to mulesing that would be adopted if required were flystrike chemicals (40%), increasing crutching frequency (32%) and leaving farming (31%).

At the national level, two thirds (66%) of Merino producers who did not mules in 2023 have ceased mulesing with the other 34% having never mulesed. The main reasons for ceasing mulesing are breeding for less body wrinkle (45%), and industry/consumer pressure (45%).

The majority (95%) of Merino producers vaccinate at 96% of their flock. The most commonly used vaccine (65%) is a combined 5 in 1 clostridial plus cheesy gland vaccine.

Nationally, an average of 72% of Merino producers vaccinate pre-lambing, 96% at marking and 79% at weaning.

The majority of Merino producers (94%) follow label recommendations when administering antibiotics to sheep.

The average weaned and adult ewe mortality rate is between 3% - 5%.

The majority of Merino producers (84%) 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 (67%).

Nationally, over a third of Merino producers are involved in wool quality assurance schemes (35%). Where Merino producers are not involved, the primary reason is that they do not see any premiums from involvement (48%).

Across Australia, 78% of Merino producers report problems with predators and lose 47 sheep on average annually due to predation. Foxes are the number one predator (90%) followed by birds (49%) and pigs (16%).

Shooting foxes is the most common control method used (76% nationally) with shooting (69%) and poison or bait (61%) for wild dogs and shooting for pig control (91%). Traps (51%) and poison or bait (51%) are also frequently used for pigs. Conversely, most Merino producers who have problems with predators do not control birds (79% nationally).

Of Merino producers who reported problems with predators, less than one fifth (18%) have a documented predator management strategy.

Half (50%) 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 42% not generating or buying any renewable energy.

Of the Merino producers who generate their own renewable energy, the vast majority (86%) have solar without batteries. Slightly under a fifth (19%) generated solar with a battery.

Merino producers interviewed had generally not taken carbon accounting training study (85%) and did not estimate their emissions (89%), however, 21% did implement carbons emissions measures.

Producers who did conduct emission reduction activities often selected more than one measure. Almost three quarters of Merino producers (70%) used pasture management and carbon storage was also a popular technique (59%).

While only around one third (38%) of Merino producers have completed a property management plan incorporating biodiversity and or conservation, almost three quarters (72%) do undertake deliberate activities to maintain, measure or enhance the biodiversity on their property. The most common practices undertaken were maintaining adequate ground cover (72%), managing soil health and organic matter (64%) and minimising tillage (63%).

Merino producers undertake multiple land management activities; the most common in 2023 were weed control (89%), destocking or spelling of pasture (64%) and maintenance of areas that are reliable livestock water sources (51%).

Producers also undertook an array of grazing management activities, with fencing for spelling (64%) and fencing by land type to manage grazing pressure (61%) the most popular.

Almost all (98%) Merino producers are able to accurately identify weeds that commonly grow in pastures and distinguish them from desirable plants.

Multiple water sources are offered to sheep with surface water (directly from dams, creeks or rivers) and groundwater were most common for Merino producers (74% and 62% respectively).

While fewer than a third (29%) of producers have a documented plan for managing their farm and animals during extreme weather, the majority (94%) state that their stock water supply can withstand prolonged periods of dry weather. 81% of Merino producers can increase their stock water supply if needed.

Most Merino producers (81%) undertake practices to improve their soil water retention.

Nationally, around four fifths of Merino producers (86%) report that they have completed chemical safety training. Four fifths of Merino producers (80%) who have completed chemical safety courses report that they have ChemCERT accreditation or a current ChemCERT card.

Merino producers learned animal husbandry practices from multiple sources, with informal (self-taught and shown by another person) and formal training common (81%, 59% and 54% respectively).

Ongoing training is undertaken by more than half (54%) of producers, among these, the most popular subject matter is animal health and husbandry (63%).

When it comes to Workplace Health and Safety, the most common actions Merino producers take are ensuring appropriate farm vehicles have roll over bars (72%) and encouraging workers to identify safety concerns (70%).

Under one third (27%) of Merino producers report no issues with general labour availability, and slightly more (35%) report no issues with shearer availability. Over one third of Merino producers however report a more major availability issue with general labour (50%) or shearers (39%).

Almost three quarters of Merino producers (72%) use contractors as additional sources of labour in their sheep operation in 2023.

Around half of Merino producers have employees (53%); employee ages range from 18-24 (17%) to 65 and over (8%) and are mostly male (81%).

Merino producers are at different stages in the succession planning process with 24% nationally having a formal succession plan in place but 28% not having commenced the planning process yet.

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 tracking data collected can be compared to the benchmark and 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

Two recommendations have been made from this research:

1. Explore the understanding and use of different types of pain management products and overcome barriers to adoption of pain management
2. 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

The push towards sustainability and sustainability initiatives has continued to gain momentum over time. The inception of the movement in its current form can largely be attributed to the ground-breaking leadership of Europe and has now become a mainstay in business globally. Leading international corporations routinely report on environmental, social, and governance issues; for others, it is a legal requirement. Customers have a strong emotional connection to sustainability initiatives, and these have 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 secure funding to keep their operations viable. 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.

Life as we know it depends on agriculture and agricultural output, yet both have an impact on the environment. To lessen the impact of agriculture, several important issues including pollution, greenhouse gas emissions, pesticide residues, and animal welfare must be addressed. In Australia, this subject has occasionally caused controversy among the public, business community, and consumers. Examples of sustainability-driven activities include the phase-out of mulesing, the removal of specific chemicals from the market, the improvement of supply chain traceability, and the discussion of emissions trading schemes.

The sheep industry's leaders have recognised how crucial sustainability is to Australia's ability to continue to grow in other markets as well as to maintain its position in international markets. Because of this, industry associations, executives, and Merino producers have been closely consulted during the construction of sustainability guidelines.

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 2023 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 2021 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 this survey was to 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. Sheep husbandry practices, management strategies and standards

Identifying the incidence and levels of key sheep 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, and animal welfare

2. Environmental profile

Understand the level of environmental on-farm management activities including the use of renewable energy. Gauge participation in biodiversity and conservation efforts and understand stock water supply and resilience

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 and utilisation of 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 Kynetec and AWI were included to maximise tracking of any demographic or behavioural change for comparison and validation purposes. This was particularly important where some questions related to differences in target audiences (Merino), class of stock (ewes and rams) 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.

An online questionnaire was piloted with 3 Merino producers and 3 non-Merino producers on 28 February 2024. The average survey length was 26:40 minutes. As the interview length matched the budgeted 25 minutes and the programmed survey captured all required data, the survey was fully launched on 1 March 2024.

A copy of the questionnaire is provided in the Appendix.

3.2. Sample design

A sample of 809 Merino producers was interviewed for this study, as part of the larger overall sample of 1,268 that covered both Merino producers (n = 809) and non-Merino producers (n = 459). The Merino sample was designed to achieve national results with a margin of error of +/- 3.4% with a 95% confidence level.

The total sample of 1,268 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. To address this, 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.

3.3. Sample selection

MLA provided Kynetec with a database of 14,513 sheep producer members who had an email address and a phone number and a further 5,421 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 2023
4. Merino producers must join maiden and / or mixed age Merino ewes to Merino rams to qualify as "Merino"
5. Non-Merino producers must have breeds other than Merino or Merino Dohne or if they had Merino sheep, they must not join them to Merino rams (i.e., they could join Merino ewes to non-Merino rams, or they could run Merino wethers).

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

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

3.4. Data collection

Data was collected via a mixed methodology approach using both Online and Computer Assisted Telephone Interview (CATI) methodologies. The methodological split was proposed to be 900 Online and 350 CATI.

A pilot (soft launch) for the Online survey was survey was conducted on 28 – 29 February 2024 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. Nine reminder emails were sent to non-respondents throughout March to May.

The online survey was closed with 835 completes. The CATI component of 433 surveys was completed by contacting non-respondents to the Online survey and also MLA members who were only contactable by phone, not email. The final sample of 1,268 producers comprised of 809 Merino producers and 459 non-Merino producers was reached on 10 May 2024.

Average survey length was 26:40 minutes.

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

Table 1: Sample methodology

Methodology	Merino
Online	**486**
Unique link	435
Generic link	51
CATI	**323**
Total	**809**

For the Online survey, of 14,513 sheep producers sent a unique link by email, 89 screened out because they did not meet the minimum requirements to qualify, and 435 Merino responses were completed. With the addition of the 51 Online surveys completed via the generic link, the final number of Merino Online surveys was 486.

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 6** in the Appendix.

The main statistically significant differences in results between states are highlighted throughout this report. If a result for one state is significantly higher or lower than the national result, this will be shown in graphs throughout the report with up (↑) or down arrow (↓) respectively, based on a 90% confidence level.

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 (33%), Victoria (20%), Queensland (4%), South Australia (22%), Western Australia (18%), and Tasmania (3%) (**Figure 1**).

The majority of Merino producers (81%) have poll Merinos (**Figure 2**).

In 2023, Merino producers joined an average of 512 maiden ewes and 1,148 mixed ewes (**Figure 3**).

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

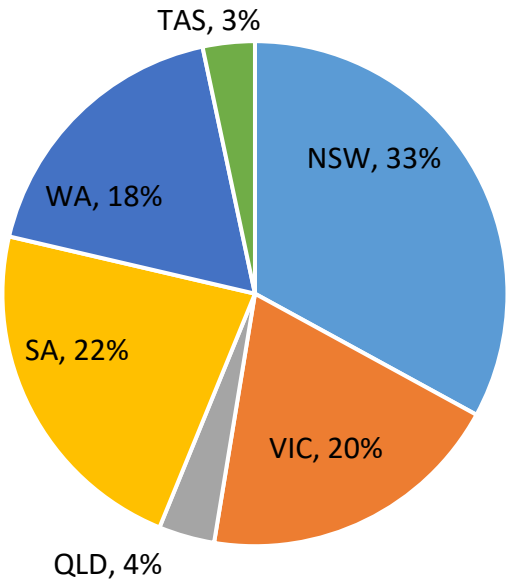
Over a quarter (28%) of Merino producers interviewed are tertiary educated (**Figure 6**).

The largest age segment of interviewed Merino producers was those 65 and over (38%), almost all Merino producers were thirty-five and over, with none 18 - 24 and 1% 25 – 34. 6% of Merino producers declined to state their age (**Figure 7**).

The majority (79%) of Merino producers identified as male. A minority (16%) identified themselves as female. Less than one percent (here rounded to 0%) identified as an unspecified alternative gender, with 5% preferring not to specify their gender (**Figure 8**).

Figure 1: Respondent demographic by state

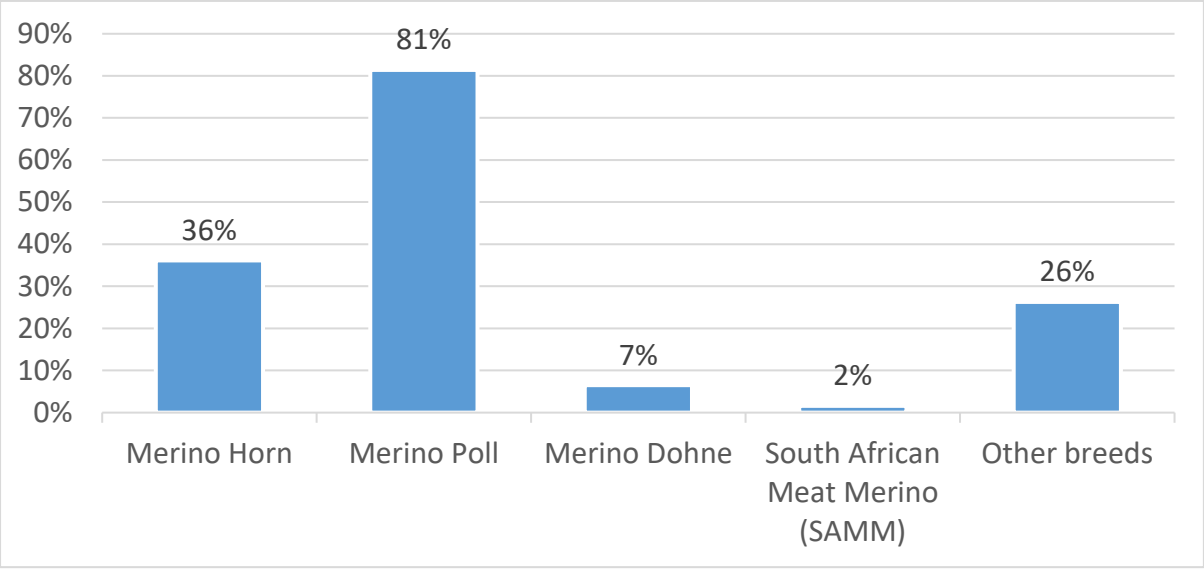
Base: All Merino producers n = 809



S1 Which state is your main sheep enterprise located?

Figure 2: Respondent demographics by sheep breed

Base: All Merino producers n = 809

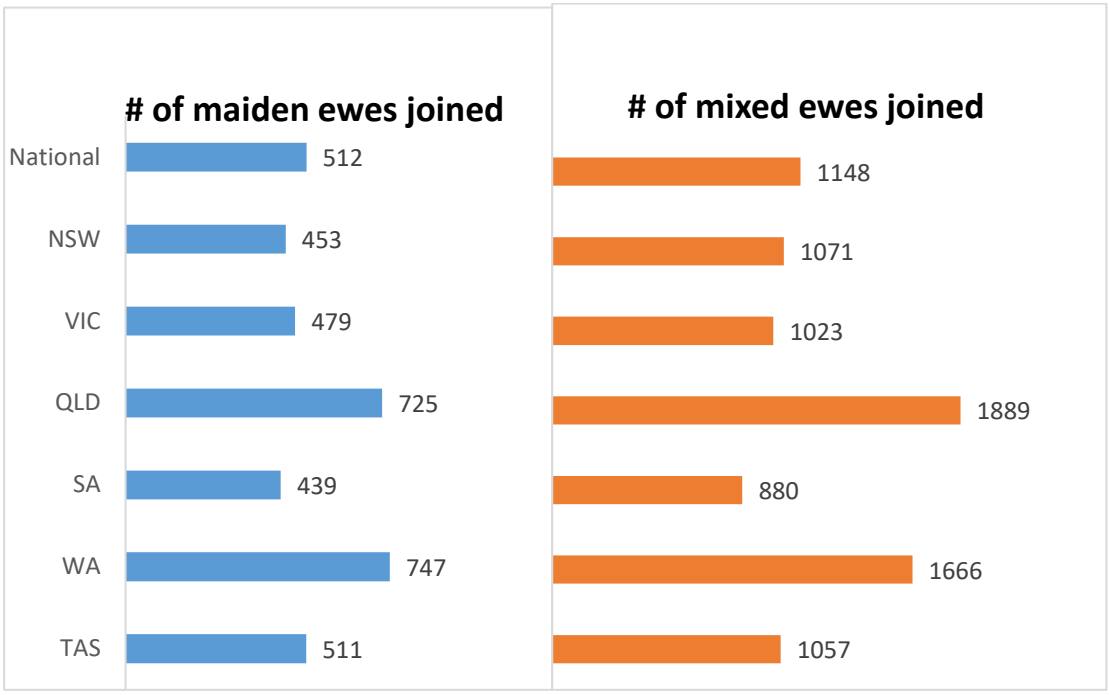


N.B. Respondents could select multiple breeds of sheep

S4b Which of the following breeds comprise your sheep flock?

Figure 3: Number of maiden ewes and mixed ewes joined

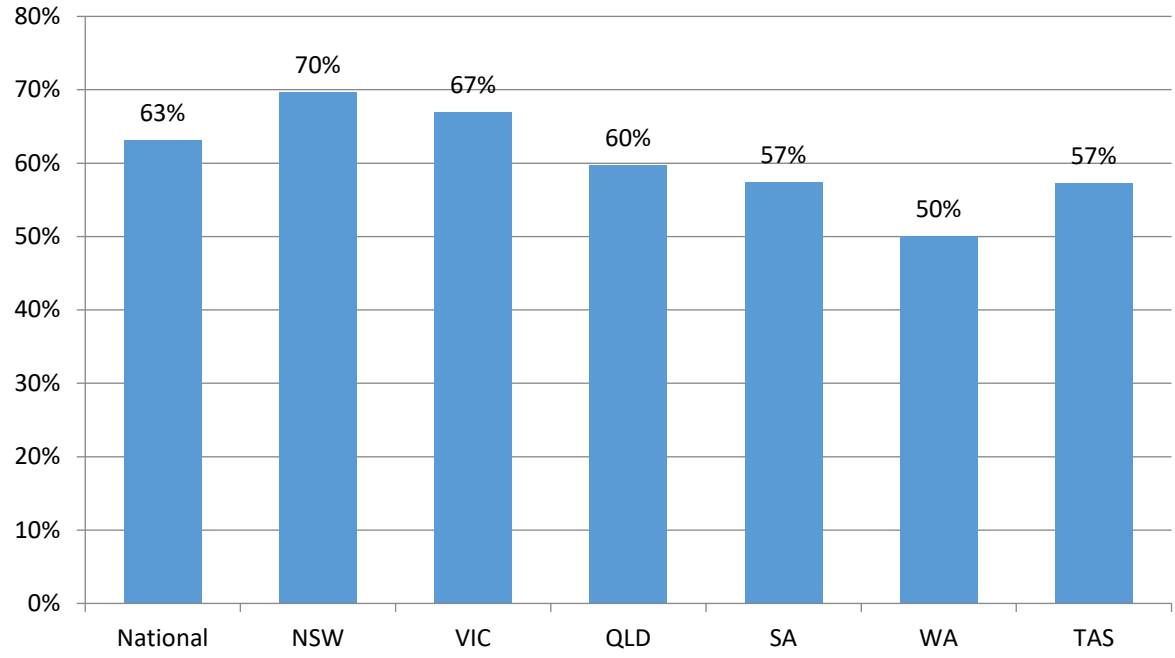
Base: Merino producers who join ewes to Merino rams s n = 690



S5a In 2023, how many maiden and mixed age merino ewes did you join to merino rams?

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

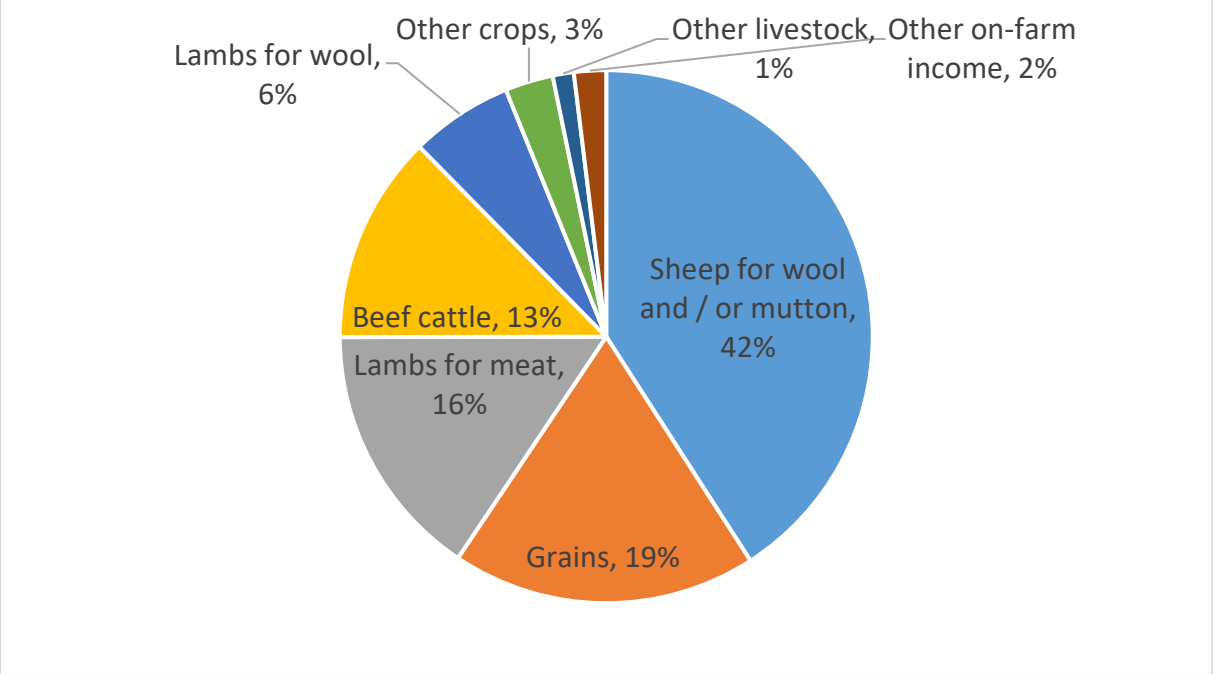
Base: All Merino producers n = 809



S3 Over the last 3 full financial years, what percentage of your gross farm income came from the following activities?

Figure 5: Percentage of gross farm income nationally

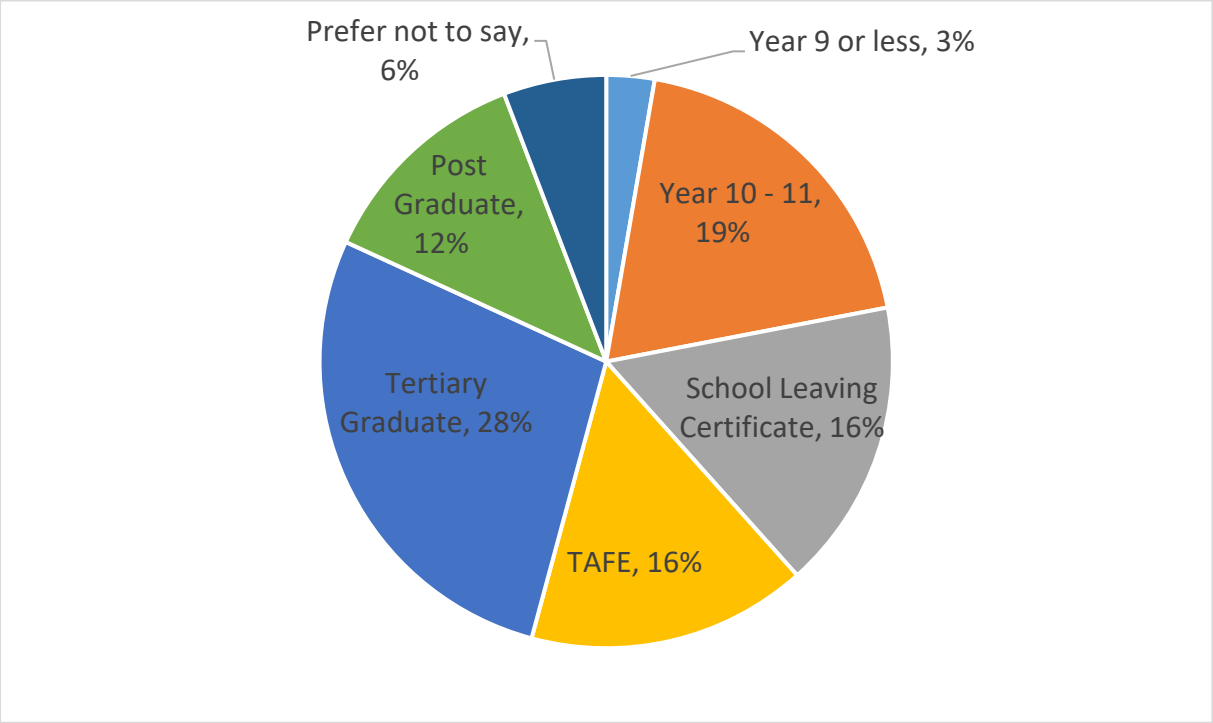
Base: All Merino producers n = 809



S3 Over the last 3 full financial years, what percentage of your gross farm income came from the following activities?

Figure 6: Respondent demographic by education

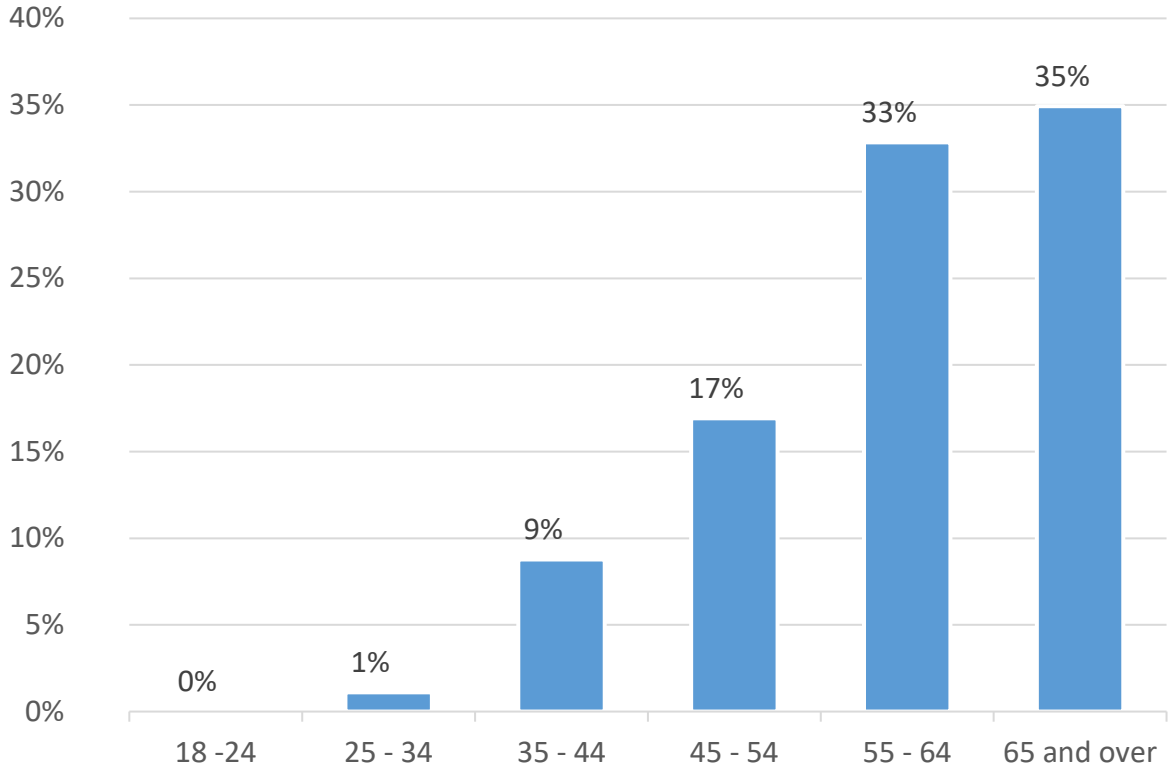
Base: All Merino producers n = 809



17.2 What is the highest level of education you have achieved?

Figure 7: Respondent demographic by age

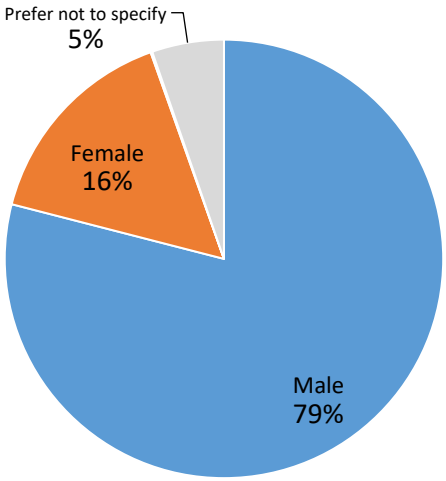
Base: All Merino producers n = 809



17.3 For classification purposes, into which of the following age groups you fall?

Figure 8: Respondent demographics by gender

Base: All Merino producers n = 809



17.4 For classification purposes, into which group do you fall into?

4.3. Flock demographics

Nationally, over one tenth of Merino producers (12%) ran between 100 and 499 sheep while 15% ran 500 - 999 sheep, and 23% between 1,000 – 1,999 sheep. 13% of Merino producers ran between 2,000 – 2,999 sheep, and 37% ran 3,000 or more sheep (**Figure 9**).

On average, producers have 738 ewe lambs and 700 male lambs on their properties (**Figure 10**).

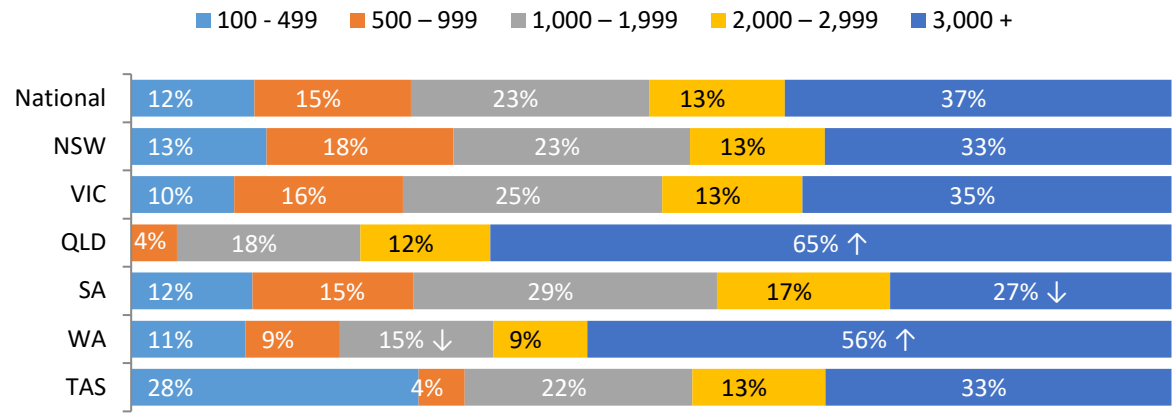
At the national level, 77% of Merino producers use polled sires, with horned sheep making up 23% of the sire percentage (**Figure 11**).

Almost one quarter of Merino producers nationally (26%) report an average adult Merino ewe micron of 19 (**Figure 12**). Only 4% of Merino producers report a micron of 22 or higher, with less than 1% reporting 15 micron or less.

Nationally, slightly over half of Merino producers state that their mixed age ewes have low body wrinkle (53%), with 44% saying that their flocks have on average a medium body wrinkle and 3% saying their flocks have a high body wrinkle (**Figure 13**).

Figure 9: Respondent demographic by total flock size

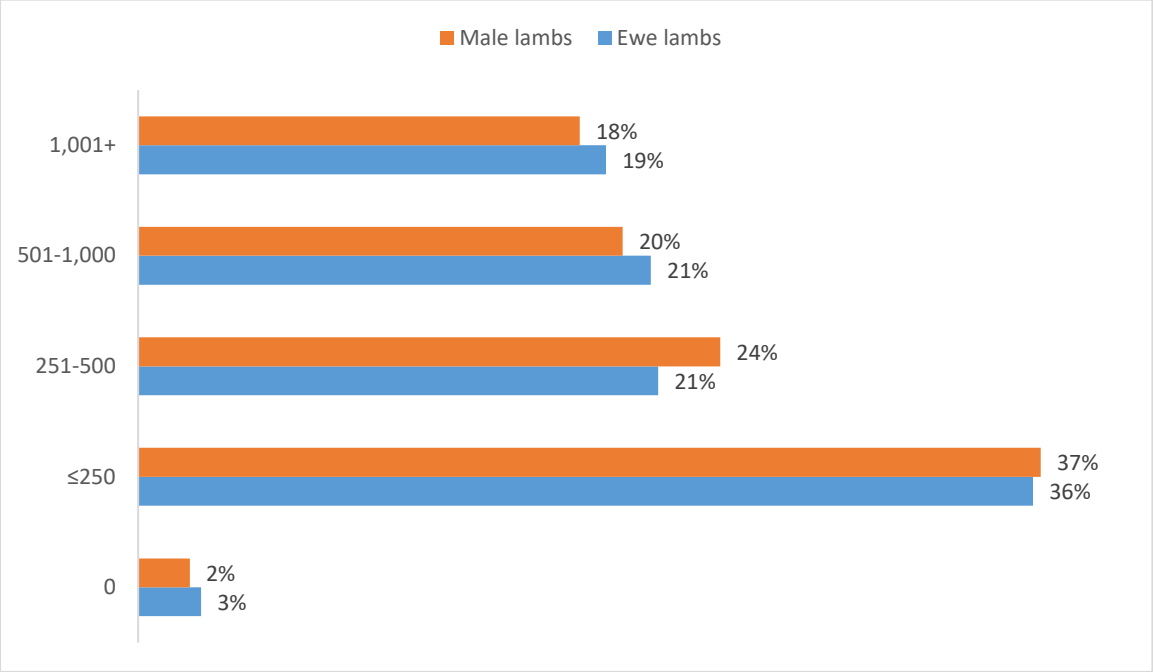
Base: All Merino producers n = 809 (2021 n=1,203)



S7 As at 31 January 2024 approximately how many sheep were in your flock, including breeding and dry ewes, lambs, wethers and rams?

Figure 10: Number of ewe lambs and male lambs on property

Base: All Merino producers n = 809

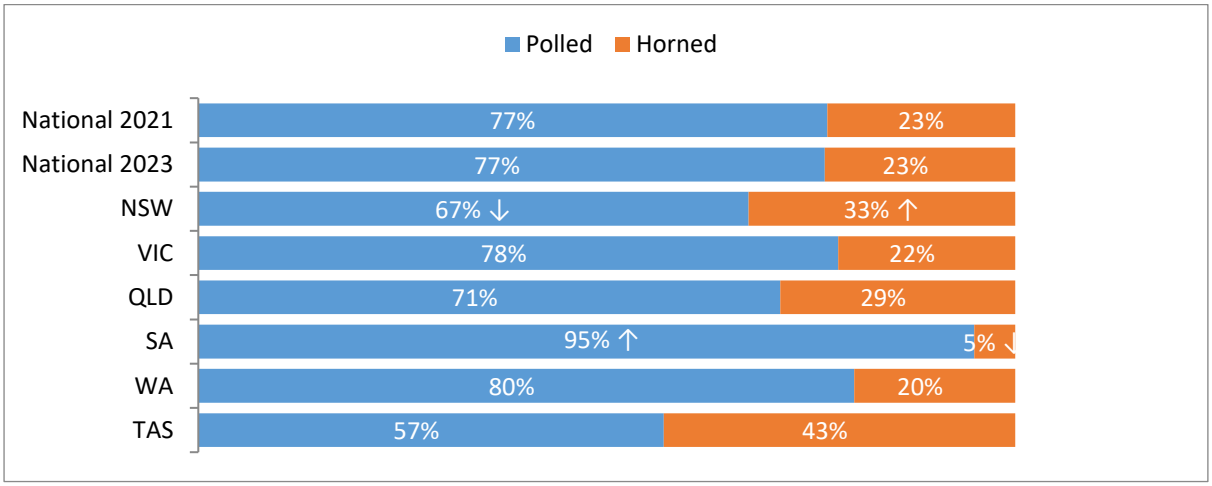


4.0 How many ewe lambs did you have on your property in 2023?

4.5.1 How many male lambs did you have on your property in 2023?

Figure 11: Polled or horned sire percentage

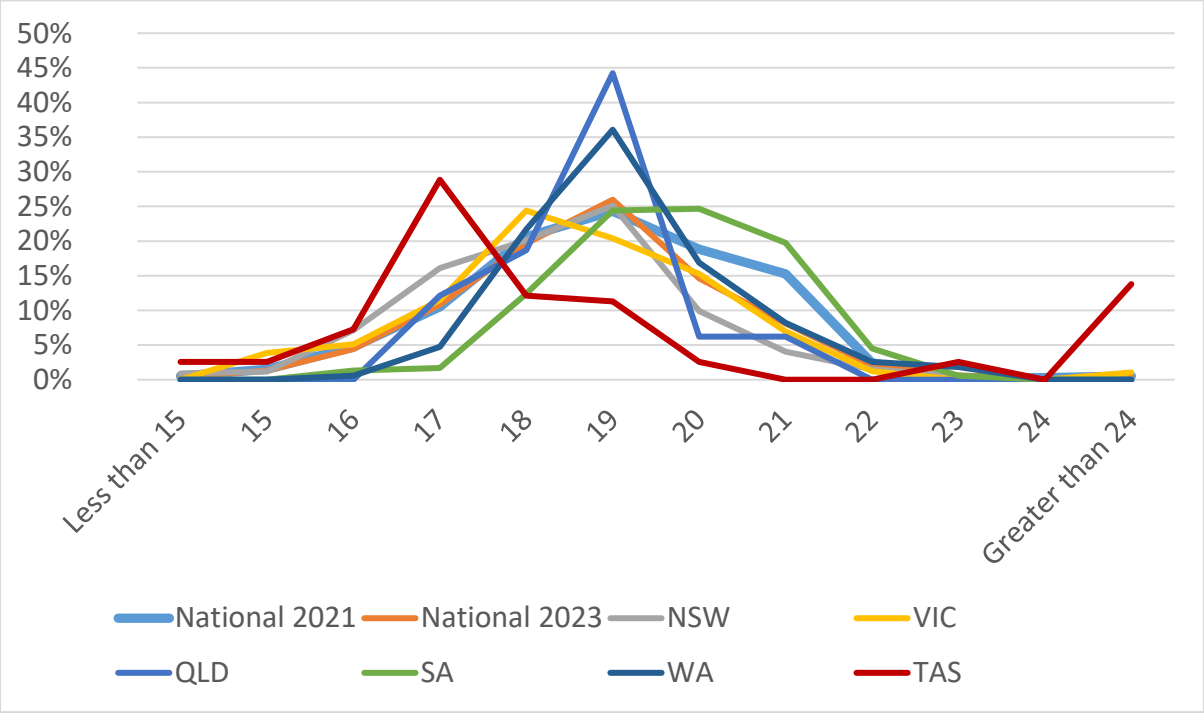
Base: All Merino producers n = 809 (2021 n=1,203)



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

Figure 12: Average adult merino ewe micron

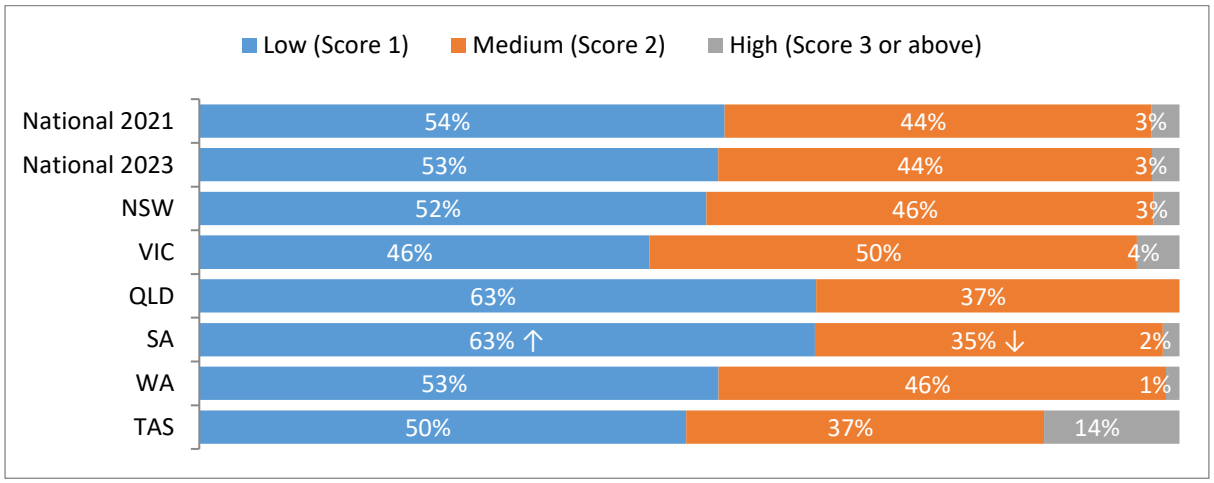
Base: All Merino producers n = 809 (2021 n=1,203)



2.2 What is your average adult merino ewe micron?

Figure 13: Average mixed age ewe body wrinkle

Base: All Merino producers n = 809 (2021 n=1,203)



2.3 Which of the following best describes your average mixed age ewe body wrinkle?

4.4. Joining and scanning

Nationally, Merino producers join their ewes to rams for an average of 7.8 weeks with almost one fifth (19%) joining ewes to rams for eight weeks or longer (**Figure 14**). Queensland Merino producers were significantly more likely to join for between seven and eight weeks (37%), while South Australians are more likely to join for 8+ weeks (24%).

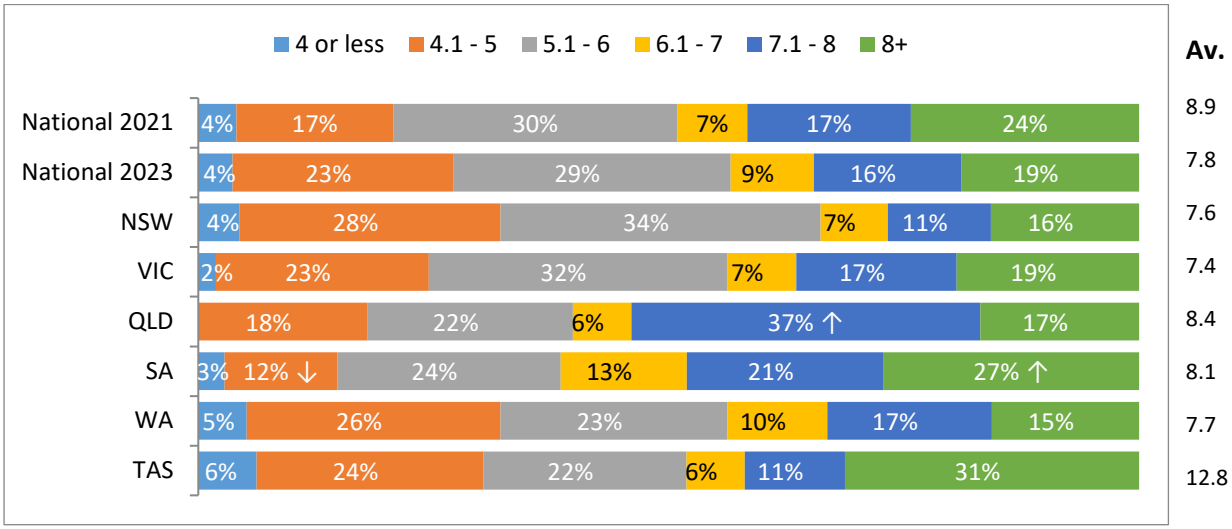
Merino producers were divided about pregnancy scanning, with 50% of Merino producers nationally stating they do not conduct pregnancy scanning (**Figure 15**). On average, producers scan 2,761 ewes. Nearly 3 in 4 Merino producers (72%) scanned for dry, single and multiple foetuses. Under a third (28%) wanted to know if the ewe was simply wet or dry (**Figure 16**).

Nationally, Merino producers scanned on average 69 days after rams in (**Figure 17**).

Around one third of Merino producers manage twin lambs separately (36%) (**Figure 18**). South Australian Merino producers were significantly less likely than other states to manage twins separately (28%).

Figure 14: Joining period in weeks

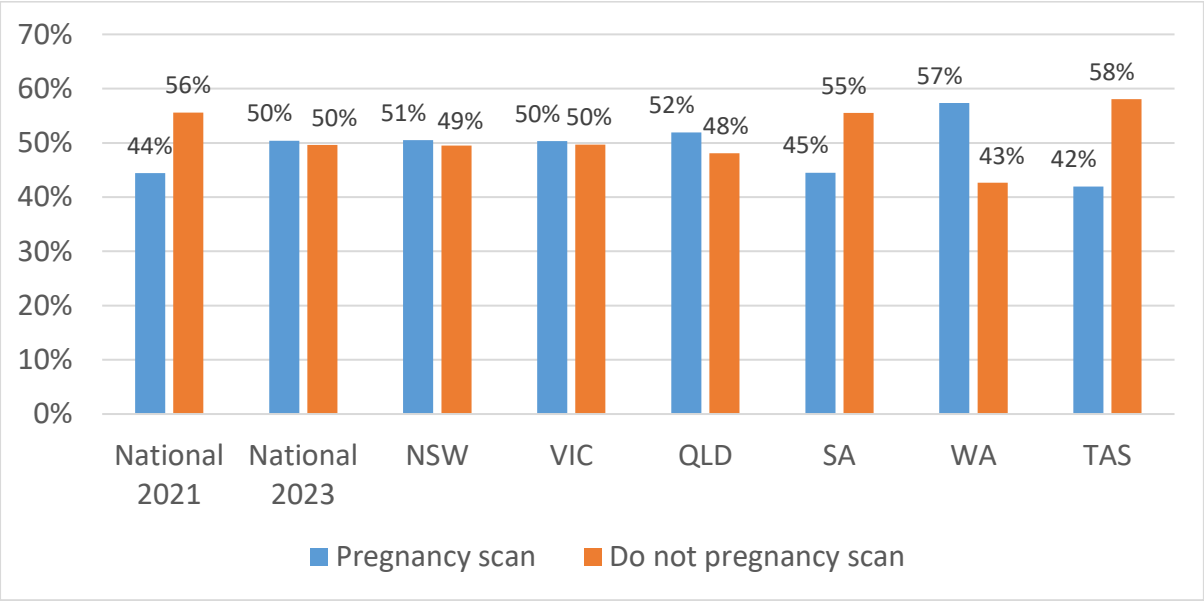
Base: All Merino producers n = 809 (2021 n=1,203)



3.1 How many weeks do you join your ewes to your rams?

Figure 15: Pregnancy scanning of ewes

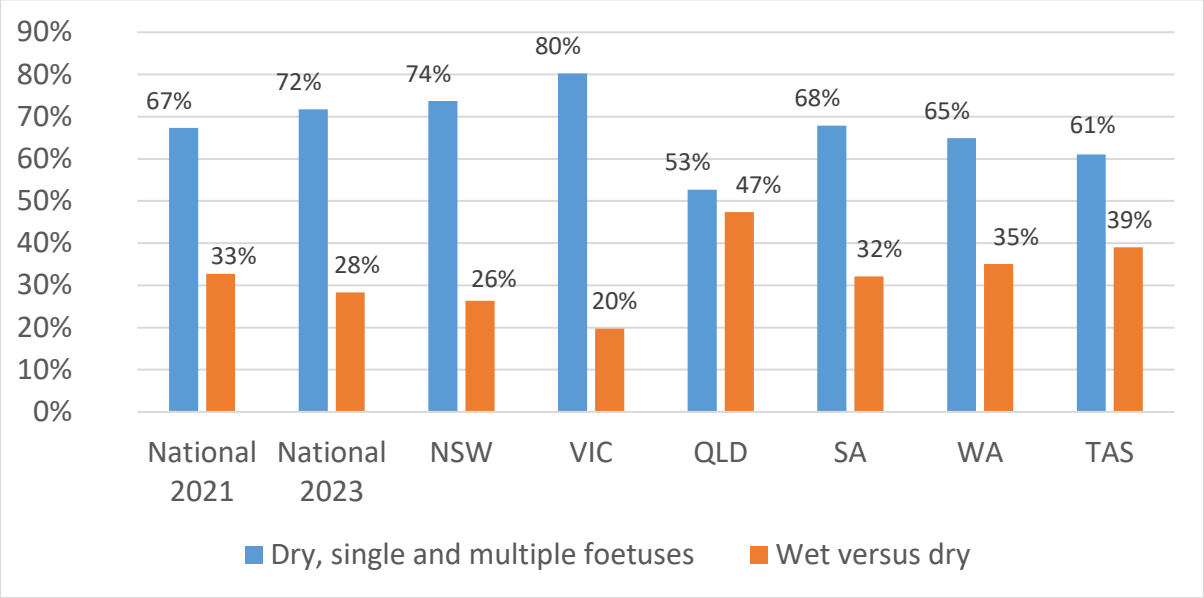
Base: All Merino producers n = 809 (2021 n=1,203)



3.2 Do you pregnancy scan your ewes?

Figure 16: Scanning for dry, single and multiple foetuses

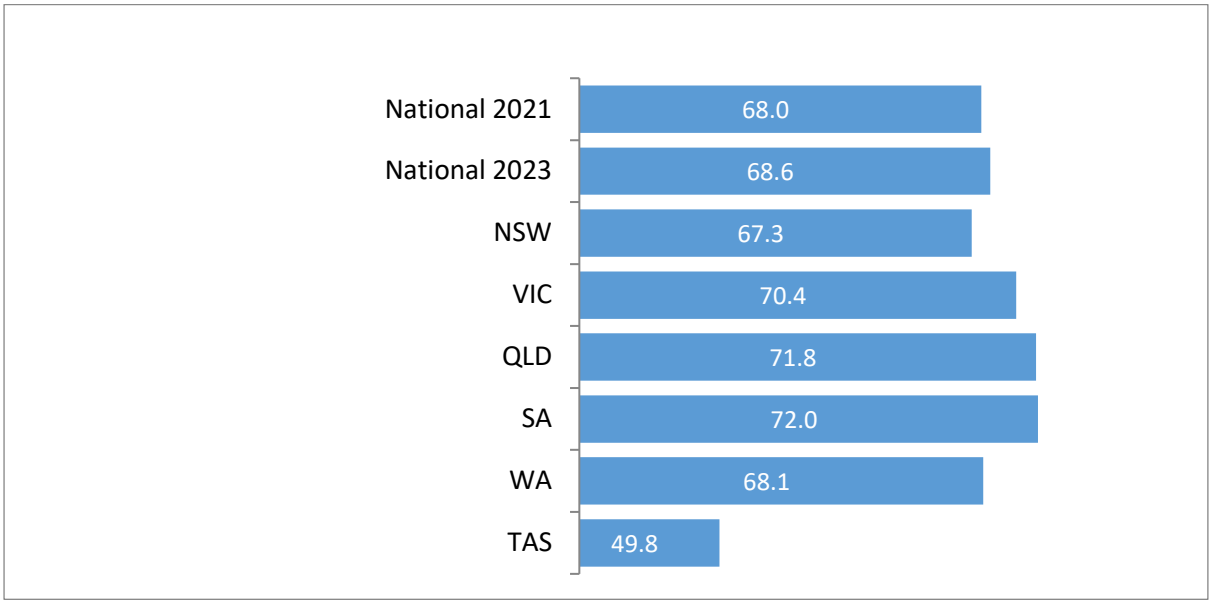
Base: Merino producers who scan for pregnancy n=449 (2021 n = 1021)



3.3 Which of the following do you scan for?

Figure 17: Number of days after rams in when scans are performed

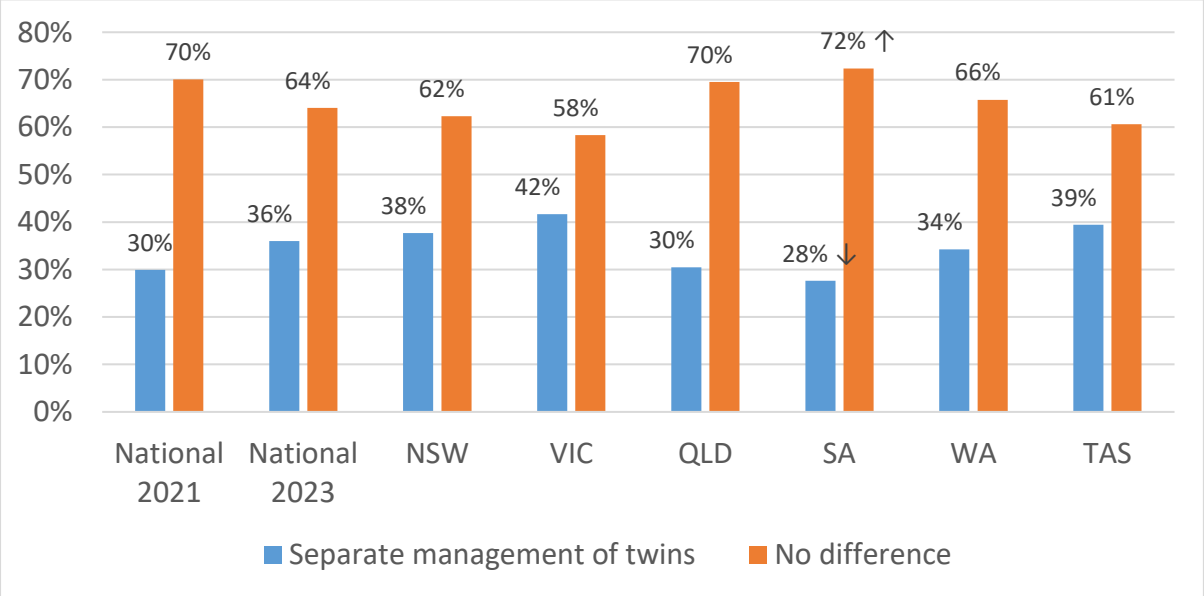
Base: Merino producers who scan for pregnancy n=449 (2021 n = 1021)



3.4 How many days after rams in do you scan?

Figure 18: Separate management of twin lambs

Base: All Merino producers n = 809 (2021 n=1,203)



3.5 Do you manage twin lambs separately?

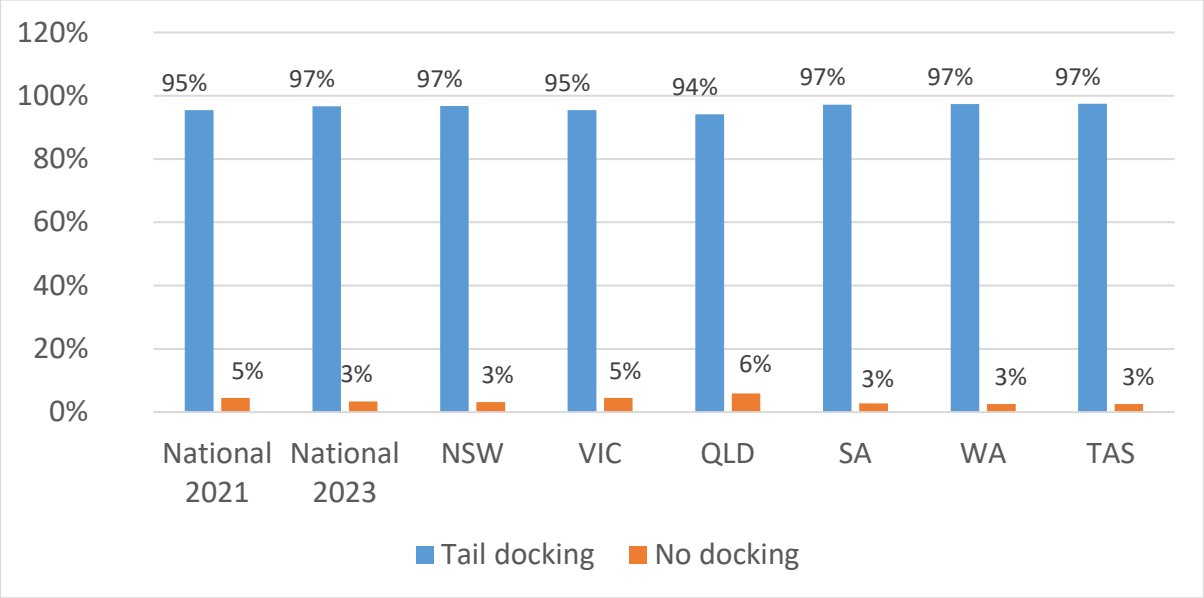
4.5. Tail docking

4.5.1. Overview

At the National level, 97% of Merino producers tail dock their ewe lambs (**Figure 19**). The proportion of ewe lambs that are tail docked is 95%. 97% of Merino producers tail dock their male lambs (**Figure 20**) which also represents 97% of male lambs being tail docked.

Figure 19: Tail docking of ewes

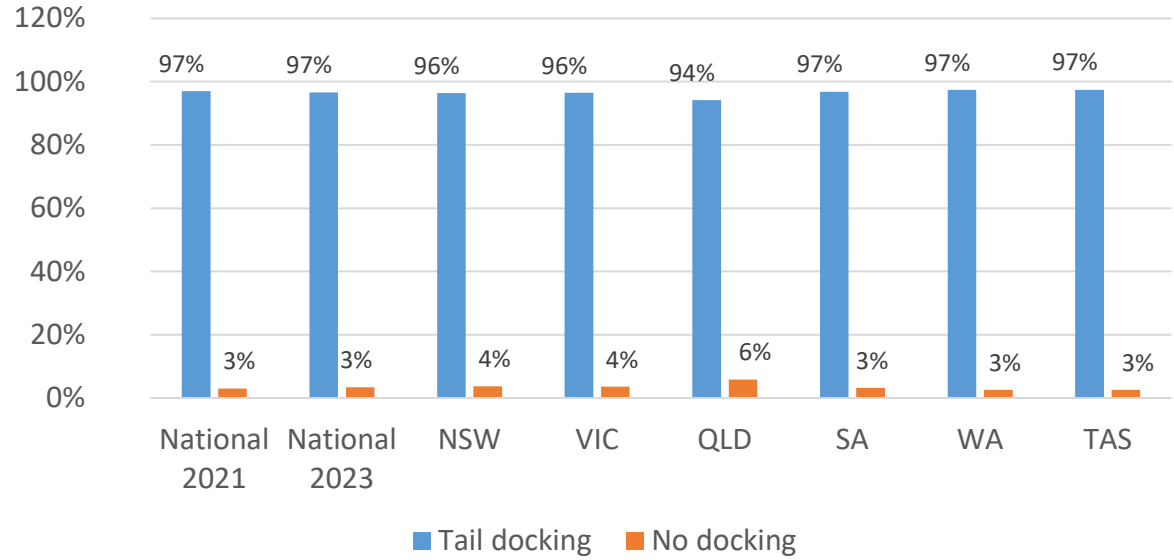
Base: All Merino producers n = 809 (2021 n=1,203)



4.1 Do you tail dock your ewe lambs?

Figure 20: Tail docking of male lambs

Base: All Merino producers n = 809 (2021 n=1,203)



4.6: Do you tail dock your male lambs?

4.5.2.Docking methods

On average, farmers tail dock 721 ewe lambs (**Error! Reference source not found.**) and 697 male lambs (**Error! Reference source not found.**).Hot knife was the most common technique (66%) used for tail docking of ewe lambs followed by rings (30%) (**Figure 23**). There was a significant state effect for tail docking method. Rubber rings were significantly more commonly used in New South Wales (42%) and Tasmania (60%). South Australians were significantly more likely to use hot knife (86%) and Queenslanders were significantly more likely to use cold knife (36%) and shears (17%).

As with ewe lambs, when tail docking male lambs hot knife was the most common technique (66%) followed by rings (31%) (**Figure 24**).

There was a significant state effect for tail docking method. Rubber rings were significantly more commonly used in New South Wales (4%). Cold knife was significantly more common in Queensland (36%). Hot knife was more common in South Australia (85%) and Western Australia (76%). Queensland Merino producers were also more likely to use shears (13%).

The most common reasons cited for using rings to tail dock ewe lambs was that it is easy (61%), bloodless (47%) and a preferable method (44%) (**Figure 25**).

The most common reasons cited for using rings to tail dock male lambs was that it is easy (61%), bloodless (49%) and effective (46%) (**Figure 26**).

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 (74%) (**Figure 27**).

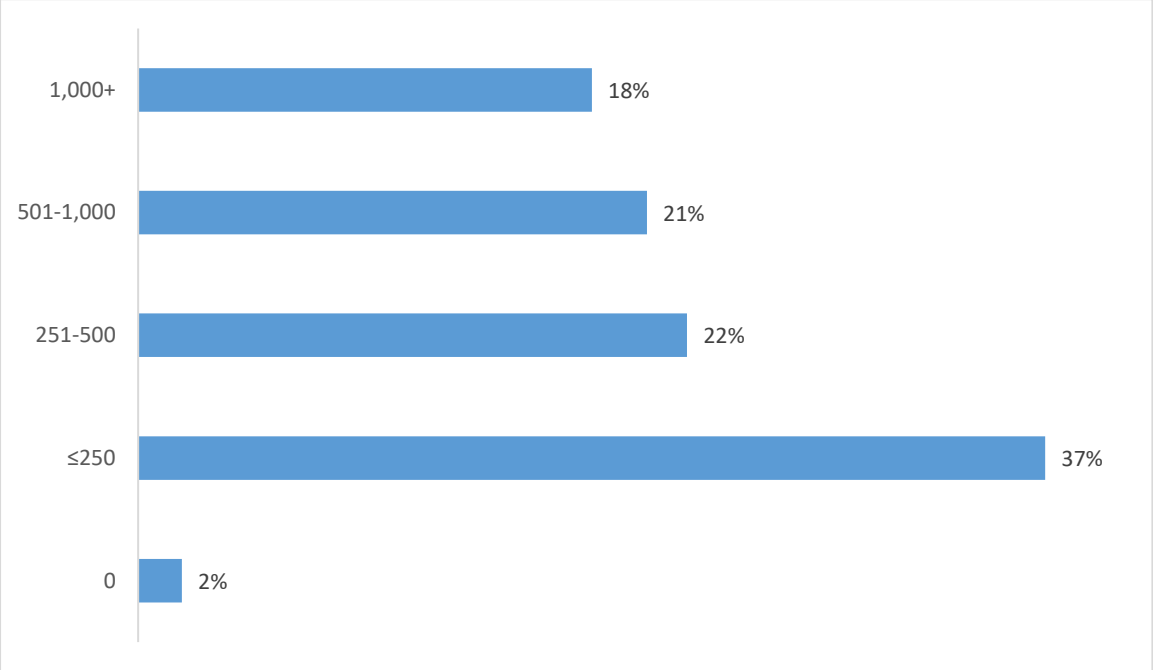
Nationally, the most common reasons cited for using a hot knife to tail dock male lambs were that it is bloodless or seals the wound (69%) and clean and neat (41%) (**Figure 28**).

At the national level, the most common reasons cited for using a cold knife to dock ewe lambs was that it is quick (59%), effective (53%) and clean and neat (52%) (**Figure 29**). Reasons given for using the cold knife on male lambs were that it is efficient (66%) and effective (58%) (**Figure 30**).

Clean and neat (70%) and quick (70%) are the main reasons for using shears for tail docking ewe lambs (**Figure 31**). The most common reasons cited for using shears to tail dock male lambs were that they were quick (60%), that it is clean and neat (53%) and efficient (53%) (**Figure 32**).

Figure 21: Number of ewe lambs tail docked

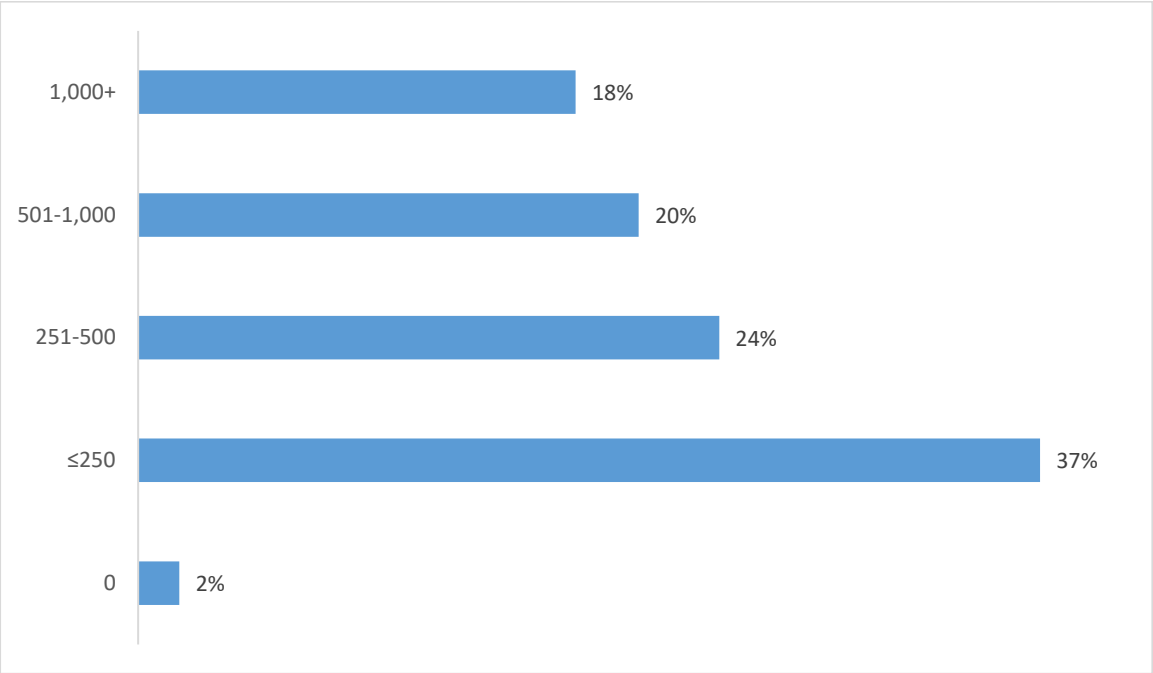
Base: Producers who docked ewe lamb tails n= n = 778



4.1.1 How many ewe lambs did you tail dock in 2023?

Figure 22: Number of male lambs tail docked

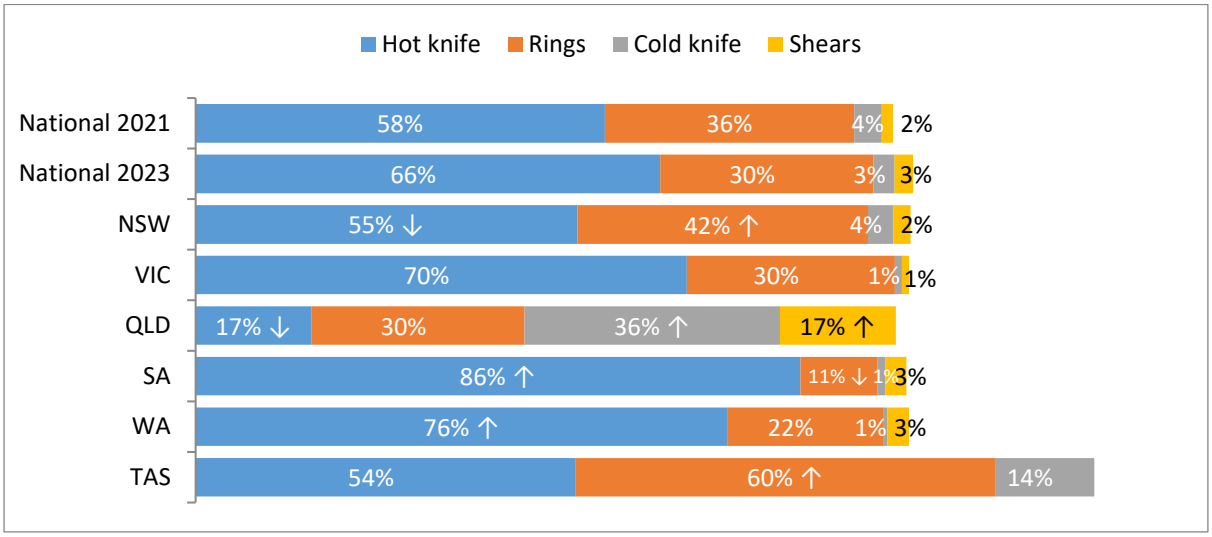
Base: Producers who docked male lamb tails n= n = 784



4.6.1 How many male lambs did you tail dock in 2023?

Figure 23: Method for tail docking ewes

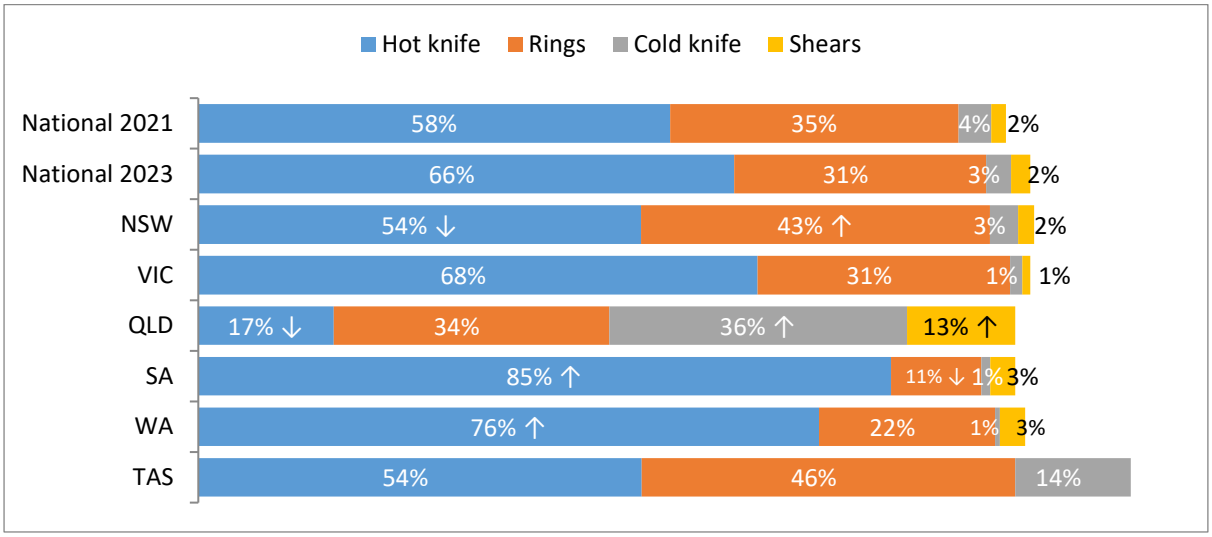
Base: Merino producers who tail dock ewes n = 786 (2021 n = 1,156)



4.2 What method do you use to tail dock ewes?

Figure 24: Method for tail docking male lambs

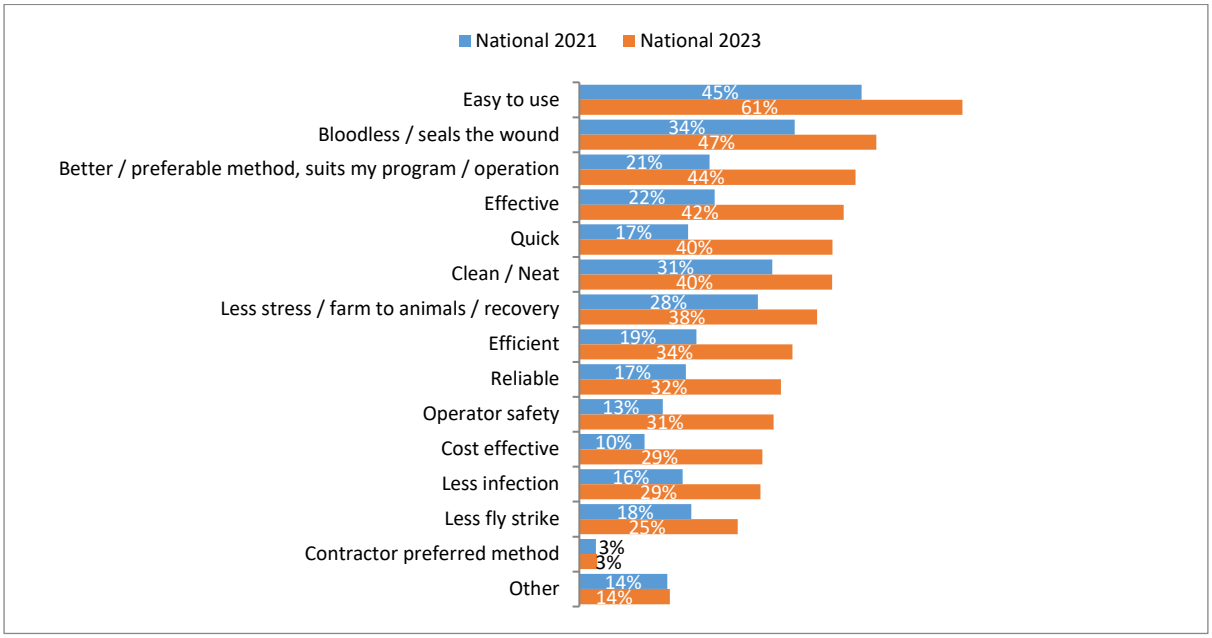
Base: Merino producers who tail dock male lambs n = 784 (2021 n = 1,174)



4.7 What method do you use to tail dock male lambs?

Figure 25: Reason for using rings to tail dock ewes

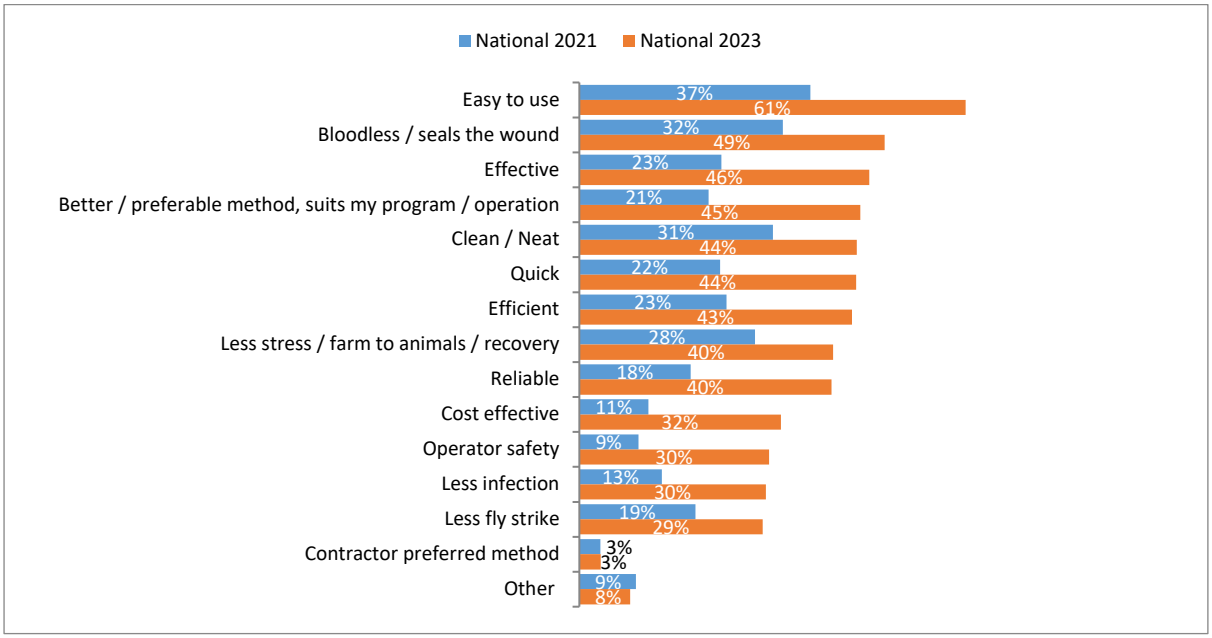
Base: Merino producers who tail dock ewes using rings n = 192 (2021 n = 324)



4.3 Why do you use rings to tail dock your ewes?

Figure 26: Reason for using rings to tail dock male lambs

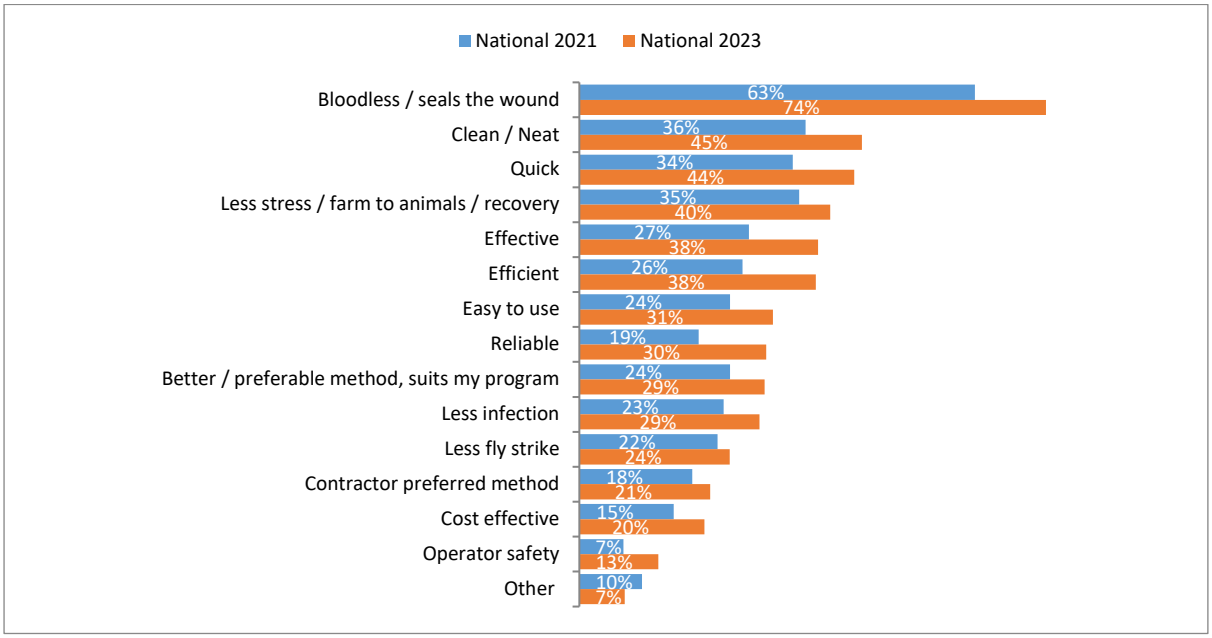
Base: Merino producers who tail dock male lambs using rings n = 196 (2021 n = 338)



4.8 Why do you use rings to tail dock your male lambs?

Figure 27: Reasons for using hot knife on ewe lambs

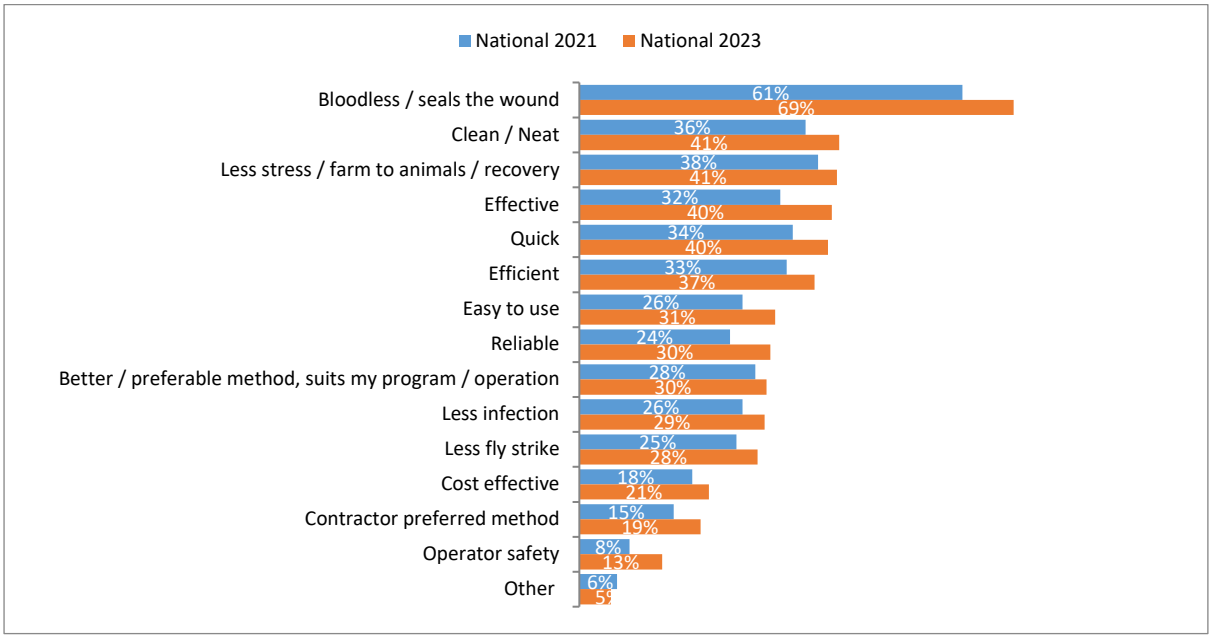
Base: Merino producers who tail dock ewes using hot knives n = 555 (2021 n = 745)



4.3 Why do you use hot knife to tail dock your ewes?

Figure 28: Reason for using hot knife to tail dock male lambs

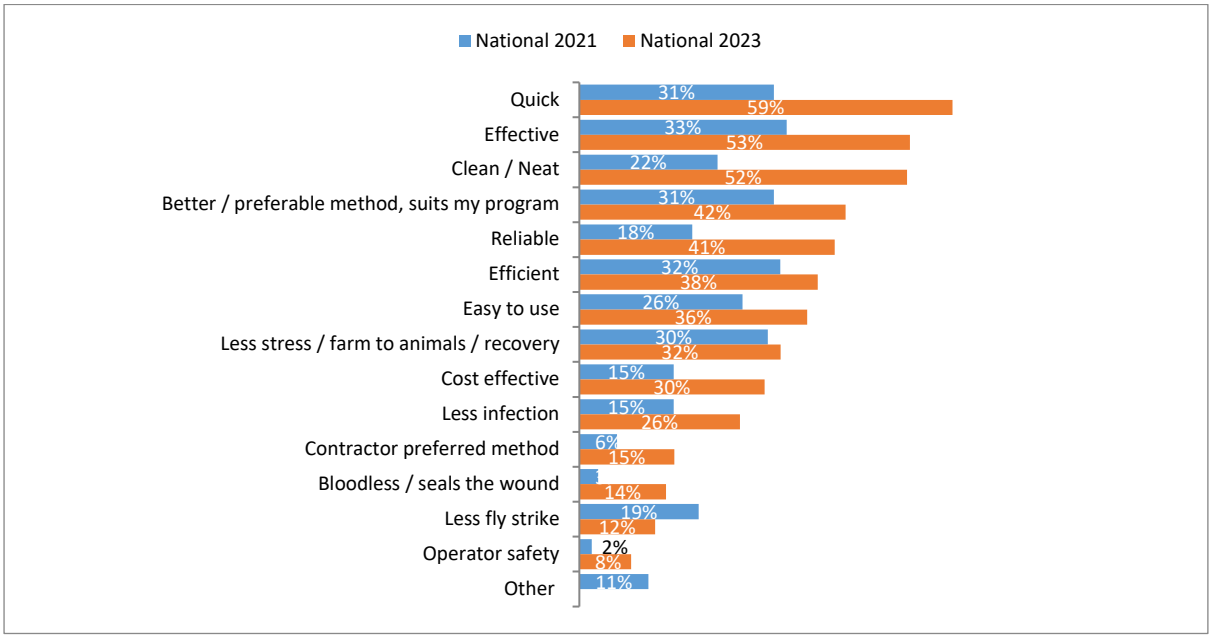
Base: Merino producers who tail dock male lambs using hot knives n = 548 (2021 n = 745)



4.8 Why do you use hot knife to tail dock your male lambs?

Figure 29: Reasons for using cold knife to tail dock ewe lambs

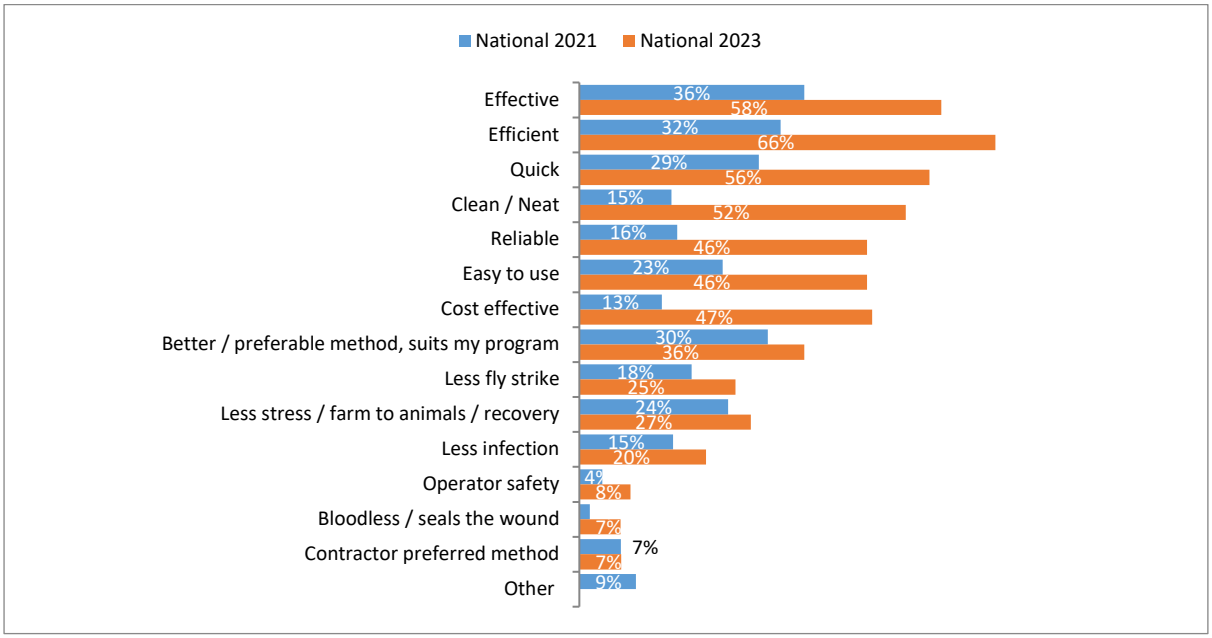
Base: Merino producers who tail dock ewes using cold knife n = 26 (2021 n = 56)



4.3 Why do you use cold knife to tail dock your ewes?

Figure 30: Reasons for using cold knife to tail dock male lambs

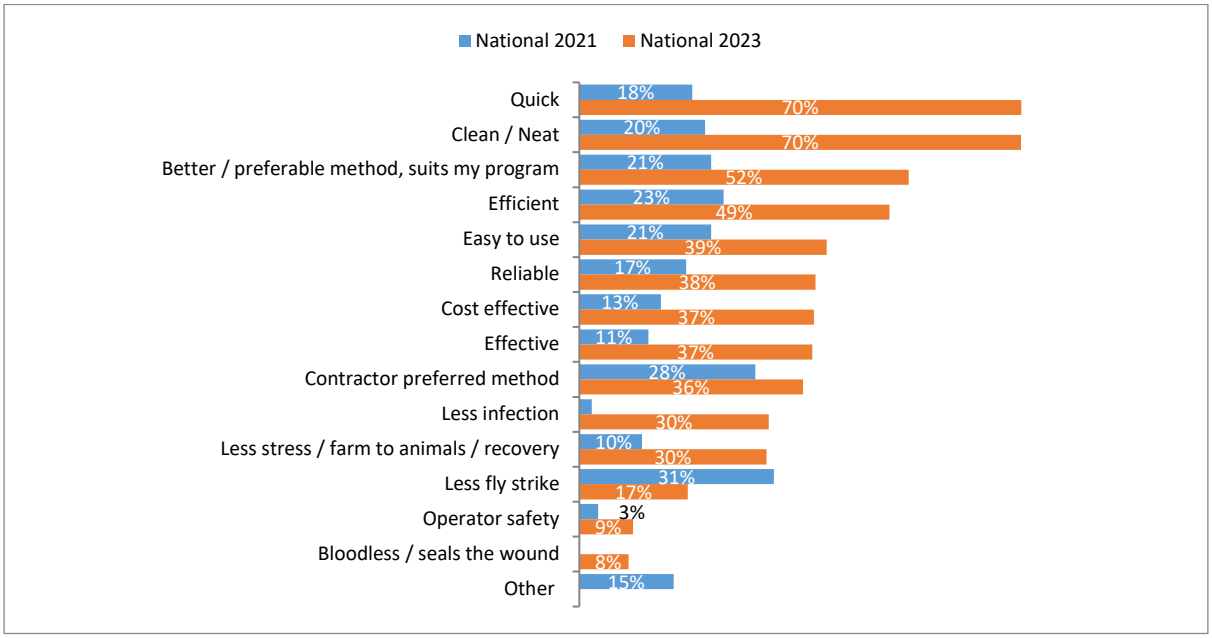
Base: Merino producers who tail dock male lambs using cold knives n = 29 (2021 n = 55)



4.8 Why do you use cold knife to tail dock your male lambs?

Figure 31: Reasons for using shears to tail dock ewe lambs

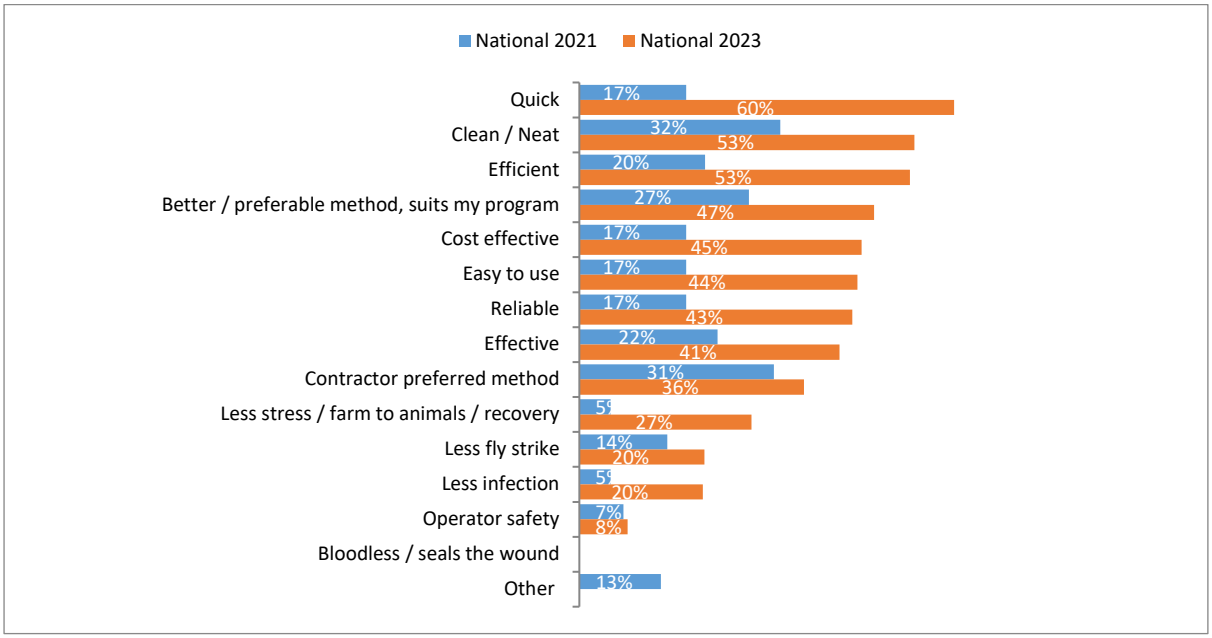
Base: Merino producers who tail dock ewes using shears n = 24 (2022 n = 24)



4.3 Why do you use shears to tail dock your ewes?

Figure 32: Reasons for using shears to tail dock male lambs

Base: Merino producers who tail dock male lambs using shears n = 21 (2021 n = 23)



4.8 Why do you use shears to tail dock your male lambs?

4.5.3.Tail length

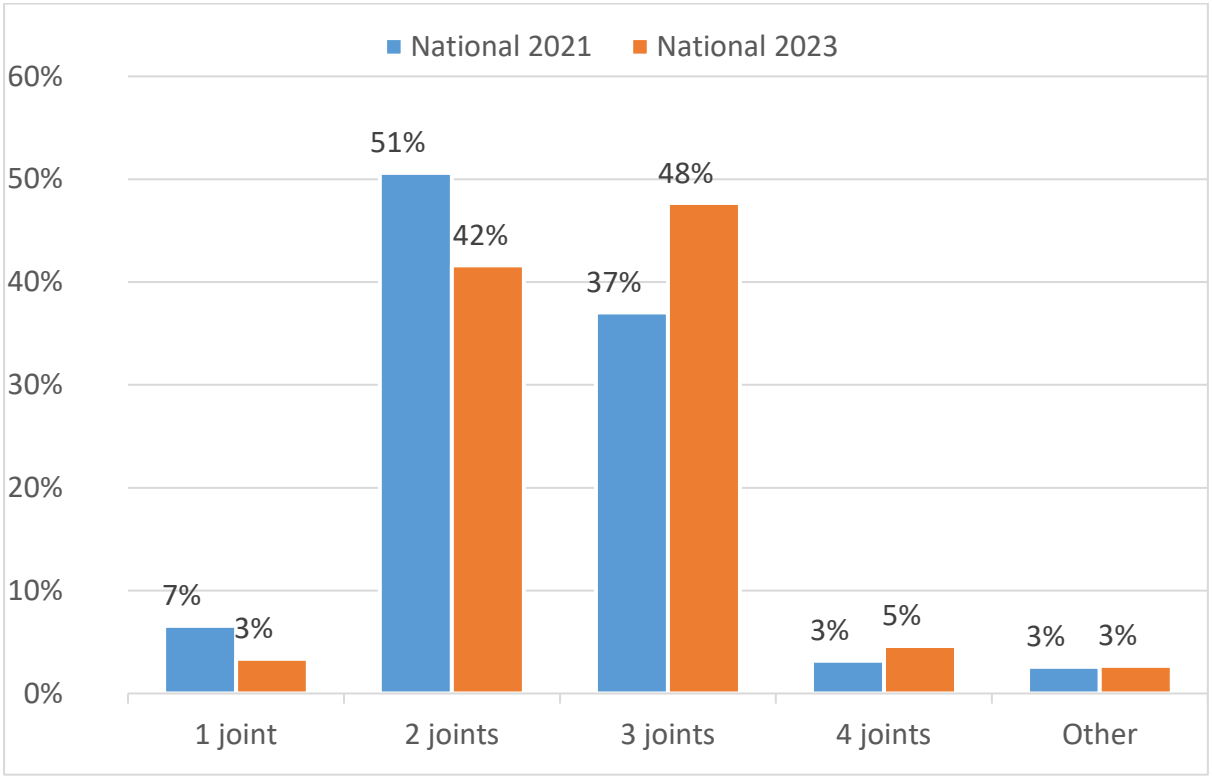
Nationally, around half of Merino producers who tail dock ewe lambs dock tails to three joints (48%) (**Figure 33**). Two joints is the next most common choice at 42%. Nationally, more than half of Merino producers who tail dock male lambs dock them to two joints (47%). Three joints is the next most common choice at 43%. (**Figure 34**).

The most common reasons cited for choosing a particular tail length when docking ewe lambs were to protect the genital area (59%) and to provide sun protection (53%) (**Figure 35**). When docking male lambs, Merino producers selected a particular tail length to allow tail movement (41%) and to provide sun protection (38%) (**Figure 36**).

The primary reason for tail docking ewe or male lambs is to reduce the risk of flystrike or disease (72%) (**Figure 37**).

Figure 33: Length of docked ewe lamb tails

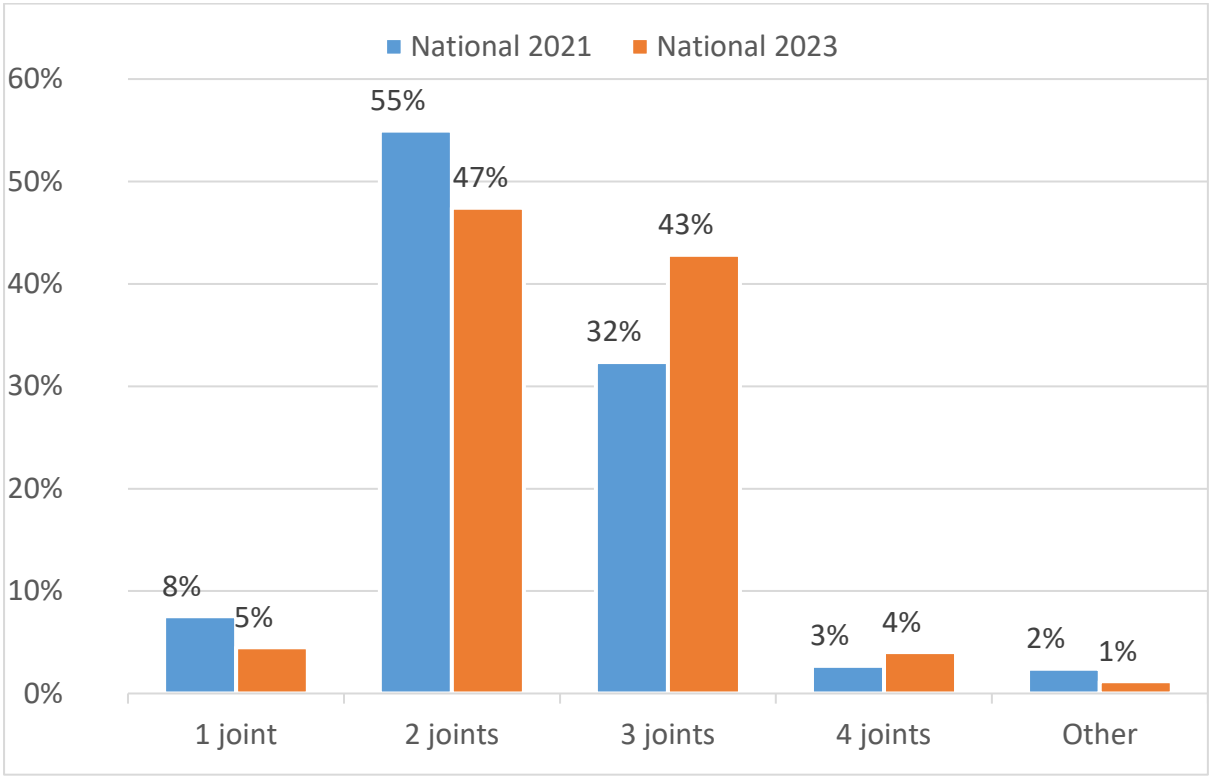
Base: Merino producers who dock ewe lamb tails n = 786 (2021 n = 1,156)



4.4 At what length do you dock ewe lambs' tails?

Figure 34: Length of docked male lamb tails

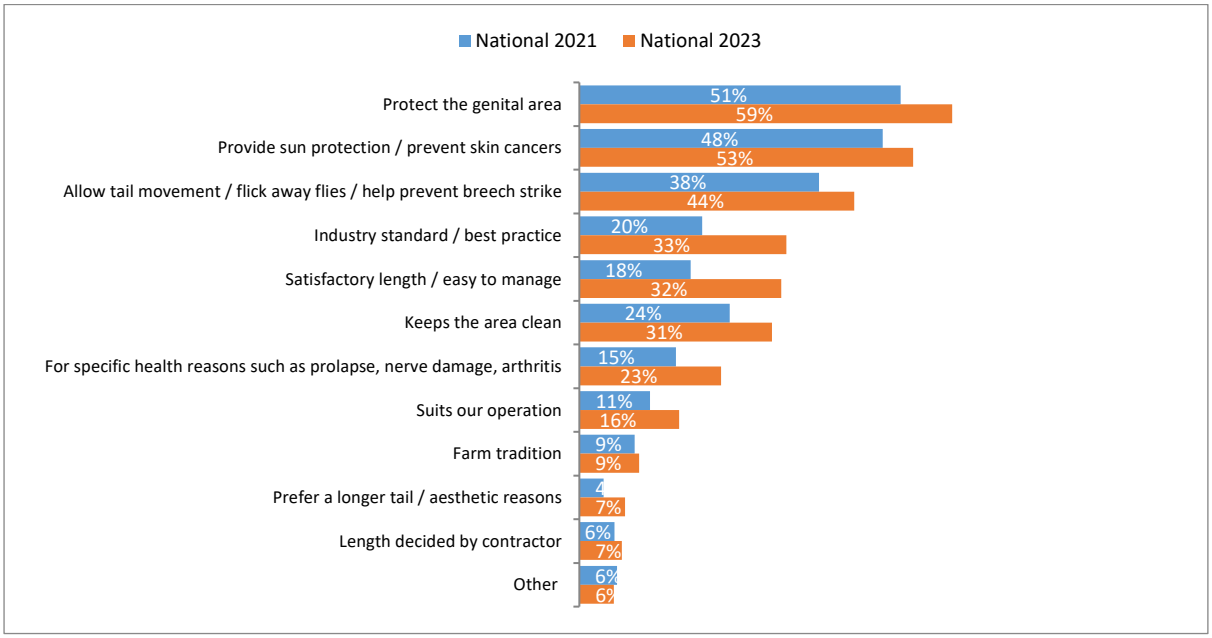
Base: Merino producers who tail dock male lambs n = 784 (2021 n = 1,174)



4.9 At what length do you dock male lambs' tails?

Figure 35: Reason for length of docked ewe lamb tails

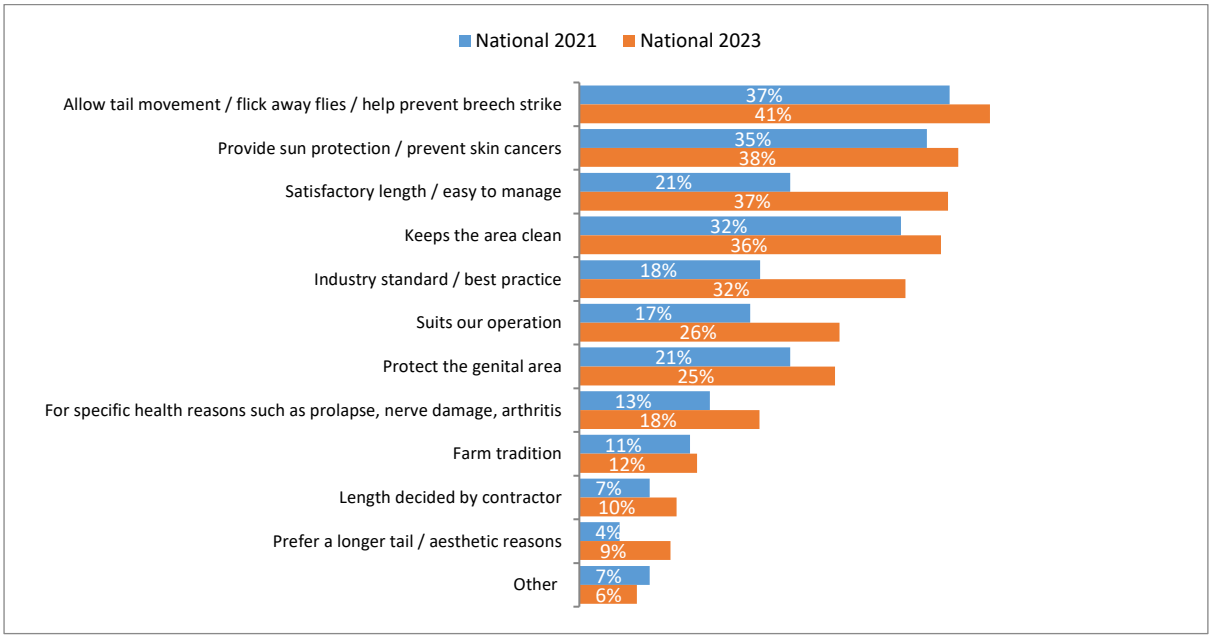
Base: Merino producers who dock ewe lamb tails n = 786 (2021 n = 1,156)



4.5 Why did you choose this tail length for your ewes?

Figure 36: Reason for length of docked male lamb tails

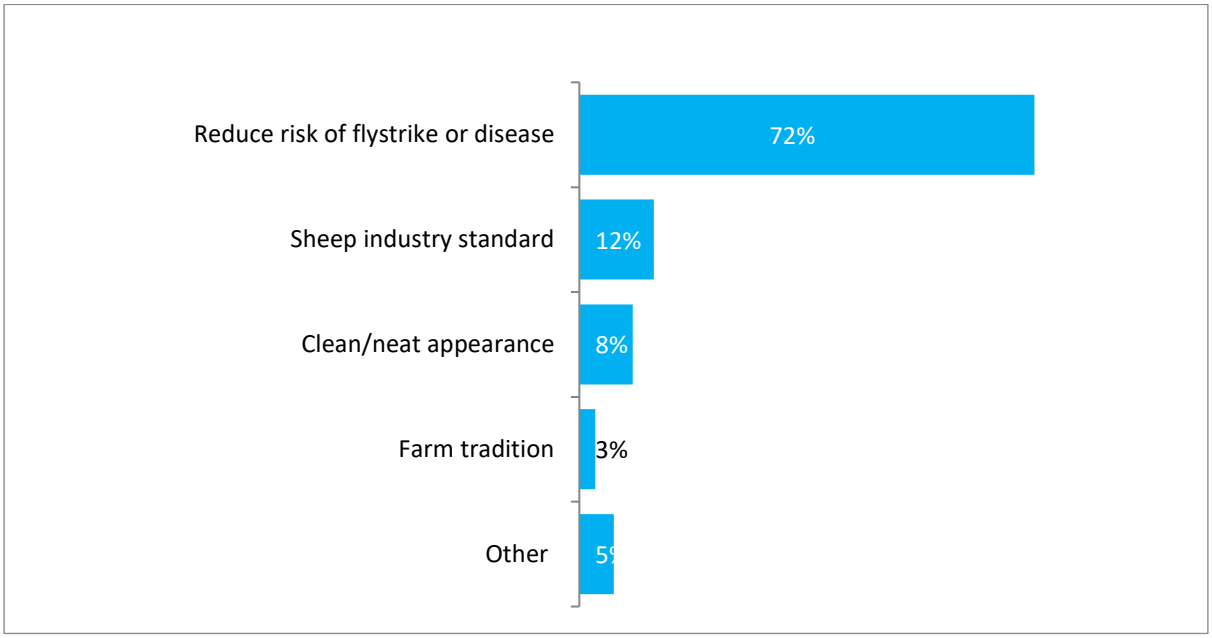
Base: Merino producers who dock male lamb tails n = 784 (2021 n = 1,174)



4.10 Why did you choose this tail length for your male lambs?

Figure 37: Reasons for tail docking lambs

Base: Producers who tail dock ewes or male lambs n = 789



4.11 Why do you tail dock either your ewe or male lambs?

4.5.4.Pain management

Nationally, 70% of Merino producers use pain management at lamb tail docking (**Figure 38**) on ewe lambs. This equates to 82% of the ewe lambs being administered pain management at tail docking. Pain management is significantly less likely to be used in New South Wales (61% of producers). Merino producers in Victoria and South Australia were significantly more likely to use pain management (both 80%).

Similarly, 69% of producers use pain management for docking male lambs, which represents 80% of male lambs. Pain management is significantly less likely to be used in New South Wales (60% of producers). Merino producers in Victoria and South Australia were significantly more likely to use pain management (78% and 80%, respectively).

Nationally, Merino producers who use rings were less likely to use pain management when tail docking ewe lambs (37%) (**Figure 39**). Merino producers who tail dock using cold knife, hot knife and shears are much more likely to use pain management (81%, 86% and 89%, respectively).

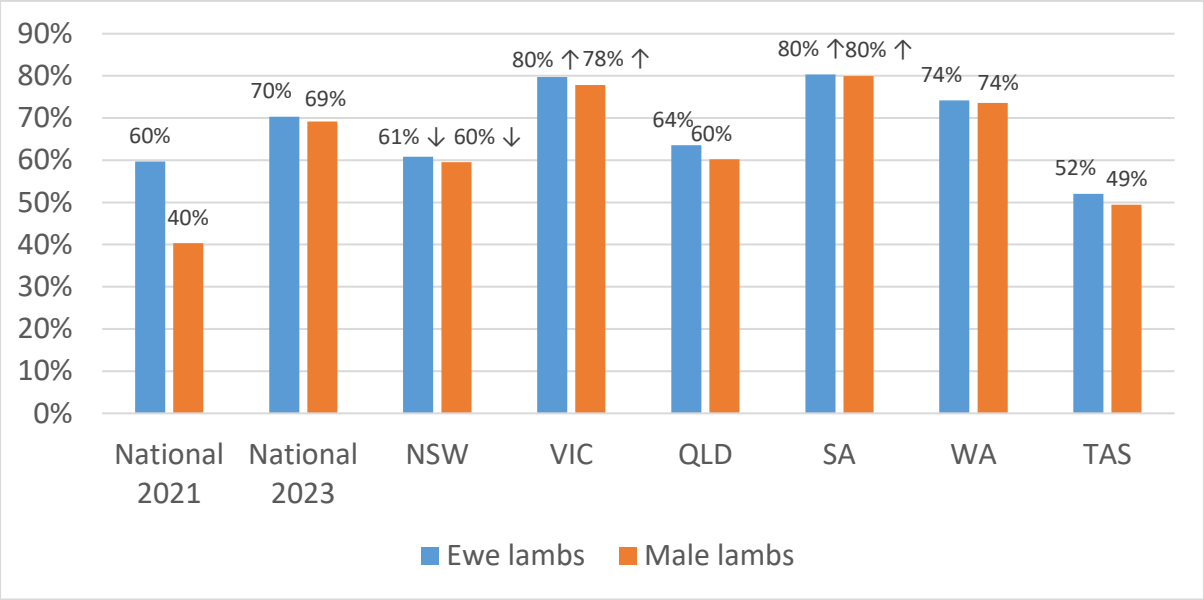
Adoption of pain management for male lambs also varies by tail docking method and is highest for hot knife and shears (both 84%) and lowest for rings (35%) (**Figure 40**).

Anaesthetic and antiseptic spray (e.g. Tri-Solfen) at the site was by far the most commonly used pain management method (**Figure 41**). Nationally, it is used by 78% of Merino producers who use pain management products at tail docking. Analgesic injection (e.g. Meloxicam) was the second most popular pain relief (13%). Western Australian Merino producers were more likely to use anaesthetic and antiseptic spray (e.g. Tri-Solfen) than other states (89%). Queensland producers were more likely to use non-veterinary prescribed analgesic oral gel e.g. Butec (30%) and other pain management products (5%), while Tasmanian producers likely to use analgesic injection e.g. Meloxicam (52%) and less likely to use anaesthetic and antiseptic spray e.g. Tri-Solfen (43%).

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 only suitable for wounds (e.g. Tri-Solfen) for rings or using anaesthetic injection at the surgery site (e.g. off label use of 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 38: Use of pain management for tail docking of lambs

Base: Merino producers who tail docked ewe lambs n =786 (2021 n = 1,185) Merino producers who tail docked male lambs n = 784 (2021 n =1,184)

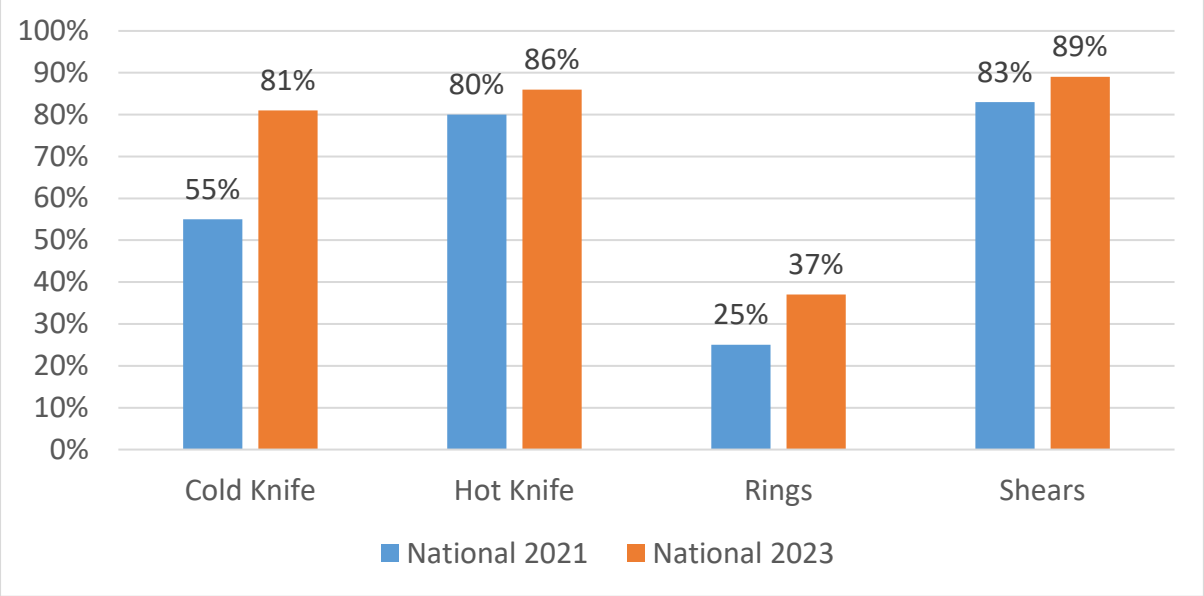


4.12 Did you use any products for pain management for tail docking your ewe lambs in 2023?

4.12.2 Did you use any products for pain management for tail docking your male lambs in 2023?

Figure 39: Use of pain management for tail docking by docking method for ewe lambs

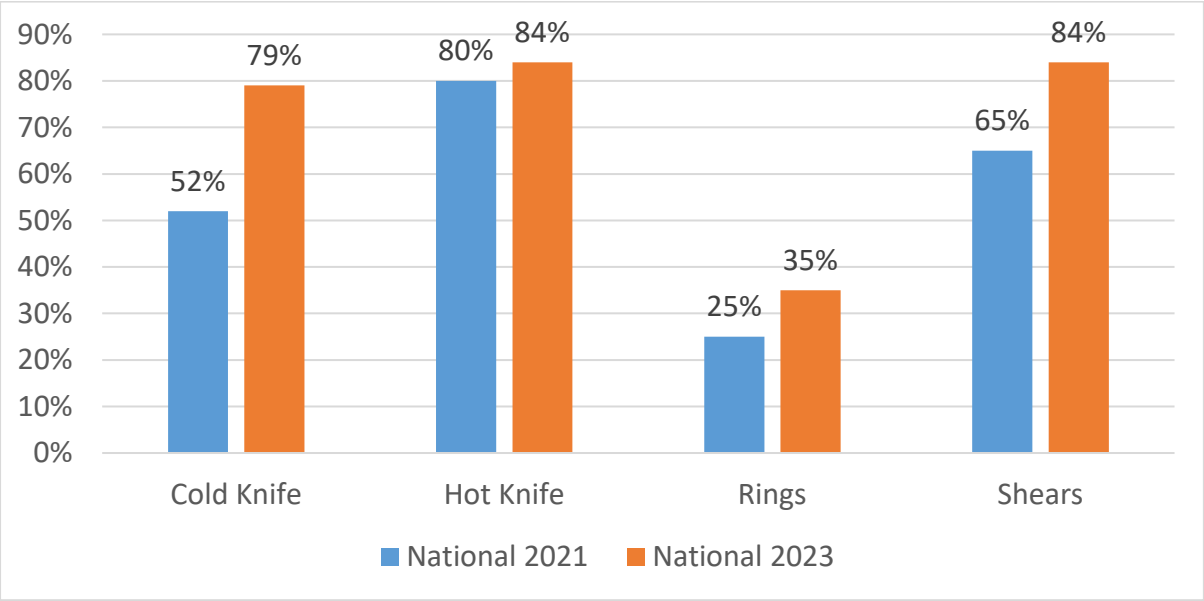
Base: Merino producers who tail docked ewe lambs n = 786 (2021 n = 1,174)



4.12 Did you use any products for pain management for tail docking your ewe lambs in 2023?

Figure 40: Use of pain management for tail docking by docking method for male lambs

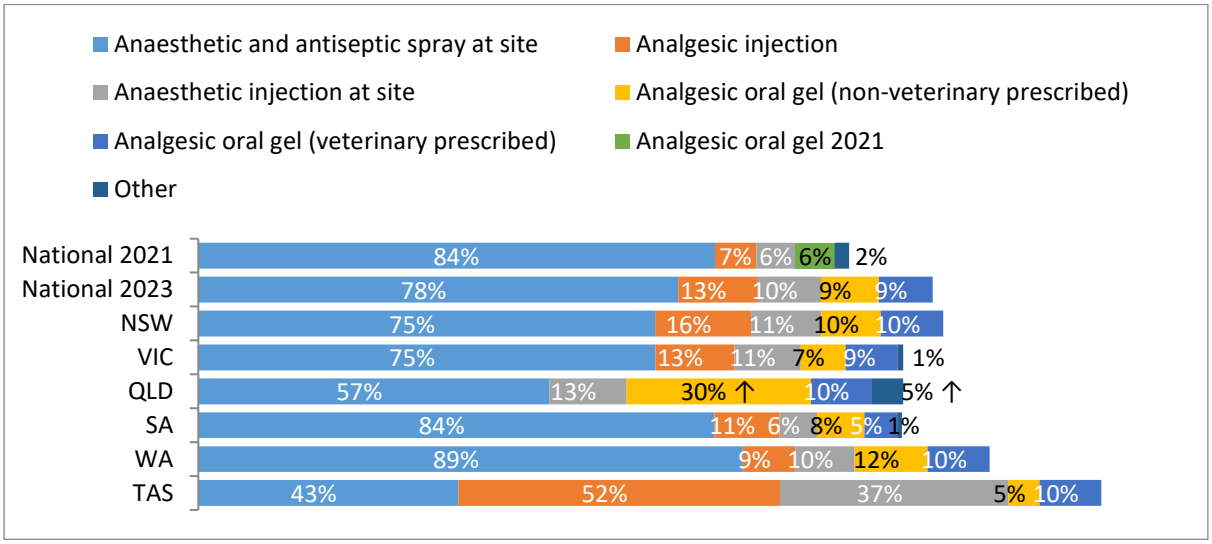
Base: Merino producers who tail docked male lambs n = 784 (2021 n = 1,174)



4.12.2 Did you use any products for pain management for tail docking your male lambs in 2023?

Figure 41: Use of pain management at tail docking

Base: Merino producers who use pain management at tail docking n = 592 (2021 n = 784)



4.13 What type of product/s did you use?

NB. Analgesic oral gel was separated into veterinary prescribed and non-veterinary prescribed in 2023

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 / oral gel Vet prescribed (e.g. Buccalgesic)	Analgesic / oral gel Non-vet prescribed (e.g. Butec)	Anaesthetic injection at the surgery site (e.g. Numnuts)	Analgesic / injection (e.g. Meloxicam)
Rubber Ring (n = 192) 25% use pain management (n = 82)	31%*	19%	15%	38%	22%
Hot Knife (n = 555) 80% use pain management (n = 479)	86%	8%	8%	6%*	12%
Cold Knife (n = 28) 55% use pain management (n = 21)	84%	3%	3%	16%	22%
Shears (n = 24) 65% use pain management (n = 21)	86%	19%	-	-	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

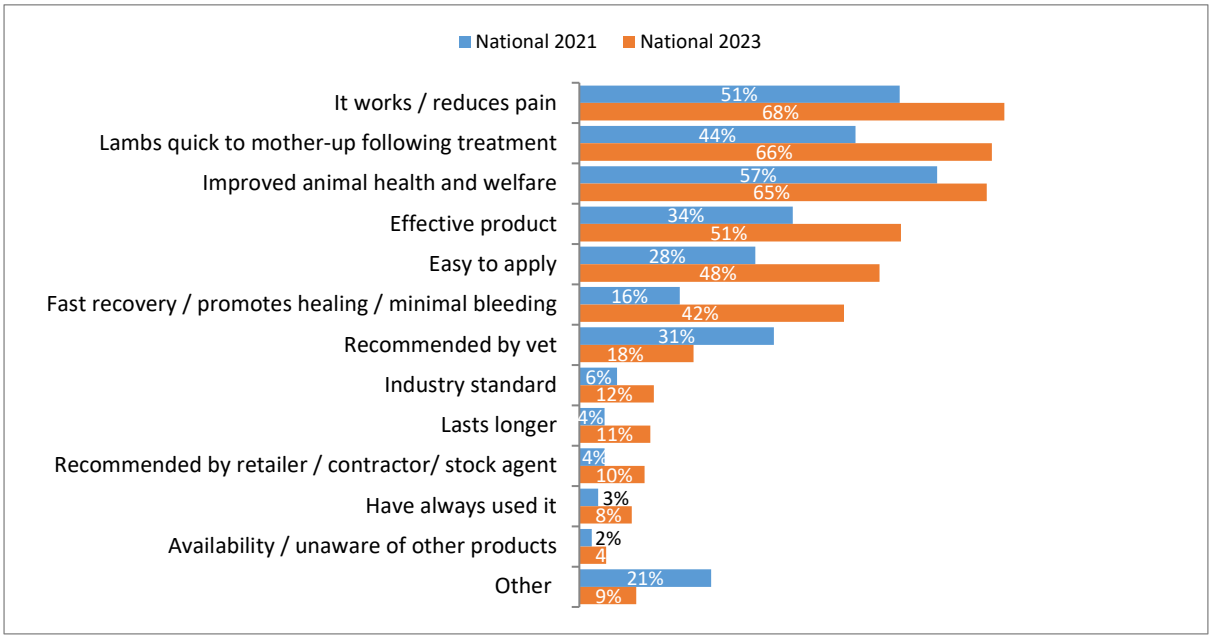
The most common reasons cited for choosing anaesthetic injections at tail docking of lambs were to reduce pain (68%), lambs are quick to mother up (66%) and to improve animal health and welfare (65%) (**Figure 42**). For anaesthetic and antiseptic spray at the surgery site (e.g. Tri-Solfen), the most common reasons cited were improved animal health and welfare (91%), and lambs quick to mother up following treatment (82%) (**Figure 43**). Merino producers who chose analgesic injections (e.g. Meloxicam) said they improved welfare (70%), reduced pain (70%) and it was longer lasting (70%)

(**Figure 44**). The most common reasons cited for choosing veterinary prescribed analgesic oral gel (e.g. Buccalgesic) were that it is longer lasting (95%), and improved animal health and welfare (86%) (**Figure 45**). Non-veterinary prescribed oral analgesic gel (e.g. Butec) was chosen because it is effective, and lambs are quick to mother up after treatment (both 47%).

The most common reason given for not using pain management is that Merino producers do not consider it necessary (46%). 32% of Merino producers claimed it was not practical or a quick procedure and a quarter (26%) felt it was too expensive (**Figure 46**).

Figure 42: Reason for using anaesthetic injection at surgery site

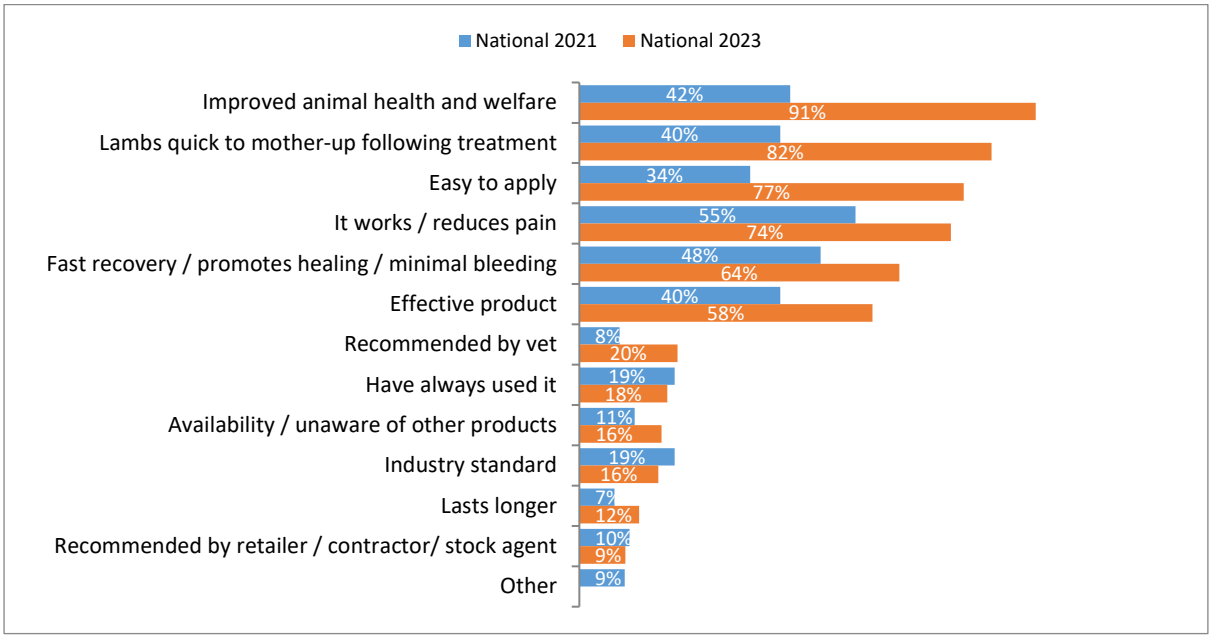
Base: Merino producers who use anaesthetic injection at tail docking n = 85 (2021 n = 49)



4.14 Why did you use this product?

Figure 43: Reason for using anaesthetic and antiseptic spray

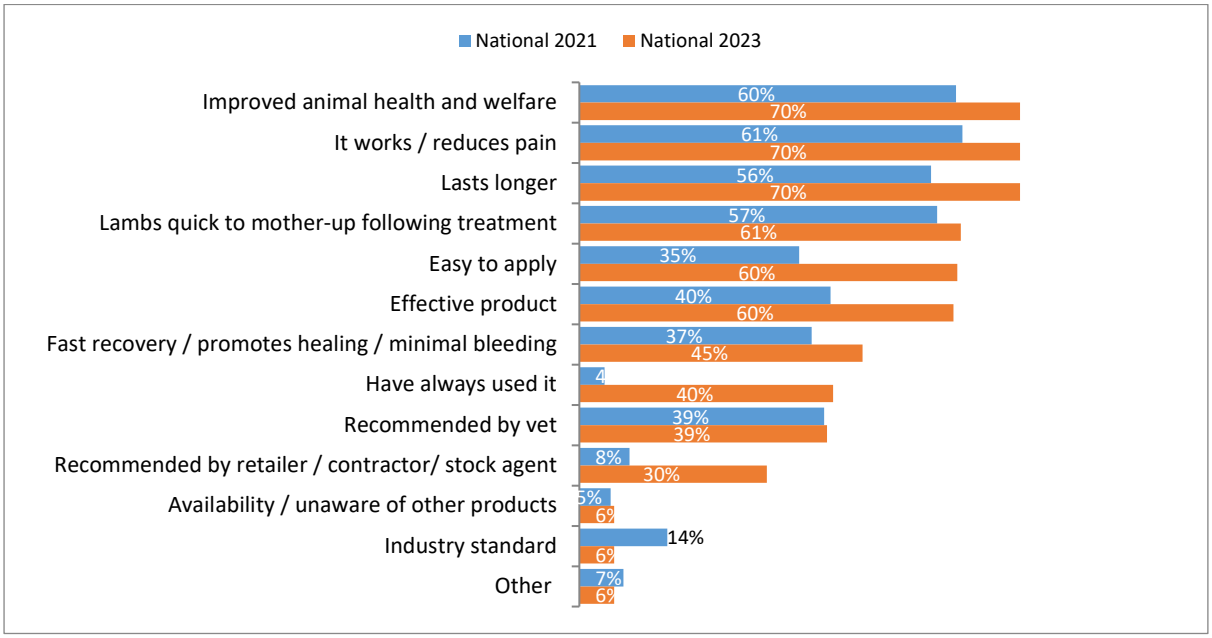
Base: Merino producers who use anaesthetic and antiseptic spray at tail docking n = 21 (2021 n = 676)



4.14 Why did you use this product?

Figure 44: Reason for using analgesic injection

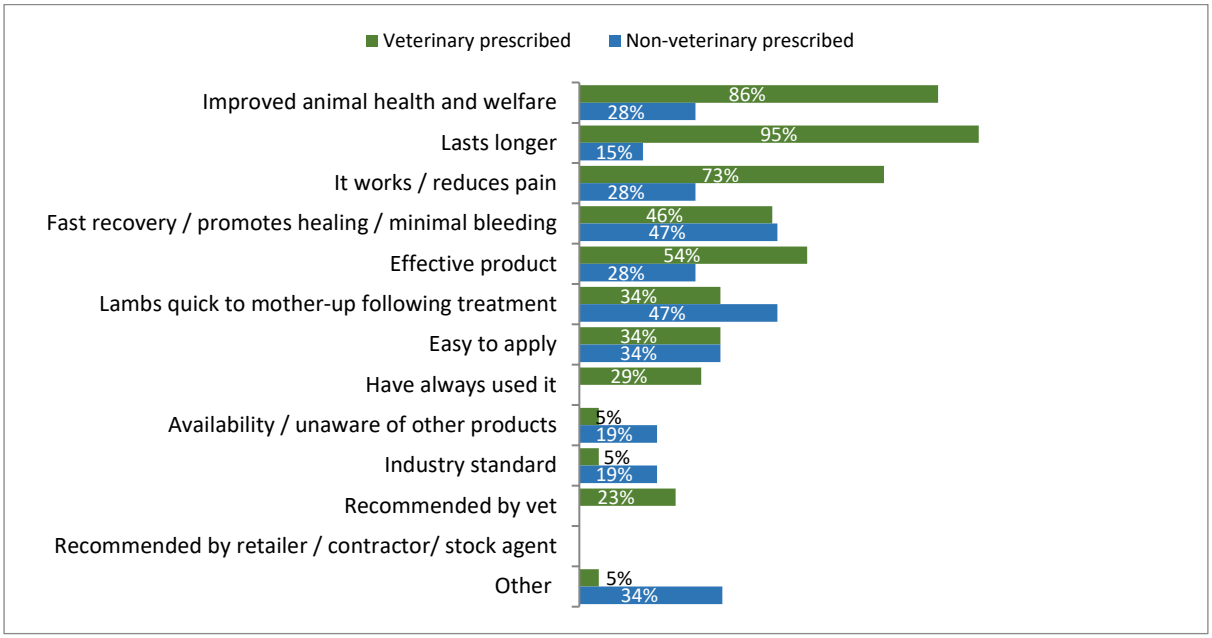
Base: Merino producers who use analgesic injection at tail docking n = 16 (2021 n = 55)



4.14 Why did you use this product?

Figure 45: Reason for using analgesic oral gel

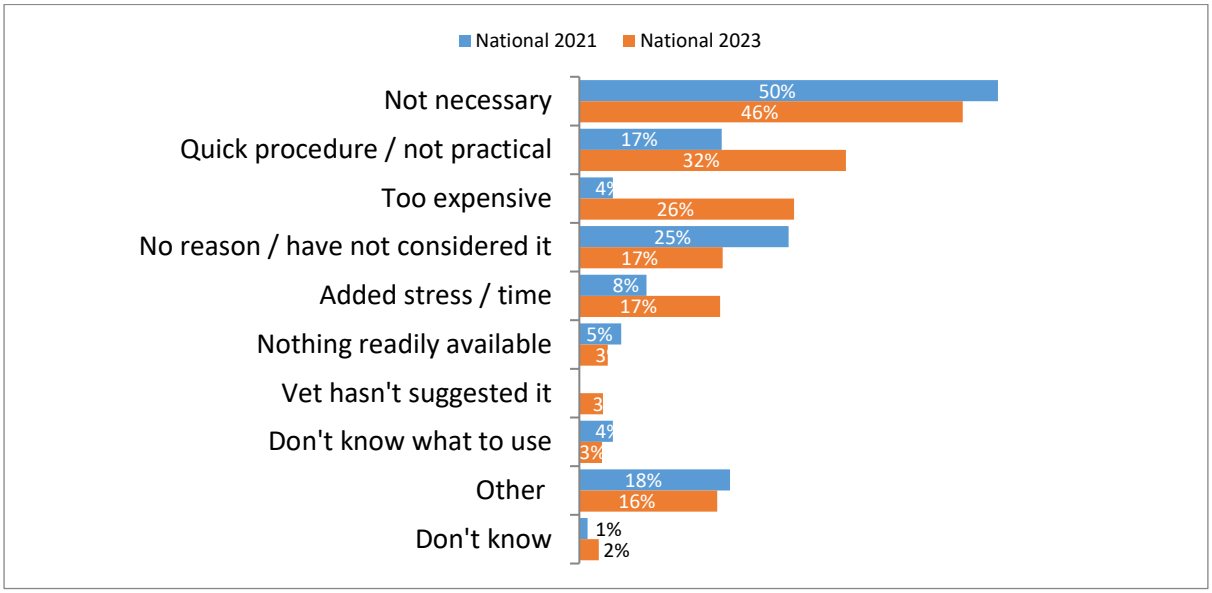
Base: veterinary prescribed n = 62, non-veterinary prescribed n=69



4.14 Why did you use this product?

Figure 46: Reasons against using pain management for tail docking

Base: Merino producers who do not use pain management at tail docking n = 209 (2021 n = 398)



4.15 Why didn't you use pain management?

4.6. Castration

4.6.1. Overview

At the national level, 98% of Merino producers castrate their male lambs (**Figure 47**). The proportion of male lambs that are castrated is 92%. On average producers castrate 640 lambs (**Figure 48**).

The most common reasons for castrating were to prevent pregnancies in a mixed flock (83%) and to meet market requirements (52%) (**Figure 49**).

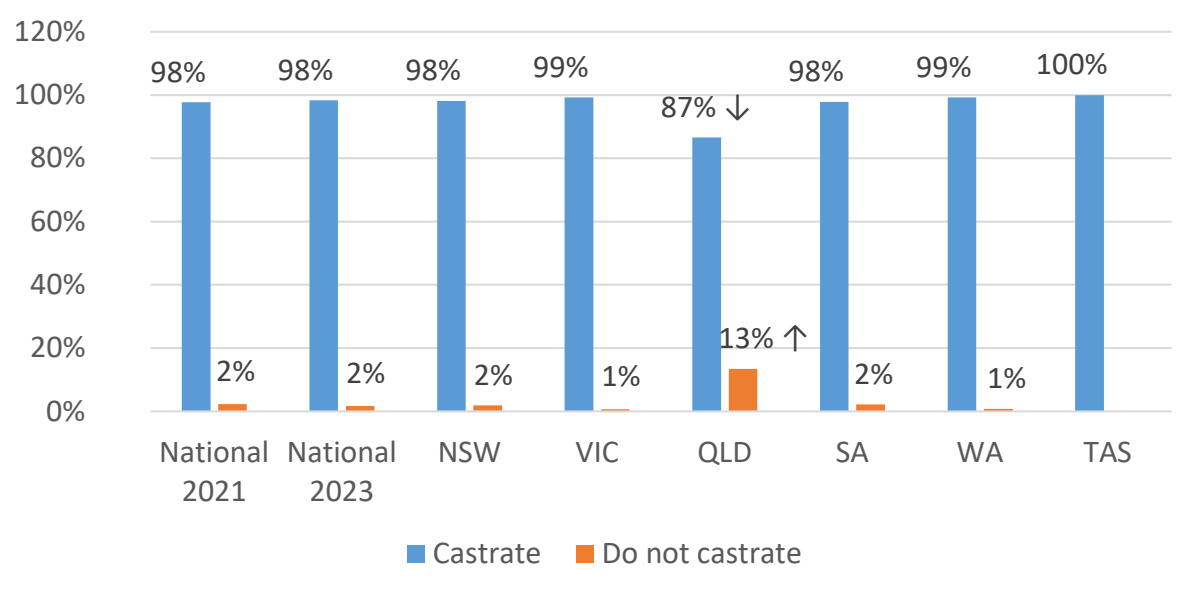
Rubber rings were by far the most common technique (98%) used for castration of male lambs nationally (**Figure 50**). Tasmanian Merino producers were significantly more likely to use cold knife (16%), or shears (14%) compared to other states.

Nationally, 47% of Merino producers used pain management in 2023 when castrating male lambs (**Figure 51**). This equates to 55% of male lambs being administered pain management at castration. Almost a third of Merino producers (32%) use pain management on 250 of fewer male lambs at castration (**Figure 52**).

Use of pain management is lowest for rings at 46% (**Figure 53**).

Figure 47: Castration of male lambs

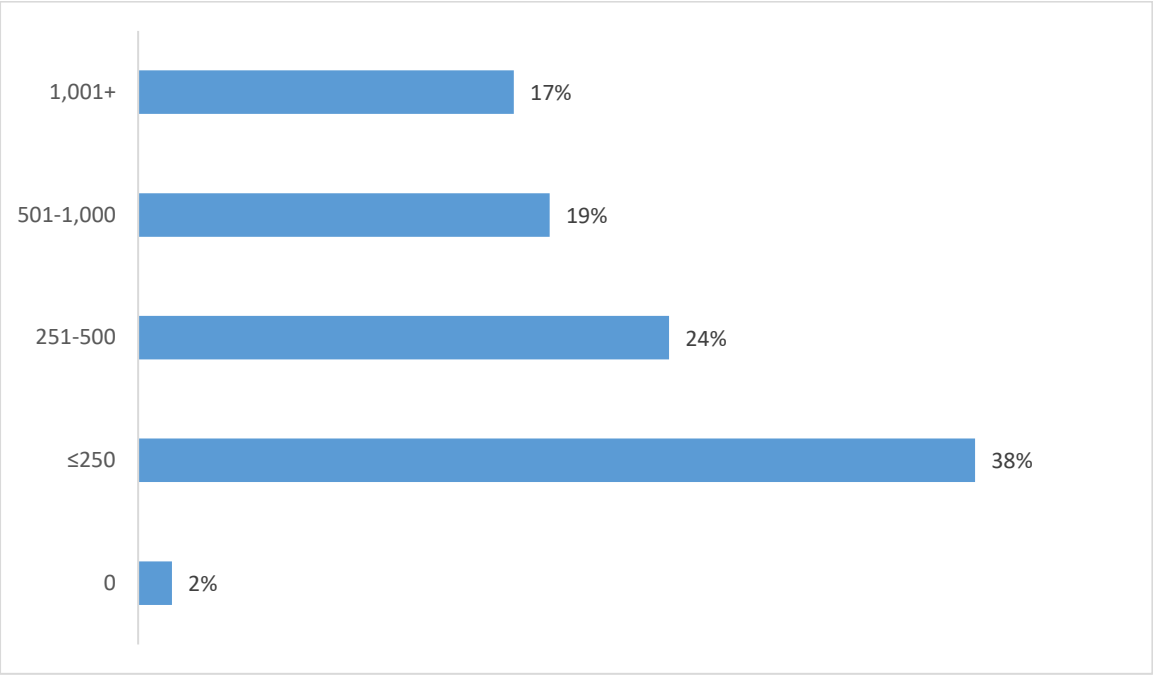
Base: All Merino producers n = 809 (2021 n = 1,203)



5.1.0 Do you castrate your male lambs?

Figure 48: Number of male lambs castrated

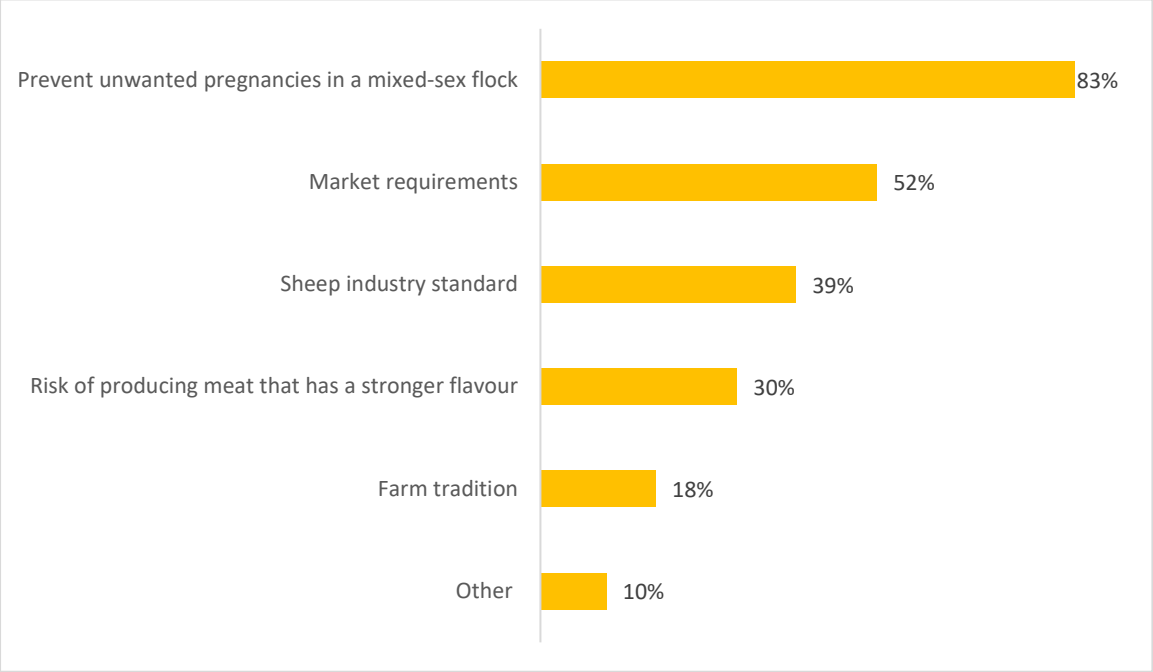
Base: All Merino producers n = 809 (2021 n = 1,203)



5.1.01 How many male lambs did you castrate in 2023?

Figure 49: Reason for castrating male lambs

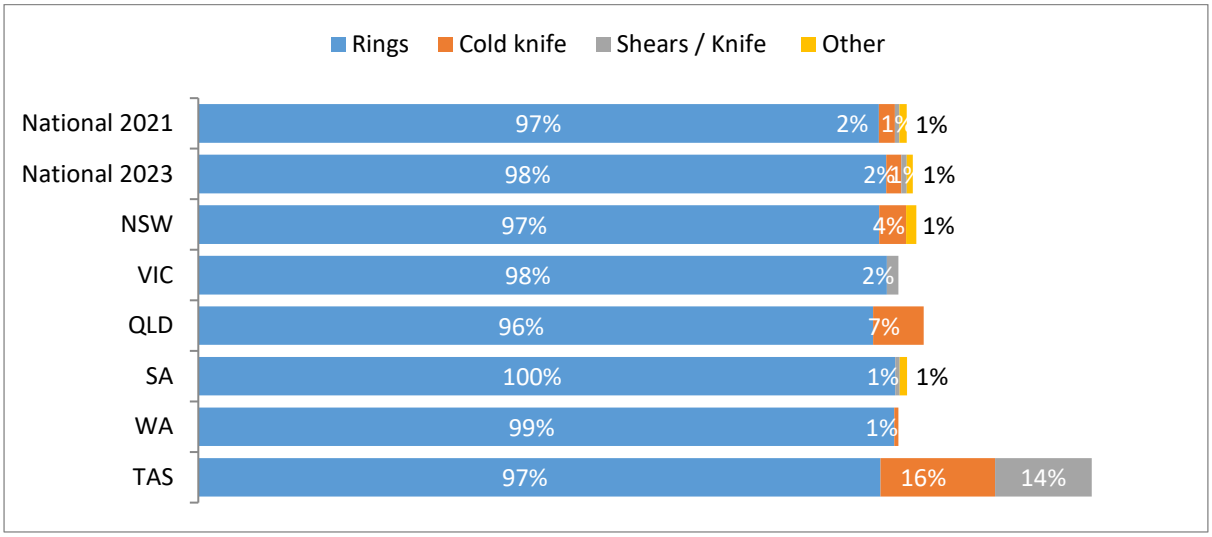
Base: All Merino producers n = 809



5.1.1 Why do you castrate your male lambs?

Figure 50: Lamb castration methods by state

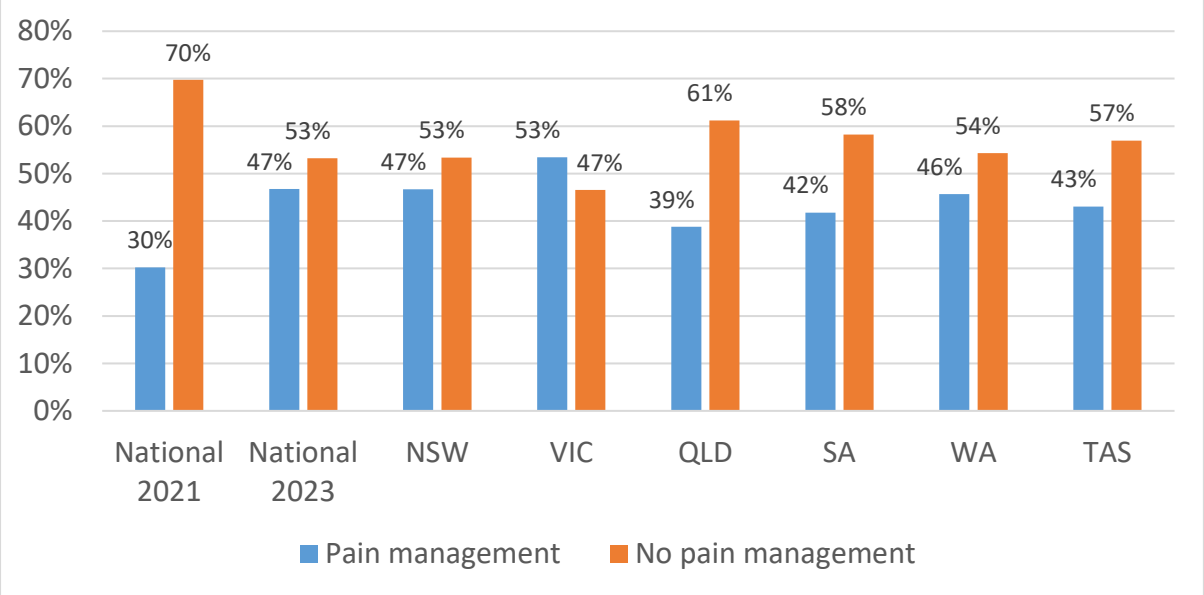
Base: Merino producers who castrate male lambs n = 795 (2021 n = 1,177)



5.2 What method do you use to castrate male lambs?

Figure 51: Use of pain management for castrating male lambs in 2023

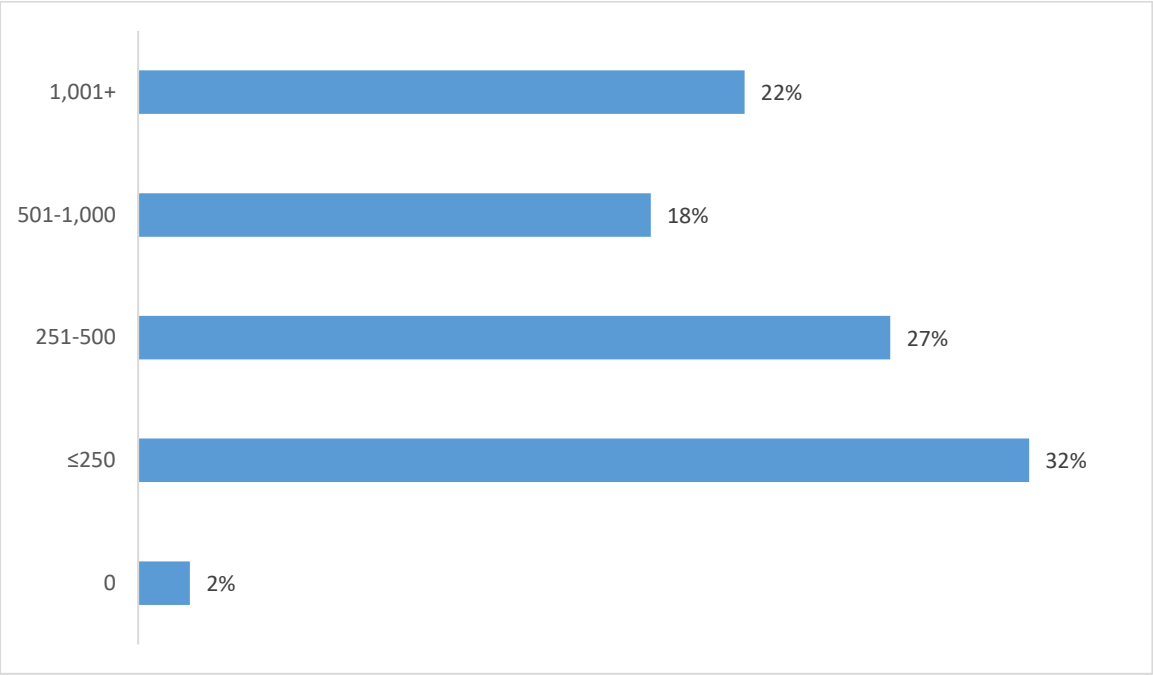
Base: Merino producers who castrated male lambs n = 795 (2021 n = 1,177)



5.3 Did you use any products for pain management for castrating your male lambs in 2023?

Figure 52: Number of male lambs castrated with pain management

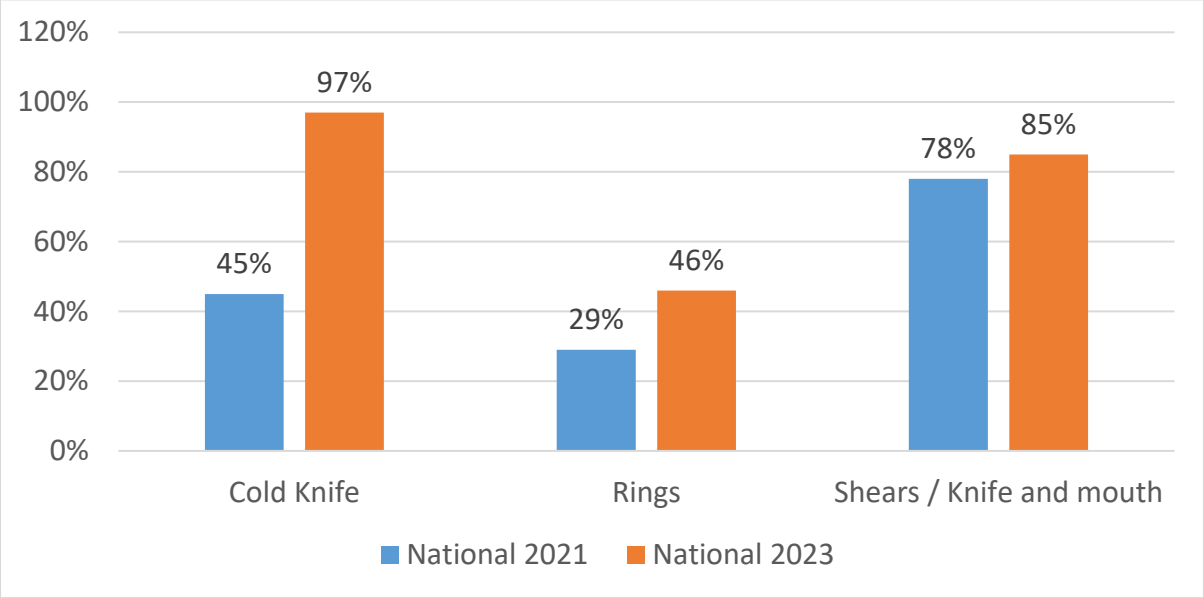
Base: Producers who castrate male lambs using pain management n = 386 (2021 n = 394)



5.3.1 Of the male lambs you castrated in 2023, how many did you use pain management on for castrating?

Figure 53: Use of pain management by castration type

Base: Merino producers who castrated male lambs n = 795 (2021 n = 1,177)



5.3 Did you use any products for pain management for castrating your male lambs in 2023?

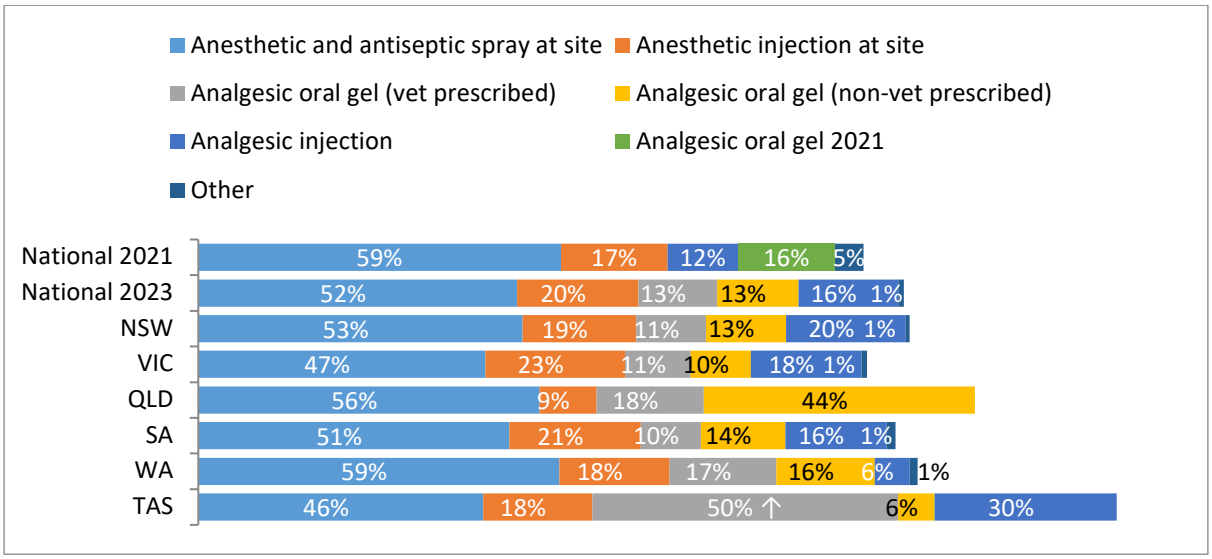
4.6.2.Pain management method

Anaesthetic and antiseptic spray (e.g. Tri-Solfen) at the site is the primary type of pain management for castration (**Figure 54**). 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.

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 54: Types of pain management products used at castration

Base: Merino producers who castrate male lambs using pain management products n = 386 (2021 n = 394)



5.4 What type of product/s did you use?

NB. Analgesic oral gel was separated into veterinary prescribed and non-veterinary prescribed in 2023

Table 3: Pain management used by castration method

Method of castration	Anaesthetic and antiseptic spray at the surgery site (e.g. Tri-Solfen)	Analgesic / oral gel Vet prescribed (e.g. Buccalgesic)	Analgesic / oral gel Non-vet prescribed (e.g. Butec)	Anaesthetic injection at the surgery site (e.g. Numnuts)	Analgesic / injection (e.g. Meloxicam)
Rubber Ring (n=780) 29% use pain management (n = 372)	51%*	13%	14%	20%	17%
Cold Knife (n = 17) 45% use pain management (n = 16)	92%	15%	-	-*	19%
Shears / Knife (n = 5) 78% use pain management (n = 4)	100%	47%	-	-	-

* Inappropriate pain management method

4.6.3. Rationale for pain management method

The most common reasons cited for choosing anaesthetic injections (e.g. Numnuts) were that it improves animal health and welfare (66%), and lambs are quick to mother up following treatment (59%) (**Figure 55**).

The most common reasons Merino producers gave for choosing anaesthetic and antiseptic spray (e.g. Tri-Solfen) were effective pain reduction (51%), and ease of application (45%) (**Figure 56**).

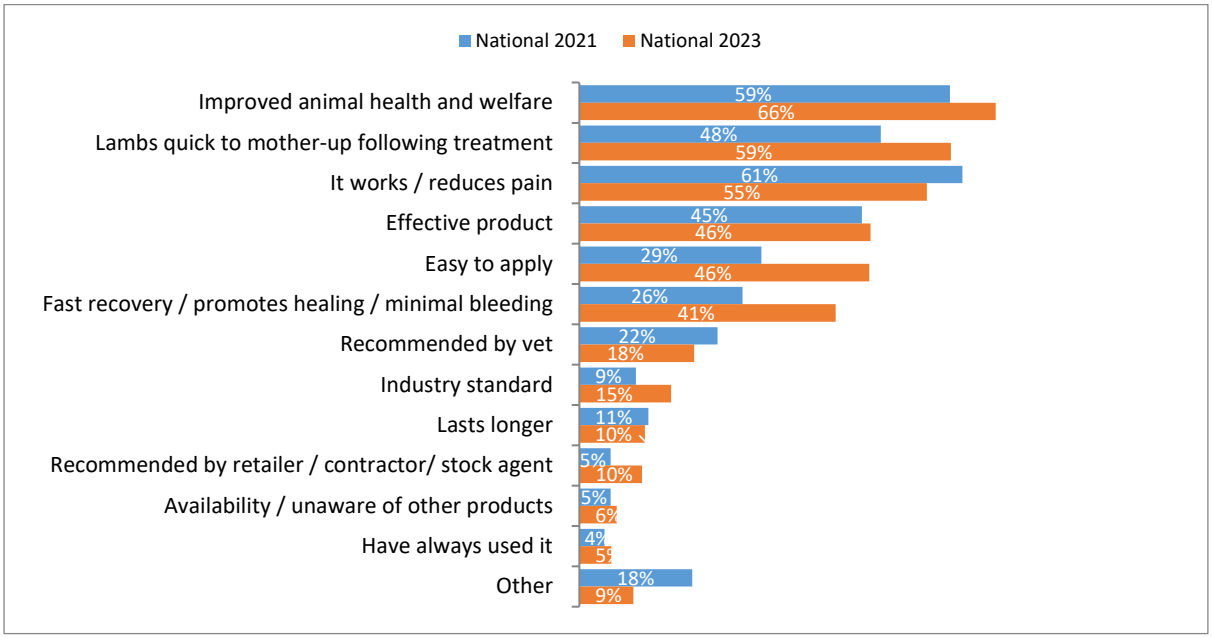
Analgesic injections (e.g. Meloxicam) were used as they improved animal health and welfare (64%), reduced pain (62%), and lambs mother-up quickly afterwards (60%) (**Figure 57**).

Veterinary prescribed analgesic oral gel (e.g. Buccalgesic) was used as it reduced pain (80%) improved animal health and welfare (77%) (**Figure 58**). Similarly, non-veterinary prescribed analgesic oral gel (e.g. Butec) reduced pain (62%) and improved welfare (55%)

The most common reason given for not using pain management is that Merino producers do not consider it necessary (44%) (**Figure 59**). 30% of Merino producers stated that it was not practical or a quick procedure.

Figure 55: Reason for using anaesthetic injection to castrate lambs

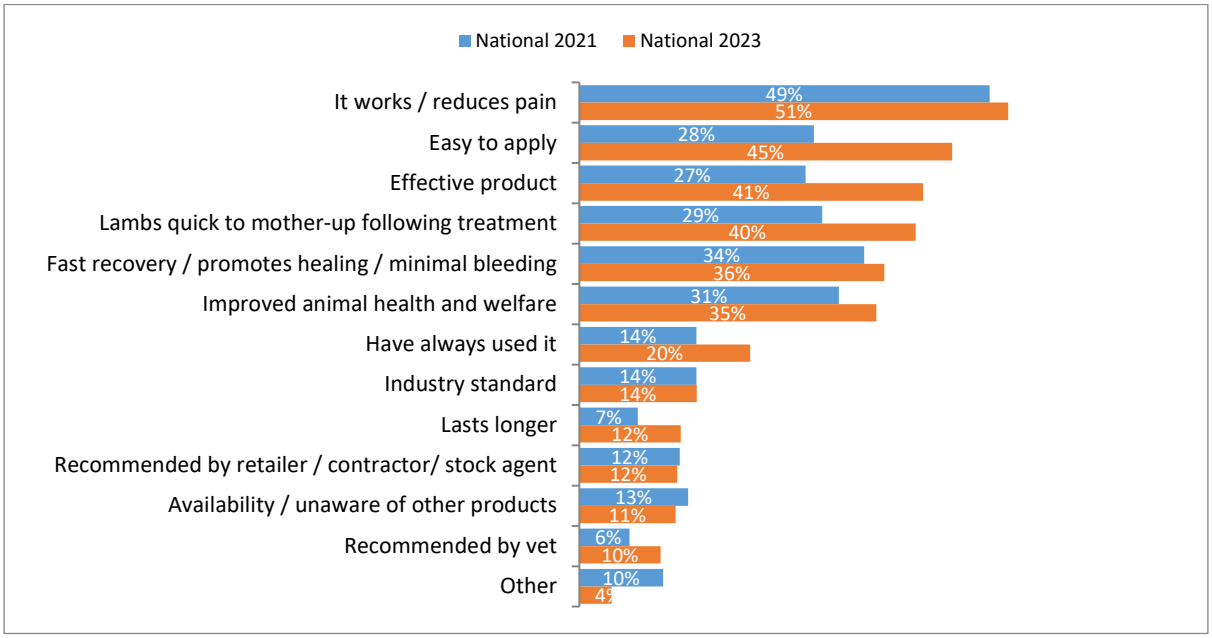
Base: Merino producers who castrate lambs using anaesthetic injection n = 110 (2021 n = 70)



5.5 Why did you use this product?

Figure 56: Reasons for using anaesthetic and antiseptic spray at castration

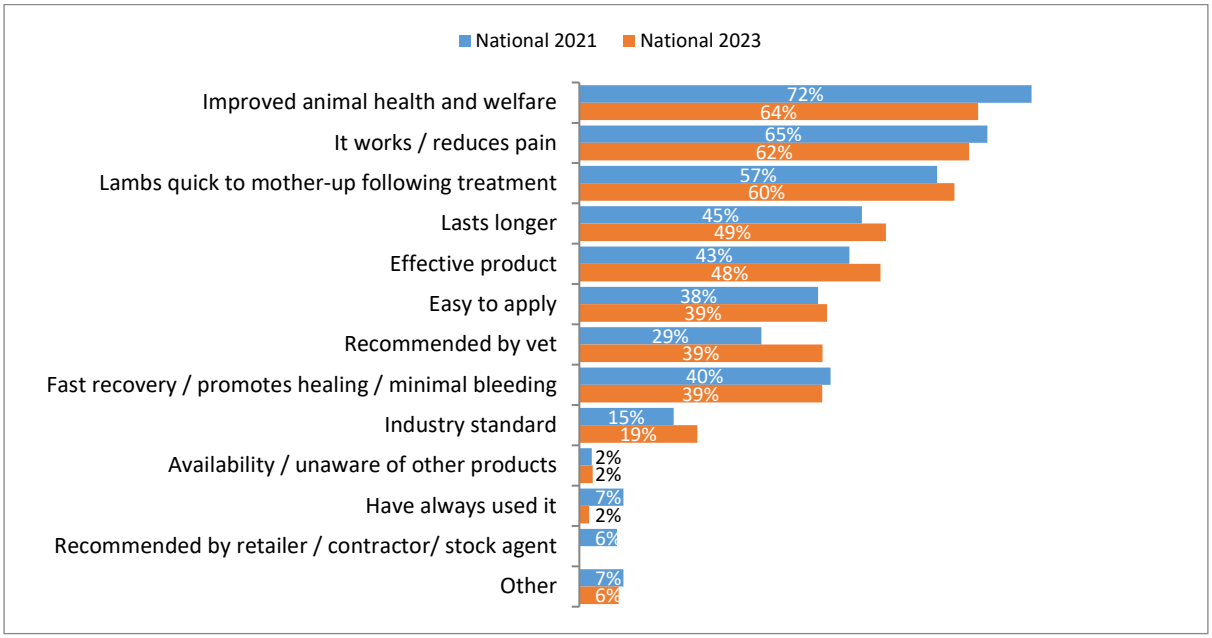
Base: Merino producers who castrate lambs using anaesthetic and antiseptic spray n = 221 (2021 n = 240)



5.5 Why did you use this product?

Figure 57: Reason for choosing analgesic injection at castration

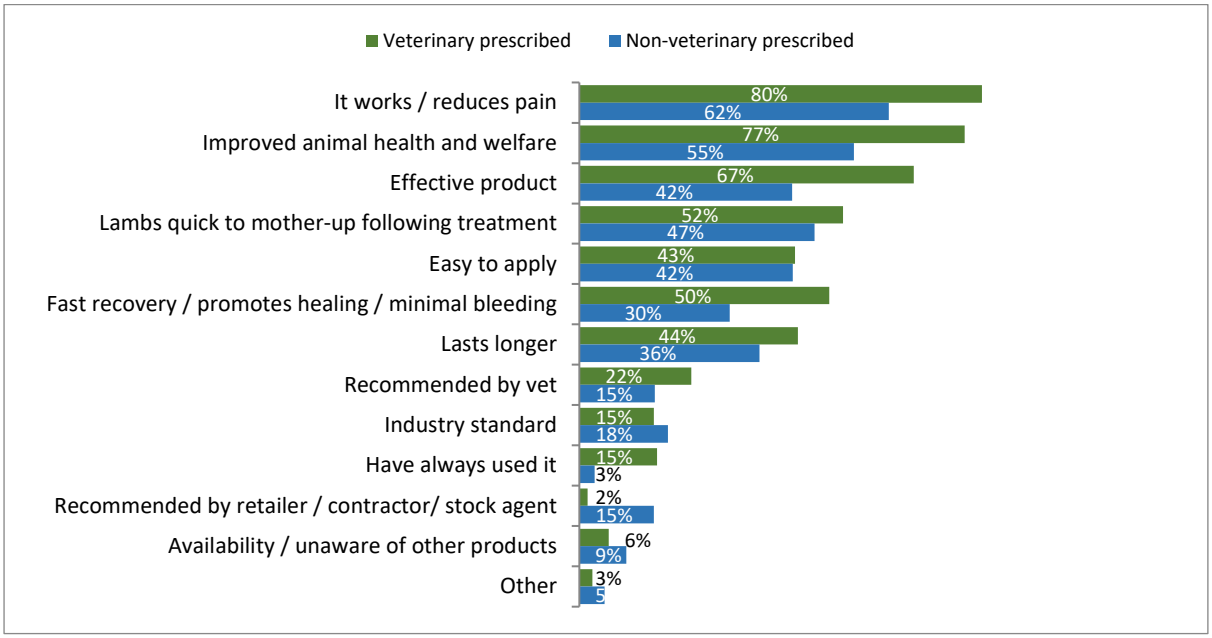
Base: Merino producers who castrate lambs using analgesic injection n = 99 (2021 n = 46)



5.5 Why did you use this product?

Figure 58: Reason for using analgesic oral gel at castration

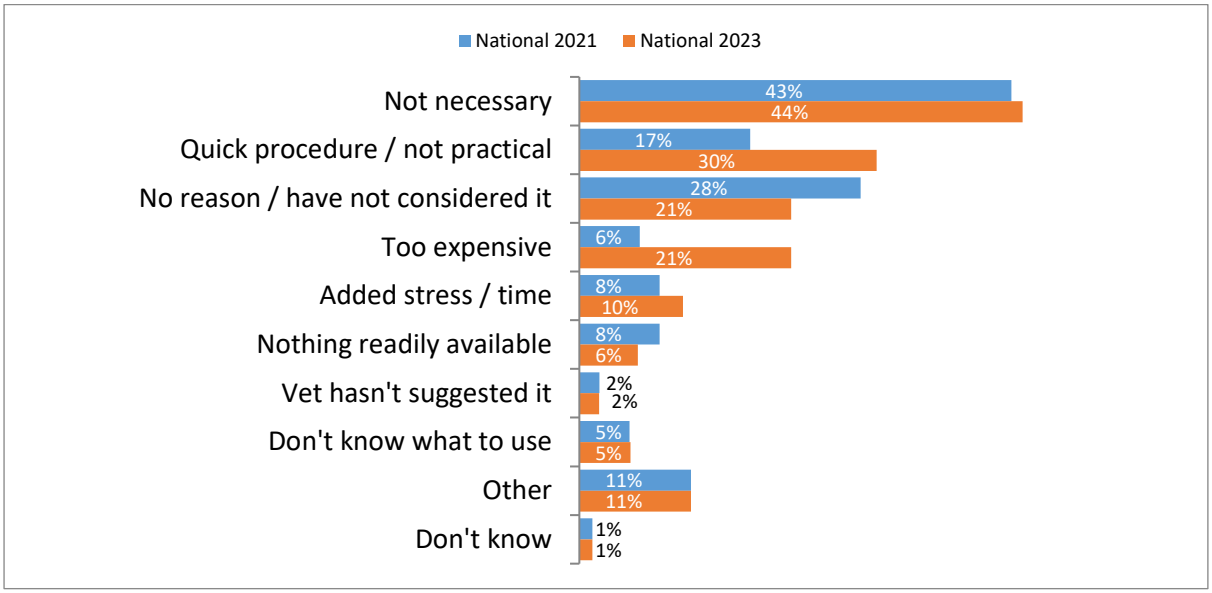
Base: Producers who castrate lambs using analgesic gel (vet prescribed) n = 58, and using analgesic gel (non-vet prescribed) n = 65



5.5 Why did you use this product?

Figure 59: Reason not to use pain management for castration

Base: Merino producers who did not use pain management products during castration n = 409 (2021 n = 783)



5.6 Why didn't you use pain management?

4.7. Mulesing

4.7.1. Overview

At the national level, 58% of Merino producers mulesed their ewe lambs in 2023 (**Figure 60**) with 61% of ewe lambs being mulesed. Merino producers vary significantly across states, with mulesing less frequent in New South Wales (47%). South Australian and Western Australian Merino producers were significantly more likely to mules (71% and 70% respectively).

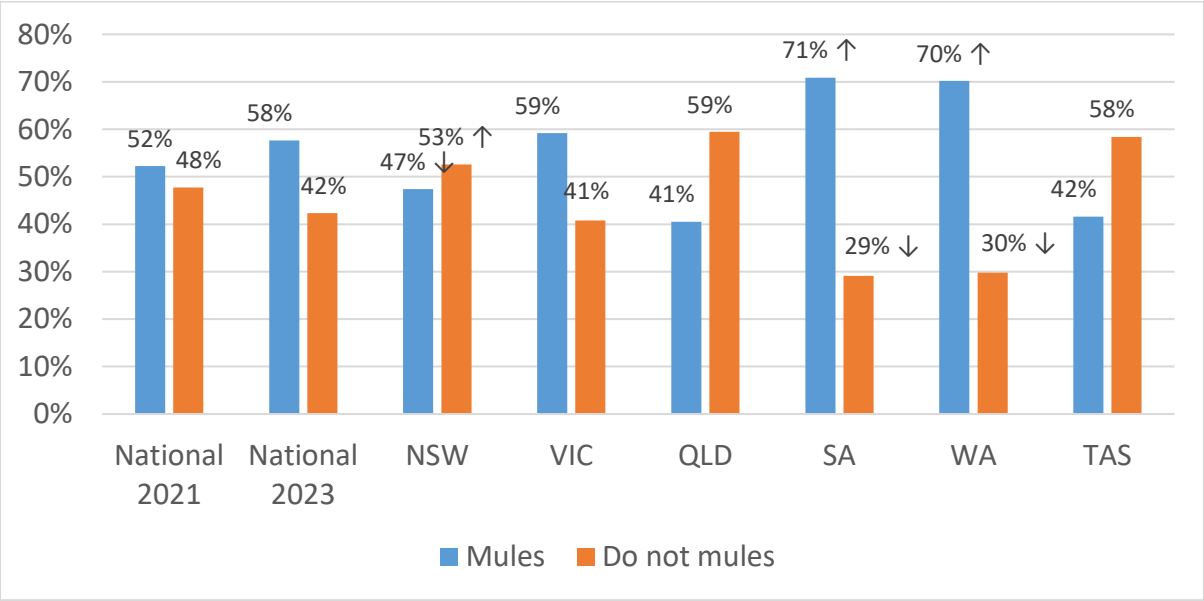
At the national level, 49% of Merino producers mulesed their male lambs in 2023 *(***Figure 61***)* with the proportion of male lambs mulesed at 54%. As with ewe lambs, Merino producers vary significantly across states, with mulesing less frequent in New South Wales and Queensland (40% and 25% respectively). South Australian and Western Australian Merino producers were significantly more likely to mules (58% and 62% respectively).

Two points are relevant when comparing the national percent of Merino producers who mulesed ewe lambs in 2021 (52%) and 2023 (58%) (the same appliers for male lambs). First, analysis by flock size identified that mulesing practices are relatively stable or lower in the large to medium flock sizes (e.g. for Merino producers with a total flock of 2,000 + head, the percent of Merino producers mulesing ewe lambs is 70% in both 2021 and 2023 and for flocks 500 – 1,999 head, it is 61% in 2021 and 49% in 2023. Any apparent lift in mulesing percentages from 2021 to 2021 is limited to Merino producers with smaller flocks of between 100 and 499 head (19% of Merino producers mulesing ewe lambs in 2021 and 33% in 2023). Second, all results should be viewed as representing the midpoint of a likely range of values due to margins of error with survey data. The 52.3% of Merino producers mulesing ewe lambs at the national level in 2021 has a margin of error of +/-2.7% meaning the upper range of the result (based on a 95% confidence level) is 55%. The 57.6% of Merino producers mulesing ewe lambs at the national level in 2023 has a margin of error of +/-3.4% meaning the lower range of the result is 54.2%. It could be interpreted therefore that the percent of Merino producers mulesing their ewe lambs has been stable between 2021 and 2023.

On average, Merino producers mulesed 757 ewe lambs and 751 male lambs in 2023 (**Figure 62**). Of the Merino producers who mules their lambs, almost all (98%) do so to avoid flystrike, with half (50%) saying they want easier access for shearers (**Figure 63**).

Figure 60: Mulesing of ewe lambs

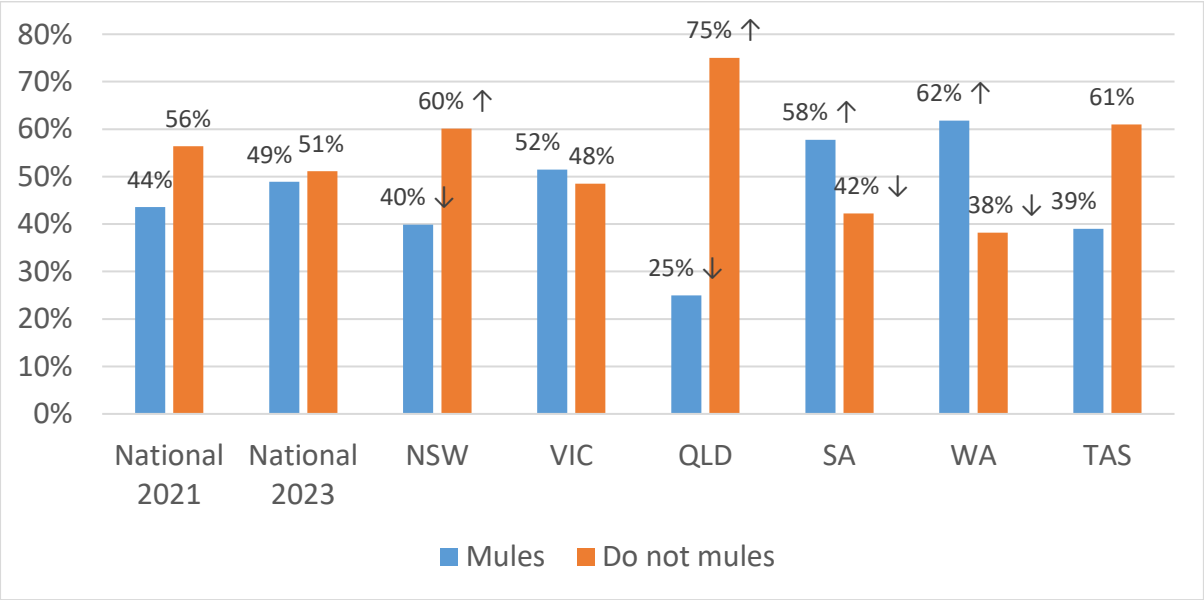
Base: All Merino producers n = 809 (2021 n=1,203)



6.1 Did you mules your ewe lambs in 2023?

Figure 61: Mulesing of male lambs

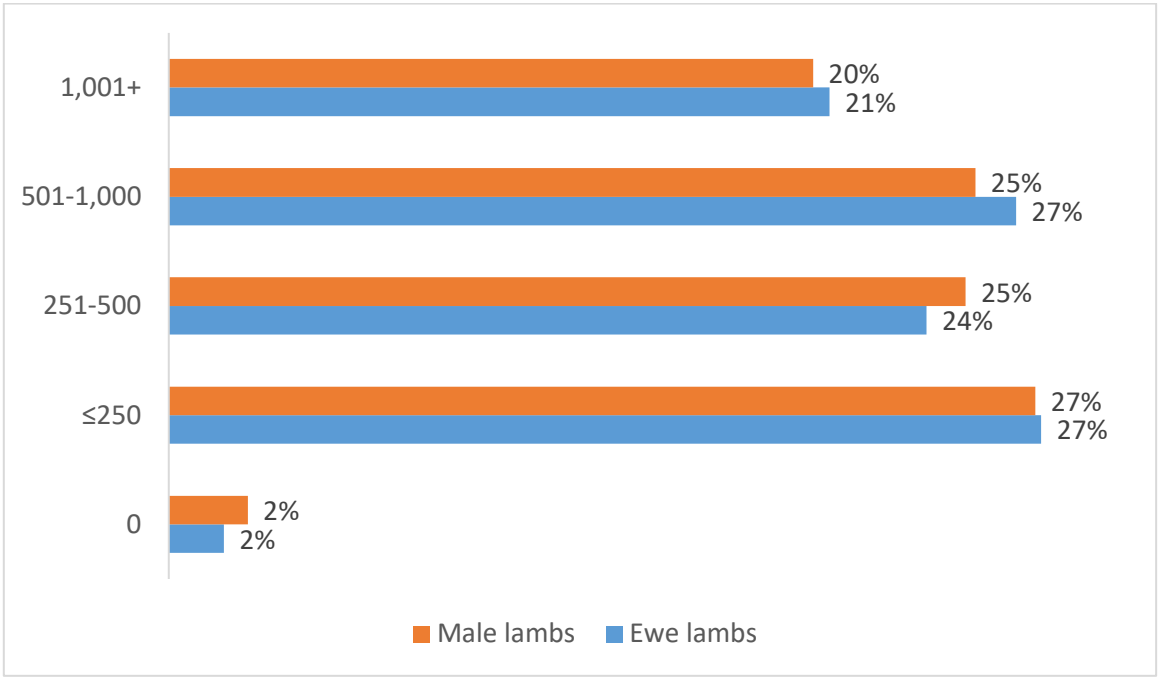
Base: All Merino producers n = 809 (2021 n=1,203)



6.2 Did you mules your male lambs in 2023?

Figure 62: Number of lambs mulesed

Base: Merino Producers who mules ewe lambs n = 482, or male lambs n = 423

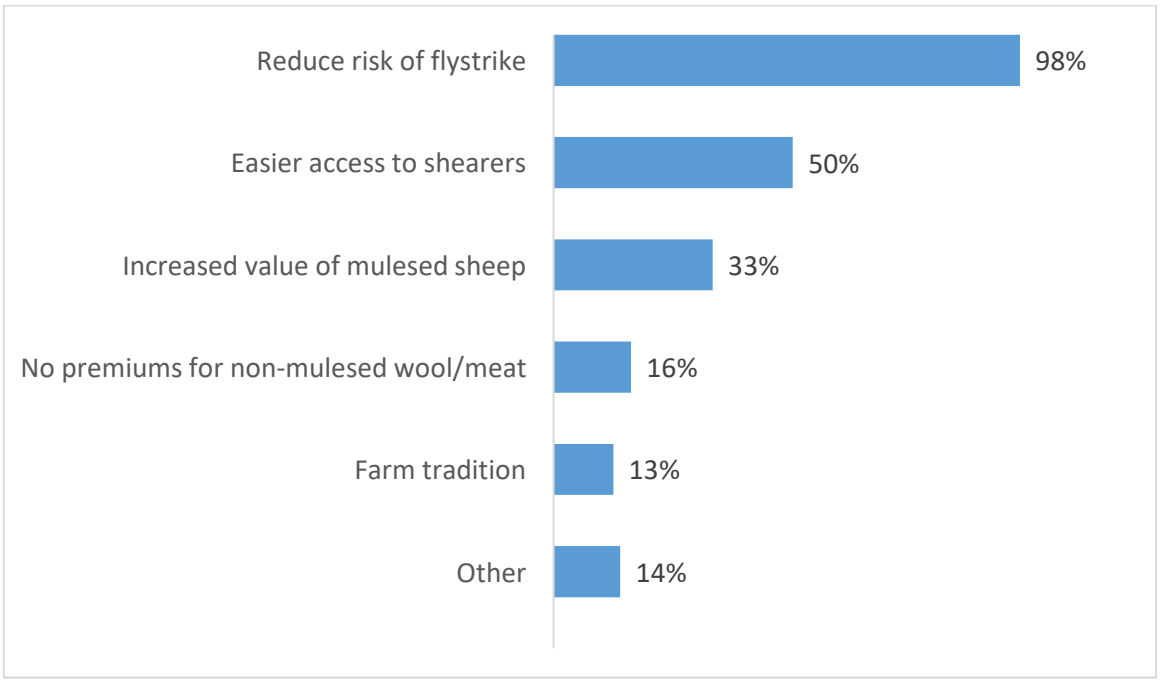


6.1.1 How many ewe lambs did you mules in 2023?

6.2.1 How many male lambs did you mules in 2023?

Figure 63: Reason for mulesing lambs

Base: Merino producers who mules lambs n = 428



6.2.2 Why do you mules your lambs?

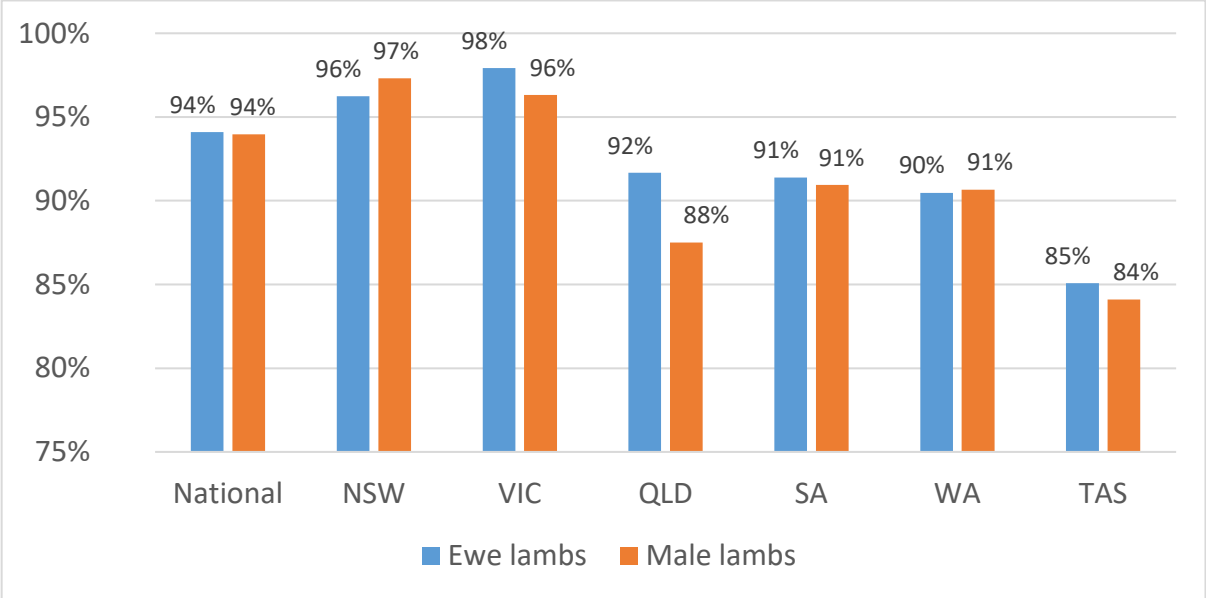
4.7.2.Pain management method

Across Australia, the majority of Merino producers who mules use pain management (94% for ewes and 94% for male lambs) (**Figure 64**). The proportion of ewe and male lambs being mulesed with pain management is similar at 95% for both ewe and male lambs. On average, Merino producers use pain management on 675 ewe lambs at mulesing and 755 male lambs (**Figure 65**).Nationally, of Merino producers who use pain management products at mulesing, virtually all (93%) use anaesthetic and antiseptic spray (e.g. Tri-Solfen) at the surgery site (**Figure 66**).

Figure 64: Use of pain management at mulesing

Base: Merino producers who mules ewe lambs n = 507, or male lambs n = 428

6.3 Did you use any products for pain management for mulesing your ewe lambs in 2023?

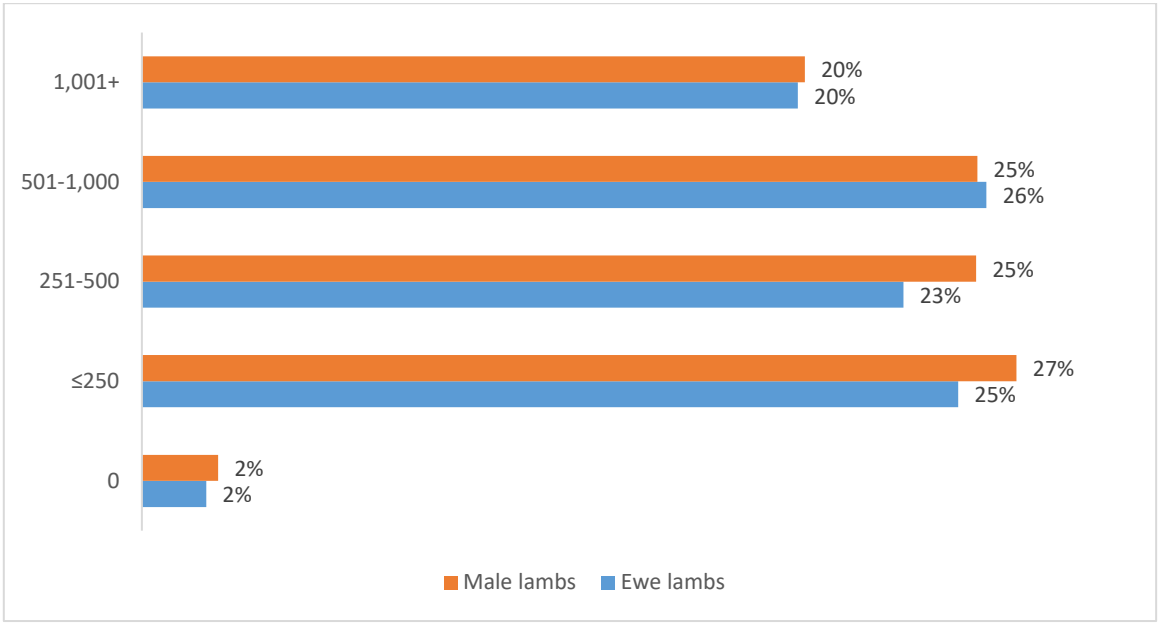


6.3.2 Did you use any products for pain management for mulesing your male lambs in 2023?

NB: this data was not split by ewe and male lambs in 2021. Nationally, an average of 92% used pain management in 2021

Figure 65: Number of lambs mulesed with pain treatment

Base: Merino Producers who mules ewe lambs n = 507, or male lambs n = 428

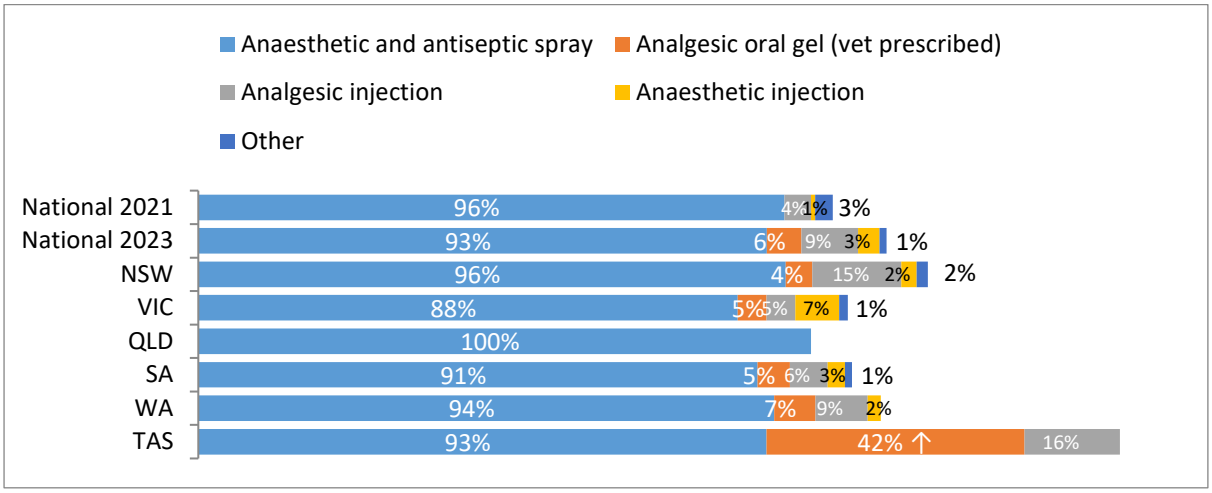


6.3 Did you use any products for pain management for mulesing your ewe lambs in 2023?

6.3.2 Did you use any products for pain management for mulesing your male lambs in 2023?

Figure 66: Types of pain management used at mulesing

Base: Merino producers who mules lambs using pain management products n = 402 (2021 n = 675)



6.4 What type of product/s did you use?

NB. Analgesic oral gel was separated into veterinary prescribed and non-veterinary prescribed in 2023

4.7.3. Rationale for pain management method

The most common reasons cited for choosing anaesthetic and antiseptic spray (e.g. Tri-Solfen) were effective pain reduction (63%) and fast recovery (56%) (***Figure 67***).

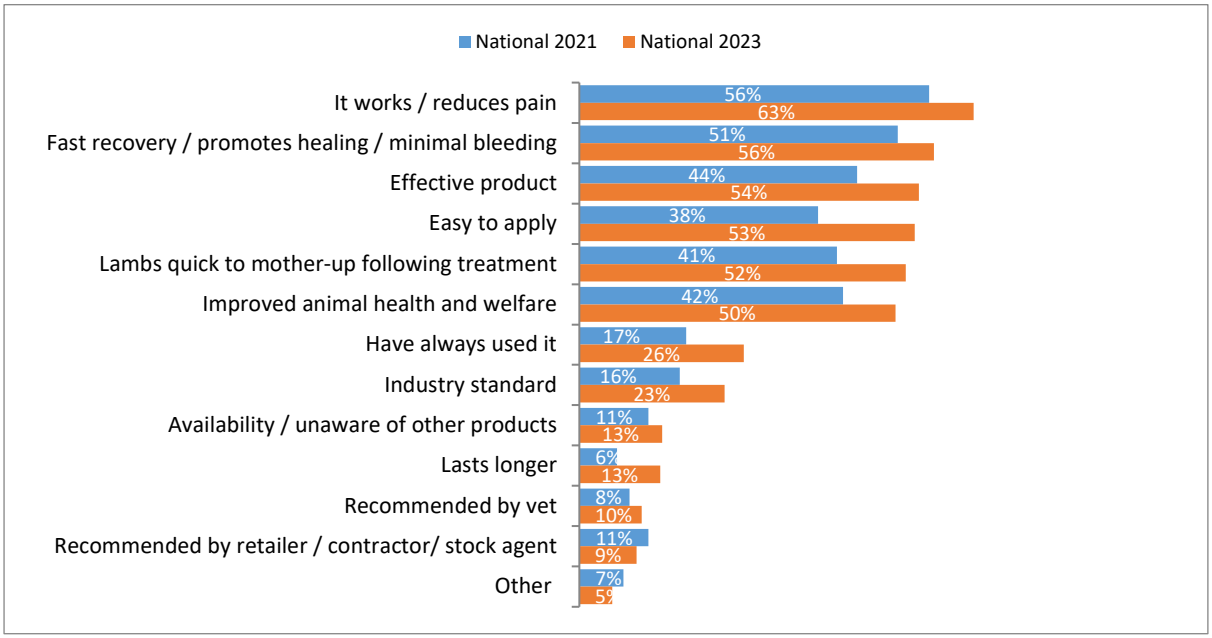
Where Merino producers choose analgesic injections (e.g. Meloxicam), they stated that they provided effective pain reduction (76%) and improved animal health and welfare (65%) (**Figure 68**).

The most common reasons cited for choosing veterinary prescribed analgesic oral gel (e.g. Buccalgesic) were efficacy (69%) and pain reduction (62%) (**Figure 69**). Non-veterinary prescribed analgesic oral gel (e.g. Butec) was utilised to improve animal health and welfare (76%) and because lambs are quick to mother up following treatment (67%).

When Merino producers did not use pain management it was because they do not consider it necessary (33%) (**Figure 70**). 32% of Merino producers said that it was not practical for a quick procedure, with 31% stating it was too expensive.

Figure 67: Reason for using anaesthetic and antiseptic spray

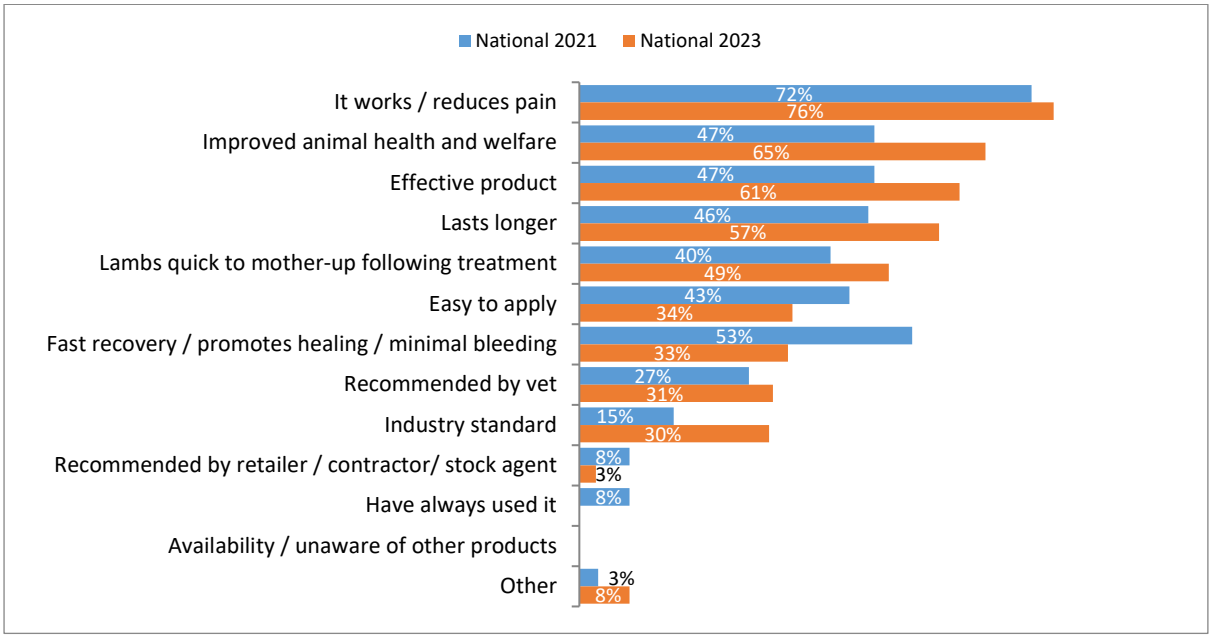
Base: Merino producers who mules lambs using anaesthetic and antiseptic spray n = 373 (2021 n = 649)



6.5 Why did you use this product?

Figure 68: Reason for using analgesic injection

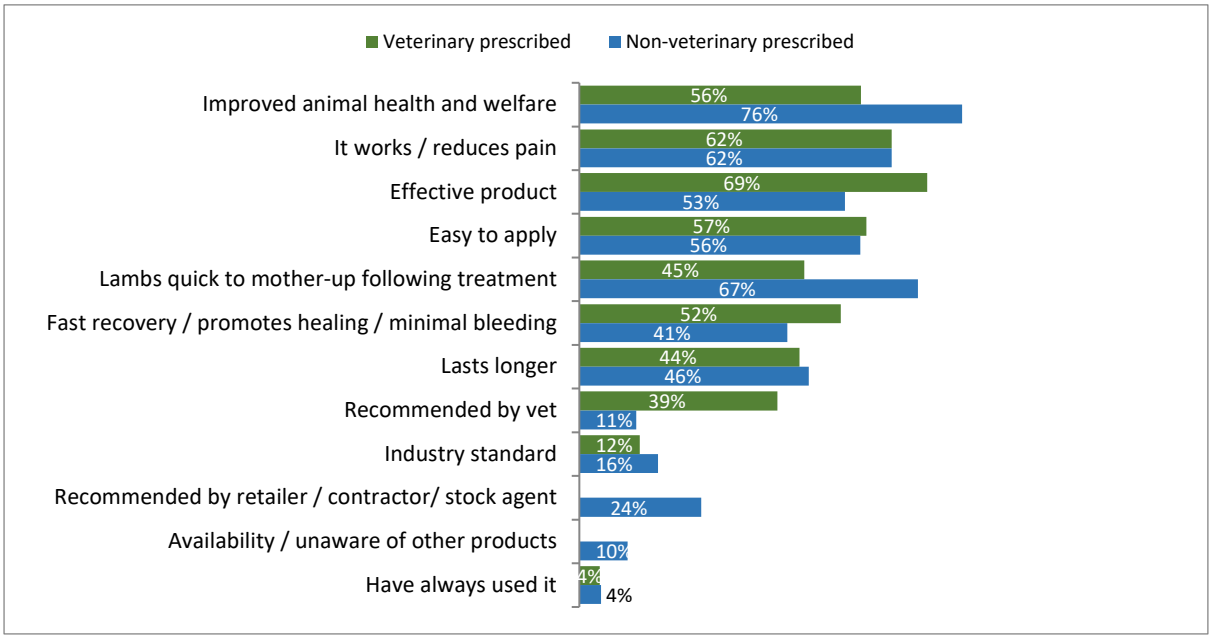
Base: Merino producers who mules lambs using analgesic injection n = 34 (2021 n = 29)



6.5 Why did you use this product?

Figure 69:Reason for using analgesic gel

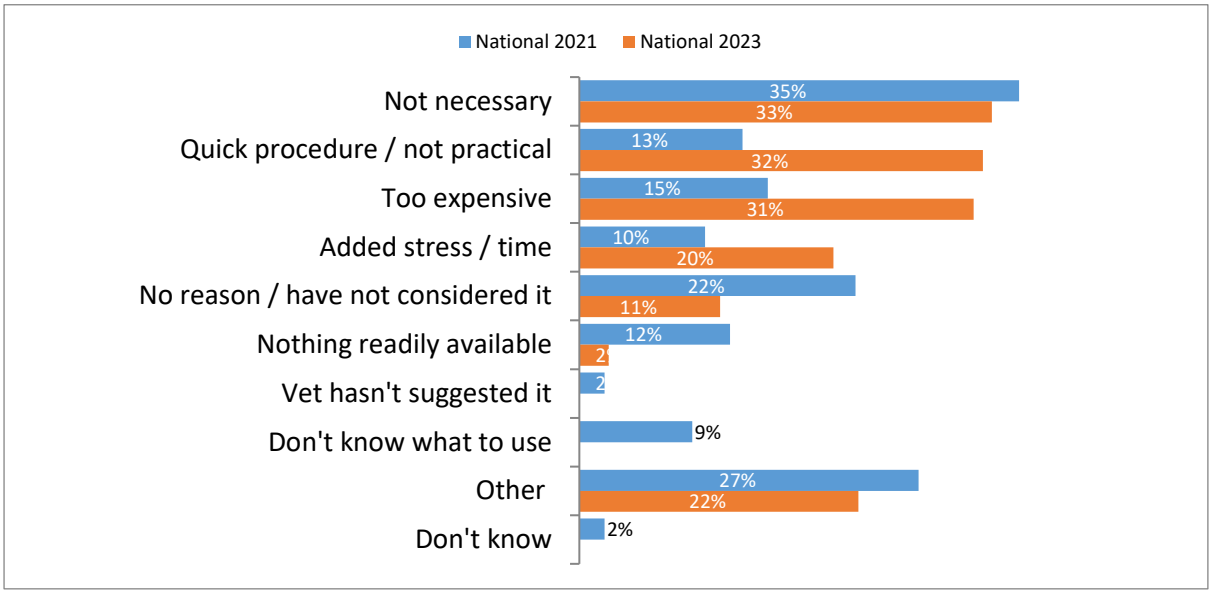
Base: Merino producers who mules lambs using veterinary prescribed analgesic gel n = 20 and non-veterinary prescribed analgesic gel n = 38



6.5 Why did you use this product?

Figure 70: Reason for not using pain management at mulesing

Base: Merino producers who did not use pain management products during mulesing n = 26 (2021 n = 50)



6.6 Why didn't you use pain management?

4.7.4.Mulesing cessation

At the national level, of Merino producers who mulesed in 2023, nearly one quarter of Merino producers said they were likely or very likely to cease mulesing in the next 5 years 24%) (**Figure 71**).

If mulesing was no longer an option, the most common alternative to mulesing that Merino producers would do is increased use of flystrike chemicals (40%) followed by increased crutching (32%) and moving to another enterprise / leave farming (31%) (**Figure 72**). New South Wales Merino producers were significantly more likely to say that they would shift to a cattle enterprise (27%).

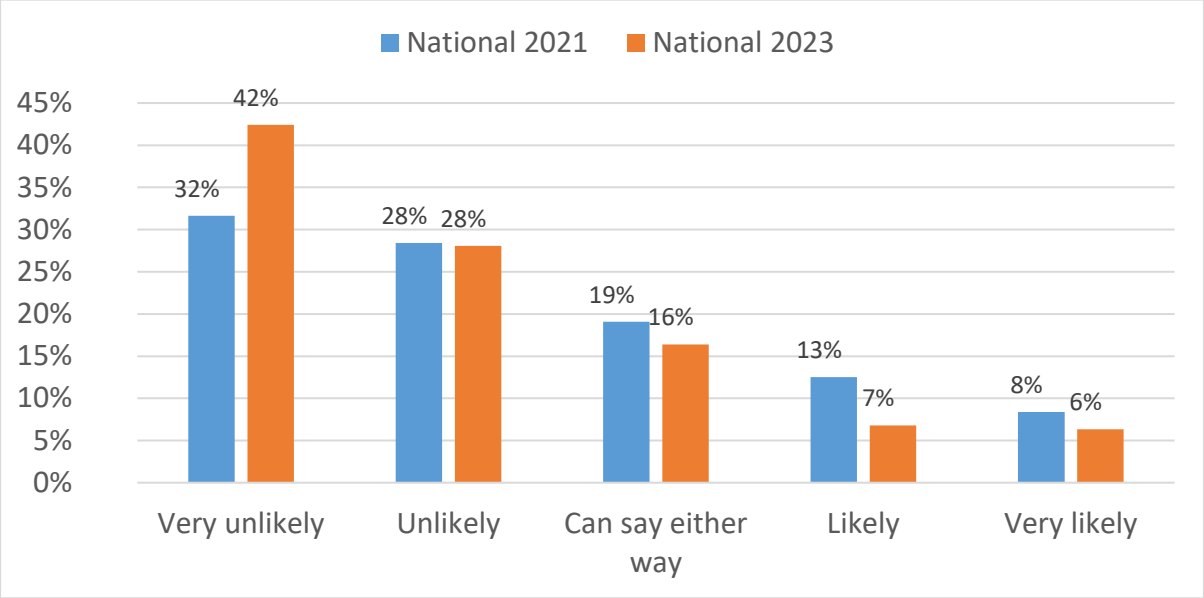
At the national level, of Merino producers who did not mules in 2023, two thirds (66%) of Merino producers have ceased mulesing (**Figure 73**) and 33% of Merino producers had never mulesed.

South Australian Merino producers significantly more likely to have ceased mulesing recently (41% between 2021 and 2024).

The most common reasons given for ceasing mulesing are that Merino producers are breeding sheep with less body wrinkle (45%), due to industry and consumer pressure (45%) and animal ethics (44%) (**Figure 74**).

Figure 71: Likelihood to cease mulesing in the next five years

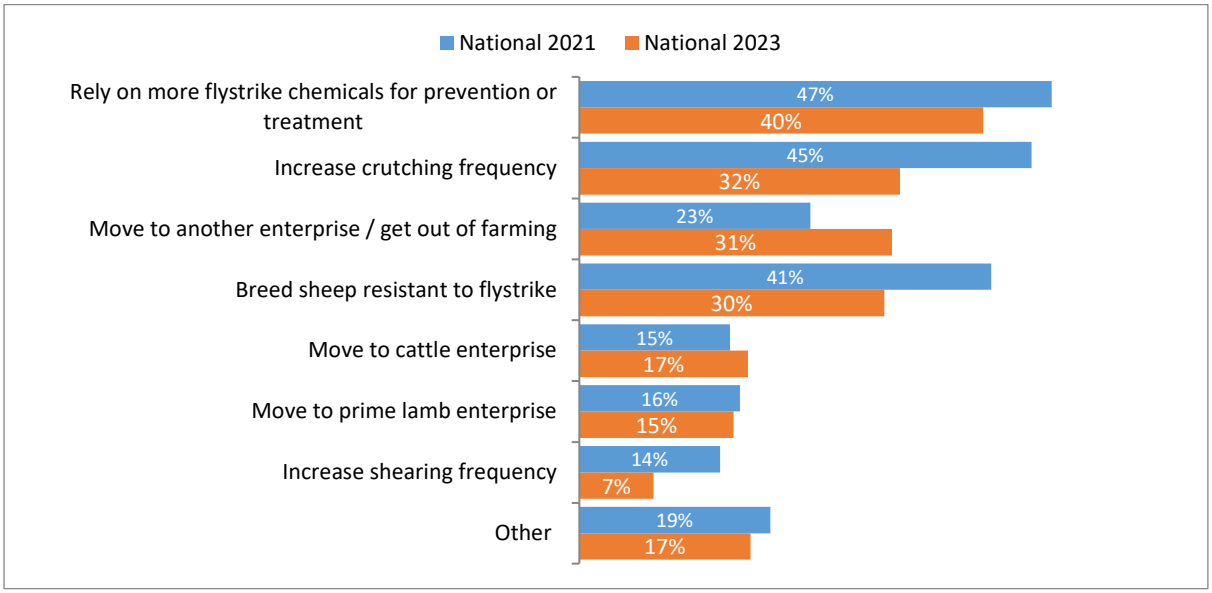
Base: Merino producers who mulesed lambs n = 508 (2021 n = 722)



6.7 How likely are you to cease mulesing in the next 5 years?

Figure 72: Alternatives used if mulesing was no longer an option

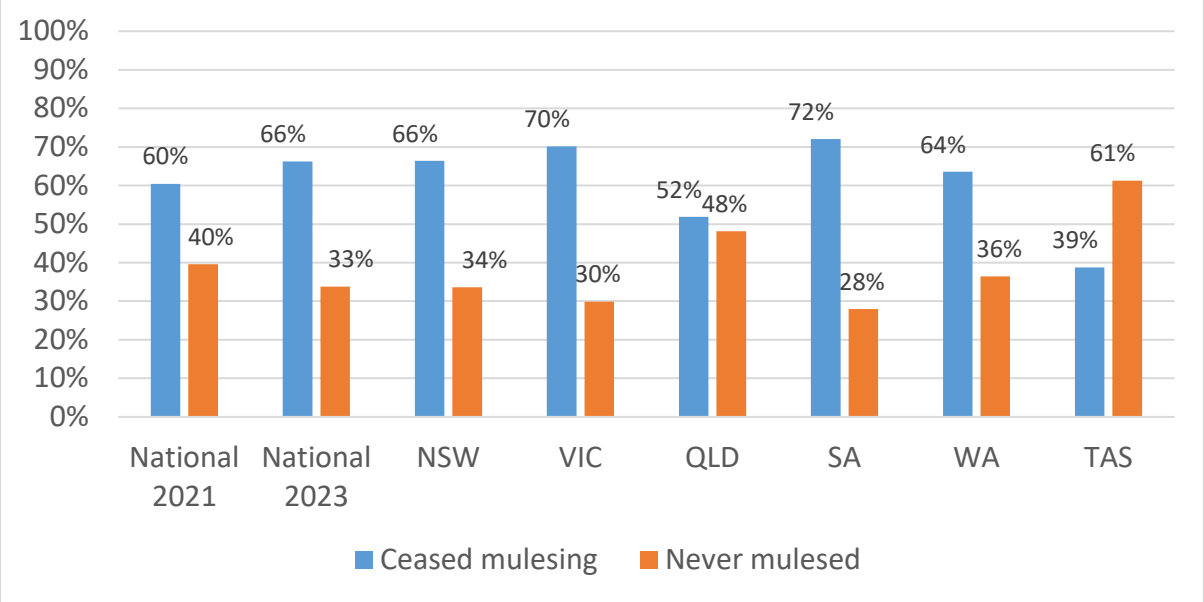
Base: Merino producers who mulesed lambs n = 508 (2021 n = 722)



6.8 If mulesing was no longer an option, which of the following would you do?

Figure 73: Mulesing cessation

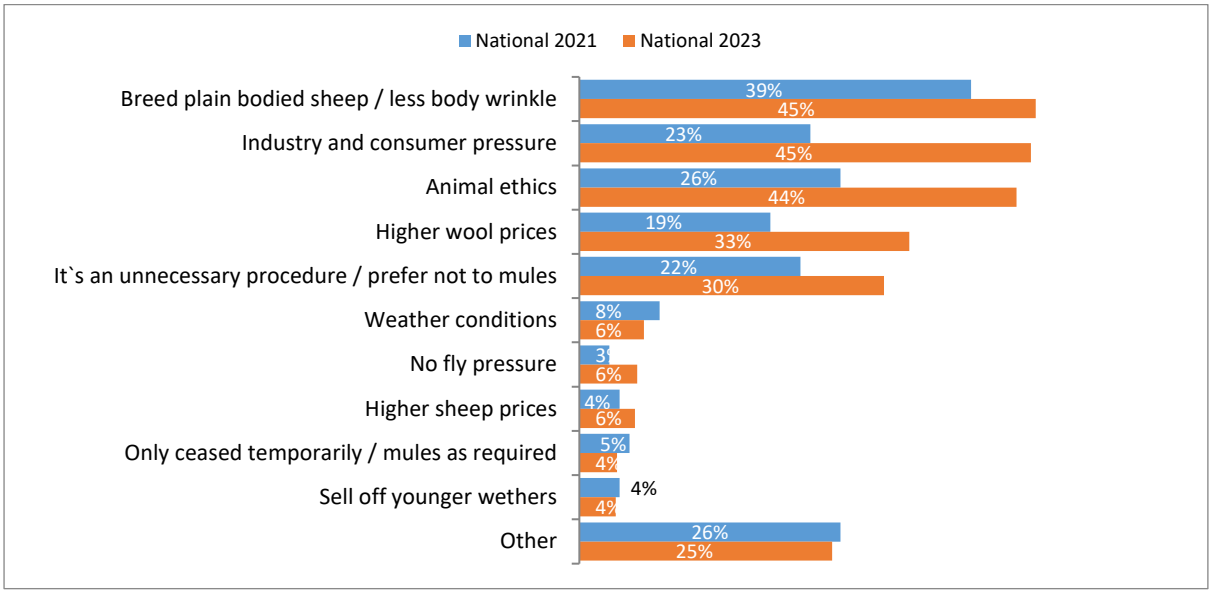
Base: Merino producers who did not mules n = 301 (2021 n = 481)



6.9 Have you ceased mulesing your ewe and male lambs or did you never mules them?

Figure 4: Reason for mulesing cessation

Base: Merino producers who ceased mulesing lambs n = 212 (2021 n = 327)



6.11 Why did you cease mulesing?

4.8. Vaccination

Nationally, an average of 95% of Merino producers vaccinate at least some of their flock. Queensland Merino producers were significantly less likely to vaccinate (63%) (5). Further questioning revealed that on average, 96% of Merino producers' entire flocks receive at least one vaccination of any type of vaccine.

Of the 95% of Merino producers who vaccinate their sheep, 92% vaccinate the entirety of their flock (**Figure 76**).

The most commonly used vaccine was a combined 5 in 1 clostridial plus cheesy gland vaccine, with 65% of Merino producers using this nationally (**Figure 77**).

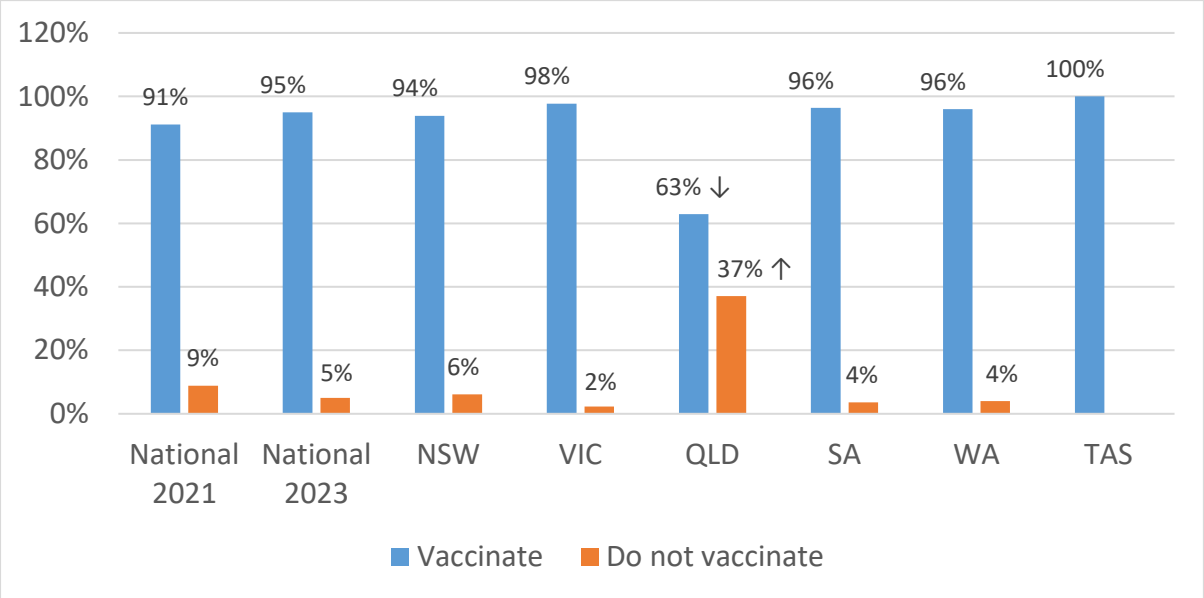
Nationally, an average of 72% of Merino producers vaccinate pre-lambing, 96% at marking and 79% at weaning (**Figure 78**). Of those who vaccinate pre-lambing, Western Australians (62%) are significantly less likely. There were no significant differences at marking. At weaning, Queensland Merino producers were less likely than other states to vaccinate (38%).

Across Australia, 57% of Merino producers vaccinate their flock at all stages (**Figure 79**). Queensland Merino producers were the least likely to vaccinate (37% do not vaccinate), while Western Australian Merino producers were more likely than other states to vaccinate at marking and weaning (25%) and South Australian Merino producers at all states (69%).

Almost all (94%) Merino producers follow label recommendations when administering antibiotics to sheep, with South Australian Merino producers least likely to do so (87%) (Figure 80).

Figure 75: Merino producers who vaccinate any sheep in flocks

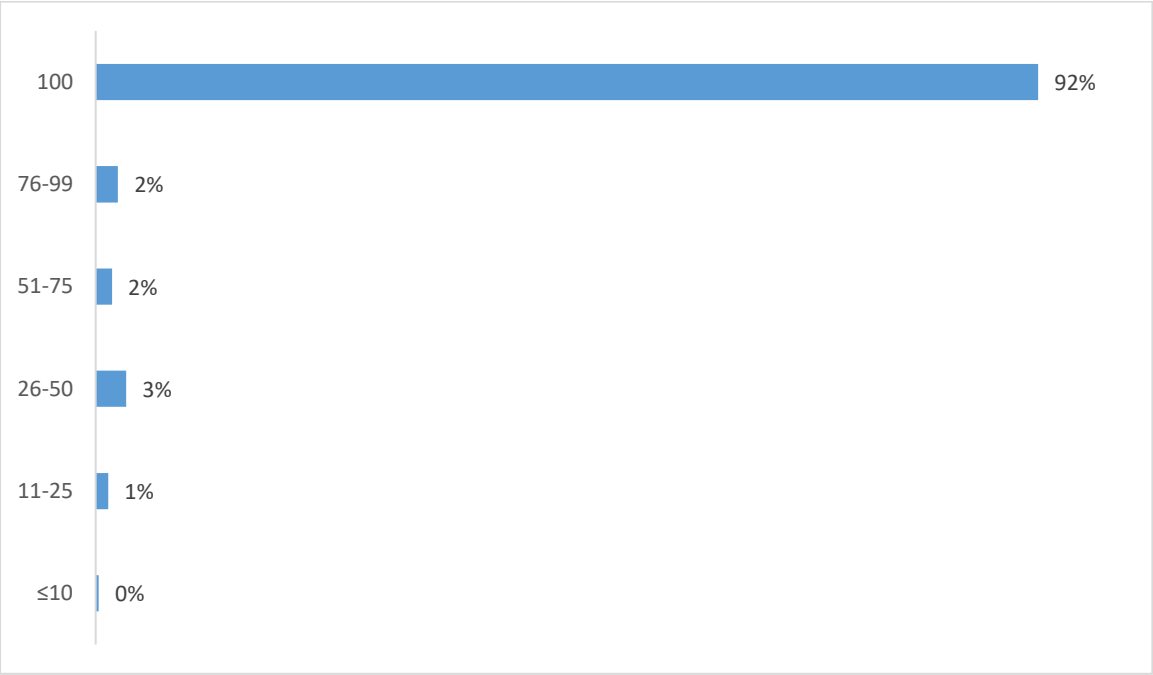
Base: All Merino producers n = 809 (2021 n=1,203)



7.1 Do you vaccinate any sheep in your flock?

Figure 76: Percent of flock which receives at least one vaccination

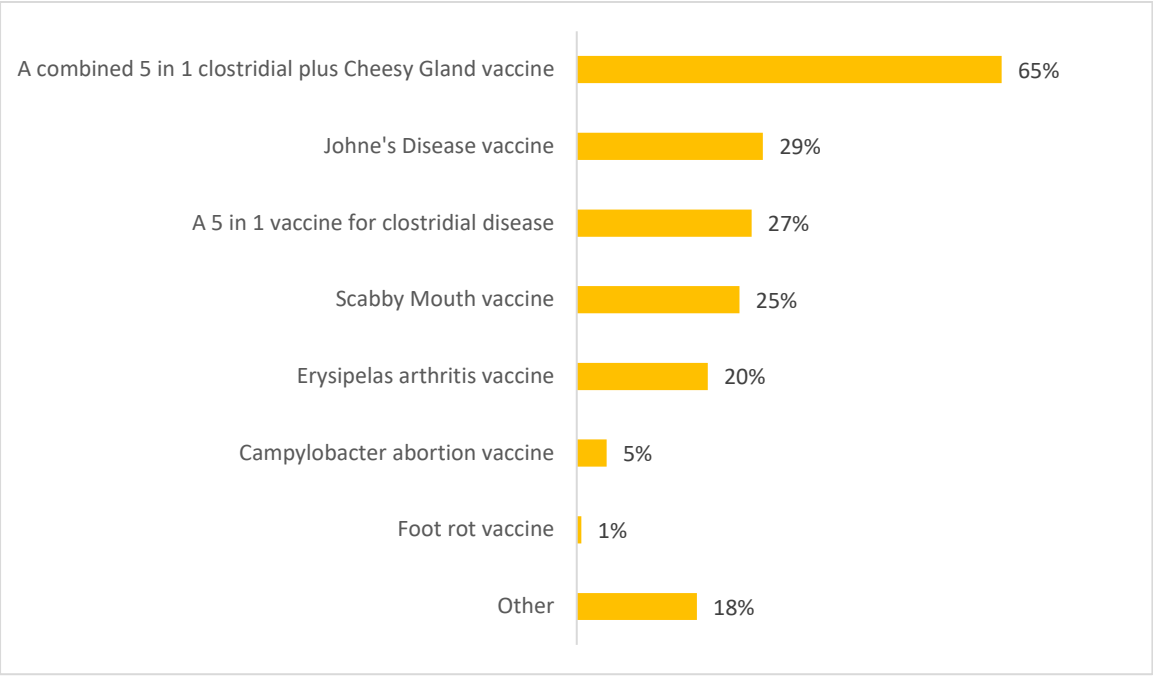
Base: Merino Producers who vaccinate sheep n = 769



7.2.0 What percent of your entire flock receives at least one vaccination of any type of vaccine?

Figure 77: Vaccines used

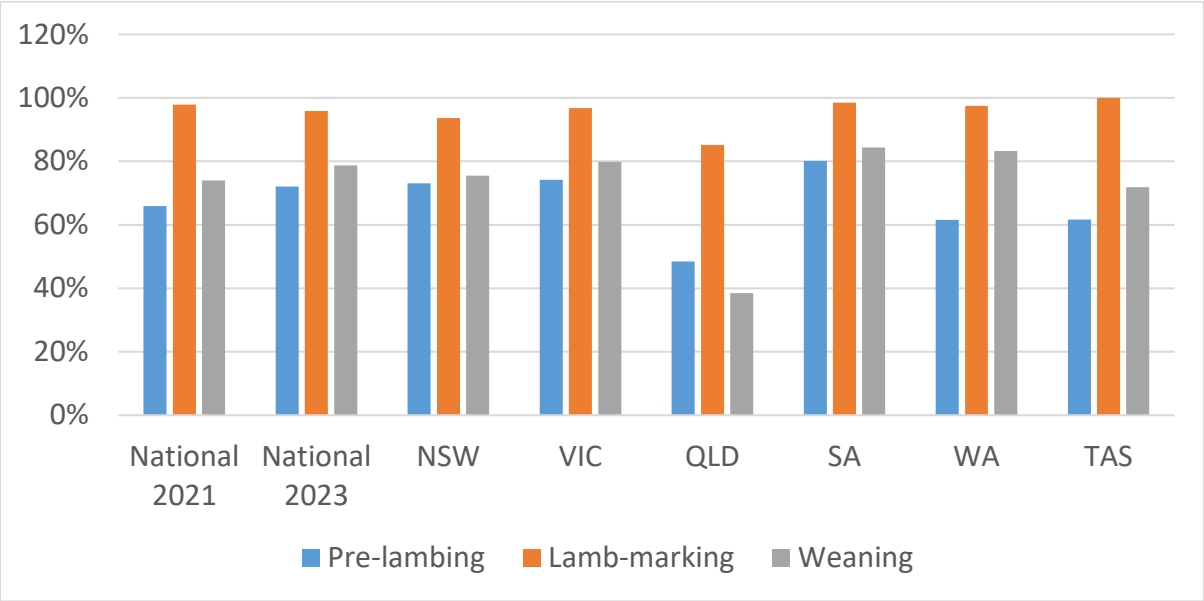
Base: Merino Producers who vaccinate sheep n = 769



7.2.1 What type of vaccines do you use on your farm?

Figure 78: Vaccination timings

Base: Merino producers who vaccinate lambs n = 769 (2021 n = 1,101)



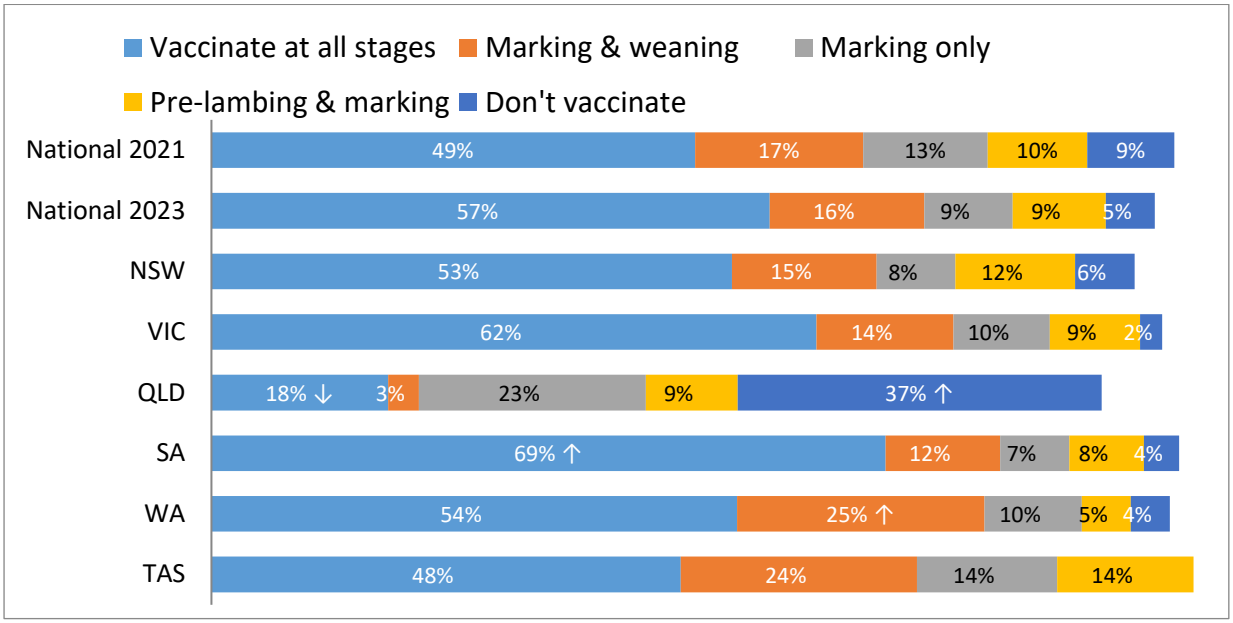
7.3 Do you do a pre-lambing vaccination?

7.4 Do you vaccinate your ewe lambs at lamb marking?

7.5 Do you vaccinate your lambs at weaning?

Figure 79: Vaccination schedule for Merino producers

Base: All Merino producers n = 809 (2021 n=1,203)



7.3 Do you do a pre-lambing vaccination?

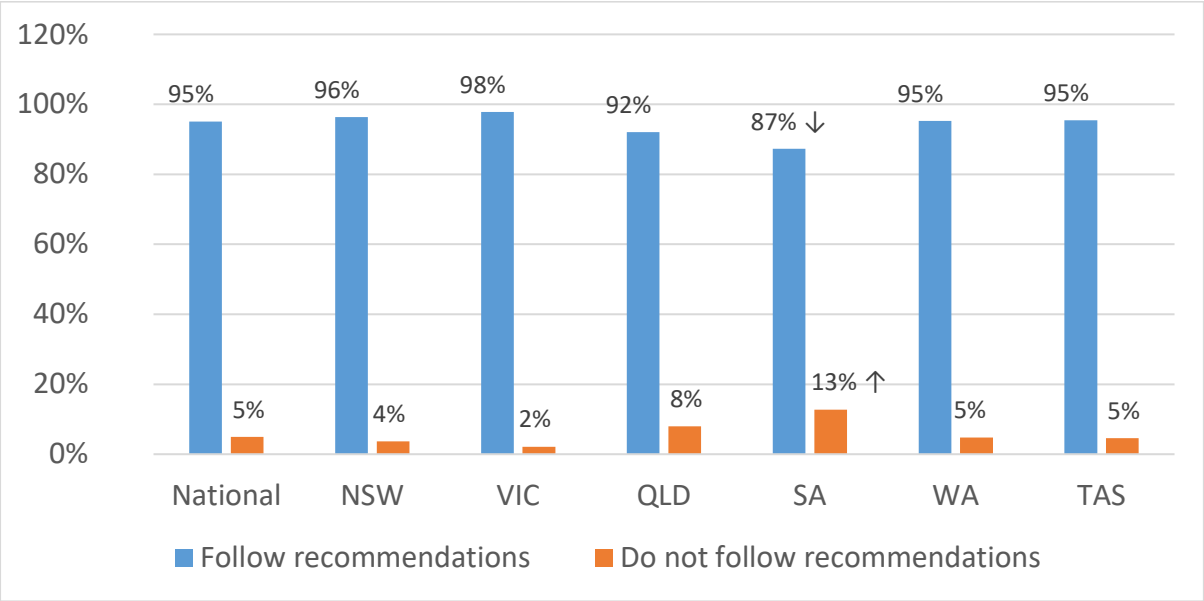
7.4 Do you vaccinate your ewe lambs at lamb marking?

7.5 Do you vaccinate your lambs at weaning?

NB: stages combinations representing fewer than 5% of Merino producers have been excluded

Figure 80: Merino Producers who follow label recommendations for antibiotics

Base: Merino Producers who vaccinate lambs n = 769



7.6 Do you follow label recommendations when administering antibiotics to your sheep?

4.9. Mortality and euthanasia

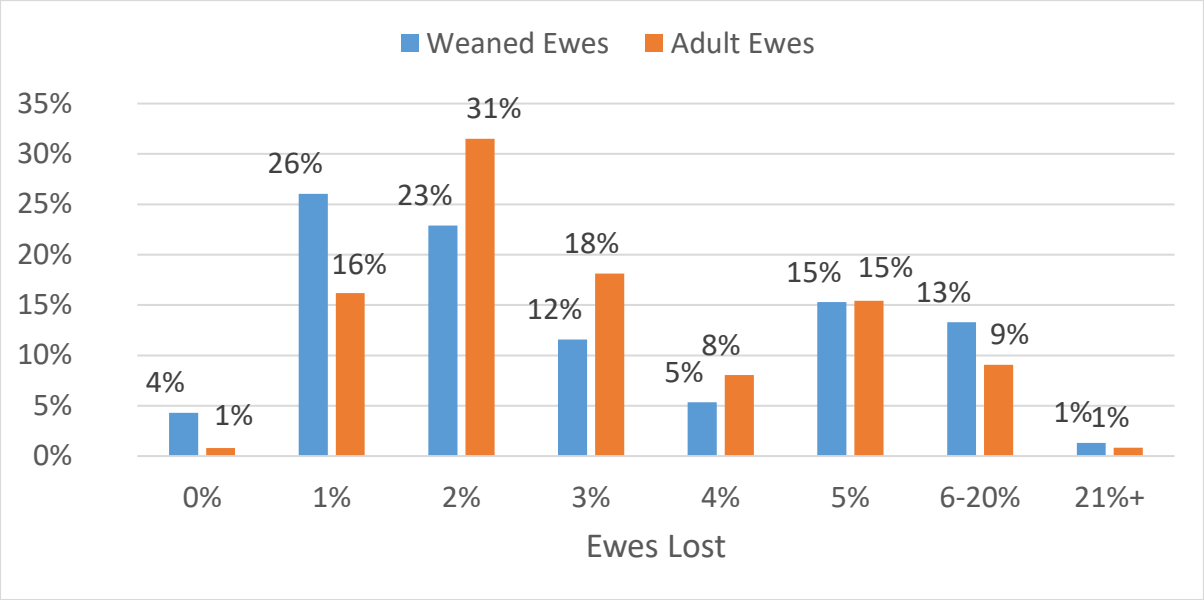
Nationally, the average weaned ewe mortality rate before joining was 4.1% with the adult ewe mortality rate at 3.5%. Slightly under half of Merino producers (49%) lost 2% of fewer weaned ewes before joining (**Figure 81**). Tasmanian Merino producers were significantly more likely to have lost 21% or more of weaned ewes (14%). Merino producers were most likely to state they had adult ewe mortality of 2% or less (49%). Tasmanian Merino producers were significantly more likely to have lost 21%+ or more of weaned ewes (14%).

Nationally, the majority (84%) of Merino producers have at least heard of the Australian Animal Welfare Standards and Guidelines for sheep and almost two thirds (62%) have read them. 16% of Merino producers had not heard of them (**Figure 82**).

Of Merino producers who are aware of the broader Australian Animal Welfare Standards and Guidelines for Sheep, a majority (67%) are aware of and have read the specific standards and guidelines for the Humane Killing of Sheep. 11% were not aware of them (**Figure**).

Figure 81: Mortality of weaned ewes and adult ewes

Base: All Merino producers n = 809

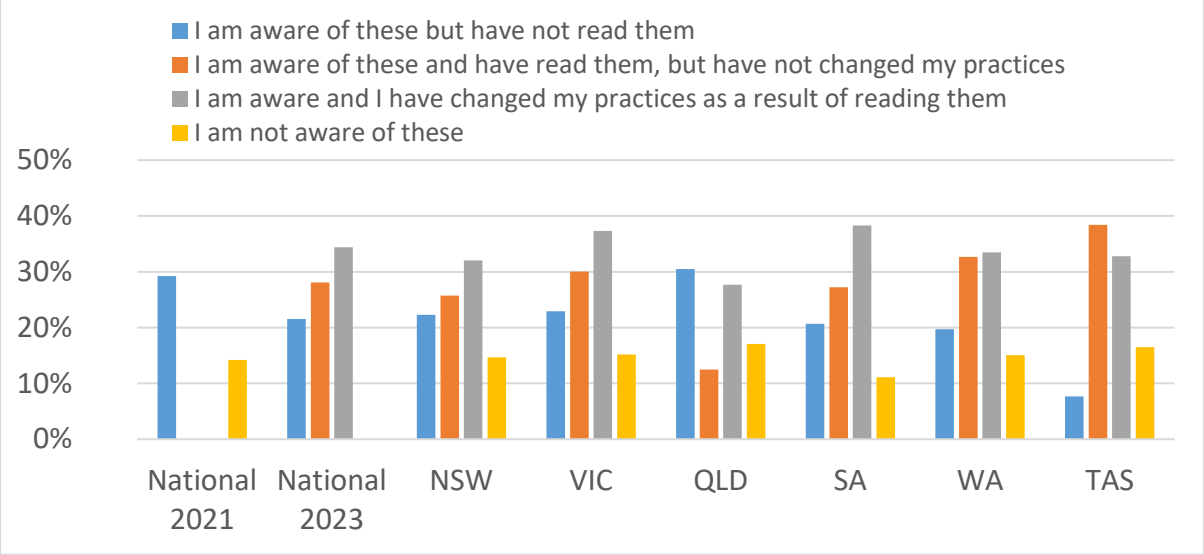


8.1 Of the ewe lambs that you wean, what percentage would you lose before the first joining?

8.2 What is your annual adult ewe mortality percentage rate?

Figure 82: Awareness of the Australian Animal Welfare Standards and Guidelines for Sheep

Base: All Merino producers n = 809 (2021 n=1,203)

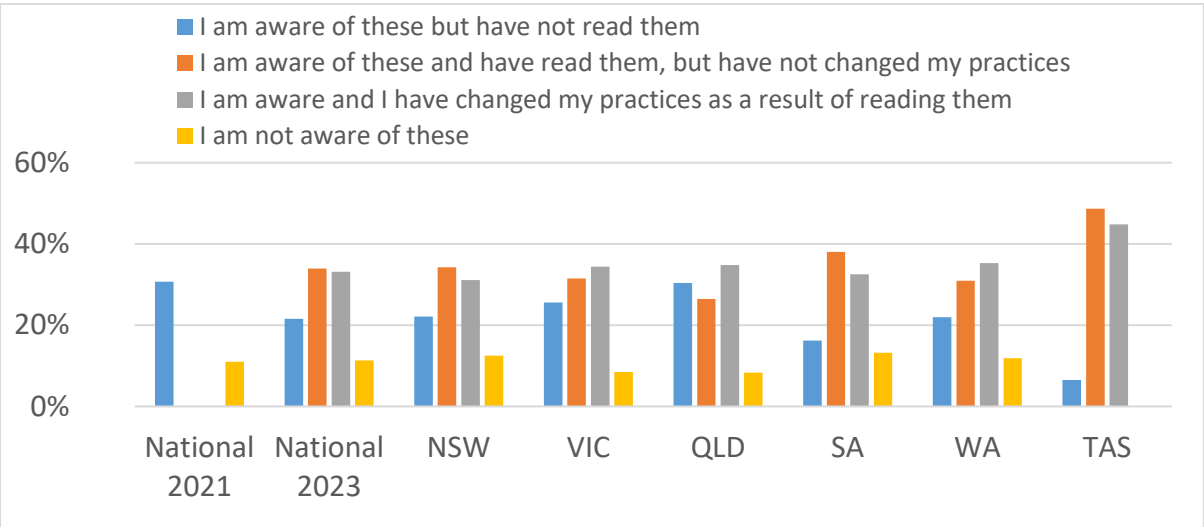


8.3 The industry has developed the Australian Animal Welfare Standards and Guidelines for Sheep. Which of the following best describes your knowledge of these standards and guidelines?

NB. Question has been slightly altered since 2021, with the response "I am aware and I have read them, but have not changed my practices" and "I am aware and I have changed my practices as a result of reading them" added in 2023, replacing "I am aware of these and I have read them" (57% nationally)

Figure 83: Humane killing of sheep guideline awareness

Base: Merino producers who are aware of the animal welfare standards for sheep n = 688 (2021 n = 1,042)



8.4 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?

NB. Question has been slightly altered since 2021, with the response "I am aware and I have read them, but have not changed my practices" and "I am aware and I have changed my practices as a result of reading them" added in 2023, replacing "I have read them" (58% nationally)

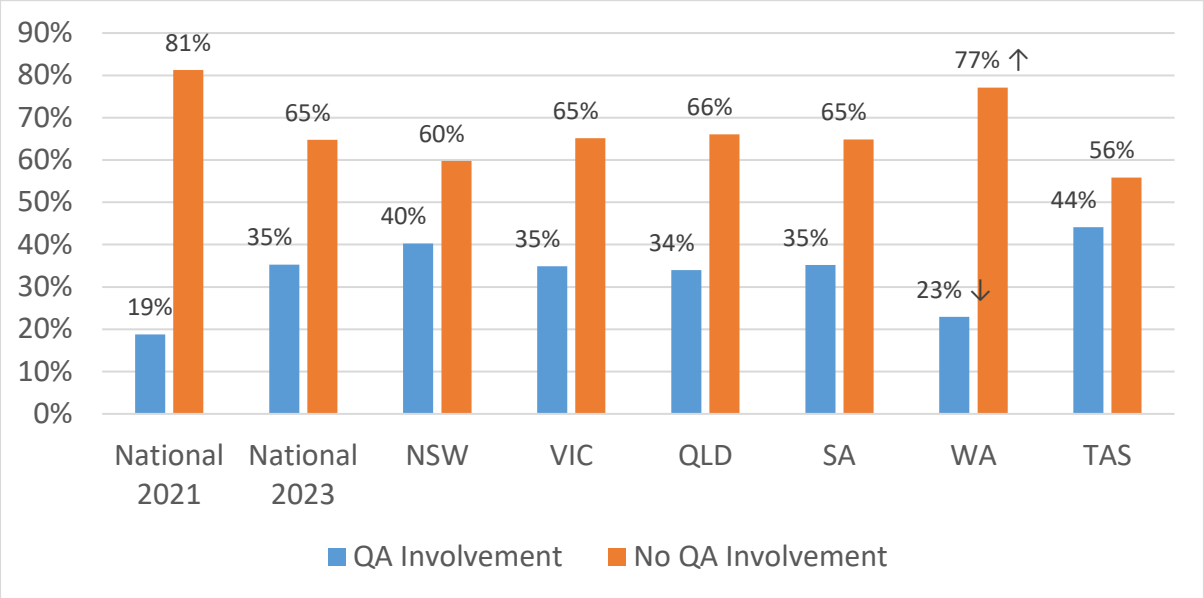
4.10. Wool quality assurance

Nationally, over one third of Merino producers are involved in wool quality assurance schemes (35%) (**Figure 84**). Western Australian Merino producers were less likely to be involved in quality assurance schemes than other states (23%).

Where Merino producers were not involved in quality assurance schemes, the most common reason is that they don't see any price premiums from them (**Figure 85**).

Figure 84: Wool Quality Assurance Scheme Involvement

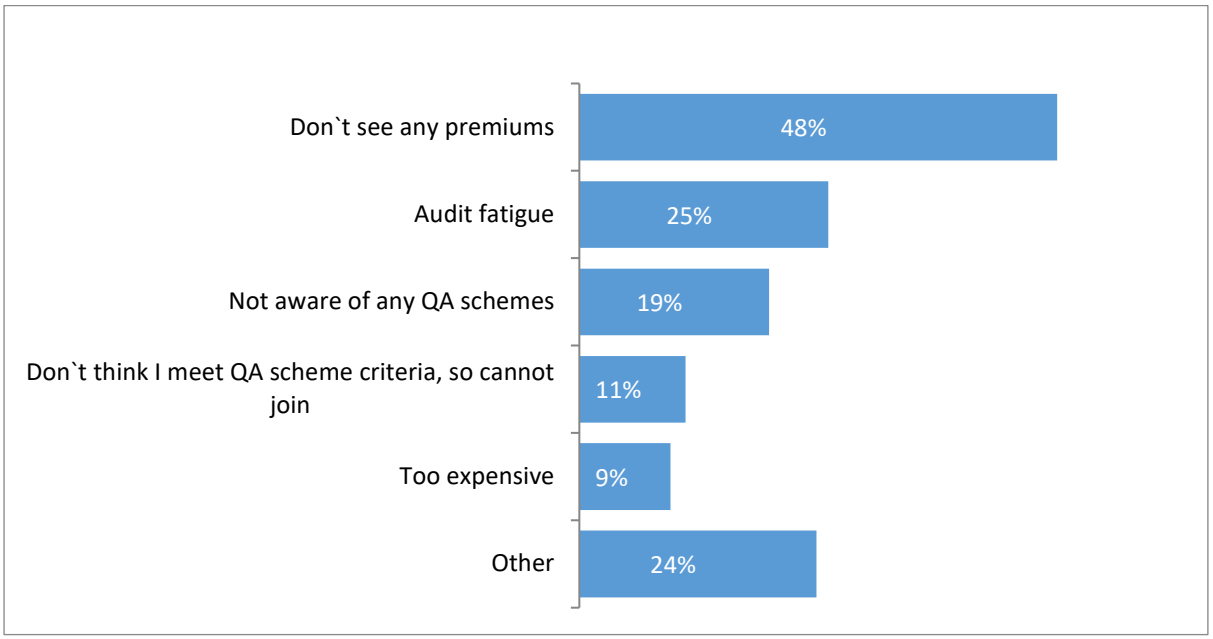
Base: All Merino producers n = 809 (2021 n=1,203)



9.1 Are you involved in any quality assurance schemes involving wool?

Figure 85: Reasons against involvement in quality assurance schemes

Base: Merino producers who are not involved in QA schemes n = 515



9.2 What has stopped you from being involved in a wool QA scheme?

4.11. Predators and pests

4.11.1. Predators

Around 4 out 5 (78%) Merino producers nationally have a problem with predators (**Figure 86**). This level was consistent across states except for Tasmania where only 24% of Merino producers had a problem. Annual losses nationally were 47 head on average and were significantly lower in South Australia (34 head) and significantly higher in Queensland and Western Australian (114 and 64, respectively).

Most significant predators vary significantly by state (**Figure 87**). Queensland and New South Wales Merino producers were more likely to report issues with wild dogs (66% and 19% respectively). Pigs were most likely to be problematic in Queensland and New South Wales (38% and 36%, respectively). Birds were a common problem in Western Australia (98%).

The most common method of wild dog control nationally is shooting or poison or bait (69% and 61% respectively) (**Figure 88**). Queensland Merino producers were significantly more likely to use fences (80%) and guardian animals (36%) when compared to other states.

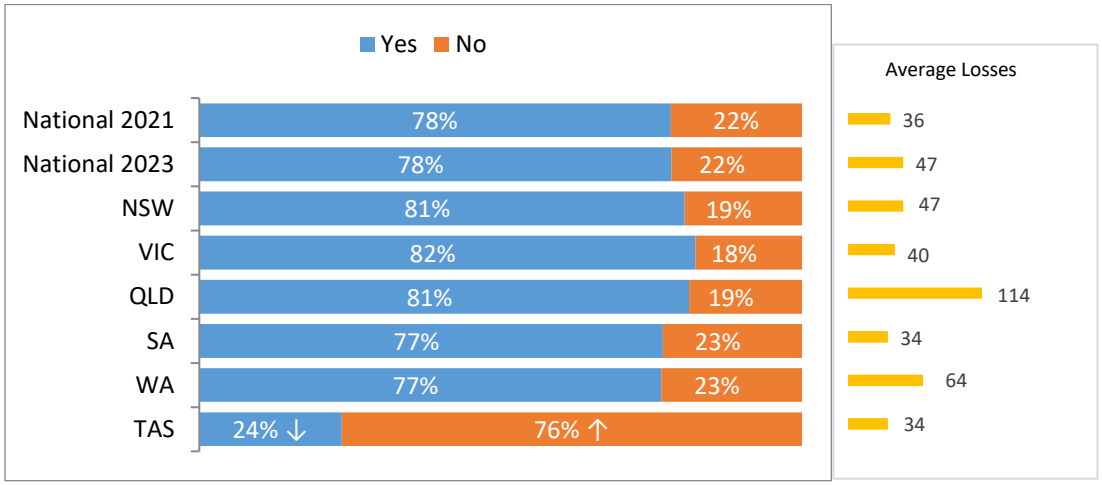
Merino producers most commonly control pigs by shooting them (91%). Traps (51%) and poison or bait (51%) are also popular (**Figure 89**). Queensland Merino producers were significantly more likely to use fences to control pigs than other states (70%).

Shooting foxes is the most common control method used (76% nationally) (**Figure 90**). There are significant differences between states with Western Australian and Victorian producers most likely to shoot (93% and 90% respectively). Poison is significantly more likely to be used in New South Wales (93%). Western Australian Merino producers are more likely to trap (22%) than other states, and Queensland Merino producers more likely to use guardian animals (47%).

Most Merino producers who have problems with birds do not control them (79% nationally) (**Figure 91**). New South Wales Merino producers were significantly more likely than other states to poison birds (10%).

Figure 86: Problems with predators

Base: All Merino producers n = 809 (2021 n=1,203), Merino producers who lost sheep to predators n = 630

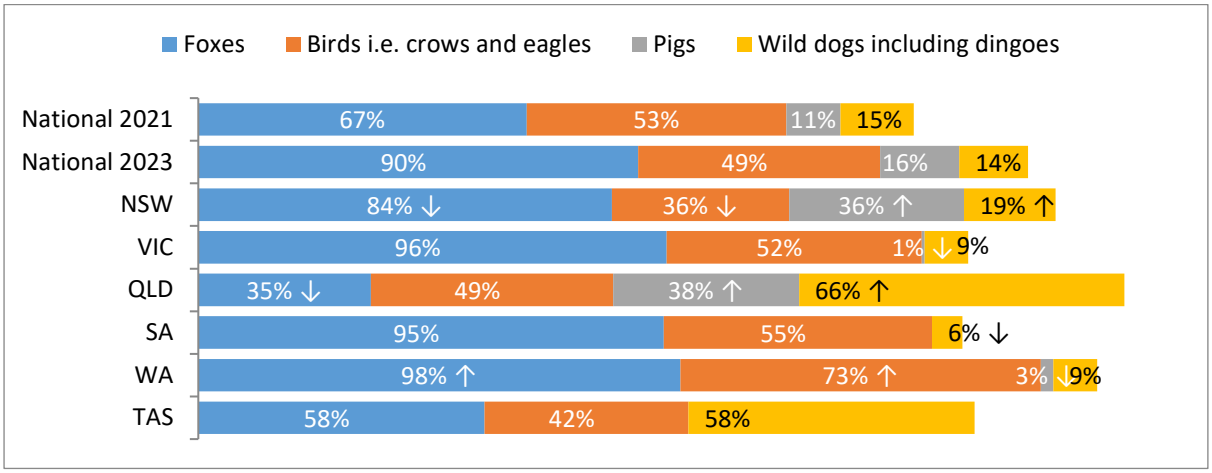


10.1 Do you have a problem with predators on your property?

10.2 How many sheep did you lose to predators in 2023?

Figure 87: Most relevant predators by state

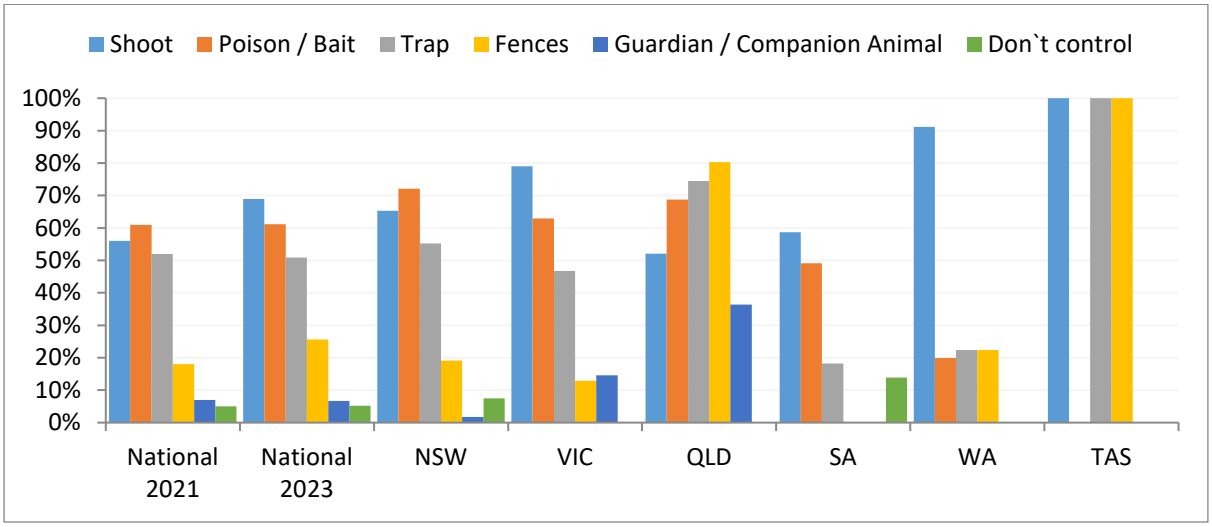
Base: Merino producers who reported problems with predators n = 630 (2021 n = 952)



10.3 What are the two most relevant predators on your property?

Figure 88: Wild dog control by state

Base: Merino producers who reported problems with wild dogs n = 84 (2021 n = 140)

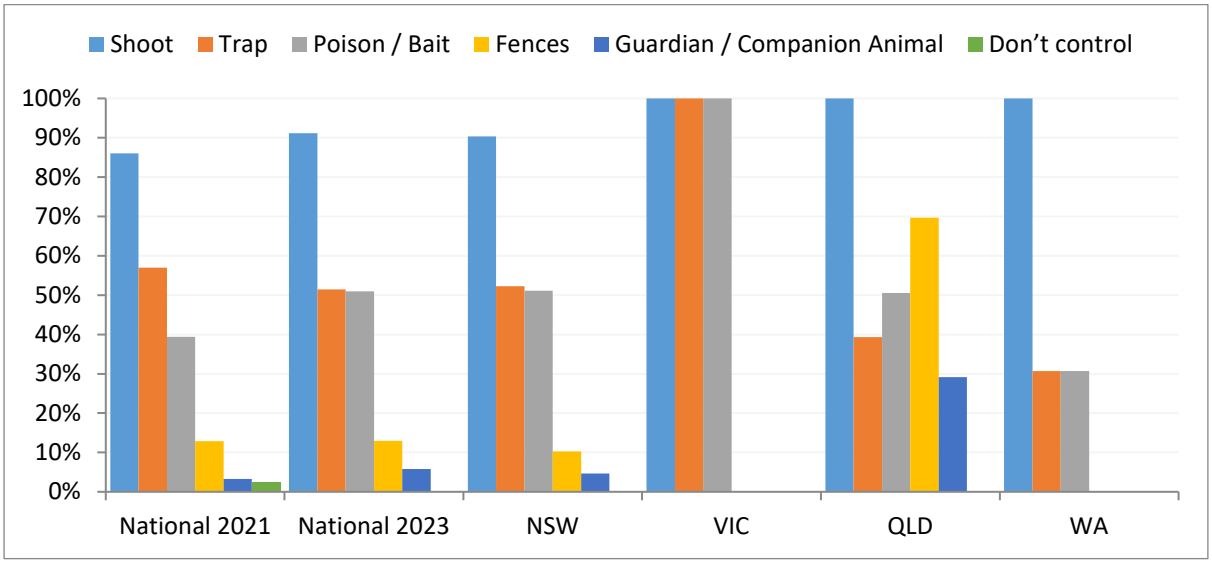


NB. South Australia, Western Australia and Tasmania had fewer than 20 respondents each

10.4 How do you control Wild dogs including dingoes?

Figure 89: Pig control by state

Base: Merino producers who reported problems with pigs n = 92 (2021 n = 122)

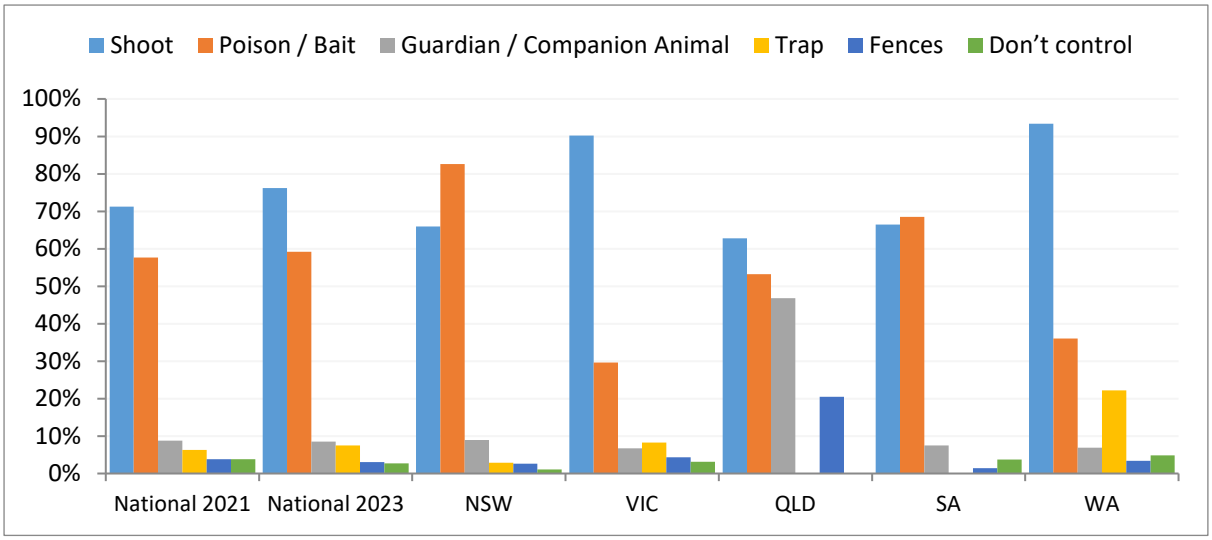


N.B. The data shown for Victoria, Queensland and Western Australia each come from fewer than ten Merino producers (n=1, n=9 and n=3, respectively).

10.4 How do you control Pigs?

Figure 90: Fox control by state

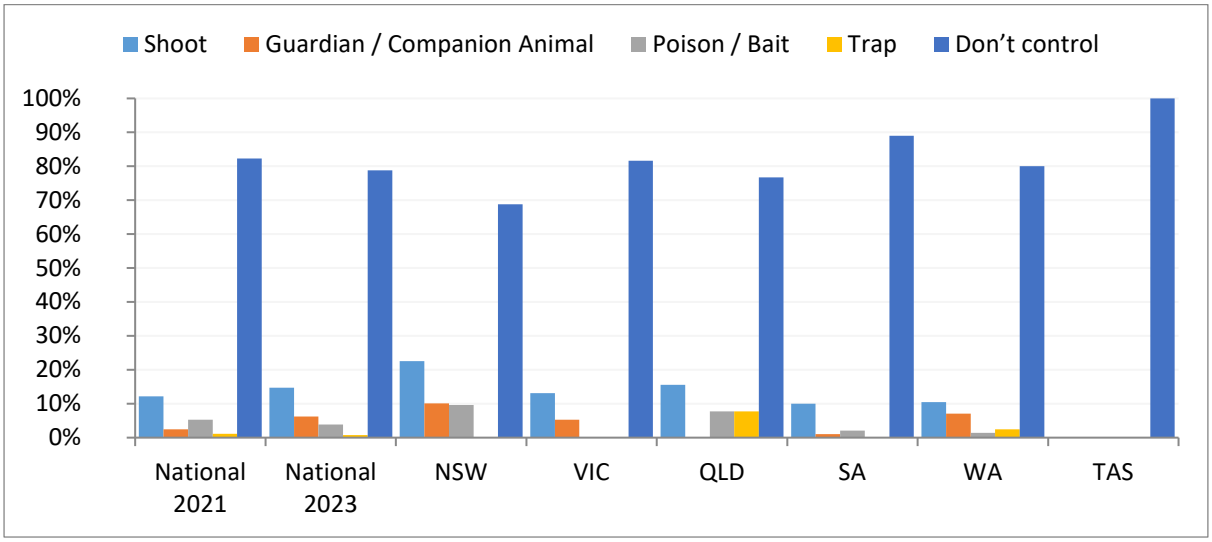
Base: Merino producers who reported problems with foxes n = 566 (2021 n = 1385)



10.4 How do you control Foxes?

Figure 91: Bird control by state

Base: Merino producers who reported problems with birds n = 325 (2021 n = 516)



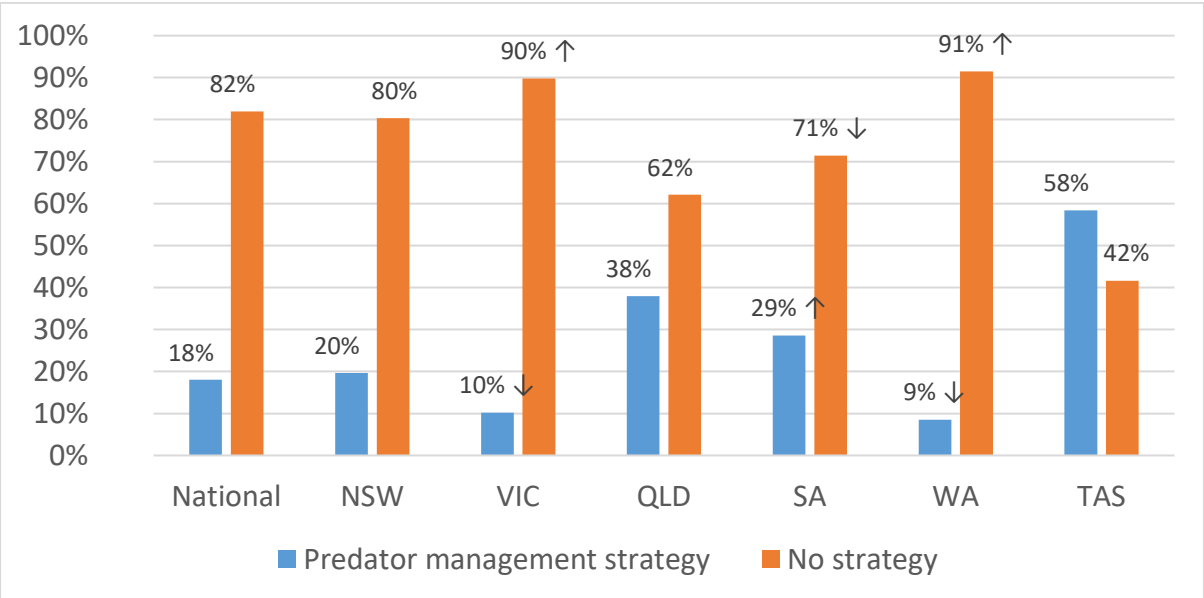
10.4 How do you control Birds i.e. crows and eagles?

4.11.2. Management strategies

Almost one fifth of Merino producers nationally have a predator management strategy for their properties (18%) (2).

Figure 92: Documented predator management strategy

Base: Merino producers who reported problems with predators n = 630



10.5 Do you have a documented predator management strategy or plan for your property?

4.12. Carbon activities

Half (50%) of Merino producers generate and use renewable energy (**Figure 93**). A further 11% of Merino producers stated that they use renewable energy bought from their energy retailer with 42% not generating or buying any renewable energy. Tasmanian Merino producers were significantly more likely to use renewable energy from a retailer (55%) than other states, while Western Australian producers were more likely not to use renewable energy (59%), with only 36% using their own generated renewable energy. Merino producers were allowed to select multiple responses and may do a combination of the responses across their business.

Where Merino producers generate their own renewable energy, the majority (86%) have solar without batteries. Slightly under a fifth (19%) generated solar with a battery. (**Figure**).

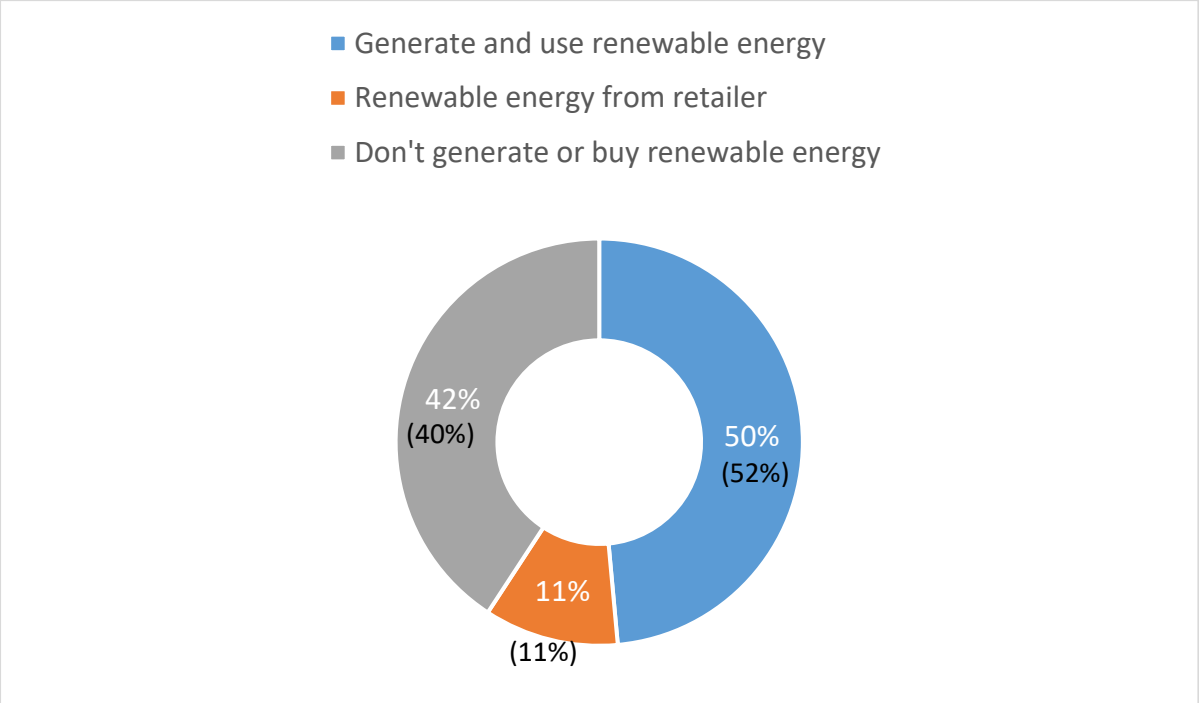
Merino producers interviewed had generally not taken carbon accounting training study (85%) and did not measure their emissions (89%) (**Figure**), however 21% did implement carbons emissions measures (**Figure**). South Australian Merino producers were significantly less likely to estimate greenhouse gas emissions (96%).

Merino producers who did conduct emission reduction activities often selected more than one measure (**Figure 97**). Over two thirds of Merino producers (70%) used pasture management, but carbon storage was also a popular technique (59%).

Examples of emission reduction measures are shown in **Table 4**.

Figure 93: Renewable energy generation and use

Base: All Merino producers n = 809 (2021 n=1,203)

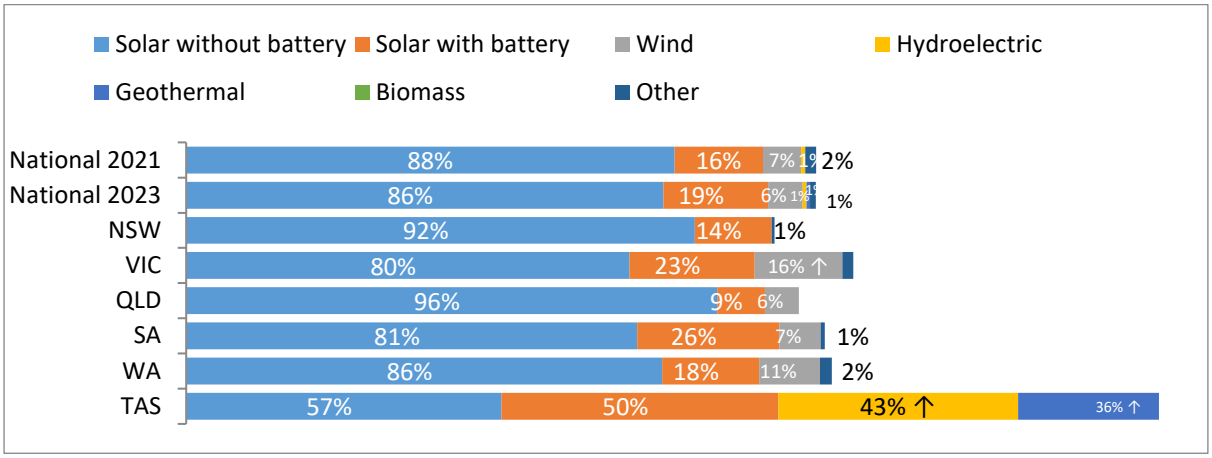


11.1 Which of the following best describes your use of renewable energy on your farm?

NB. 2021 results in brackets

Figure 94: Renewable energy generation methods

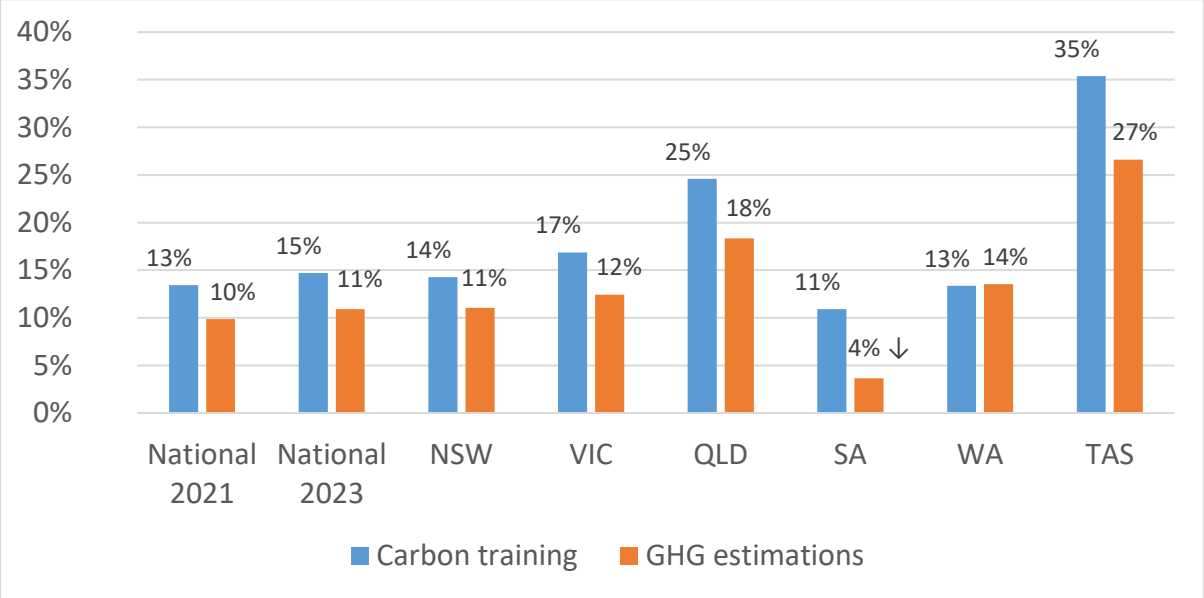
Base: Merino producers who generate their own renewable energy n = 409 (2021 n = 613)



11.2 Which of the following types of renewable energy do you generate and use on your farm?

Figure 95: Carbon training and emissions measurement

Base: All Merino producers n = 809 (2021 n=1,203)

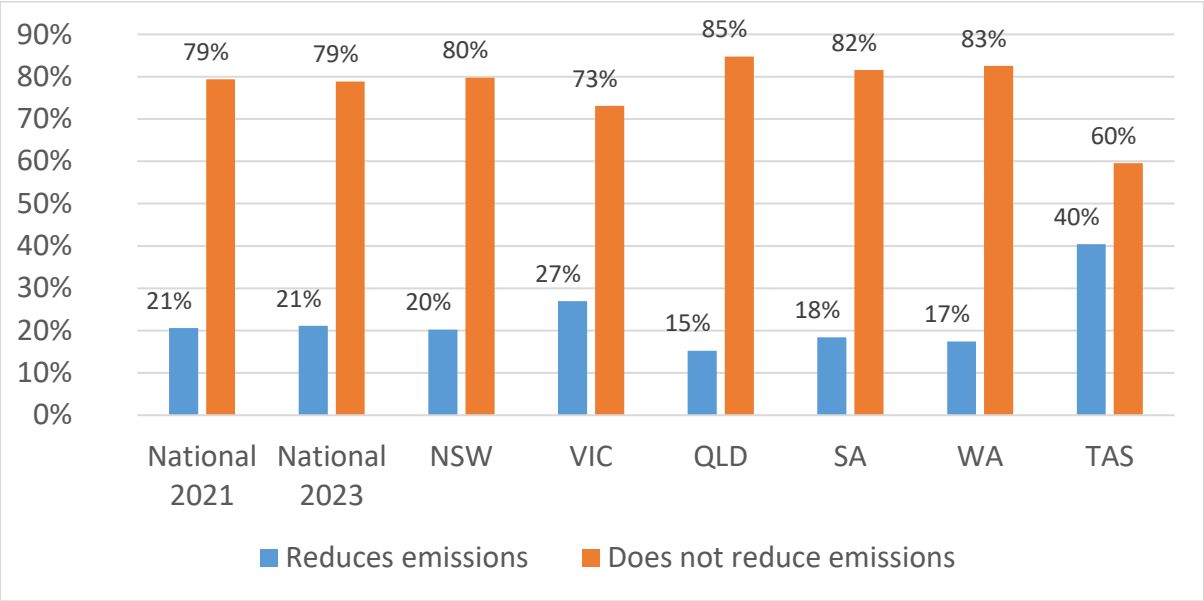


11.3 Have you undertaken any carbon neutral or carbon accounting training?

11.4 Have you estimated the net greenhouse gas emissions produced in your operation using a carbon calculator tool or another process?

Figure 96: Implementation of emissions reduction measures

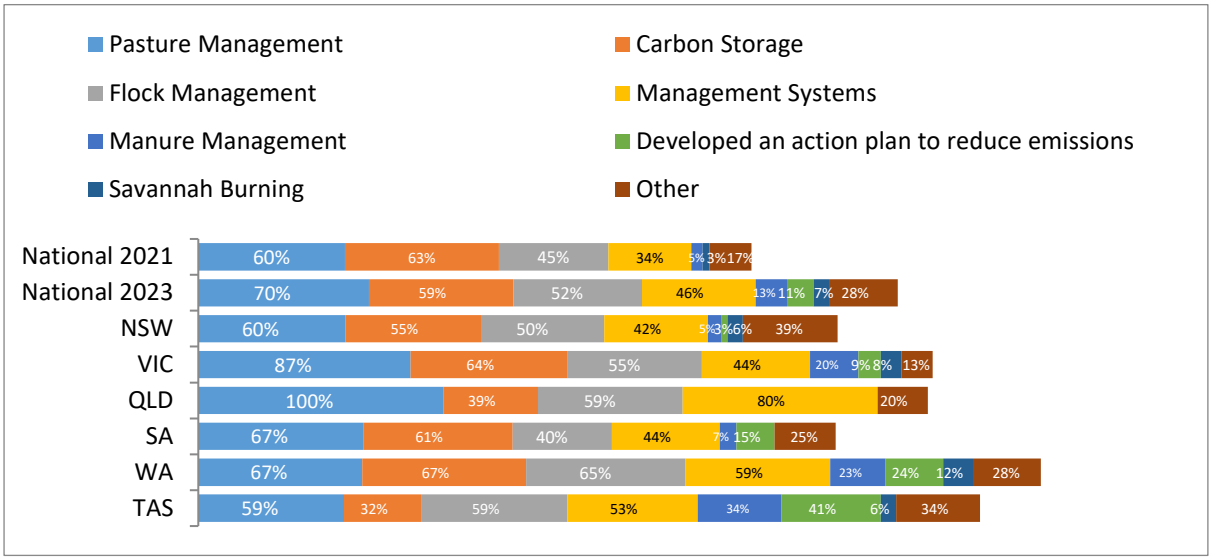
Base: All Merino producers n = 809 (2021 n=1,203)



11.5 Have you implemented any activities to reduce your net greenhouse gas emissions or emissions intensity (emissions per kilogram liveweight) while producing livestock?

Figure 97: Implementation of emissions reduction measures

Base: Merino producers who implement emissions reduction measures n = 161 (2021 n = 278)



NB. Small sample size for Queensland (n=4) and Tasmania (n=7)

11.6 Which of the following activities have you implemented?

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 Dung Beetles Manure, plant debris and compost application Planting of permanent pastures	Grazing management Earthworms Grass species Legumes Perennial pastures	Increasing fertility Decreasing average age Reducing proportion of unproductive animals	Stocking rates Improved nutrition Improved rates of liveweight gain	Reducing overall livestock numbers	Manure stockpile aeration Addition of urease inhibitors	Management of savannah burning

4.13. Biodiversity and land and water management

4.13.1 Biodiversity and land management

Almost two fifths (38%) of Merino producers had completed a property management plan which incorporates biodiversity and or conservation (**Figure)**. Conversely, nearly three quarters (72%) of Merino producers undertook deliberate activities to maintain, measure or enhance biodiversity.

Producers undertook an array of activities to maintain and improve biodiversity, with many undertaking multiple measures (**Figure 99**). The most common of these was maintenance of adequate ground cover (72%), management of soil health (64%) and minimum tillage (63%). Victorian Merino producers were significantly more likely to undertake minimum tillage (76%), with Queensland less likely to do so (25%) and also less likely to plant multiple species (14%) and utilise cover crops (4%). South Australian Merino producers were significantly less likely to maintain adequate ground cover (60%).

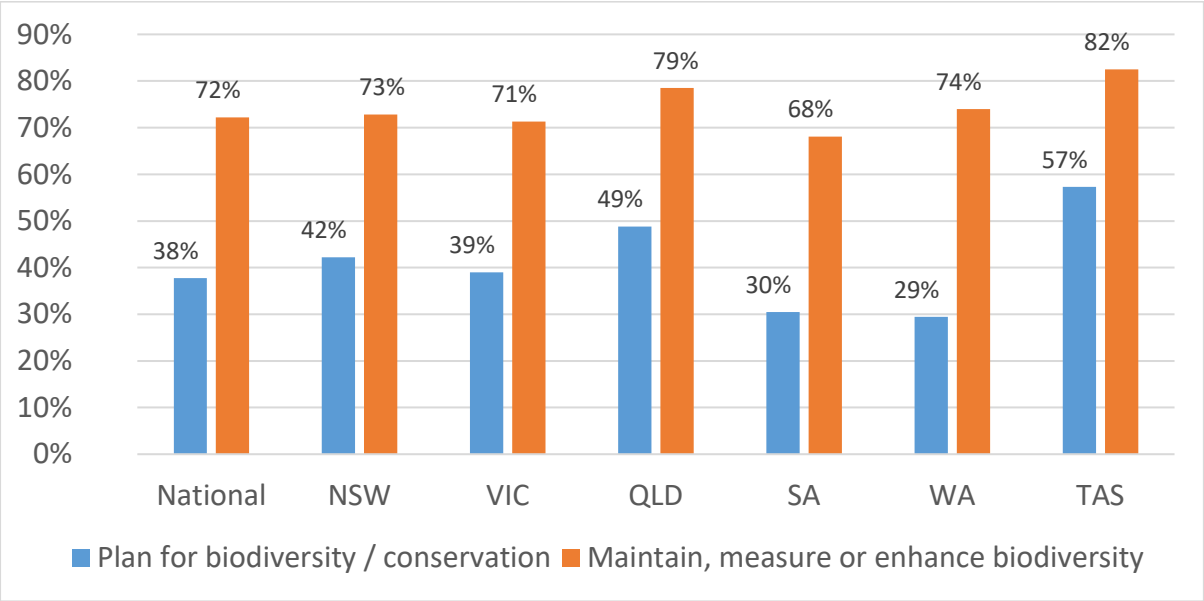
Likewise, Merino producers undertook multiple land management activities (**Figure 100**), most commonly, weed control (89%), destocking of pastures (64%) and maintaining reliable water sources for livestock (51%). Victorian and Western Australian Merino producers were significantly more likely to apply soil treatments (56% and 66% respectively). Erosion control was most common in Western Australia (45%), while New South Wales Merino producers were more likely to maintain reliable water sources (58%) and Tasmanian Merino producers were more likely to carry out prescribed burning (57%).

Producers also undertook multiple grazing management activities, with fencing areas “to prevent livestock access”(64%) or “to better manage grazing pressure” (61%) the most common measures (**Figure 101**). Western Australian Merino producers were more likely to fence areas to prevent livestock access (75%) and fence waterways (52%) and South Australian Merino producers were less likely to fence waterways (22%) and provide off stream water (27%).

The majority of Merino producers (98%) felt that they can accurately identify common weeds (**Figure**).

Figure 98: Biodiversity plan and activities

Base: All Merino producers n = 809

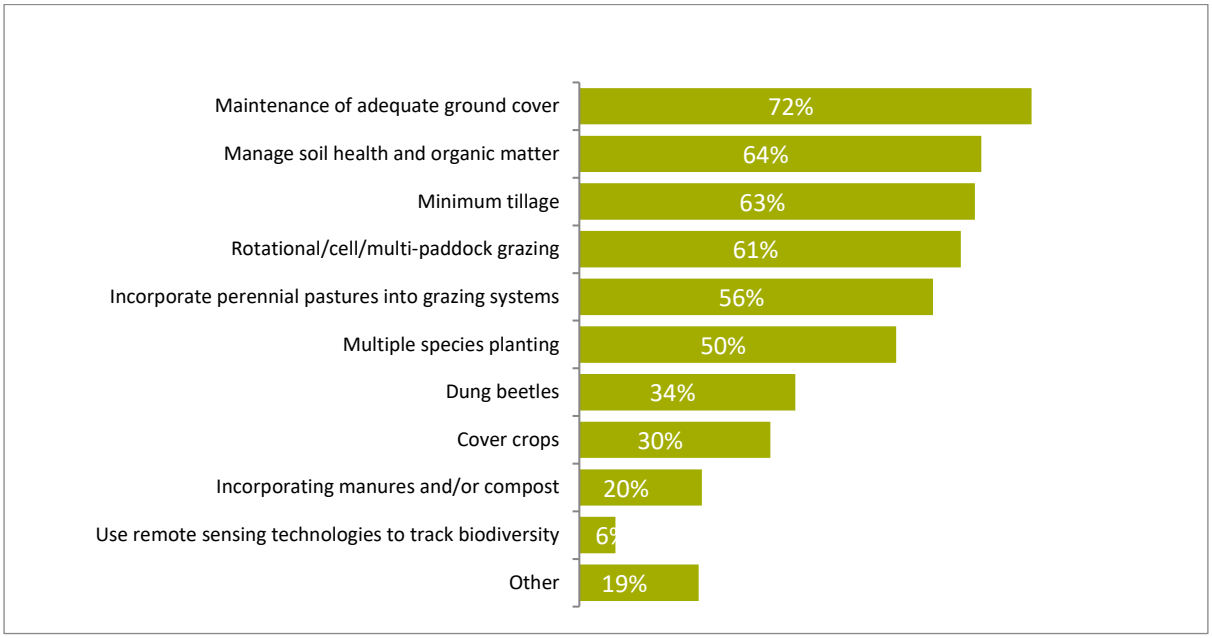


12.1 Do you have a completed property management plan that incorporates biodiversity and/or conservation?

12.2 Do you undertake deliberate activities to maintain, measure or enhance biodiversity on your property?

Figure 99: Practices to maintain and improve biodiversity

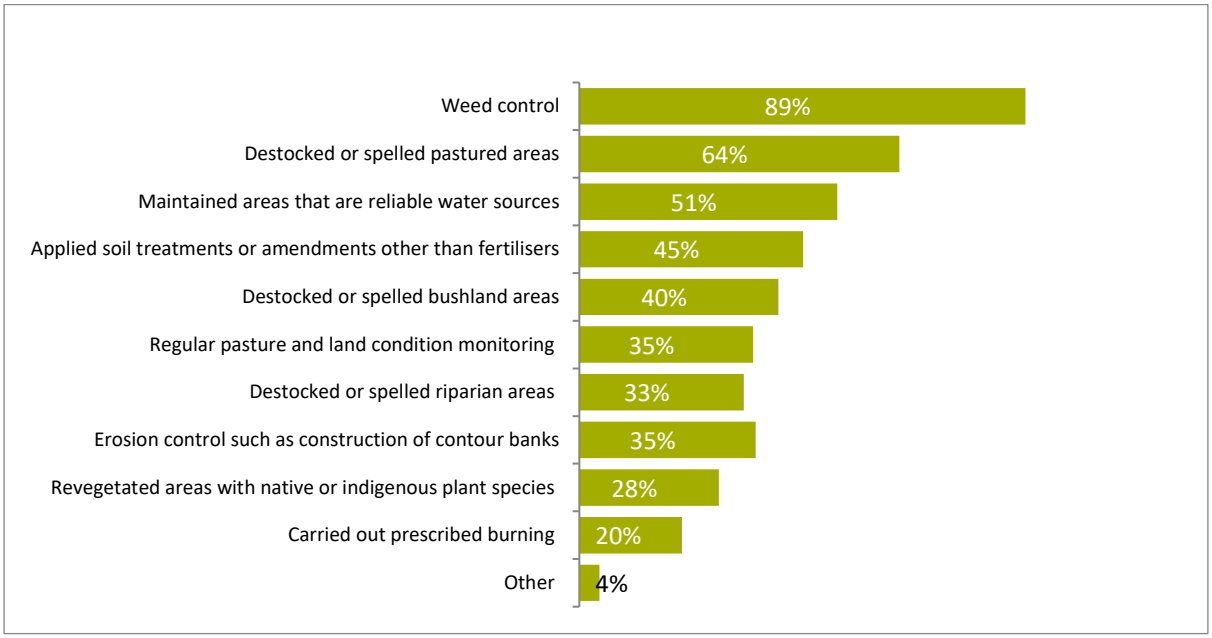
Base: Merino producers who undertake practices to maintain, measure or enhance biodiversity n = 594



12.3 Which practices do you use to maintain and improve biodiversity on your property?

Figure 100: Land management activities

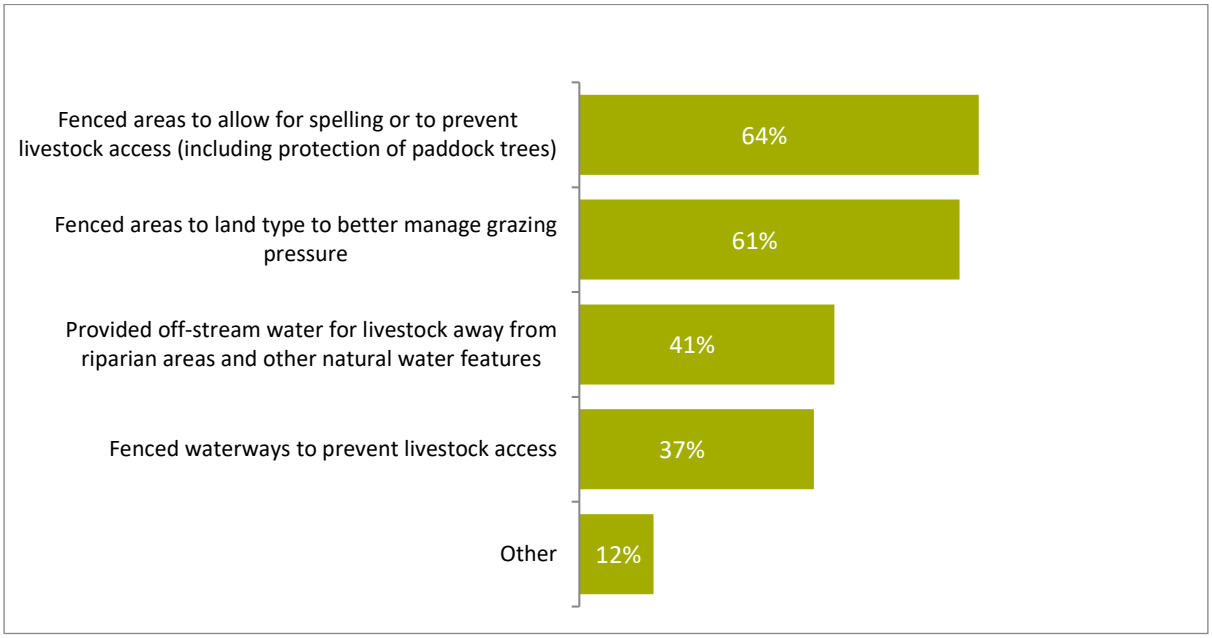
Base: All Merino producers n = 809



12.4 Which of the following land management activities did you undertake on your property/ies in 2023?

Figure 74: Grazing management activities

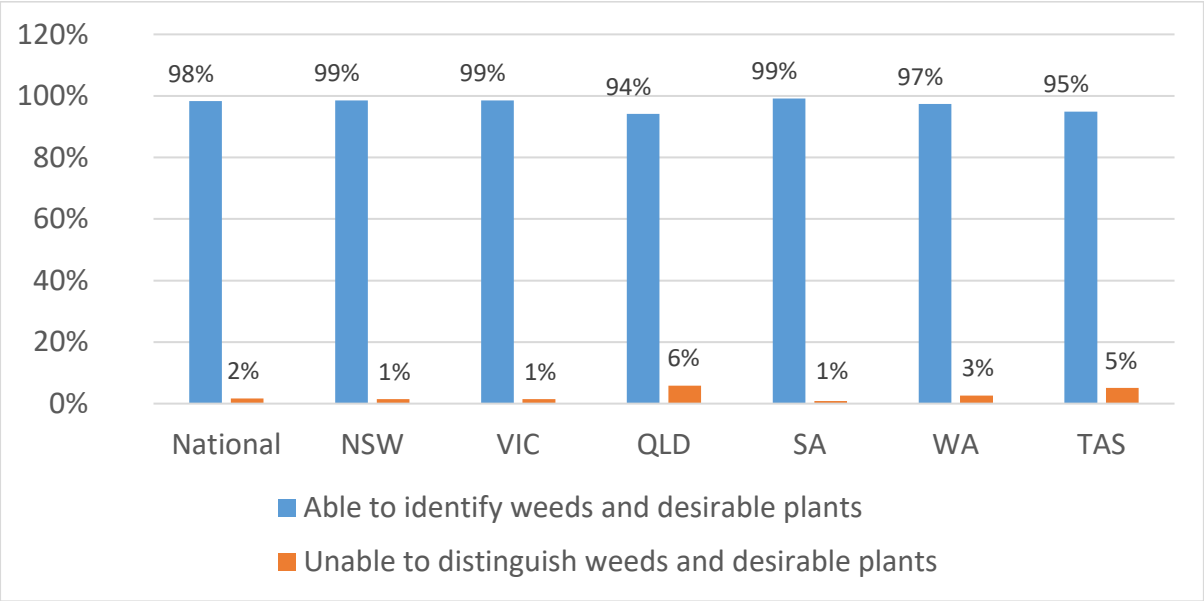
Base: All Merino producers n = 809



12.5 Have you previously (in 2023 or earlier) undertaken any of the following grazing management activities on your property?

Figure 102: Identification of weeds

Base: All Merino producers n = 809



12.6 Are you able to accurately identify various types of weeds that commonly grow in pasture systems, and distinguish them from desirable plants?

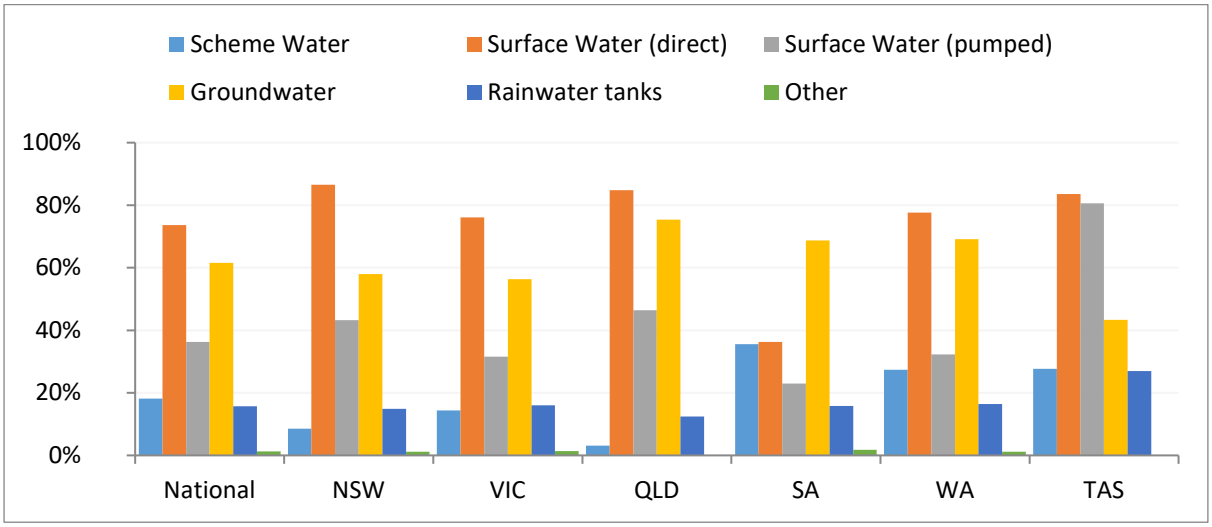
4.13.2 Water management

Nearly three quarters of Merino producers (74%) sourced water for animals from surface water, directly from dams, creeks or rivers (**Figure 103**). New South Wales Merino producers were most likely to source water directly from surface water (87%) and pumped surface water (43%) but less likely to use scheme water (9%). South Australian and Western Australian Merino producers are more likely to source from scheme water (36% and 27%, respectively), Tasmanian Merino producers were most likely to use pumped surface water (81%). South Australian Merino producers were less likely to utilise surface water than other states, both direct water (36%) and pumped water (23%).

Fewer than one third (29%) of Merino producers had a documented plan for managing their farms and animals during extreme weather (**Figure**), however the vast majority (94%) believe their stock water supplies could withstand prolonged dry periods. 81% were confident that they could increase their stock water supply if needed. Western Australian Merino producers were least likely to have a plan for extreme weather (20%). There were no other significant differences.

Figure 75: Water source

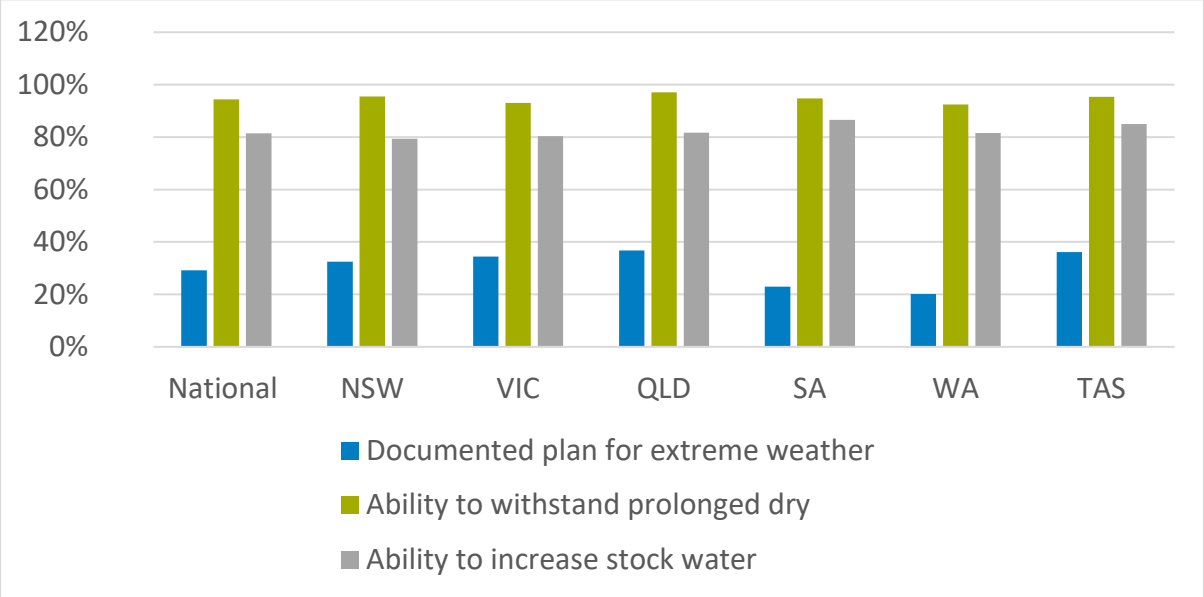
Base: All Merino producers n = 809



12.7 What is the source of water for your animals?

Figure 104: Water supply resilience

Base: All Merino producers n = 809



12.8 Do you have a documented plan for managing your farm and animals during extreme weather e.g. droughts, extreme heat events and floods?

12.9 Can your stock water supply withstand prolonged dry periods?

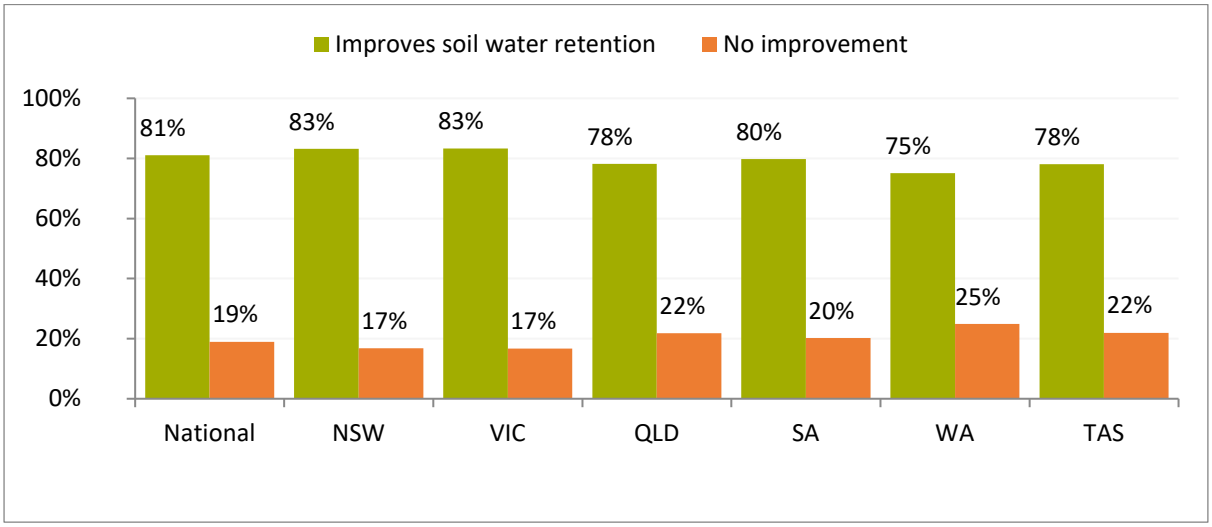
12.10 Can you increase stock water supply if needed?

1.1 Soil Management

The majority of Merino producers undertook practices to improve soil water retention (81%) (**Figure**).

Figure 105: Soil water practices

Base: All Merino producers n = 809



13.1 Did you undertake practices to improve your soil water retention? (e.g. leaving tall pasture grass stubble, greater grazing rotation, cover cropping, claying, aeration, pasture slashing/mulching, composting)

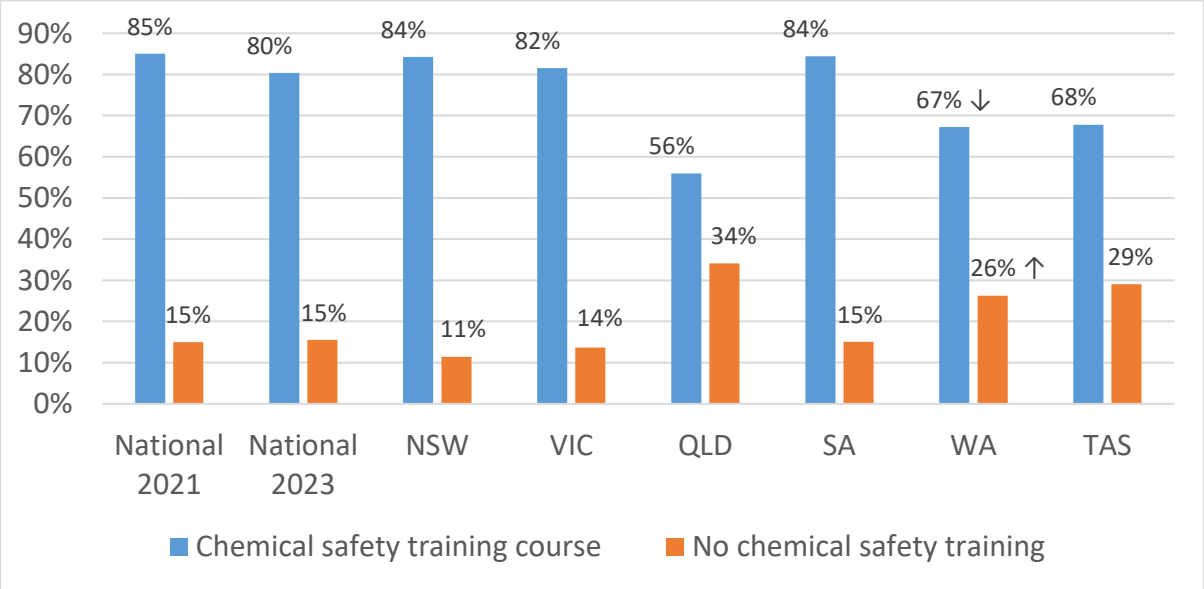
1.2 Chemicals

Nationally, around four fifths of Merino producers (86%) report that they have completed chemical safety training (**Figure**). New South Wales (92%) Merino producers were significantly more likely to have completed training. Western Australian (63%), Queensland (77%) Merino producers were significantly less likely to have completed training.

Nationally, four fifths of Merino producers (80%) who have completed chemical safety courses report that they have ChemCERT accreditation or a current ChemCERT card (**Figure**). Western Australian (67%) Merino producers were significantly less likely to have completed training.

Figure 76: Attendance at chemical safety training courses

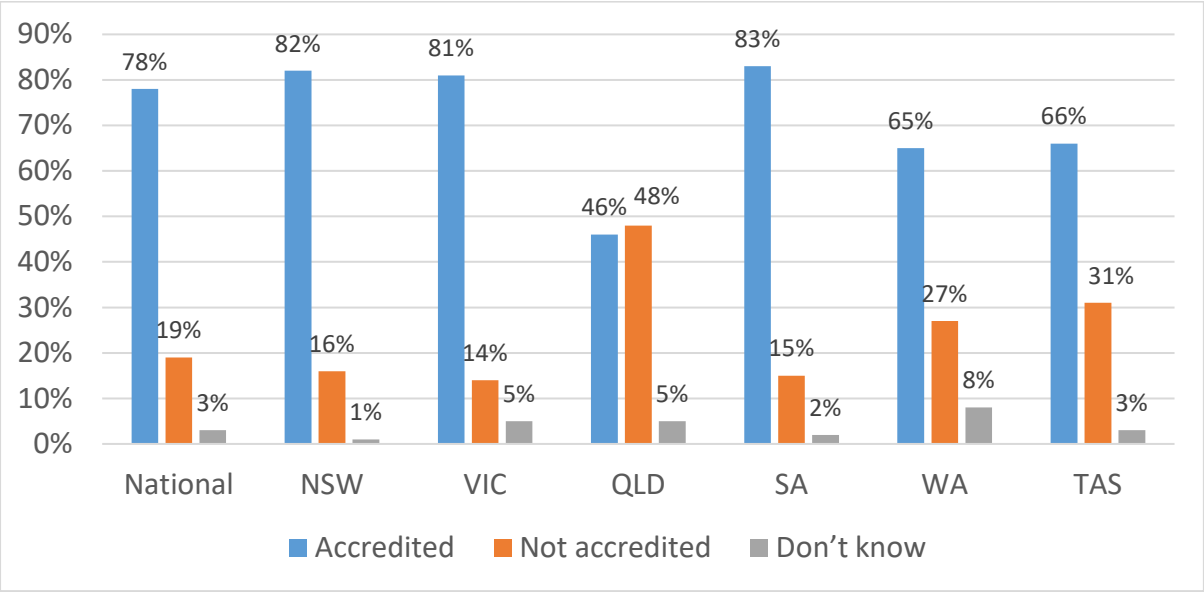
Base: All Merino producers n = 809 (2021 n = 1,203)



14.1 Have you done any chemical safety training courses?

Figure 107: Chemical Accreditation Status

Base: Merino producers who have attended chemical safety training n = 706 (2021 1,038)



14.2 Do you have ChemCERT accreditation or hold a current ChemCERT card?

4.14. Training and WHS

Generally, Merino producers had received multiple sources of animal husbandry education (**Figure**). Most commonly, education was informal – either shown to them by another person (81%) or self-taught (59%).

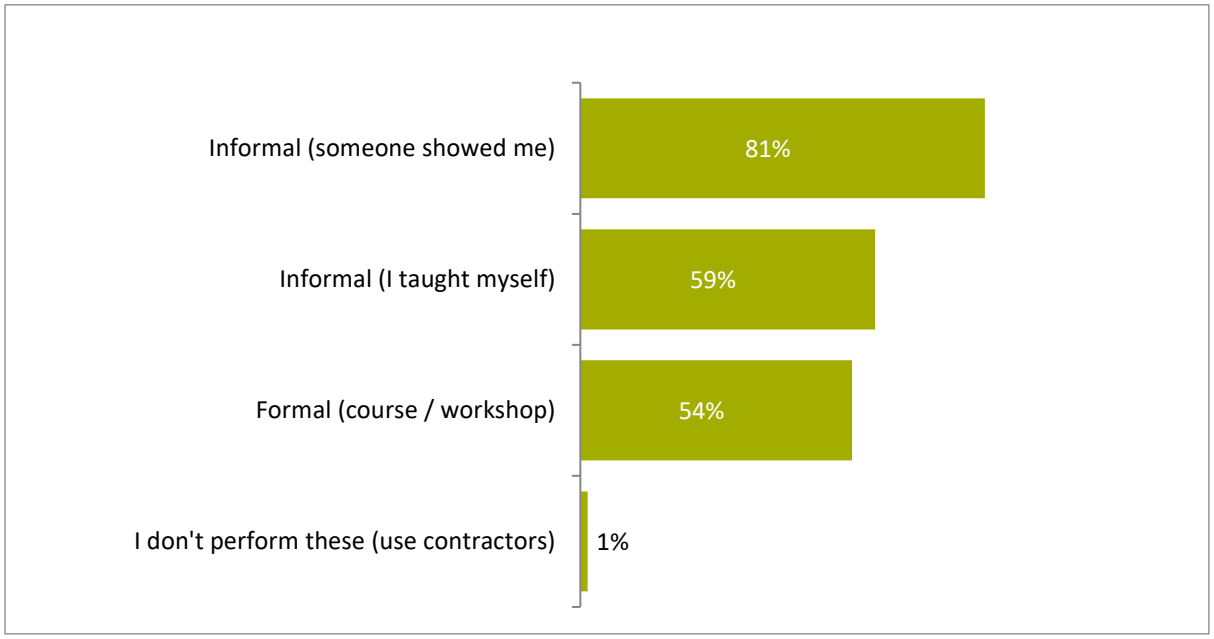
Over half (54%) of Merino producers undertook training or education in 2023 (**Figure**), with Queensland Merino producers significantly more likely to do so (75%).

Of those who did undertake training, producers covered multiple topics, with animal health / husbandry (63%) and pasture management / improvement (46%) most popular (**Figure**).

Nationally, 75% encourage workers to identify safety concerns and 71% of producers have roll over bars on vehicles (**Figure**). Victorian Merino producers were significantly more likely to have roll bars (85%) with Tasmanian Merino producers more likely to have a WHS plan (81%) and New South Wales Merino producers less likely to induct workers in WHS obligations.

Figure 108: Animal husbandry education

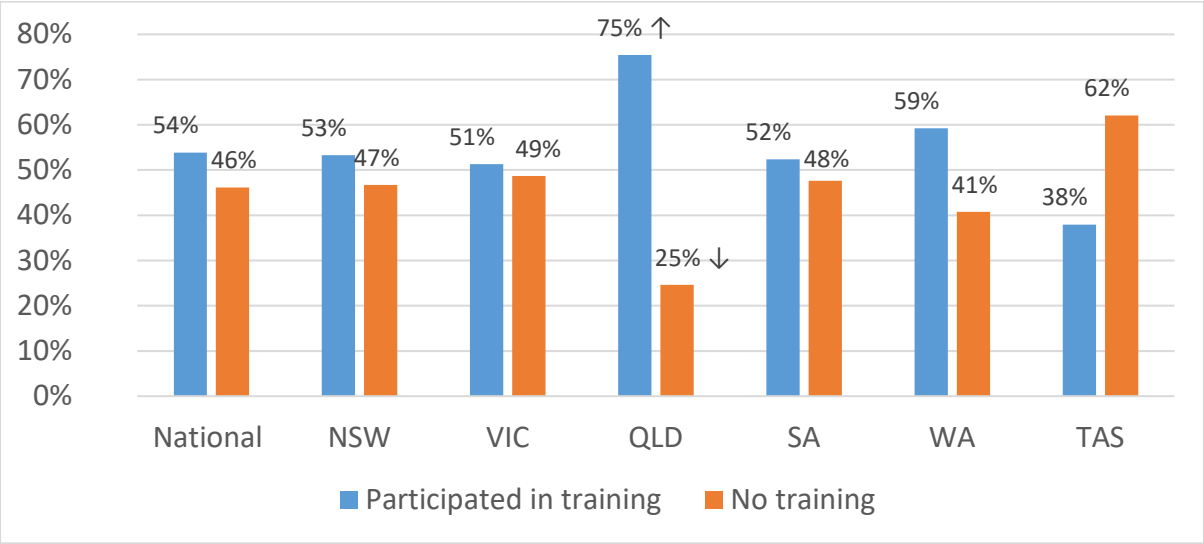
Base: All Merino producers n = 809



15.1 How did you learn to perform the various animal husbandry practices undertaken on farm?

Figure 77: Participation in training or education

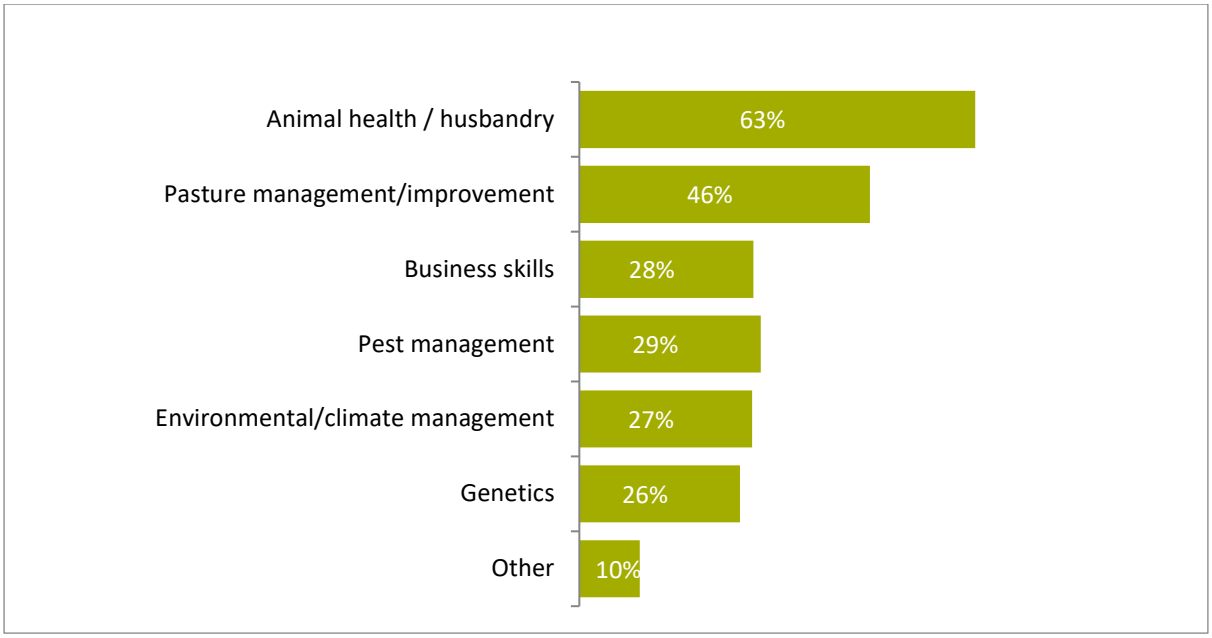
Base: All Merino producers n = 809



15.2 In 2023, did you participate in any other training or continued education courses?

Figure 78: Training or education subject matter

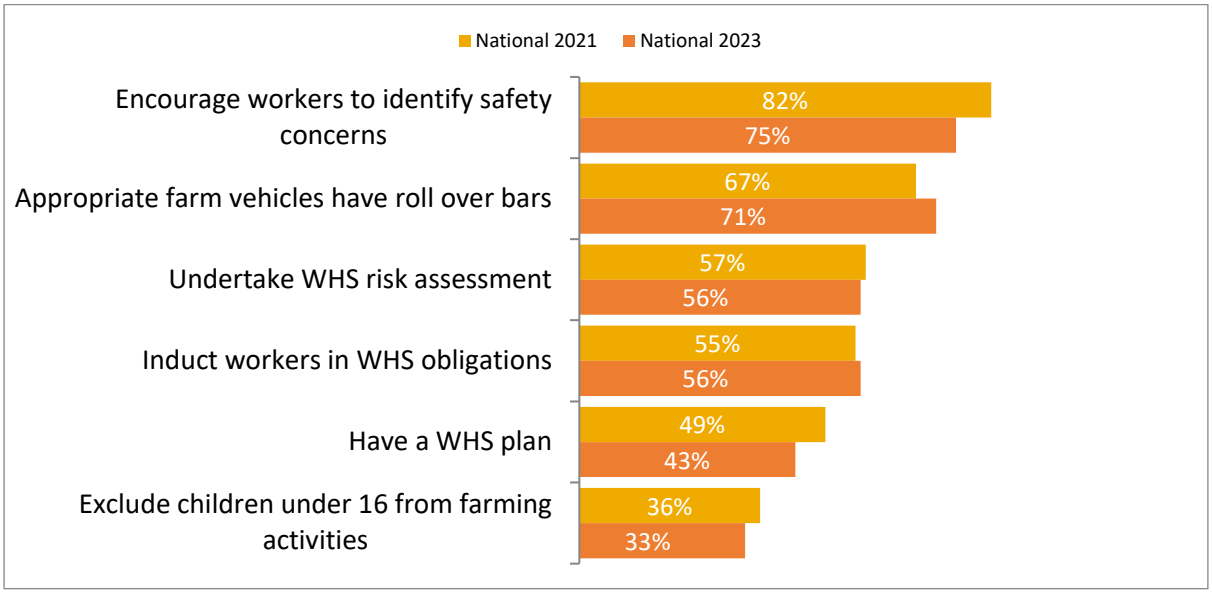
Base: Merino Producers who undertook training or education in 2023 n = 446



15.3 What type of subject matter did the training or continued education courses cover?

Figure 111: Work health and safety on farm

Base: All Merino producers n = 809 (2021 n = 1,203)



15.4 Do you have, or are you doing, any of the following in regards to Workplace Health and Safety (WHS) on your farm?

4.15. On-Farm Issues

Around a third (27%) of Merino producers report no issues with general labour availability, and slightly over one third (35%) report no issues with shearer availability (**Figure**). For shearers and general labour, the average rating given by Merino producers was 5.9 and 5.3 respectively.

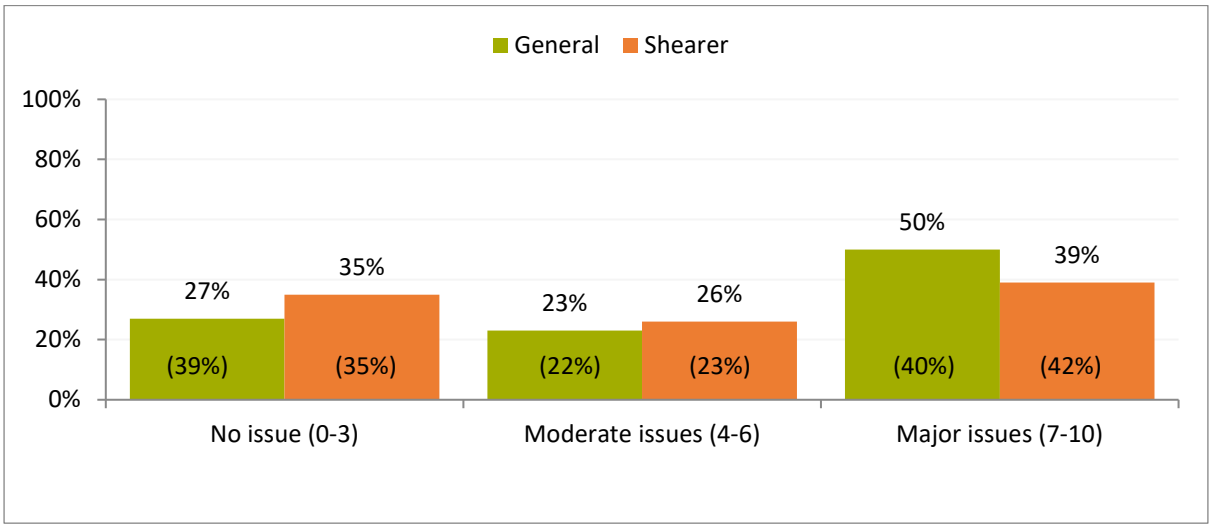
Contractors were the most common additional source of labour in 2023 (72%), 2022 (70%) and 2023 (69%) (**Figure**).

53% of producers had employees (**Figure**), with New South Wales producers less likely to have employees (45%). A quarter of these employees are between 25 and 34 years of age (25%) (**Figure**), and the majority (81%) are male (**Figure**).

The stage in succession planning is split fairly evenly across Merino producers, with nearly a third (30%) having discussed the succession plan with their family but not having reach an agreed outcome (**Figure**). New South Wales Merino producers were significantly more likely to have not commenced succession planning than other states (34%).

Figure 112: Labour availability rating out of ten

Base: All Merino producers n = 809



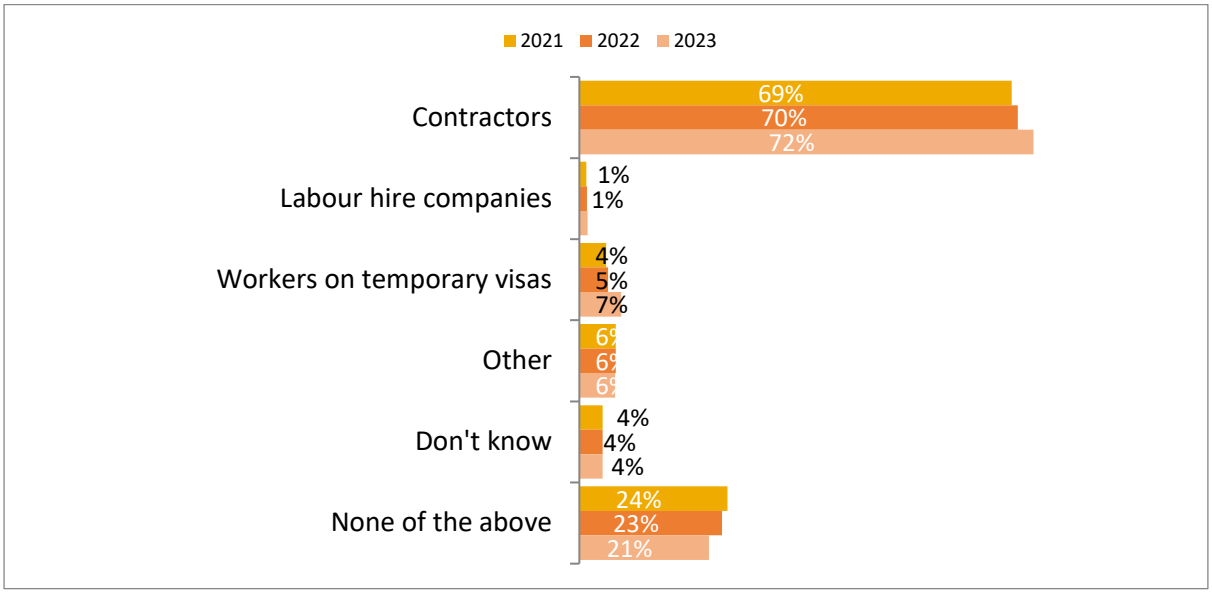
16.1 How much of an issue is the availability of general labour for your sheep operation?

16.2 How much of an issue is the availability of shearers for your sheep operation?

NB. 2021 results in brackets

Figure 79: Additional labour

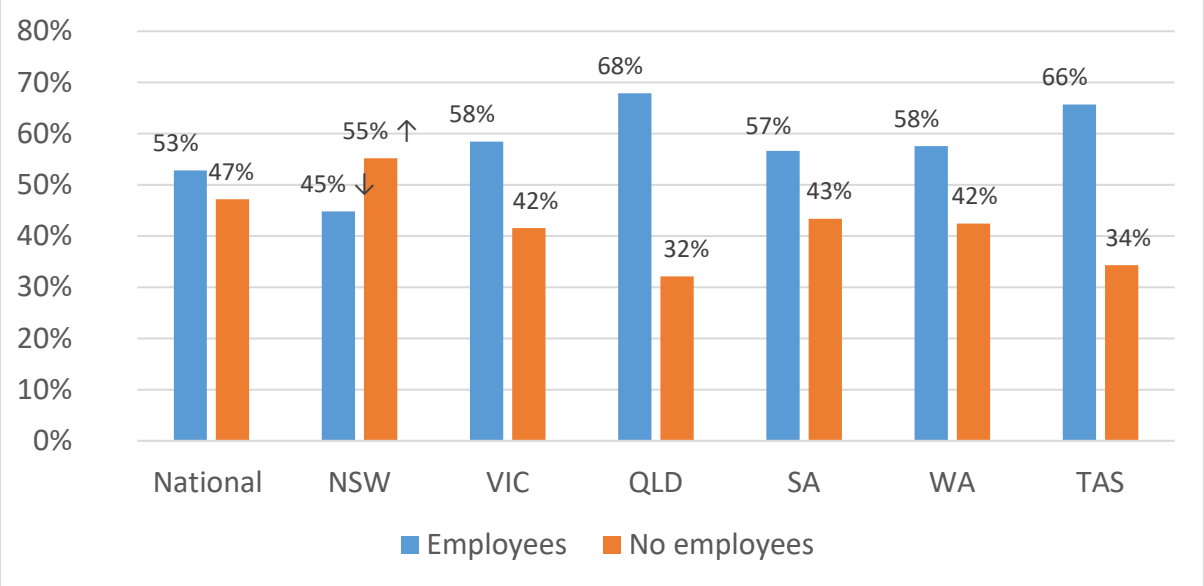
Base: All Merino producers n = 809



16.3 Did you use any of the following additional sources of labour for your sheep operation in 2023, 2022 or 2021?

Figure 114: Non-contractor employees

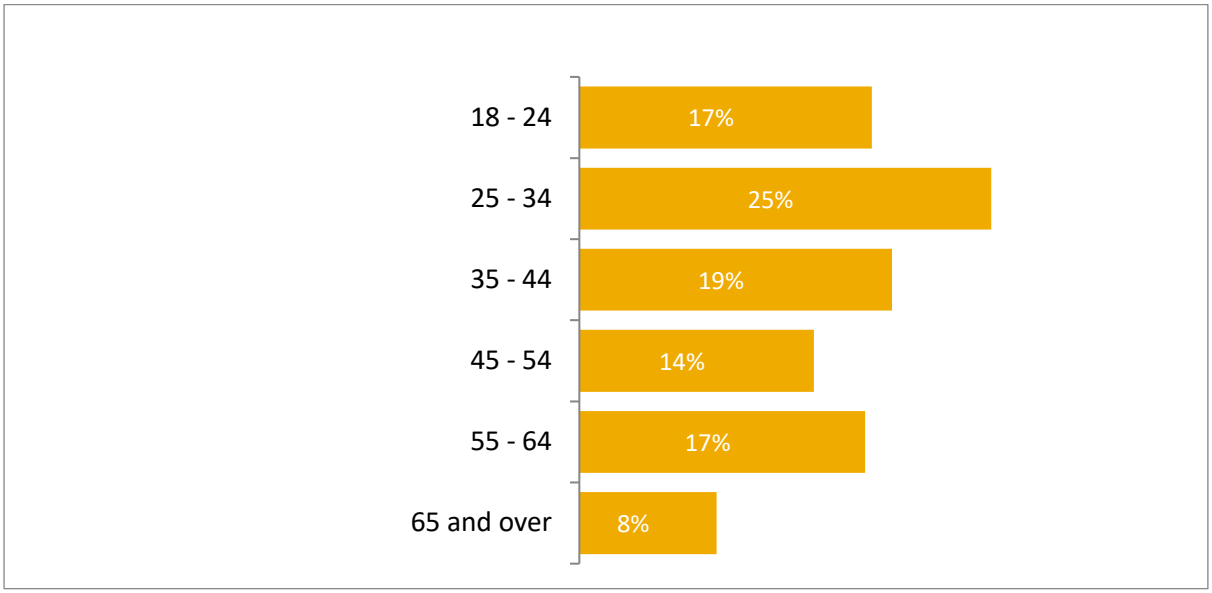
Base: All Merino producers n = 809



16.4 Do you have any employees on your property/ies? An employee can be either family or external, full-time, part-time or casual, who is paid a wage and has tax paid on that wage directly by the farm business. It does not include contractors

Figure 115: Age of employees

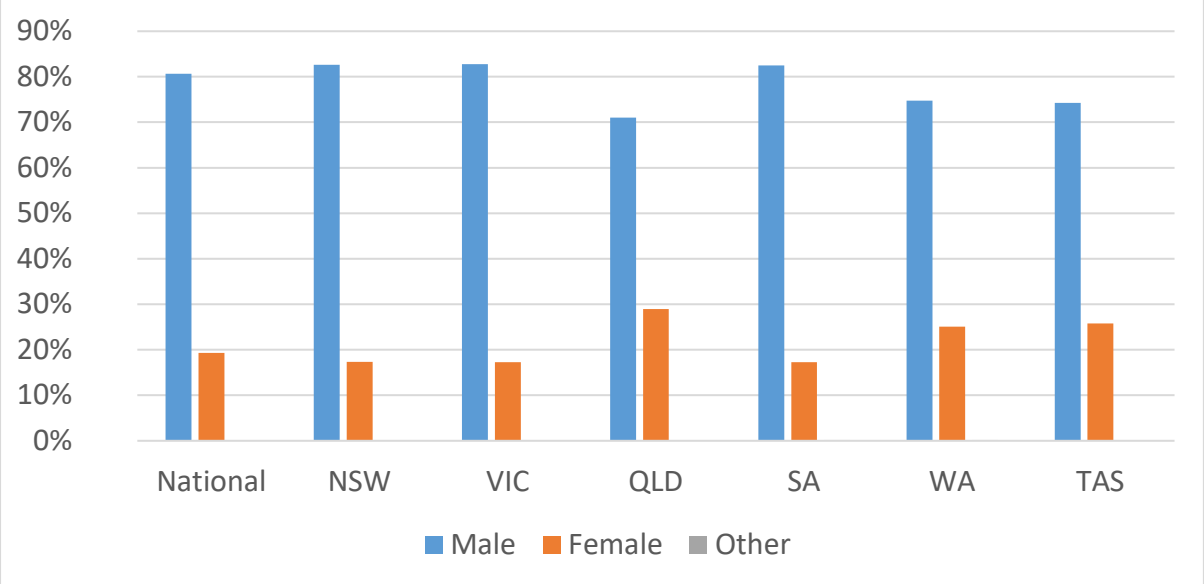
Base: Merino producers with employees n = 479



16.5 What percentage of your employees (full-time, part-time or casual) fall into the following age groups?

Figure 116: Gender of employees

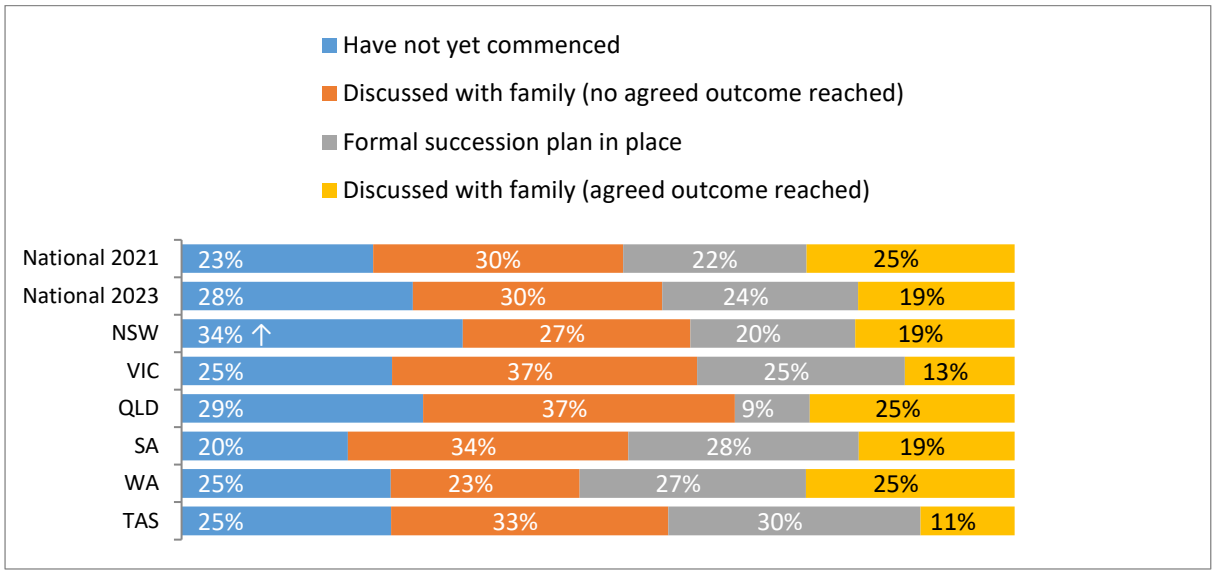
Base: Merino producers with employees n = 479



16.6 What percentage of your employees (full-time, part-time or casual) fall into the following categories?

Figure 117: Succession planning by state

Base: All Merino producers n = 809



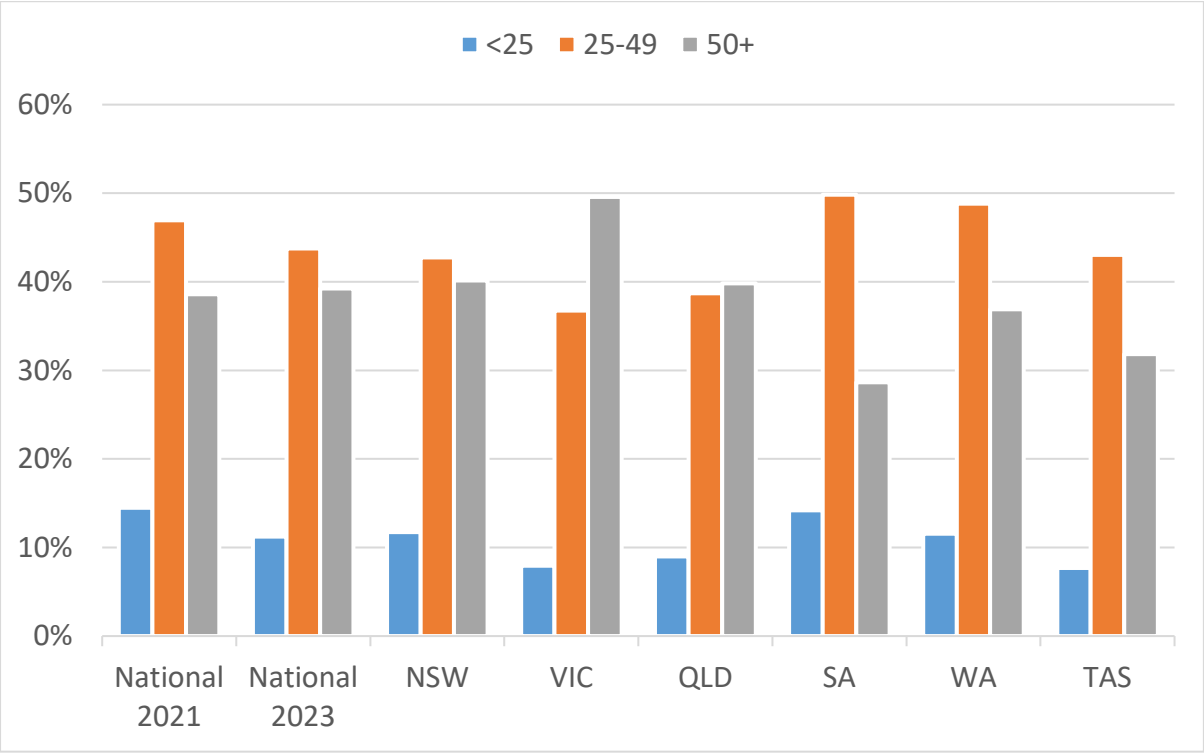
16.7 Which of the following best describes the stage you are at in relation to succession planning for your property?

4.16. Final demographics

On average, Merino producers had been in farming for 43.3 years. Nationally, the largest years of farming segment of Merino producers were those who had been involved in farming from 25-49 years (44%) (**Figure 118**). Victorian Merino producers were significantly more likely to have been farming 50 or more years (50%).

Figure 118: Years in farming

Base: All Merino producers n = 809 (2021 n = 1,203)



17.1 How many years have you been involved with farming?

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, and vaccination;
2. Management strategies and standards related to predators, animal welfare, quality assurance, succession planning, chemical training and WHS; and
3. Environmental strategies including renewable energy, carbon accounting and emissions measurement and reduction, biodiversity, soil and water management.

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 and barriers to adoption

The research has identified that some Merino producers are still using inappropriate pain management products for the specific animal husbandry practice. This could indicate a lack of knowledge of the appropriate pain management product needed for that practice or that multiple animal husbandry practices are being conducted concurrently 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. The barriers to adoption of pain management for various animal husbandry practices have been identified and AWI could develop message content and delivery strategies to overcome these barriers

2. 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. In order to detect longitudinal change and evaluate the effectiveness of AWI's policies and initiatives to influence changes in the attitudes and behaviours of Merino producers, it makes sense for AWI to compare the findings of this survey with those of earlier surveys and data sources.

Appendices

Sampling

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

	100 – 499 head		500 – 1,999 head		2,000 + head		Total	
State	Quota	Sample	Quota	Sample	Quota	Sample	Quota	Sample
NSW	184	117	133	146	128	143	444	406
VIC	171	104	109	100	75	86	355	290
QLD	34	27	8	7	11	11	53	45
SA	61	70	69	106	56	94	186	270
WA	50	44	39	58	72	99	161	201
TAS	31	25	9	16	9	15	50	56
Total	531	393	368	432	352	443	1,250	1,268

Table 6: Margin of error for survey results based on different sample sizes*

	Survey Result									
Sample	**5%/95%**	**10%/90%**	**15%/85%**	**20%/80%**	**25%/75%**	**30%/70%**	**35%/65%**	**40%/60%**	**45%/55%**	**50%**
25	9	12	14	16	17	18	19	19	20	20
50	6	8	10	11	12	13	14	13	14	14
75	5	7	8	9	10	10	11	11	11	11
100	4	6	7	8	9	9	10	10	10	10
200	3	4	5	6	6	6	7	7	7	7
300	3	4	4	5	5	5	6	6	6	6
400	2	3	4	4	4	5	5	5	5	5
500	2	3	3	3	4	4	4	4	4	4
600	2	2	3	3	3	4	4	4	4	4
700	2	2	3	3	3	3	4	4	4	4
800	2	2	2	3	3	3	3	3	3	3

*Based on 95% confidence level

As a guide to interpretation, a survey result of 60% from a sample of 809 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 57% and 63%. A result of 60% from a sample of 200 respondents (e.g. a particular state or flock size group) would have a higher error of plus / minus 6%.

Survey questions

Section 1: Demographic Screeners

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

S2	What is the postcode of your main sheep enterprise? **Postcode** ☐☐☐☐

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? *STOP WHEN TOTAL REACHES 100%*	Record %	
	Beef cattle		
	Sheep for wool and / or mutton		
	Lambs for meat		
	Lambs for wool		
	Grains		
	Sugar cane		
	Other crops		
	Other livestock		
	Other farm income		

S4b	Which of the following breeds comprise your sheep flock? Please select all that apply SHOW. MULTIPLE		
	Merino Horn	1	***CONTINUE***
	Merino Poll	2	
	Merino Dohne (*pronounced Doo-nee*)	3	
	South African Meat Merino (SAMM)	4	***ALLOCATE TO NON-MERINO SAMPLE (CODE 'NON-MERINO')***
	Breeds other than Merino and Merino Dohne	5	

S5a	ASK IF CODES 1, 2 OR 3 AT S4b In 2023, how many maiden and mixed age merino ewes did you join to merino rams?		
	Maiden merino ewes		***ALLOCATE TO MERINO SAMPLE (CODE 'MERINO')***
	Mixed age merino ewes		
	(AUTO SUM) Total Merino breeding ewes		
	None	00	***ALLOCATE TO NON-MERINO SAMPLE (CODE 'NON-MERINO')***

QUOTA SUMMARY

MERINO SAMPLE: JOINS MAIDEN AND MIXED AGE EWES TO MERINO RAMS AT S5a (N = 800)

NON-MERINO SAMPLE: CODES 4 AND 5 AT S4b OR CODE 00 AT S5a (N = 450)

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 31 January 2024 approximately how many sheep were in your flock, including breeding and dry ewes, lambs, wethers and rams? RECORD NUMBER	
	Breeding ewes	
	Dry ewes	
	Lambs	
	Wethers	

S8	100 - 499	1	***CHECK STATE FLOCK SIZE QUOTAS***
	500 – 999	2	
	1,000 – 1,999	3	
	2,000 – 2,999	4	
	3,000 +	5	

Section 2: Flock Demographics

Firstly, we would like to ask some questions on the characteristics of your 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? Would it be … (READ OUT)? 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 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	
	Pregnant or not pregnant	1
	Not pregnant, 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 sheep operation

EWE LAMBS

4.0	How many ewe lambs did you have on your property/ies in 2023?	Number

4.1	Do you tail dock your ewe lambs? SHOW. SINGLE		
	Yes	1	***CONTINUE***
	No	2	***GO TO 4.5.1***

4.1.1	How many ewe lambs did you tail dock in 2023?	Number

4.2	ASK IF CODE 1 AT 4.1 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	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

MALE LAMBS

4.5.1	How many male lambs did you have on your property/ies in 2023?	Number

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

4.6.1	How many male lambs did you tail dock in 2023?	Number

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	Why do you tail dock either your ewe or male lambs? SHOW. MULTIPLE. RANDOMISE	
	Reduce risk of flystrike or disease	1
	Farm tradition	2
	Sheep industry standard	3
	Clean/neat appearance	4
	Other (Please specify)	98

4.12	ASK IF CODE 1 AT 4.1 Did you use any products for pain management for tail docking your ewe lambs in 2023?	
	Yes	1
	No	2

4.12.1	ASK IF CODE 1 AT 4.12 Of the (SHOW NUMBER AT 4.1.1) ewe lambs you tail docked in 2023, how many did you use pain management on for tail docking? NUMBER CANNOT BE GREATER THAN 4.1.1	Number

4.12.2	ASK IF CODE 1 AT 4.6 Did you use any products for pain management for tail docking your male lambs in 2023?	
	Yes	1
	No	2

4.12.3	ASK IF CODE 1 AT 4.12.2 Of the (SHOW NUMBER AT 4.6.1) male lambs you tail docked in 2023, how many did you use pain management on for tail docking? NUMBER CANNOT BE GREATER THAN 4.6.1	Number

4.13	ASK IF CODE 1 AT 4.12 or 4.12.2 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 – veterinary prescribed (e.g. Buccalgesic)	4
	Analgesic / pain killing oral gel – non-veterinary prescribed (e.g. Butec)	5
	Other (Please specify)	98

4.14	ASK FOR CODES 1 – 5 AT 4.13 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

4.15	ASK IF CODE 2 AT 4.12 or 4.12.2 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 sheep operation.

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

5.1.01	How many male lambs did you castrate in 2023?	Number

5.1.1	Why do you castrate your male lambs? SHOW. MULTIPLE. RANDOMISE	
	Prevent unwanted pregnancies in a mixed-sex flock	1
	Farm tradition	2
	Risk of producing meat that has a stronger flavour	3
	Sheep industry standard	4
	Market requirements	5
	Other (Please specify)	98

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)	98

5.3	Did you use any products for pain management for castrating your male lambs in 2023?	
	Yes	1
	No	2

5.3.1	ASK IF CODE 1 AT 5.3 Of the (SHOW NUMBER AT 5.1.01) male lambs you castrated in 2023, how many did you use pain management on for castrating? NUMBER CANNOT BE GREATER THAN 5.1.01	Number

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 – veterinary prescribed (e.g. Buccalgesic)	4
	Analgesic / pain killing oral gel – non-veterinary prescribed (e.g. Butec)	5
	Other (Please specify)	98

5.5	ASK FOR CODES 1 – 5 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 sheep operation.

6.1	Did you mules your ewe lambs in 2023?	
	Yes	1
	No	2

6.1.1	You indicated that you had (SHOW NUMBER FROM 4.0) ewe lambs on your property/ies in 2023. How many ewe lambs did you mules in 2023?	Number

6.2	Did you mules your male lambs in 2023? SHOW. SINGLE		
	Yes	1	***CONTINUE***
	No	2	***IF CODE 2 AT BOTH 6.1 AND 6.2, GO TO 6.9 IF CODE 2 AT 6.1 BUT CODE 1 AT 6.2, GO TO 6.2.2***

6.2.1	You indicated that you had (SHOW NUMBER FROM 4.5.1) male lambs on your property/ies in 2023. How many male lambs did you mules in 2023?	Number

6.2.2	Why do you mules your lambs? SHOW. MULTIPLE. RANDOMISE	
	Reduce risk of flystrike	1
	Farm tradition	2
	Increased value of mulesed sheep	3
	Easier access to shearers	4
	No premiums for non-mulesed wool/meat	5
	Other (Please specify)	98

6.3	Did you use any products for pain management for mulesing your ewe lambs in 2023?	
	Yes	1
	No	2

6.3.1	ASK IF CODE 1 AT 6.3 Of the (SHOW NUMBER AT 6.1.1) ewe lambs you mulesed in 2023, how many did you use pain management on for mulesing? NUMBER CANNOT BE GREATER THAN 6.1.1	Number

6.3.2	Did you use any products for pain management for mulesing your male lambs in 2023?	
	Yes	1
	No	2

6.3.4	ASK IF CODE 1 AT 6.3.2 Of the (SHOW NUMBER AT 6.2.1) male lambs you mulesed in 2023, how many did you use pain management on for mulesing? NUMBER CANNOT BE GREATER THAN 6.2.1	Number

6.4	ASK IF CODE 1 AT 6.3 or 6.3.2 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 – veterinary prescribed (e.g. Buccalgesic)	4
	Analgesic / pain killing oral gel – non-veterinary prescribed (e.g. Butec)	5
	Other (Please specify)	98

6.5	ASK FOR CODES 1 – 5 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 cattle 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 AND 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? Year	

6.11	IF CODE 1 AT 6.9 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)	98	

Section 7: Vaccination

We would like to capture your use of vaccines in your flock.

7.1	Do you vaccinate any sheep in your flock?		
	Yes	1	***CONTINUE***
	No	2	***GO TO SECTION 8***

ASK 7.2.0 – 7.5 IF CODE 1 AT 7.1

7.2.0	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

7.2.1	What type of vaccines do you use on your farm? SHOW. MULTIPLE. RANDOMISE	
	A 5 in 1 vaccine for clostridial disease	1
	A combined 5 in 1 clostridial plus Cheesy Gland vaccine	2
	Johne's Disease vaccine	3
	Scabby Mouth vaccine	4
	Campylobacter abortion vaccine	5
	Foot rot vaccine	6
	Erysipelas arthritis vaccine	7
	Other	99
7.3	Do you do a pre-lambing vaccination?	
	Yes	1
	No	2

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

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

7.6	Do you follow label recommendations when administering antibiotics to your sheep?	
	Yes	1
	No	2

Section 8: Mortality and Euthanasia

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

8.1	Of the ewe lambs that you wean, what percentage would you lose before the first joining? (Or: Of every 100 ewes that you wean, how many do you lose before the joining?) | | | | | Number / percent

8.2	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

8.3	The industry has developed the Australian Animal Welfare Standards and Guidelines for Sheep. Which of the following best describes your knowledge of these standards and guidelines? SHOW. SINGLE		
	I am aware of these but have not read them	1	***CONTINUE***
	I am aware of these and have read them, but have not changed my practices	2	***CONTINUE***
	I am aware and I have changed my practices as a result of reading them	3	***CONTINUE***
	I am not aware of these	4	***GO TO SECTION 9***

8.4	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, but have not changed my practices	2
	I am aware and I have changed my practices as a result of reading them	3
	I am not aware of these	4

ONLY ASK SECTION 9 IF ‘MERINO’ AT S4

Section 9: Wool QA

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

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

9.2	ASK IF CODE 2 AT 11.1 What has stopped you from being involved in a wool QA scheme? SHOW. MULTIPLE. RANDOMISE	
	Too expensive	1
	Not aware of any QA schemes	2
	Don’t think I meet QA scheme criteria, so cannot join	3
	Don't see any premiums	4
	Audit fatigue	5
	Other (Please Specify)	98

Section 10: Predators

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

10.1	Do you have a problem with predators on your property? SHOW. SINGLE		
	Yes	1	***CONTINUE***
	No	2	***GO TO SECTION 11***

10.2	How many sheep did you lose to predators in 2023?	
		number

10.3	What are the two 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

10.4	How do you control (SHOW PREDATOR SELECTED AT 10.3)? REPEAT FOR EACH PREDATOR SELECTED AT 10.3 SHOW. MULTIPLE. RANDOMISE	
	Poison / Bait	1
	Shoot	2
	Trap	3
	Fences	4
	Guardian / Companion Animal	5
	Don’t control	0

10.5	Do you have a documented predator management strategy or plan for your property? SHOW. SINGLE	
	Yes	1
	No	2

Section 11: Carbon Activities

Turning now to the topic of renewable energy and your carbon accounting and storage activities on-farm.

11.1	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

11.2	ASK IF CODE 1 AT 11.1 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

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

11.4	Have you estimated the net greenhouse gas emissions produced in your operation using a carbon calculator tool or another process? SHOW. SINGLE	
	Yes	1
	No	2

11.5	Have you implemented any activities to reduce your net greenhouse gas emissions or emissions intensity (emissions per kilogram liveweight) while producing livestock? SHOW. SINGLE	
	Yes	1
	No	2

11.6	ASK IF CODE 1 AT 11.5 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)	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, enhancing dung beetle activity)	4
	Pasture management (grazing management, earthworms, grass species, legumes, perennial pastures)	5
	Savanna burning management	7
	Developed an action plan to reduce emissions	8
	Something else (Please specify)	98

Section 12: Biodiversity and Land and Water Management

We would now like to ask you some questions about biodiversity and land and water management.

12.1	Do you have a completed property management plan that incorporates biodiversity and/or conservation?	
	Yes	1
	No	2

12.2	Do you undertake deliberate activities to maintain, measure or enhance biodiversity on your property?	
	Yes	1
	No	2

12.3	ASK IF CODE 1 AT 12.2 Which practices do you use to maintain and improve biodiversity on your property? SHOW. MULTIPLE. RANDOMISE	
	Rotational/cell/multi-paddock grazing	1
	Maintenance of adequate ground cover	2
	Minimum tillage	3
	Multiple species planting	4
	Cover crops	5
	Incorporating manures and/or compost	6
	Dung beetles	7
	Manage soil health and organic matter	8
	Incorporate perennial pastures into grazing systems	9
	Use remote sensing technologies or external assessment to track biodiversity indicators	10
	Other (Please specify)	99

12.4	Which of the following land management activities did you undertake on your property/ies in 2023? SHOW. MULTIPLE. RANDOMISE	
	Weed control	1
	Carried out prescribed burning to reduce weeds, control regrowth, or improve pasture condition	4
	Revegetated areas with native or indigenous plant species by either direct seeding of plating seedlings (including windbreaks, shelterbelts, around dams, or within pastures)	5
	Erosion control such as construction of contour banks, deep ripping etc	6
	Applied soil treatments or amendments other than fertilisers (e.g. lime, dolomite, gypsum, compost, green manure crops, biochar)	7
	Regular pasture and land condition monitoring (through photos or documenting change)	8
	Maintained areas that are reliable sources of water for livestock	9
	Destocked or spelled pastured areas	10
	Destocked or spelled bushland areas	11
	Destocked or spelled riparian areas and other natural water features	12
	Other (Please Specify)	98

12.5	Have you previously (in 2023 or earlier) undertaken any of the following grazing management activities on your property/ies? SHOW. MULTIPLE. RANDOMISE	
	Fenced areas to land type to better manage grazing pressure	1
	Fenced areas to allow for spelling or to prevent livestock access (including protection of paddock trees)	2
	Fenced waterways to prevent livestock access	3
	Provided off-stream water for livestock away from riparian areas and other natural water features	4
	Other (Please Specify)	99

12.6	Are you able to accurately identify various types of weeds that commonly grow in pasture systems, and distinguish them from desirable plants?	
	Yes	1
	No	2

12.7	What is the source of water for your animals? SHOW. MULTIPLE. RANDOMISE	
	Scheme Water	1
	Surface Water (direct from dams, locked dams, creeks, rivers)	2
	Surface Water (pumped to watering points such as troughs)	3
	Groundwater (bores, siphons, springs)	4
	Rainwater tanks	5
	Other (Please specify)	98

12.8	Do you have a documented plan for managing your farm and animals during extreme weather e.g. droughts, extreme heat events and floods. SHOW. SINGLE	
	Yes	1
	No	2

12.9	Can your stock water supply withstand prolonged dry periods? SHOW. SINGLE	
	Yes	1
	No	2

12.10	Can you increase stock water supply if needed? SHOW. SINGLE	
	Yes	1
	No	2

Section 13: Soil Management

Thinking now about soil management on your property.

13.1	Did you undertake practices to improve your soil water retention? (e.g. leaving tall pasture grass stubble, greater grazing rotation, cover cropping, claying, aeration, pasture slashing/mulching, composting) SHOW. SINGLE	
	Yes	1
	No	2

Section 14: Chemicals

Please now consider the topic of chemical safety

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

14.2	ASK IF CODE 1 AT 14.1 Do you have ChemCERT accreditation or hold a current ChemCERT card? SHOW. SINGLE	
	Yes	1
	No	2
	Don't know	9

Section 15: Training and WHS

Can you now consider the topic of learning and training

15.1	How did you learn to perform the various animal husbandry practices undertaken on farm? SHOW. MULTIPLE	
	Informal (someone showed me)	1
	Informal (I taught myself)	2
	Formal (course / workshop)	3
	I don't perform these (use contractors)	5

15.2	In 2023, did you participate in any other training or continued education courses? SHOW. SINGLE	
	Yes	1
	No	2

15.3	What type of subject matter did the training or continued education courses cover? SHOW. SINGLE. MULTIPLE	
	Animal health / husbandry	1
	Environmental/climate management	2
	Genetics	3
	Business skills	4
	Pasture management/improvement	5
	Pest management	6
	Other (Please specify)	98

15.4	Do you have, or are you doing, any of the following in regards to Workplace Health and Safety (WHS) on your farm? SHOW. SINGLE		
		Yes	No
	Undertake WHS risk assessment	1	2
	Have a WHS plan	1	2
	Induct workers in WHS obligations	1	2
	Induct visitors 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 16: On-farm Issues

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

16.1	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

16.2	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

16.3	Did you use any of the following additional sources of labour for your sheep operation in 2023, 2021 or 2021? SHOW. MULTIPLE			
		2023	2021	2021
	Contractors	1	1	1
	Labour hire companies	2	2	2
	Workers on temporary visas	3	3	3
	Other (Please specify)	98	98	98
	Don't know	99	99	99
	None of the above	0	0	0

16.4	Do you have any employees on your property/ies? An employee can be either family or external, full-time, part-time or casual, who is paid a wage and has tax paid on that wage directly by the farm business**. It does not include contractors / contracted services or labour hire** SINGLE	
	Yes	1
	No	2

ASK 16.5 AND 16.6 IF CODE 1 AT 16.4

16.5	What percentage of your employees (full-time, part-time or casual) fall into the following age groups?	
	18 – 24	
	25 – 34	
	35 – 44	
	45 – 54	
	55 – 64	
	65 and over	
	Total must add to	100%

16.6	What percentage of your employees (full-time, part-time or casual) fall into the following categories? SHOW	
	Male	
	Female	
	Other	
	Total must add to	100%

16.7	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 17: Final Demographics

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

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

17.2	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
	Post Graduate	6
	Prefer not to say	99

17.3	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

17.4	For classification purposes, which group do you fall into? SHOW. SINGLE ANSWER ONLY.	
	Male	1
	Female	2
	Other	3
	Prefer not to specify	4

THANK AND CLOSE