animalhealth AUSTRALIA

NATIONAL SHEEP HEALTH MONITORING PROJECT

ANNUAL REPORT 2017-18

CONTENTS

EXECUTIVE SUMMARY

The National Sheep Health Monitoring Project (NSHMP) operated throughout 2017-18 in 12 abattoirs around the country. Meat inspectors inspected 6,734,985 sheep in over 28,000 lines for up to 20 animal health conditions.

This report contains a basic analysis of the data from the project, including 13 of the monitored conditions (seven had insignificant levels of incidence), thus providing a snapshot of the health of a significant proportion of the Australian sheep flock.

OBJECTIVES OF THE NSHMP

- To monitor sheep for a range of significant animal health diseases and conditions which reduce productivity in the sheep value chain or can impact market access.
- To facilitate feedback to producers through state departments and the Livestock Data Link (LDL) about the diseases and conditions occurring in their flock.
- To explore options for a comprehensive and cost-effective animal disease monitoring/surveillance system and post-mortem inspection service.
- To provide accurate and timely animal health information as a driver for:
  - » further improvements in Australia's animal health status, and the management of human health risks,
  - » maximising market access,
  - » improving profitability,
  - » informing future investment into research and development (R&D) .
- enhancing productivity within the sheep value chain by improving the quality of product entering the chain, therefore reducing wastage

The NSHMP was reviewed in 2016 by Greenleaf Enterprises. The review report provided economic modelling for conditions monitored by the project using 2015 data (Greenleaf, 2016). The economic modelling section of the report is available on the project webpage: *www.animalhealthaustralia.com.au/nshmp*

LOCATION OF PARTICIPATING ABATTOIRS

A total of 12 abattoirs participated in data collection in 2017-18 (some part-time) and provided national coverage of the significant sheep producing regions of Australia (Table 1).

In South Australia the NSHMP is part of the Enhanced Abattoir Surveillance Program, managed by Primary Industries & Regions, South Australia (PIRSA).

STATE	ABATTOIR
New South Wales	Cowra, Dubbo, Gundagai, Tamworth
South Australia	Lobethal, Murray Bridge
Tasmania	Cressy
Victoria	Ararat, Cranbourne, Geelong, JBS Melbourne
Western Australia	Narrikup

Table 1. Abattoirs participating in the NSHMP July 2017 – June 2018

NUMBER OF SHEEP INSPECTED

The total number of sheep inspected in 2017-18 was 6,734,985. This number has significantly increased from 2016-17 by 1,415,099. The total number of lines inspected in 2017-18 was 28,666. This number has significantly increased from 2016-17 by 7,038.

The total number of lines inspected in 2017-18 was 28,666.

SOURCE OF SHEEP

Sheep were sourced from all states. The number of sheep and lambs inspected from each state (for most diseases and conditions) is provided in Table 2.

The total number of sheep inspected in 2017-18 was 6,734,985.

STATE	NSW	QLD	SA	TAS	VIC	WA	TOTAL
No. of sheep inspected	2,247,648	96,256	1,935,605	501,867	899,991	1,053,618	6,734,985
No. of lines inspected	8,601	374	9,181	3,202	3,904	3,404	28,666
No. of PICs inspected	1,922	154	2,759	548	1,307	1,379	8,069

Table 2. Total number of sheep, properties (PICs) and lines inspected from each state over the 2017-18 financial year.

NSHMP MEAT INSPECTION

Carcases and viscera are examined grossly by certified meat inspectors. Laboratory confirmation of conditions is not utilised, except for ovine Johne's disease. The presence or absence of pathology consistent with diseases and conditions is recorded by the inspectors.

Not all animals are examined for all conditions.

Responsibility for product disposition for market access and food safety rests with the on-plant veterinarian and company management.

NSHMP PRODUCER FEEDBACK

Feedback from the NSHMP is returned in some states directly to producers by the relevant Department of Primary Industries/Agriculture. In June 2017 the LDL (managed by Integrity Systems Company) commenced, allowing streamlined access to NSHMP information online for producers. Producers can gain access to LDL by logging into the site, using their current NLIS account login. Once producers log on, they have access to information about lines of sheep they have consigned to participating abattoirs, as well as prevention methods and tools to help manage any conditions affecting their flock.

RESEARCH AND DEVELOPMENT ACTIVITIES UTILISING DATA

Data provided to:

- OJD data (for WA only) to Murdoch University to investigate the current spatial distribution and identify mechanisms which facilitate the spread of OJD in Western Australia.
- Data for arthritis, pleurisy/pneumonia, sarcocystis, CLA, liver fluke and sheep measles to Herd Health Pty Ltd to:
  - » analyse the data using appropriate epidemiological and/or statistical methods to determine if, when supplied to producers, these data lead to a reduction in diseased animals being consigned to abattoirs.
  - » conduct an analysis of every condition; incorporate seasonal trends; regional impacts at the state, regional, abattoir and producer level.
- AHA is working with MINTRAC on developing voice recognition technology for improving animal health data recording in abattoirs.

ANIMAL HEALTH INFORMATION

This report contains a 'snap shot' of the health of the Australian sheep flock for the 2017-18 financial year, using data collected through the NSHMP. Summary data sets from previous years have been utilised for some conditions to provide a comparison.

- The data collected by the NSHMP is stored in the Endemic Disease Information System, managed by Animal Health Australia on behalf of the stakeholders.
- Each state department of Primary Industries/Agriculture has access to its own state data which can be used for further detailed analysis.
- The NSHMP collects information on 20 conditions:
  - » Arthritis
  - » Bladder worm
  - » Caseous lymphadenitis (CLA, cheesy gland)
  - » Dog bites
  - » Grass seeds
  - » Hydatids
  - » Knotty gut
  - » Liver fluke
  - » Ovine Johne's disease (OJD on request by the producer)
  - » Pleurisy
  - » Pneumonia
  - » Sarcocytosis
  - » Sheep measles
  - » Vaccination lesions
  - » Lung worm
  - » Rib fractures
  - » Bruising
  - » Cirrhosis
  - » Nephritis
  - » Fever/Septicaemia
- Summary information on these diseases is found in this report except for rib fractures, bruising, cirrhosis, nephritis and fever/septicaemia as insignificant levels were recoded for both conditions.
- Ovine Johne's disease is not included in this report.
- For the purpose of this analysis the information has been obtained from direct (vendor consigned) and indirect (saleyard or mixed in transportation) lines. Ages of sheep are recorded as less than two years of age, over two years of age or mixed.

ARTHRITIS

Arthritis in sheep is caused by a bacterial infection of the joints. It usually occurs in young sheep when bacteria localise in the joints after entering the body through the umbilical cord (navel ill) or any wound. Arthritis causes lameness and a reduced growth rate. Carcases affected with arthritis can undergo trimming of affected joints and possibly be condemned.

In 2015 arthritis cost the sheep industry an estimated $25,586,354 (Greenleaf, 2016).

Figure 1. Percentages of inspected lines with at least one sheep over two years of age infected with arthritis for each state and each financial year from 2014 to 2018.

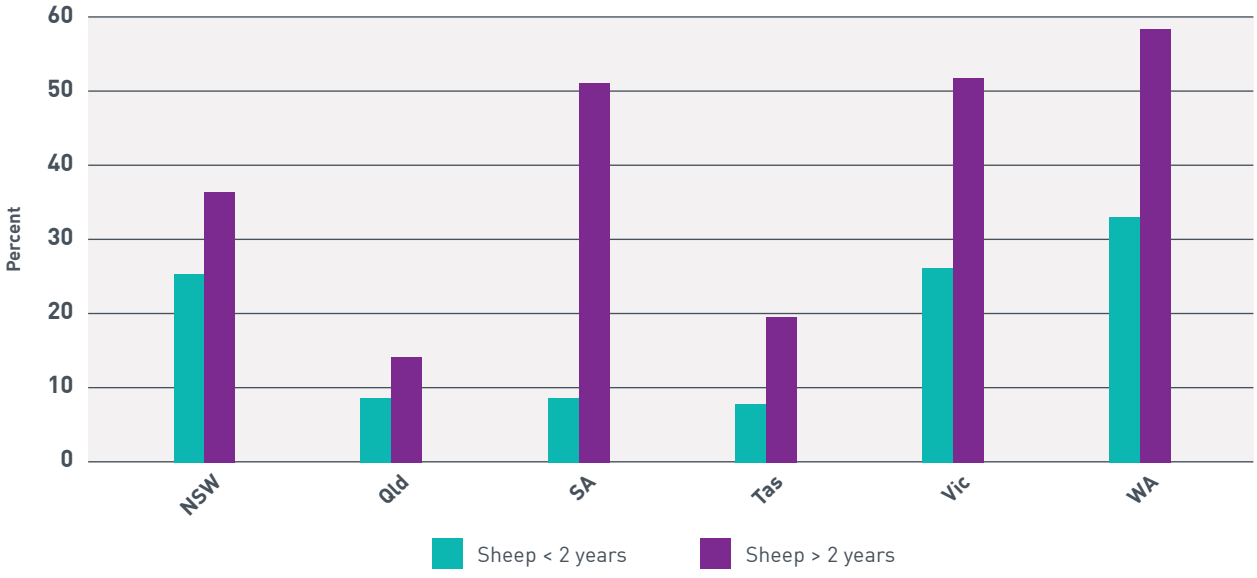

Figure 2. Percentages of inspected lines with at least one sheep infected with arthritis for each state over the 2017-2018 financial year.

BLADDER WORM

Bladder worms are infective cysts from the dog tapeworm *Taenia hydatigena* and are found in the liver and the abdominal cavities of sheep. Bladder worm has little or no effect on sheep health or on farm production, but occasionally heavy infections can predispose sheep to the fatal bacterial infection, Black disease. Infected carcases usually have livers trimmed or are condemned.

Bladder worm cost the Australian sheep industry an estimated $1,174,500 (Greenleaf, 2016).

Over the 2017–18 financial year, South Australia recorded the highest percentage of infected sheep followed by Victoria.

- Over the 2017–18 financial year, South Australia recorded the highest percentage of infected sheep followed by Victoria (Figure 3).

Figure 3. Overall percentage of inspected sheep infected with bladder worm for each state and each financial year from 2014 to 2018.

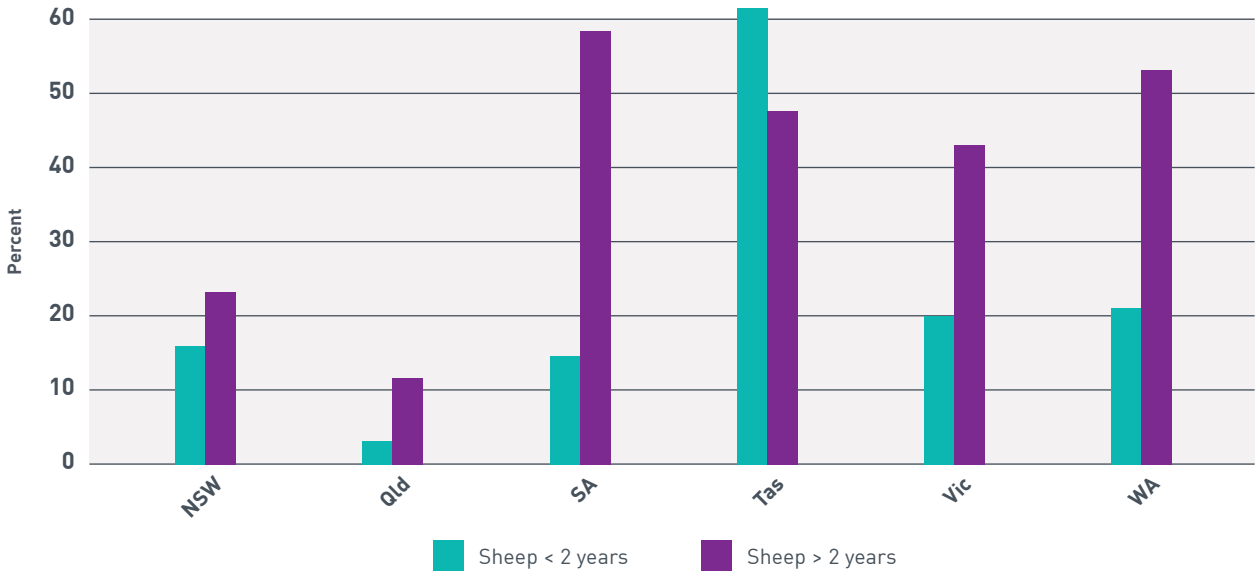

Figure 4. Percentage of inspected lines with at least one sheep infected with bladder worm for each state over the 2017-18 financial year.

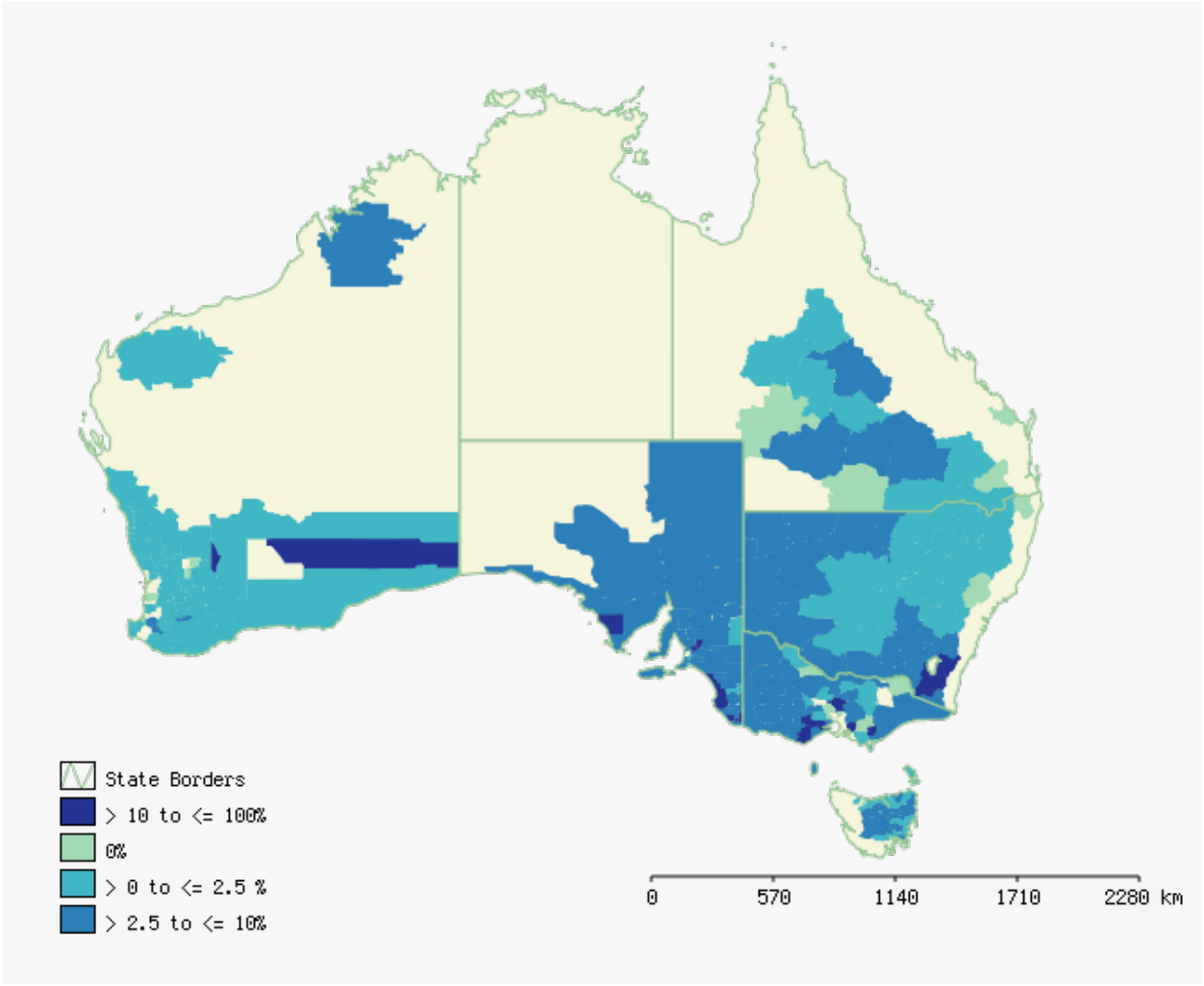

Figure 5. Bladder worm – percentage of affected sheep by LGA over the 2017-18 financial year.

CHEESY GLAND

Cheesy gland (or caseous lymphadenitis – CLA) is a bacterial disease that results in the formation of lymph node abscesses throughout the body. Most commonly these abscesses are superficial but they can also be found in the lungs, liver, spleen and kidneys. The abscesses are initially puss filled, which over time dries and becomes "cheesy" progressing to multi-layered capsules resembling "onion rings".

CLA causes a decrease in wool production, wool contamination, chronic infection which causes ill thrift, emaciation and can affect reproductive performance. CLA can result in a decrease in carcase weight and increased carcase trimming at the abattoirs. CLA can result in a decrease in carcase weight and increased carcase trimming at the abattoirs. In 2015 CLA cost the Australian sheep industry an estimated $21,637,553 (Greenleaf, 2016).

Over the 2017-18 financial year the incidence of CLA detected in South Australia, Tasmania, Victoria and Western Australia has decreased.

- Over the 2017-18 financial year the incidence of CLA detected in South Australia, Tasmania, Victoria and Western Australia has decreased when compared to the 2016-17 financial year (Figure 6).
- The incidence of CLA in Queensland has increased since the 2016–17 financial year (Figure 6). It should be noted that only a small number of sheep and lines were monitored in Queensland during the year.

Figure 6. Overall percentages of inspected sheep infected with CLA for each state and each financial year from 2015 to 2018.

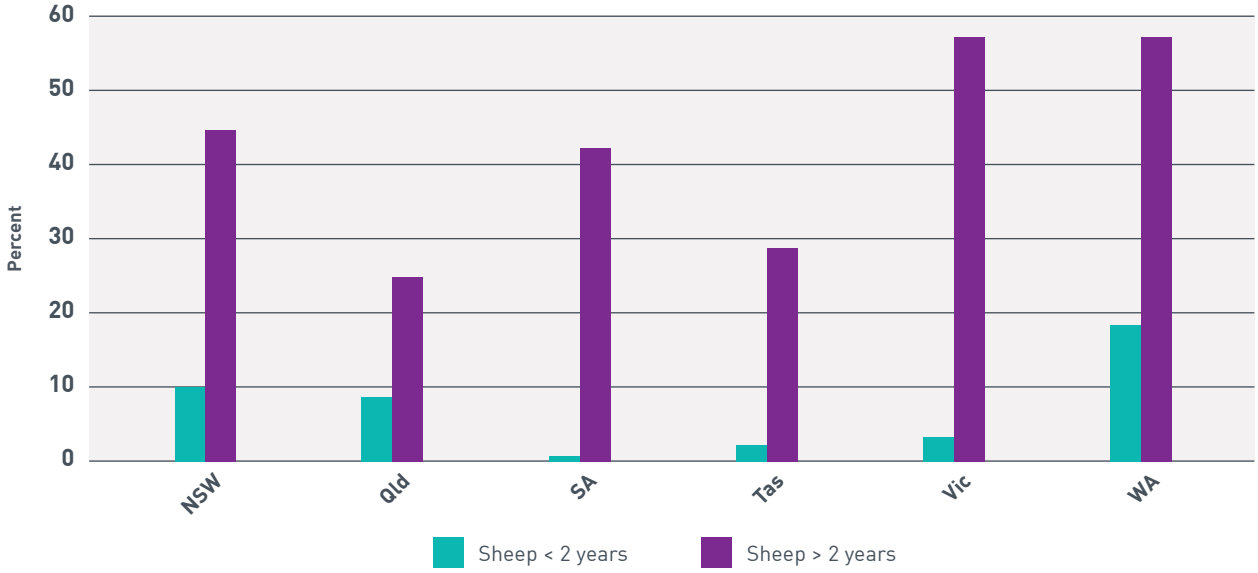

Figure 7. Percentages of inspected lines with at least one sheep infected with CLA for each state over the 2017-18 financial year.

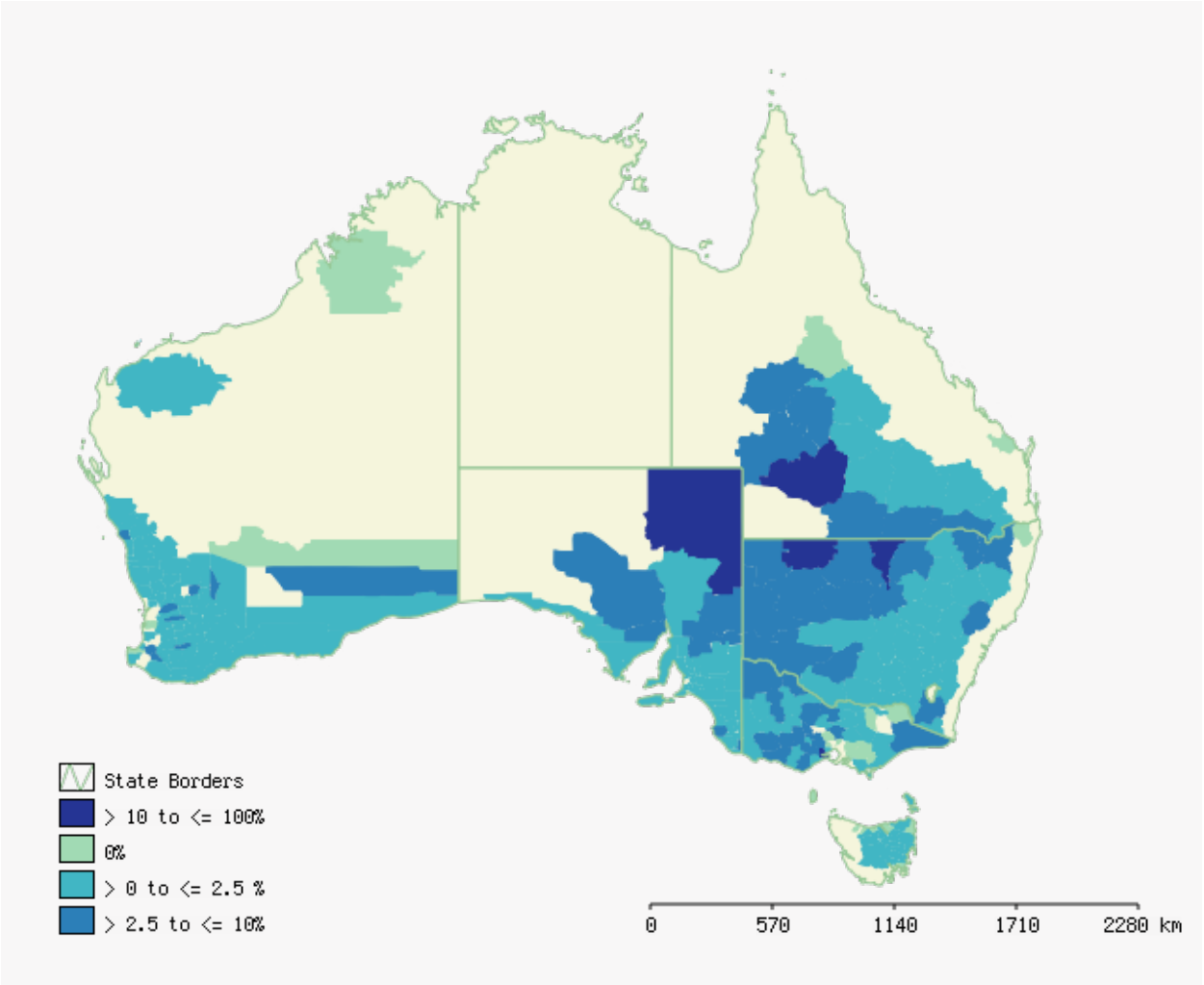

Figure 8. Cheesy Gland – percentage of infected sheep by LGA over the 2017-18 financial year.

DOG BITES

Dog bites occur as a result of un-muzzled or incorrectly muzzled dogs with access to sheep, either in the paddock, yards or during transport. Abattoirs require dogs to be muzzled at all times. Dog bites usually occur in the hind quarters, but also can occur on the face or along the back. The *Australian Animal Welfare Standards and Guidelines for Sheep* states: 'A person in charge of a dog that habitually bites sheep must ensure the dog is muzzled while working sheep'.

Carcases of sheep with dog bites are usually trimmed to the nearest joint which may be the entire hind leg, resulting in a significant reduction in dressed weight. Occasionally whole carcases are condemned when wounds are infected and the animal is showing evidence of septicaemia (blood poisoning).

In 2015 the cost of dog bites to the Australian sheep industry was an estimated $85,512 (Greenleaf, 2016).

Western Australia recorded the highest percentage of inspected lines with at least one affected animal followed by New South Wales.

- In 2017-18 dog bites were most common in sheep over two years of age (Figure 9). Western Australia recorded the highest percentage of inspected lines with at least one affected animal followed by New South Wales.
- Overall the percentage of affected animals is very low (Figure 10).

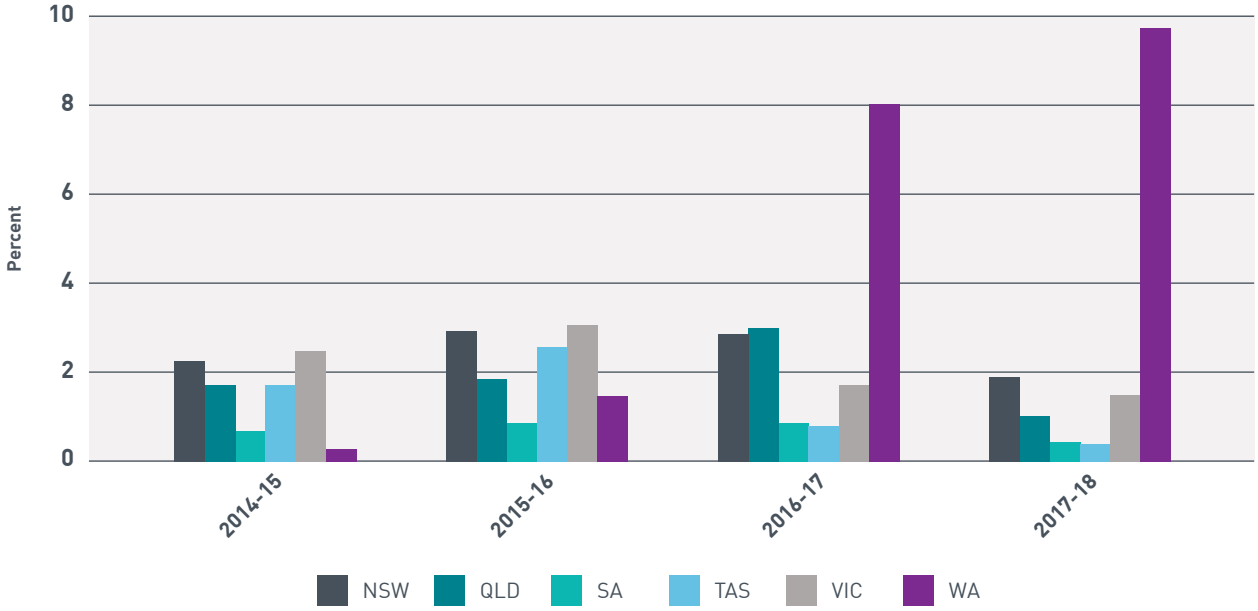

Figure 9. Overall percentages of inspected lines affected by dog bites for each state and each financial year from 2014 to 2018.

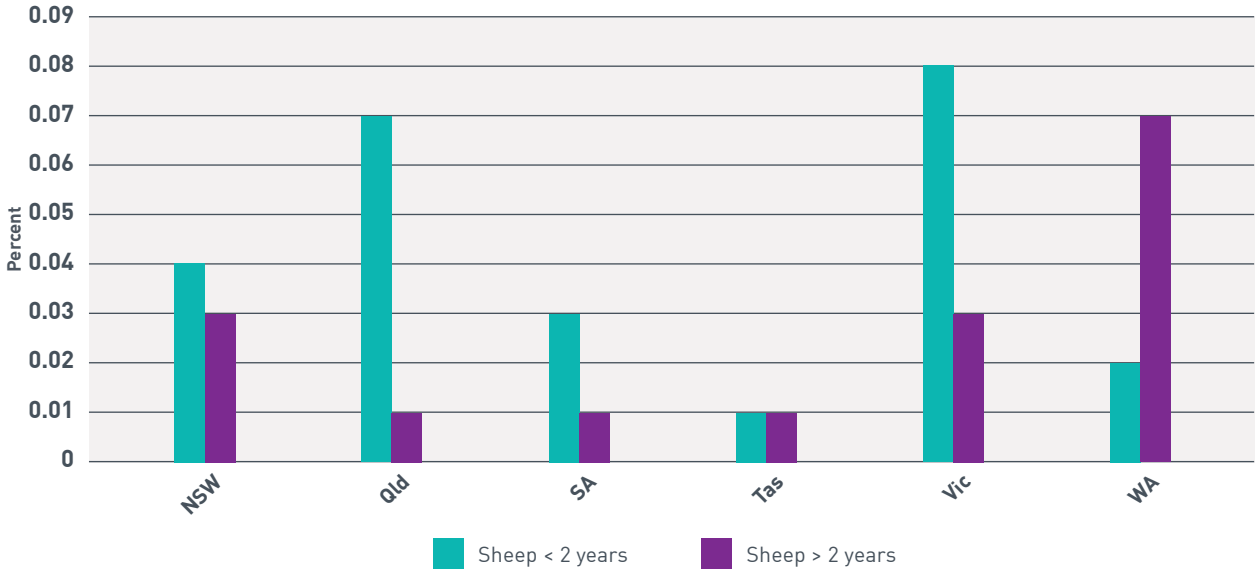

Figure 10. Percentages of sheep affected with dog bites for each state over the 2017-18 financial year.

GRASS SEEDS

Grass seeds embedded in the carcase due to spear, brome, barley, silver and Chilean needle grasses cause weaner ill thrift, infections and/or death, reduction in wool production and wool value. Grass seeds also cause trimming of the carcase and a decrease in meat and skin value. In 2015 Grass seed contamination cost the sheep industry an estimated $47,544,373 (Greenleaf, 2016).

- Over the 2017-18 financial year the incidence of grass seeds detected in Queensland, New South Wales, and Tasmania has decreased from the 2016-17 financial year, likely due to seasonal conditions (i.e. drought).
- The incidence of grass seeds has increased slightly in Western Australia over the 2017-18 financial year (Figure 11).

Levels of grass seed generally continued to be low in 2017-18, likely due to drought in many regions.

- Overall the percentage of affected sheep is low for all states for 2017-18.
- Figure 13 illustrates the percentage of affected animals by local government area (LGA) over the 2017-18 financial year.

Figure 11. Percentages of inspected lines with at least one carcase affected by grass seeds for each state and each financial year from 2014 to 2018.

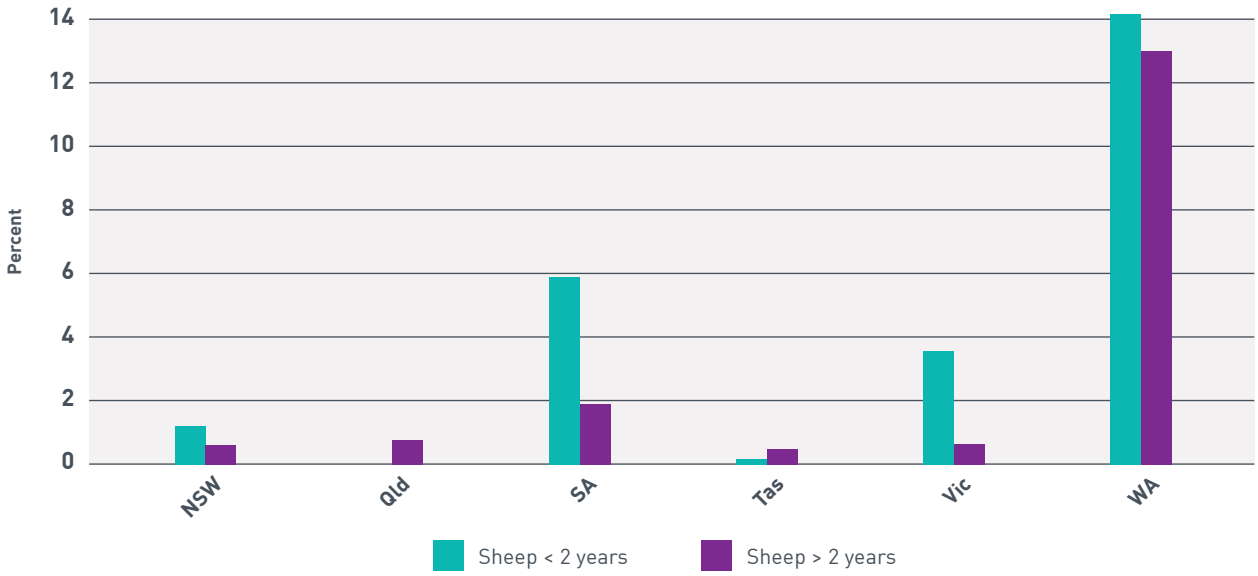

Figure 12. Percentage of inspected lines with at least one carcase affected by grass seeds over the 2017-18 financial year.

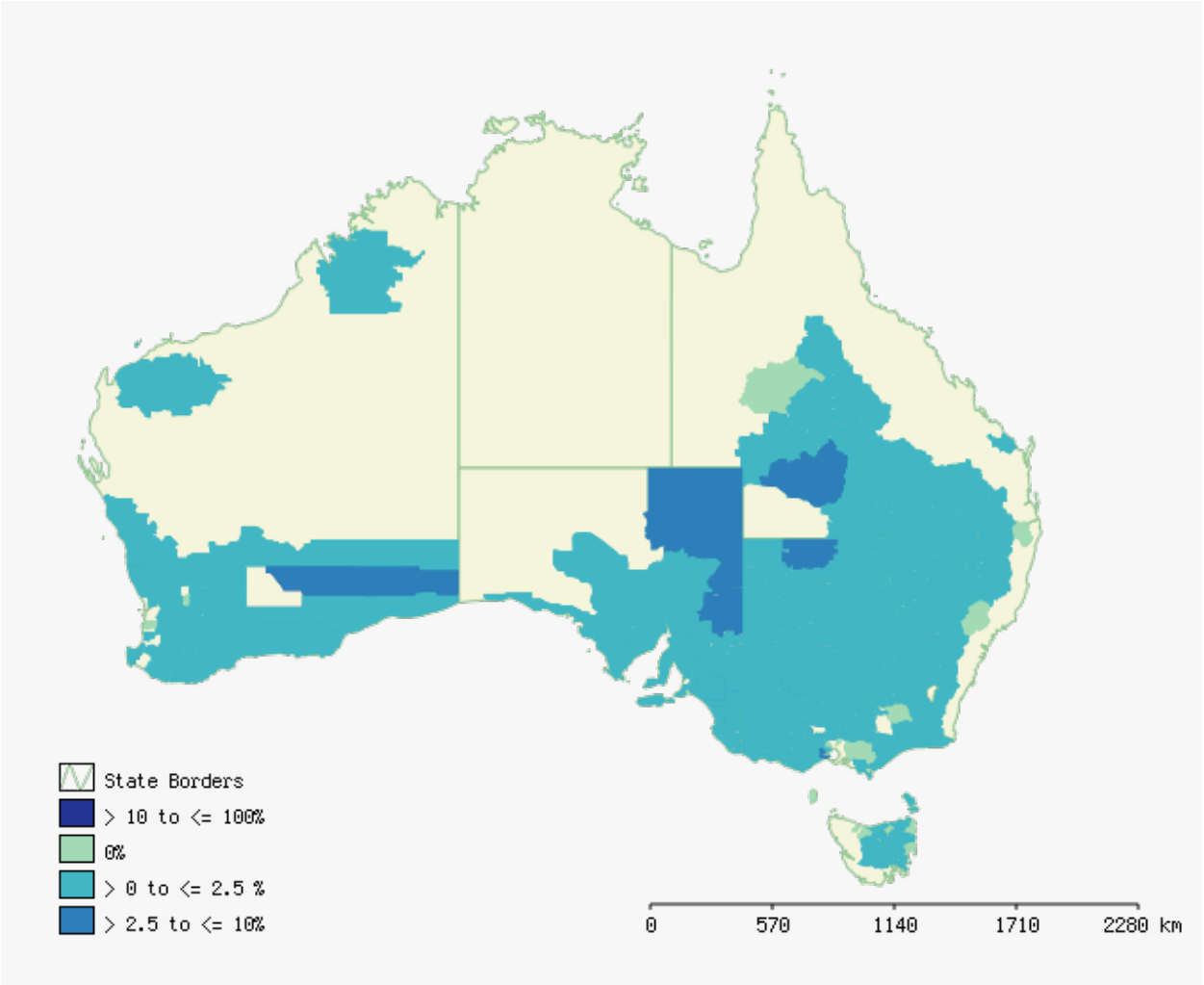

Figure 13. Grass seed lesions – percentage of affected sheep by LGA over the 2017-18 financial year.

HYDATIDS

Hydatids are the large cysts from the dog hydatid tapeworm (*Echinococcus granulosus*) which develop mainly in the liver and/or lungs of infected sheep. If infected, sheep organs may be condemned at the abattoir.

- The percentage of lines of sheep infected with hydatids decreased in all states since the 2016–17 financial year (Figure 14).

The percentage of sheep infected with hydatids has continued to decrease in NSW and Qld since 2014-15.

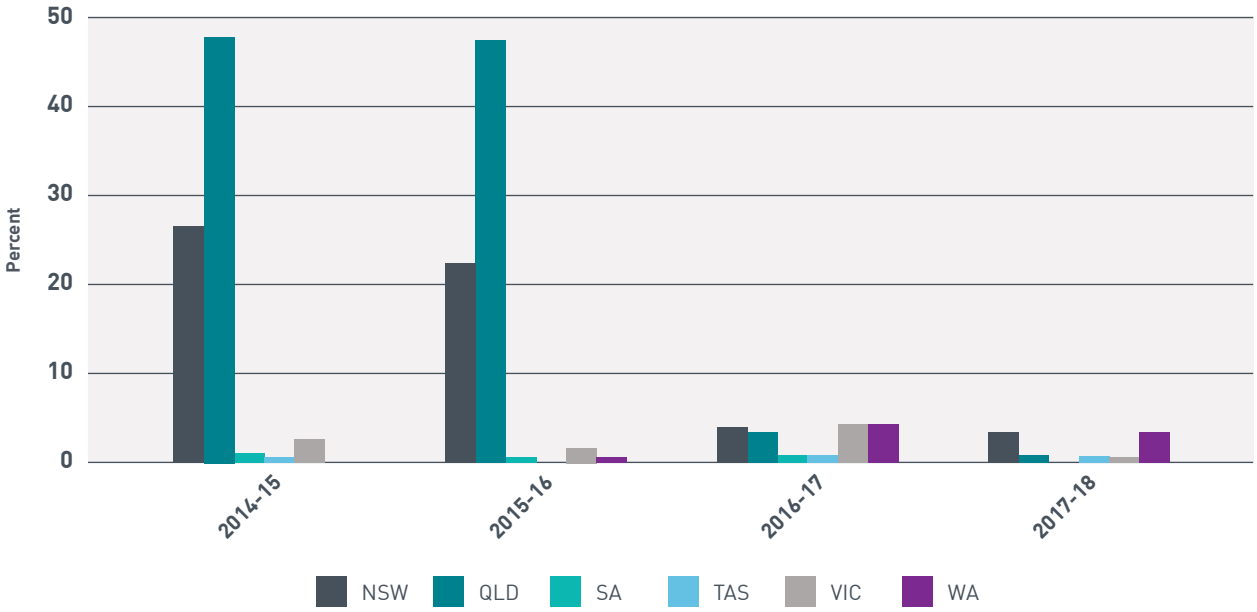

Figure 14. Percentages of inspected lines with at least one sheep infected with hydatids for each state and each financial year from 2014 to 2017.

KNOTTY GUT

Knotty gut (also called pimply gut) is a condition of the intestines caused by the larval stage of the nodule worm (*Oesphagostomum columbianum*). These lesions can range from small gritty lesions 2-3mm in diameter, to pea sized cysts, rendering the affected intestines unsuitable for sausage casings. Nodule worm eggs and larvae are particularly sensitive to cold weather and drying out, so tend to only exist in areas with predominately summer rainfall.

- Over the 2017-18 financial year, South Australia recorded the highest rate of knotty gut infection followed by Queensland, although overall, the numbers recorded for South Australia are still low (Figure 15).

Over the 2017-18 financial year, South Australia recorded the highest rate of knotty gut infection followed by Queensland, although overall, the numbers recorded for South Australia are still low.

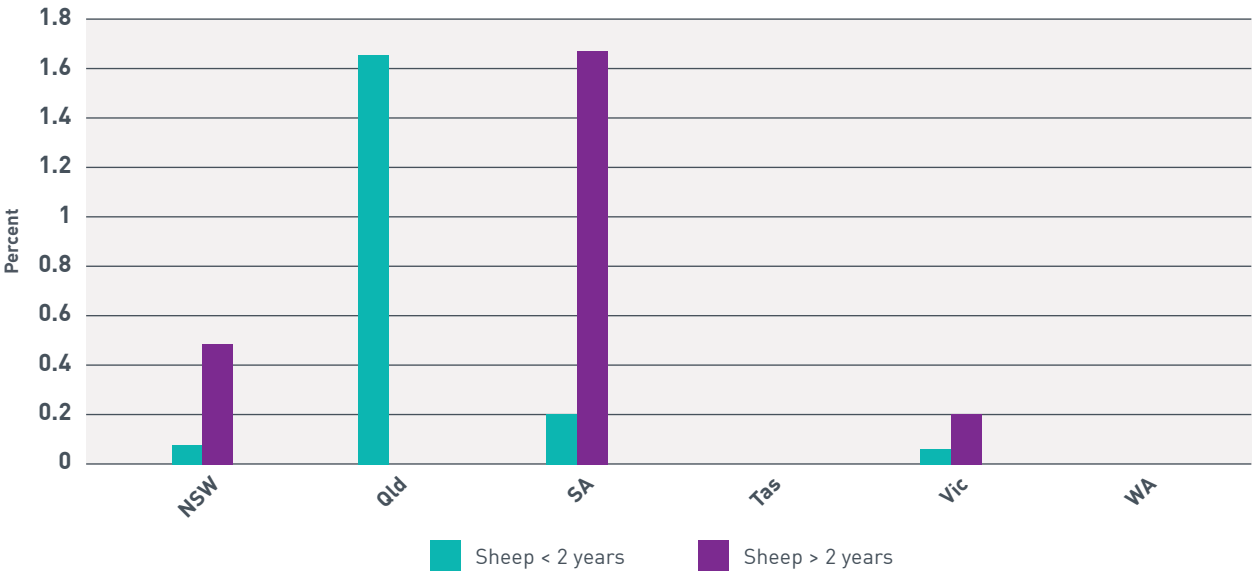

Figure 15. Percentages of inspected lines with at least one sheep infected with knotty gut for each state over the 2017-18 financial year.

LIVER FLUKE

Liver fluke are large, flatworm parasites that infect sheep and cattle in high rainfall areas and irrigated areas of eastern Australia. A permanent water source and specific snails are required for the liver fluke life cycle to occur. Affected livers are condemned at abattoirs and in some cases, whole carcases can be condemned. In 2015 liver fluke cost the Australian sheep industry an estimated $7,240,302 (Greenleaf, 2016).

- The percentage of inspected lines with at least one infected sheep was highest in NSW followed by Tasmania for the 2017 -18 financial year (Figure 16).

The percentage of infected lines with at least one infected sheep was highest in New South Wales followed by Tasmania for the 2017-18 financial year.

- Consistent with reports from previous years, no liver fluke was reported from Western Australia.

Figure 16. Percentage of inspected lines with at least one infected sheep for each financial year from 2014 to 2018.

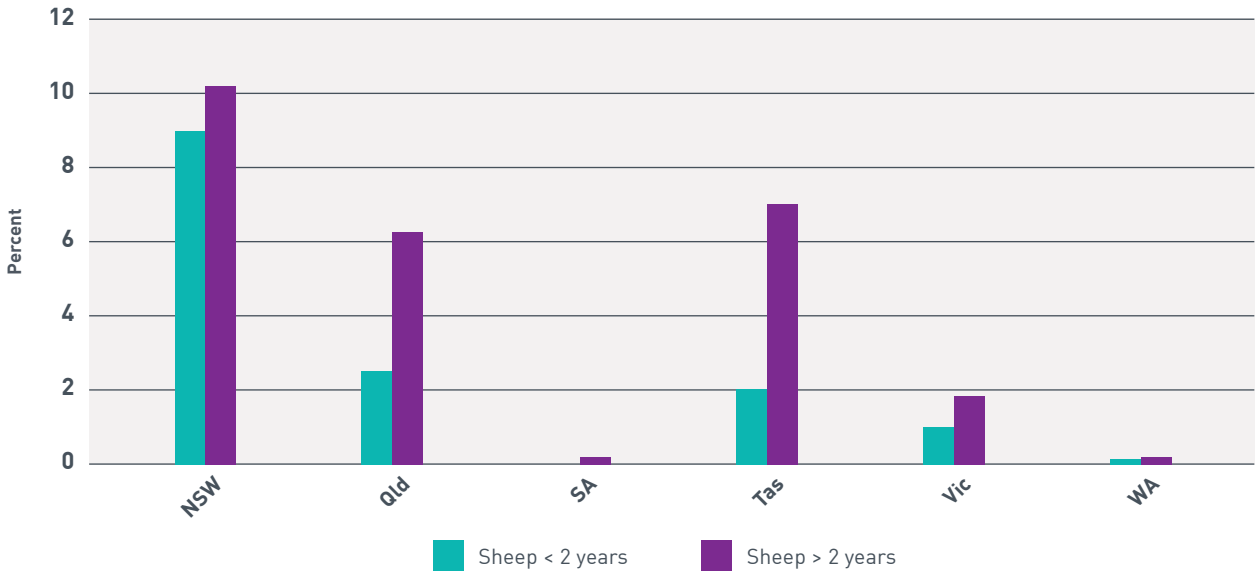

Figure 17. Percentage of inspected lines with at least one infected animal with liver fluke for each state over the 2017-18 financial year.

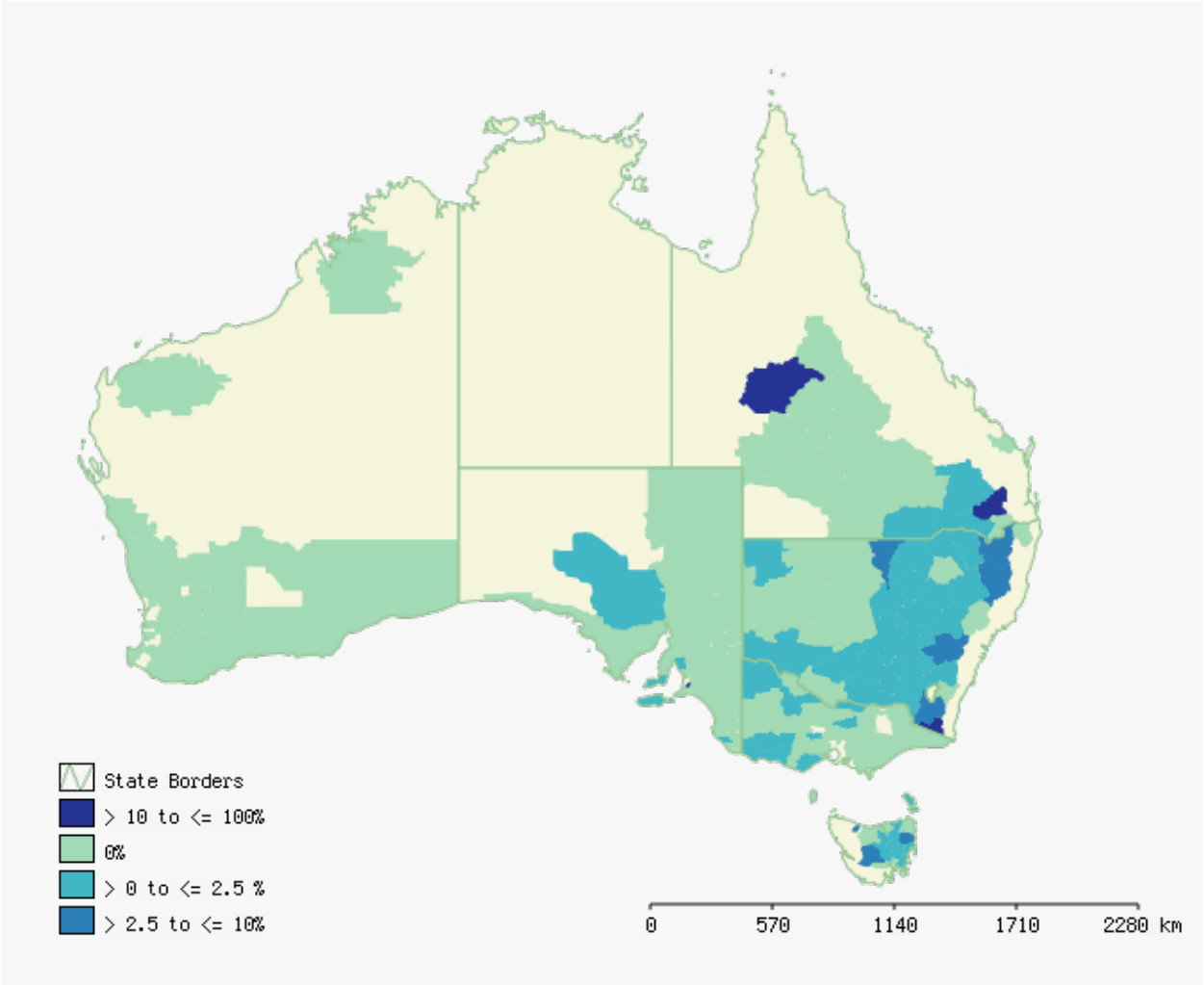

Figure 18. Liver Fluke – percentage of infected sheep by LGA over the 2017-18 financial year.

PNEUMONIA AND PLEURISY

Pneumonia in sheep is the infection and inflammation of the lungs. In severe cases pneumonia can extend to the outer layer of the lung, the pleura, causing a disease called pleurisy. Pneumonia is initially caused by an infection with a bacterium (such as a mycoplasma) or virus, or sometimes lungworm, with secondary bacterial invasion of the damaged lungs. The disease can be limited to isolated cases or can result in outbreaks of disease typically in weaners over summer and is often called "summer pneumonia". Production losses are seen on farm with affected lambs being on average 3kg lighter.

Pleurisy cost the sheep industry an estimated $4,400,000 million in 2015, while the cost of pneumonia was estimated at $517,526 (Greenleaf, 2016).

South Australia and Victoria recorded the highest percentages of inspected sheep infected with pleurisy for the 2017-18 financial year.

- South Australia and Victoria recorded the highest percentages of inspected sheep infected with pleurisy for the 2017-18 financial year (figure 19).
- Victoria and South Australia recorded the highest percentage of inspected sheep with pneumonia for the 2017-18 financial year (figure 20).

Figure 19. Overall percentages of inspected sheep infected with pleurisy for each financial year from 2014 to 2018.

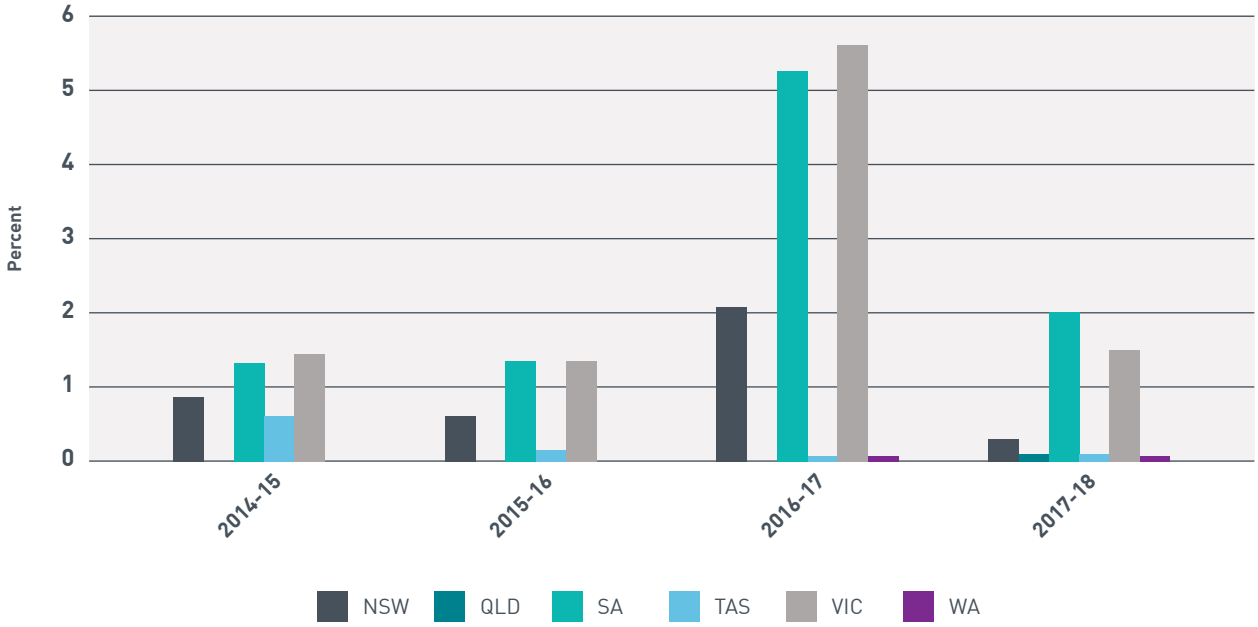

Figure 20. Overall percentages of inspected sheep infected with pneumonia for each financial year from 2014 to 2018.

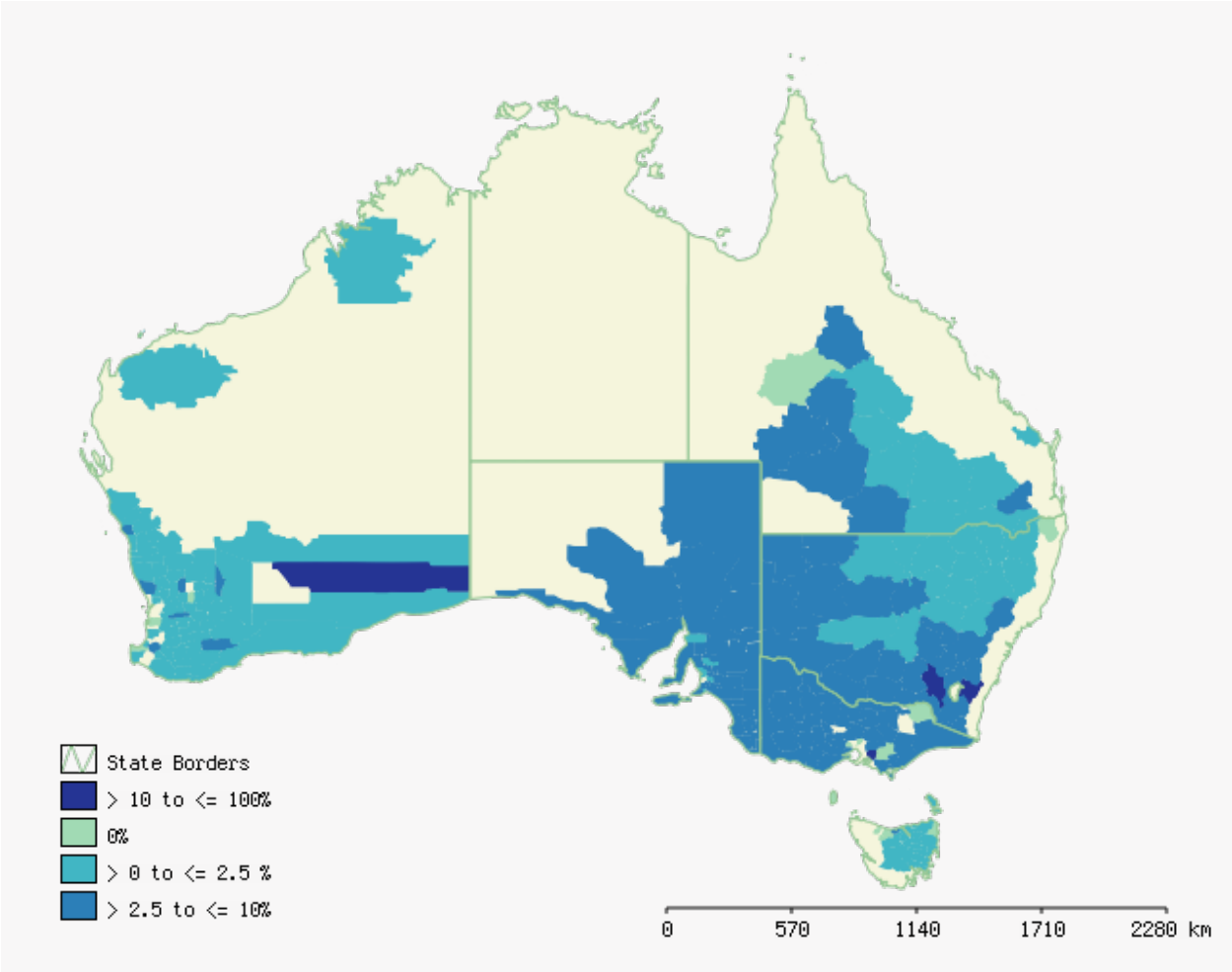

Figure 21. Pleurisy – percentage of infected sheep by pleurisy over the 2017-18 financial year.

SARCOCYSTOSIS

Sarcocystis is a single cell parasite with a sheep-cat life cycle. Cats become infected when they eat infected sheep meat, often through scavenging carcases. The parasite develops in the intestines of the cat and they produce large quantities of microscopic spores in their faeces. The life cycle continues when sheep ingest these spores on pasture or feed, eventually localising and developing into cysts in the muscle. Sarcocystosis has no impact on sheep health or productivity.

At the abattoirs, infected carcases will undergo trimming while heavily infected carcases will be condemned. In 2015 sarcocystosis cost the sheep industry an estimated $4,902,000 (Greenleaf, 2016).

Tasmania recorded the highest incidence of sarcocystosis in sheep age.

- Tasmania recorded the highest incidence of sarcocystosis in sheep age (Figure 22). The high levels of sarcocystosis infection of sheep is likely due to the large population of feral cats in Tasmania.

Figure 22. Percentages of inspected lines with at least one sheep affected by sarcocystosis for each financial year from 2014 to 2018.

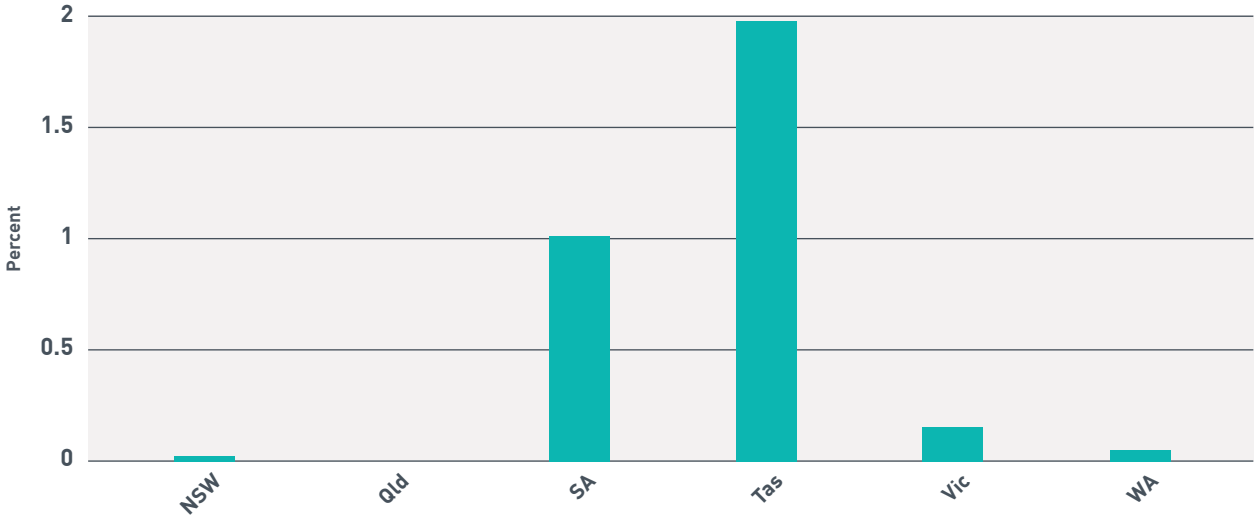

Figure 23. Overall percentages of inspected sheep infected with sarcocystosis for each state over the 2017-18 financial year.

SHEEP MEASLES

Sheep measles (Cysticercus ovis) are infective cysts from the dog tapeworm Taenia ovis, found in the muscles of sheep and goats. Sheep measles causes trimming, downgrading and condemnation at abattoirs. Sheep measles cost the sheep industry an estimated $1,545,252 in 2015 (Greenleaf, 2016).

- All states recorded a large proportion of lines that had sheep infected with sheep measles on abattoir inspection (Figure 24).

All states recorded a large proportion of lines that had sheep infected with sheep measles on abattoir inspection.

- The overall percentages of inspected lines infected with sheep measles over the 2017-18 financial year was lowest in Queensland and New South Wales (Figure 25).

Figure 24. Percentages of inspected lines with at least one sheep affected by sheep measles for each financial year from 2014 to 2018.

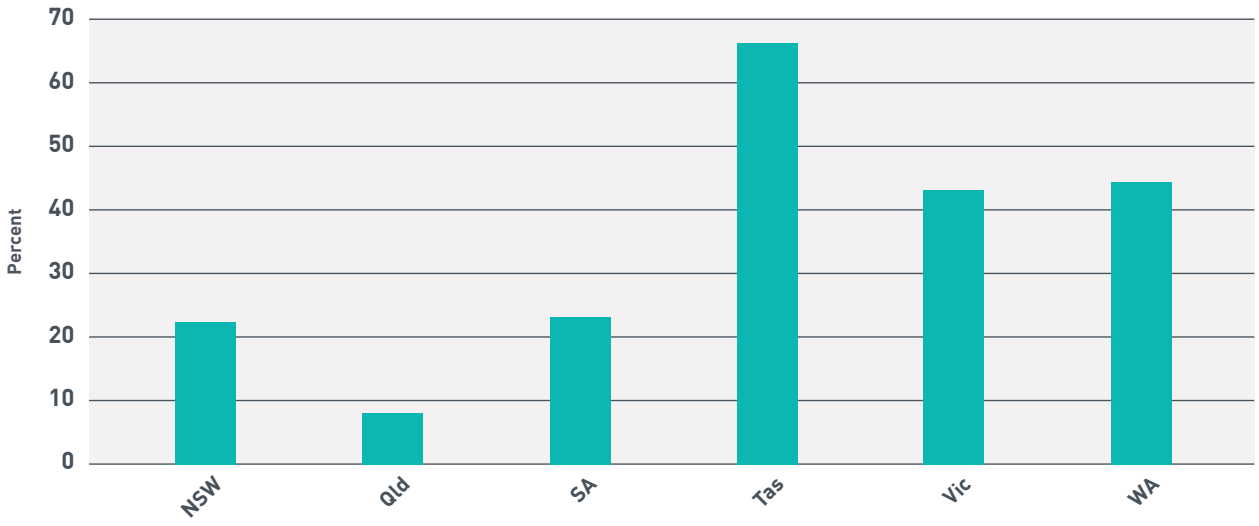

Figure 25. Percentages of inspected lines with at least one infected sheep affected by sheep measles for the 2017-18 financial year.

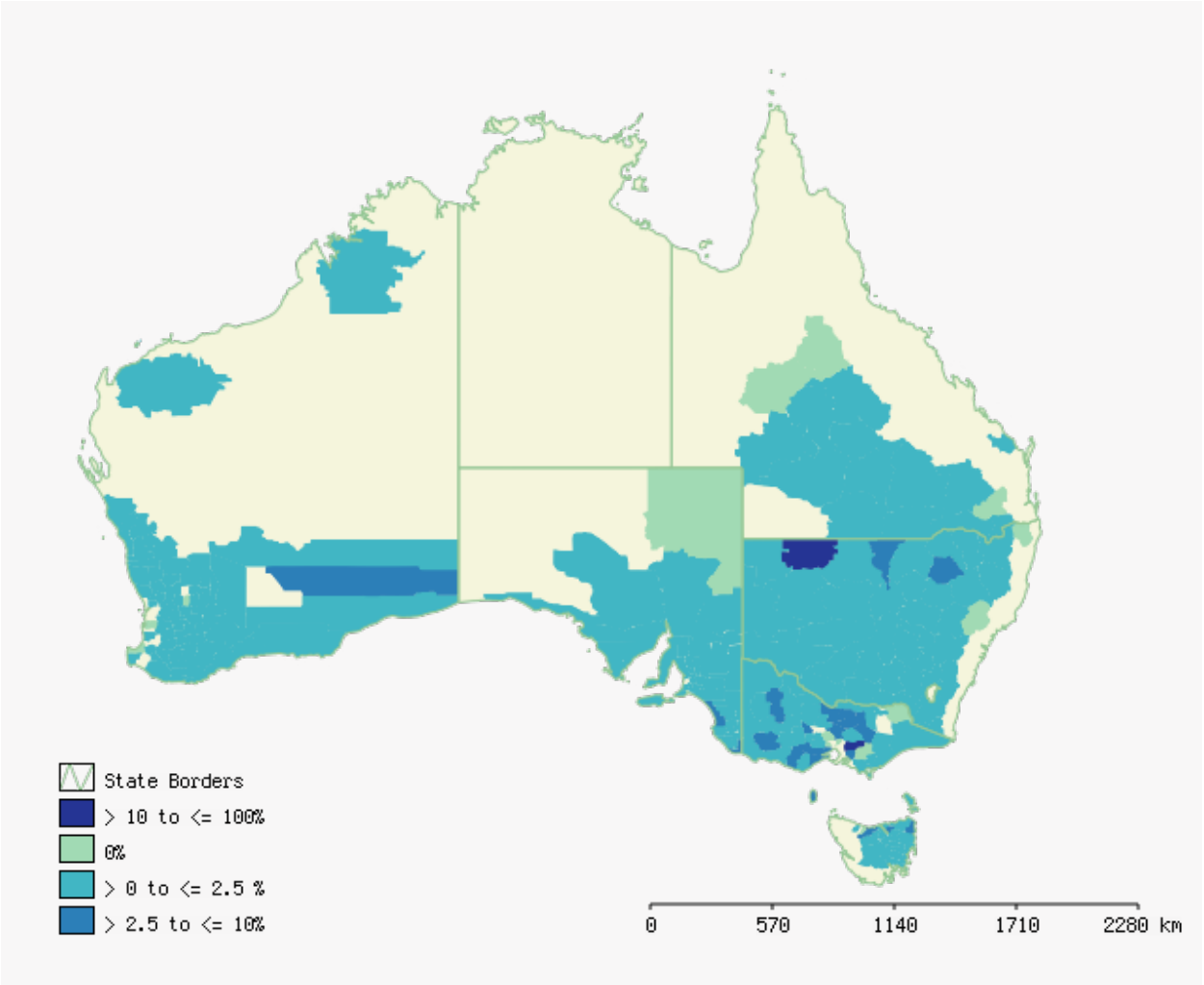

Figure 26. Sheep measles – percentage of infected sheep by LGA over the 2017-18 financial year.

VACCINATION LESIONS

Vaccination lesions can be caused by improper technique, poor hygiene or using a contaminated vaccine. The accidental inoculation of bacteria or dirt with the vaccine results in infection which can lead to abscess formation.

At the abattoir, vaccination lesions are trimmed from the carcase. In 2015 vaccination lesions cost the sheep industry an estimated $1,304,102 (Greenleaf, 2016).

In 2017-18 Victoria recorded the highest percentage of sheep with vaccination lesions

- In 2017-18 Victoria recorded the highest percentage of sheep with vaccination lesions (Figure 27).

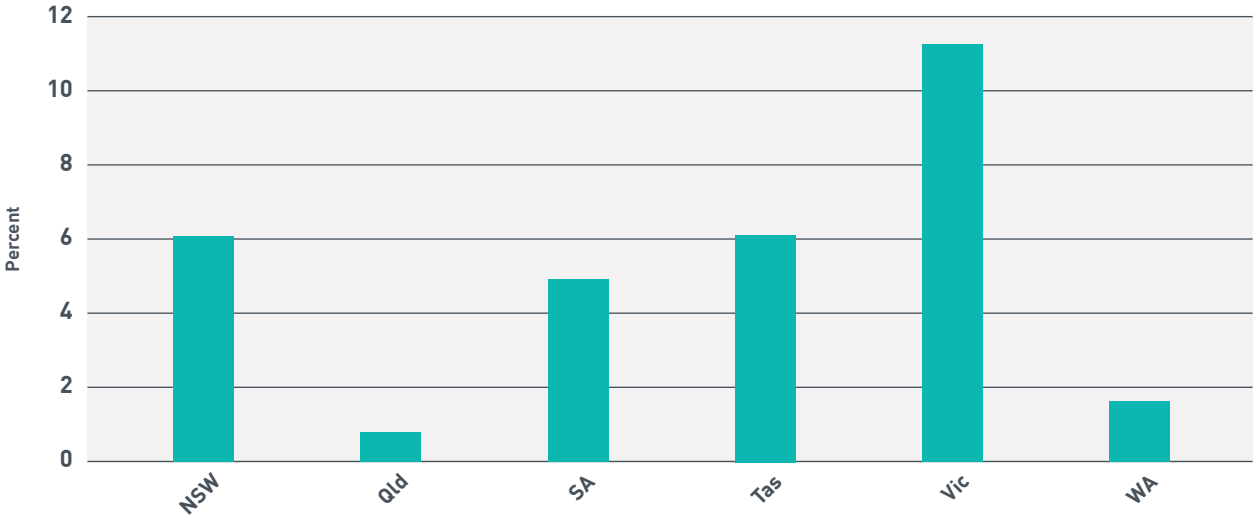

Figure 27. Percentages of inspected lines with at least one sheep affected by vaccination lesions for each state over the 2017-18 financial year.

STATE CONTACTS

STATE	NAME	ORGANISATION	NUMBER
New South Wales	Kate Wingett	NSW Department of Primary Industries	02 6391 3717
South Australia	Elise Spark	Department of Primary Industries and Regions, SA	08 8429 3388
Tasmania	Rowena Bell	Department of Primary Industries, Parks, Water and Environment	03 6777 2135
Victoria	Robert Suter	Department of Economic Development, Jobs, Transport and Resources	03 9217 4109
Western Australia	Anna Erickson	Department of Agriculture and Food WA	08 9881 0211
Queensland	Louise Mullemeister	Department of Agriculture and Fisheries	07 4688 1470

INDUSTRY CONTACTS

INDUSTRY	EMAIL
Sheep Producers Australia	admin@sheepproducers.com.au
WoolProducers Australia	admin@woolproducers.com.au

AHA would like to acknowledge the National Meat Industry Training Advisory Council Limited (MINTRAC) and participating plants for helping to deliver the NSHMP.