

JD NEWS

Back From The Brink Of OJD

When New South Wales sheep producer and 2010 Biosecurity Farmer of the Year finalist, Terry Hayes, discovered his sheep had ovine Johne's disease (OJD) back in 1995, he set out on a decade-long journey in search of information to tackle the most challenging obstacle in his farming career. It has been his proactive, determined approach to solving problems that has helped researchers, animal health experts and other sheep producers gain a better understanding of OJD, and has also put his business back in the black.

Terry and his wife Cecily run a 3,000-head self-replacing Merino flock along with 50 Angus cattle on their 780-hectare grazing property, 'Hillwood', at Middle Arm in the Southern Tablelands—held by the Hayes family for over 100 years.

After being suspicious of increasing stock deaths for several years, they discovered their flock was infected with OJD after losing half their breeding ewes (600 head) and having only 200 lambs on the ground that season. Terry said the property was immediately thrust into quarantine and his sheep could only be sold to slaughter with authorisation—leaving him totally devastated.

"This left me in the position that I had no tools to deal with the problem. We didn't have vaccine and we were told that because we were eradicating the disease in the state, we wouldn't ever get access to vaccine because vaccine would help us manage it and they didn't want us to manage it—they wanted us to eradicate it," he said.

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Image: Terry Hayes

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Terry says the personal impact of the disease was immense. "I had a lot of very poor sheep that were unsaleable, my woolclip was completely tender and the effect of the state policy meant I had no way forward."

Frustrated by the regulatory process and lack of information available to producers, Terry became actively involved in a local producer group to help discuss problems and share information with others. During 1998 to 2004, Terry formed an agreement with researchers at the Elizabeth Macarthur Agricultural Institute and became heavily involved with extensive trials on his property, many which can be attributed to underlying much of today's knowledge of the disease.

Terry became passionate about sharing the information he was learning and was determined to arm others with the power of this knowledge. For a number of years he travelled extensively throughout New South Wales and to South Australia, to talk with animal health experts about OJD and share his experiences with others. He also became a producer representative on the New South Wales OJD Advisory Committee, having input into policy making decisions.

At that time there were limited tools available for OJD Control and Terry says things started turning around when he gained access to the Gudair vaccine in 1998. He vaccinated three drops in the first year and has vaccinated every lamb born since, without fail.

"Vaccination has been a key tool in managing the disease and since I've been vaccinating, my flock has returned to profitability, my lambing percentages are close to 100 percent, my wool production is good and I've got on with the business of running a self-replacing merino flock the way it should be run," he said.

Even though things have turned for the better, Terry says there is no room for complacency when it comes to OJD. He monitors his flock conscientiously, he is aware of what is happening on his farm's boundaries and in the surrounding area, and he has recently tested his flock to measure the effectiveness of his management program. Although he still has low levels of OJD in his flock, he is confident about his ongoing management of the disease.

Terry urges producers living in high or medium prevalence areas to remain vigilant, be careful and confident where they buy their sheep from and vaccinate if they're experiencing losses.

"My advice is to be aware of OJD. If you suddenly start having losses by wasting, you need to get it identified and you need to vaccinate. And don't be afraid to become identified and get on with the business of managing the disease. It's worse to try and put it under the carpet—that's just counterproductive in terms of the overall management of the disease."

And when it comes to good management practices, Terry has one last OJD tip to impart when vaccinating young lambs. "I can't stress strongly enough to at all times restrain the lamb and vaccinate in the proper vaccination site—that is close to the ear to minimise carcass damage—and do it with the minimum exposure to other people to avoid any accidental needle stick injuries, which can be quite serious. In the event of an injury, it is absolutely vital that medical help is sought as quickly as possible and remember to take the manufacturer's instructions with you."

OJD Prevalence Area changes from 1/1/2011

From 1 January 2011 there have been changes to ovine Johne's disease (OJD) Prevalence Areas in Western Australia, Victoria and some regions of New South Wales.

Changes are the consequence of an increasing prevalence of OJD over the past two years in some regions, which has pushed these areas above their allocated prevalence area cut-off under the OJD Management Plan 2007 – 2012.

Amendments have been made to the following OJD Prevalence Areas:

- **New South Wales:** changes to all Medium Prevalence Area boundaries and Low Prevalence Area boundaries (refer to the Prevalence Area Map);
- **Victoria:** the Medium Prevalence Area has become a High Prevalence Area, and the Low Prevalence Area has change to a Medium Prevalence Area; and
- **Western Australia:** the Low Prevalence Area has become a Medium Prevalence Area.

There are no changes to prevalence areas in Queensland, South Australia or Tasmania. However, Sheepmeat Council and WoolProducers Australia caution producers in these

states not to be complacent. Don Hamblin, President of WoolProducers Australia said to help protect flocks from OJD, producers are urged to adopt preventative measures and management tools.

“When purchasing or bringing new sheep onto your property, insist they are accompanied by a signed Sheep Health Statement. In the Medium and High Prevalence areas you should buy sheep with a higher ‘Assurance Based Credit’ (ABC) score than your own flock,” Mr Hamblin said.

The ABC scheme is an important tool for producers to help prevent the spread of OJD when trading sheep. The higher the ABC score, the lower the OJD risk status of the sheep.

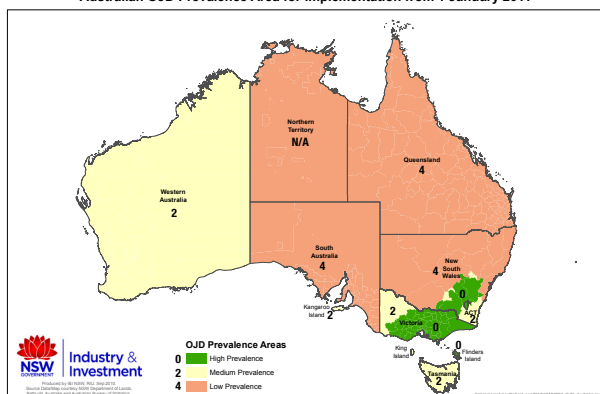
“Good grazing management is one of the keys to minimising infection rates within flocks as prolonged exposure to OJD-contaminated pastures appears to be a major factor leading to high infection rates,” Mr Hamblin said.

Producers wishing to increase market opportunities and the level of assurance of their flock can gain ABC points through vaccination, testing and abattoir monitoring under the ABC Scheme.

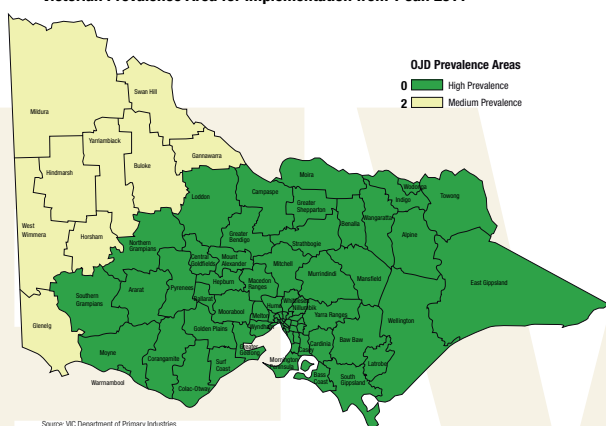
Kate Joseph, President of Sheepmeat Council of Australia said that vaccination is necessary for those producers now classified in medium and high prevalence areas.

“We recommend that all sheep producers in the medium and high prevalence areas vaccinate all intended replacement sheep before they are 16 weeks of age after which they are more likely to be exposed to bacteria on contaminated pasture and the vaccination is less effective. Lambs intended for slaughter are not required to be vaccinated,” Ms Joseph said.

Australian OJD Prevalence Area for Implementation from 1 January 2011



Victorian Prevalence Area for Implementation from 1 Jan 2011



Visit www.ojd.com.au for further information or www.farmbiosecurity.com.au to download a Sheep Health Statement.

Kangaroo Island reins in OJD

South Australia's decade-long approach to control ovine Johne's disease (OJD) has placed sheep producers in an enviable position. With a state-wide infection rate of just 0.5 percent, and prevalence levels on Kangaroo Island now in significant decline, the hardline control program is becoming a national success story.

The proportion of properties on the island where OJD is detectable has dropped from around 20 percent to 6 percent over the last ten years, and is expected to continue to fall as more properties become eligible for clearance testing. This bucks the trend seen in other states, as the prevalence of the disease climbs across parts of New South Wales, Tasmania, Western Australia and Victoria.

Animal health experts and sheep producers attribute the success of the control program to a multi-faceted, yet controversial, strategy implemented by the Department of Primary Industries and Resources of South Australia (PIRSA) twelve years ago. It involved a combination of preliminary destocking, stock movement controls, industry-funded vaccination and whole-of-island testing, abattoir surveillance, compulsory sheep health statements and extraordinary community and industry support. However, three new cases of the disease recently detected by abattoir inspections have experts warning sheep producers of the dangers of becoming complacent.

OJD was first diagnosed on the island in 1998, but authorities believe the disease was probably introduced as early as the 1970s from sheep brought in from New Zealand or New South Wales. As the first OJD case was found in a closed flock, it was assumed the disease had been passed on through neighbouring sheep. This meant OJD had already taken hold in the region and it was estimated that more than 35 properties were already infected at this point. Since then, 97 of the 330 flocks on Kangaroo Island have been identified as contaminated—almost a third of the region's sheep properties.

After observing a rapid and widespread escalation of the disease across parts of New South Wales, South Australian animal health authorities swung into action with a strict and comprehensive control program.

Kangaroo Island veterinarian, Dr Debra Lehmann, says the control of OJD on the island was fast-tracked largely as a result of early detection through the introduction of Pooled Faecal Culture (PFC) testing.

“Once PFC testing became available to us we were able to test all properties on the island, not just those with known contact with infected flocks,” she said. “As a result, a number of flocks were detected as infected with no known traces. The majority of flocks had a very low number of infected sheep and some in just one age group.”

Debra says a destocking policy targeting identified high-risk age groups, along with the culling of their progeny, helped enormously to reduce contamination on properties. This was coupled with a ‘ring vaccination’ approach — targeting entire flocks and their neighbouring flocks to minimise any new infection outbreaks.

John Symons and his wife, Jo, have a self-replacing Merino flock and run around 4,800 adult sheep, with lambs, on their Kangaroo Island property, ‘Turkey Lane’. John has

been farming all his working life and has been a producer representative on the South Australian Sheep Advisory Group for the past six years.

Although they have never had OJD on their property, or any neighbouring properties, John knew it would only be a matter of time before they were dealing with the problem firsthand.

John and Jo vaccinated their entire flock with Gudair within the first two years of its availability, and continue to vaccinate new lambs each year with the help of state subsidies. They were also part of the island's initial testing program and are involved in ongoing abattoir surveillance. John says it is crucial for their business to keep their flock as tightly controlled as possible, and although they have had a closed flock for many years, they would never consider buying in rams or sheep without a Sheep Health Statement.

John strongly believes one of the most important components to the Kangaroo Island OJD Control Program has been the voluntary 35 cent/sheep producer contribution to the SA Sheep Industry Fund. This funding mechanism is unique to South Australia and brings in a little over \$2 million each year, from which around \$750,000 is spent on OJD control - subsidising the vaccination and abattoir surveillance programs.

"The mechanism has been very good at holding OJD in South Australia to the level it's at. It's stayed there for the past 12 to 15 years and we believe, with our current strategies, providing everyone toes the line and doesn't bring in infected sheep from interstate, we can hold the infection rate where it is over the foreseeable future," John said.

Twelve years ago mainland South Australia and Victoria were rated at similar OJD infection levels of about 0.7 percent. While levels across South Australia have dropped, the disease has gained momentum in Victoria, spiking to around 30 percent in some parts.

"I'm pretty alarmed about where other states in Australia are going, like Victoria, Tasmania and Western Australia. They're going to rue the day they didn't deal with OJD when they had the opportunity.

"What scares me is farmers in the South East (of the state) are buying in sheep from Victoria. Farmers there need to be very careful what they buy and they definitely need to be vaccinating," he said.

Kangaroo Island's Biosecurity SA Animal Health Advisor, Andrew Ewers, is equally concerned about the rising prevalence of OJD in other states and believes the answer lies in developing a 'regulated team approach', as seen in South Australia, Queensland and western New South Wales.

"Incredible industry support has been one of the key factors here in South Australia. Producers, stock agents, veterinarians, PIRSA staff and others have worked together to provide strategic, operational and financial support to the program. It has contributed significantly to the success of the program," he said.

"If you deregulate the disease, you will have the disease rampant in your sheep flocks. If you want to reduce its prevalence, you need to have a team approach from all facets of industry supporting a controlled program."

Another important lesson that can be learnt from the South Australian OJD control model comes from recent detection of the disease picked up through abattoir surveillance. While these three cases are currently under investigation, it

is known that one of the flocks had never vaccinated with Gudair.

The three detections this year make it clear that the battle is not over. Sheep producers must maintain approved vaccinate flocks by vaccinating replacement sheep with Gudair vaccine each year.

OJD is greatly reduced on the island, so we're winning in terms of reducing the disease, but it confirms the fact that we can't be complacent at all," Andrew said.

Animal Health Australia would like to acknowledge the contributions from the staff at PIRSA and the producers of Kangaroo Island.



Image: Graham Lean

Beef measles: forgotten but not gone!

What is beef measles?

Beef measles is a parasitic infection caused by the cystic stage of a tapeworm of humans called *Taenia saginata*. Small cysts, about the size of a pea, develop in the musculature of infected cattle (Figure 1). These cysts form, most commonly, in the heart, tongue, diaphragm and cheek muscles. In more heavily infected animals cysts can occur throughout the body musculature. Beef measles is uncommon in Australia but when it occurs it is usually in 'storms' with many animals in a single herd being infected.



*Figure 1. Cysticercus bovis (Taenia saginata) cysts in bovine muscle
Image: The Center for Food Security & Public Health- Iowa State University*

Taenia saginata cycles between humans and cattle. Humans contain a tapeworm that produces anything up to 800,000 eggs daily. These eggs pass out of the human host in their faeces. Cattle become infected in situations where pasture becomes contaminated with human faeces/sewage. Humans become infected through eating raw or lightly cooked beef.

Why is beef measles of importance?

- Through eating poorly cooked or raw 'measly' beef humans become infected with a tapeworm that may grow to a length of 25 metres, but usually 8-10 metres.
- Infection with this parasite causes minimal health impacts, but people are generally averse to the idea of having a huge parasite inside them.
- The negative impact on domestic and international markets if beef measles was prevalent in Australian beef.
- Under certain circumstances this parasite causes considerable financial loss to beef producers through condemned and/or downgraded carcasses.

How to stop transmission

- 1) Humans should not eat raw or poorly cooked beef.
- 2) Infected humans should be de-wormed
- 3) Human faeces should be disposed of in a sanitary manner
- 4) Public education
- 5) Vaccinate cattle in the future. (A vaccine against beef measles in cattle, with almost 100% efficacy, has been developed by scientists at the University of Melbourne, currently not commercially available.)

How do cattle become infected?

Cattle become infected through accidentally ingesting eggs of *T. saginata* whilst grazing. Since Australia is a well developed country with efficient sewage disposal procedures, beef measles is seen rarely. However, it should be appreciated that the methods available for processing sewage in Australia and around the world do not actually inactivate the eggs of *T. saginata*. Therefore, if processed sewage is pumped onto cattle pasture, tapeworm eggs present are an infection risk to cattle grazing that pasture for up to 3 months.

How do you know cattle are infected?

Until cattle are killed you cannot tell if they are infected. Beef measles cysts in the heart are usually visible or felt by running your finger tips over the surface the organ. To observe cysts in the cheeks, tongue and body musculature, the muscles need to be sliced.

Contributed by Dr David Jenkins, Senior Lecturer Parasitology, Charles Sturt University

Case studies of beef measles unexpectedly appearing in Australian cattle

Case study 1

In the mid 1980s, a mob of cattle were sent for slaughter from a farm in south eastern NSW, all were discovered to be infected with beef measles. Investigations revealed the farm septic tank was malfunctioning and raw sewage was

discharging into a paddock. This effluent encouraged lush grass growth over a defined area of the paddock around the discharge point. This area was a focus for grazing cattle, providing an abundant supply of grass contaminated with *T. saginata* eggs. Therefore, one (or more) members of the family living on the farm had to be infected with a *T. saginata* tapeworm to provide these eggs for the cattle to eat. It was discovered the owners of the farm enjoyed very rare to "blue" steak and also travelled regularly to Europe where they ate steak tartare (raw ground beef accompanied with a raw egg). All members of the family were de-wormed, the septic was fixed and the problem was solved.

Case study 2

In 2010, over 100 cattle from a feed-lot were sent to slaughter. More than 70 were found to be infected with beef measles. Another mob from the same feed lot, that had only been grass-fed were slaughtered and all were uninfected. The source of infection for the infected animals had to be feed contaminated with human faeces. Investigations revealed that a component of the feed provided for the non-grass-fed cattle was imported from outside Australia. This imported component was included in a mixture of other ingredients and fed to the cattle. These animals were maintained on this ration for up to 100 days prior to slaughter.

The most likely explanation for this outbreak was that some or all of a batch of the imported feed had been inadvertently mixed with human faeces. How this occurred will probably never be known. There was no way the feed lot owner would have been aware of this, so in good faith he combined this contaminated feed with the rations fed to the cattle and they became infected with beef measles. The cattle need only to have been exposed once to have become infected, but as there were lesions of clearly two different sizes in many of the animals it is likely there were two exposures.

Drench resistance in sheep worms: the 'refugia' concept

Resistance by worms to drenches has been the main focus of applied sheep parasite research over the past decade, as resistance has developed to all available drench groups. Until a new anthelmintic, monepantel, was released in September 2010, an increasing number of farmers relied on a combination of anthelmintics from all available anthelmintic groups. New drenches bring welcome relief, but it is essential that we learn from the past, and minimise the development of resistance to remaining effective anthelmintics as well as to new ones.

While well-known causal factors such as excessive drench use and the over-use of persistent anthelmintics remain specific risks for resistance, there is universal agreement that the major underlying factor is the failure to ensure that sufficient non-resistant (strictly, 'less resistant') worms survive 'in refugia' to dilute any resistant survivors of drenches.

The refugia theory

Worms in refugia from drenches may survive either as worm larvae on pasture or as adult worms in the host. A classic demonstration of a direct result of insufficient refugia is the heavy selection pressure for resistance where the

'summer drenching' program is used in climates with hot and dry summer periods. With no worm larval pick-up from dry summer pastures, the worm population takes many months to recover and the strategy provides excellent worm control. However, the few worms surviving these drenches then become the major source of future worm generations. The 'summer drenching' effect explains the development of resistance to ivermectin in WA just four years after its introduction.

The degree of selection pressure varies greatly between environments, and is far lower in New Zealand, where until recently the prevalence of resistance was half that of WA. In this moist temperate climate, worm larvae survive well year-round, and provide significant dilution for resistant worms, even though the average treatment frequency is more than twice that in WA.

Refugia in practice

Where drench resistance has developed relatively rapidly, changes to current practices are necessary if drenching is to be sustainable in the long term. The first step is to assess the regional refugia potential: how long is there likely to be substantial survival of infective larvae on pasture? How does this relate to routine worm control programs?

The degree of modification of programs necessary – and possible – varies according to environment. In WA, summer drenching is no longer recommended for adult sheep, as studies have found that effective refugia can be provided by delaying the routine drench until autumn, when worm eggs begin to develop to larvae.

However, in more temperate winter rainfall regions, where there is significant over-summer survival of worm larvae on the pasture, less dramatic changes may be needed – provided frequent drenching does not select heavily for resistance.

Refugia versus worm risk

There is an obvious trade-off between the deliberate retention of worms to dilute drench resistance and the potential for excessive worm burdens and overt parasitism. This is especially significant where the lethal *Haemonchus contortus* predominates, and relatively frequent drenching is often necessary (and resistance levels are often correspondingly high). 'Sustainable' drenching strategies here require monitoring of flocks at adequate intervals to allow a reduction in routine treatments, and careful paddock planning.

In regions where less-pathogenic worms are more common, there is greater scope for deliberately withholding drenches to prevent resistance development, but even here there is potential for unexpected parasitic surprises. Refugia strategies therefore typically involve adult sheep (as in the WA example), as even moderate worm burdens may be harmful in young stock.

Although drench resistance levels continue to increase, we now have a reasonable conceptual understanding of how sub-populations of worms may be manipulated by sheep management to provide useful refugia. The challenge is to develop locally-applicable –and practical – recommendations to implement these strategies.

Contributed by Brown Besier, Principal Veterinary Parasitologist, Department of Agriculture and Food Western Australia

Snippets

New National Sheep Health Statement format

The National Sheep Health Statement is now available in a writable format that will assist producers who wish to retain an electronic version for their own records.

New certificates for MAP

The Australian Johnes' Disease Market Assurance Program (MAP) Public Register has been improved to enable producers to print a transcript from the register. This can be used in lieu of a certificate and provided to clients who purchase animals.

http://edis.animalhealthaustralia.com.au/public.php?page=mapsearch&aha_program=3

National Financial and Non-Financial Assistance Package

Since 2004 the number of beef herds known to be infected with bovine Johnes' disease has dropped by over 50% down to 68 from 140. The National Financial and Non-financial Assistance Package initiated by Cattle Council of Australia provides support for beef producers who herds are diagnosed with bovine Johnes' disease.

Outstanding nominees win Australia's Biosecurity Farmer of the Year

The Farm Biosecurity team is delighted to announce the very deserving winner of the Australian Biosecurity Farmer of the Year-Livestock award is wool producer Michael Blake from 'Bally Glunin Park' of Hamilton in Victoria.

All of the finalists showed outstanding leadership in biosecurity and excelled in their farming practice and biosecurity awareness. In particular recognition must be given to the two livestock runners up Jim Cudmore from 'Kerwee Lot Feeders' of Jondaryan in Queensland and Terry Hayes from 'Hillwood' of Middle Arm in New South Wales. Find out more about Michael and the other finalists at www.farmbiosecurity.com.au

A footrot warning

Although last year NSW was declared a Footrot Protected Area, it is still prevalent in some other states. This time of the year creates an ideal environment for footrot to breakdown and spread due to the warmer weather and current wet conditions combined with lush pastures.

Sheep entering NSW from VIC must have a valid footrot declaration but clearly these declarations alone cannot be relied upon to keep disease out. A number of recent detections in southern NSW have been traced to the introduction of Victorian sheep so if you are thinking about going south to source replacement sheep or have already done so – be very careful and ask for a Sheep Health Statement.

Footrot is a notifiable disease in NSW and anyone who has reason to suspect footrot in their sheep must notify the LHPA.

Contributed by Steve Whittaker, Senior District Vet Hume LHPA, Albury

The 11th International Colloquium on Paratuberculosis 2012

The 11th International Colloquium on Paratuberculosis will be hosted at the University of Sydney from 5 to 10 February 2012. The five day colloquium will include presentations from leading professionals such as Dr John Bannantine, Dr Marcl Behr and Dr Mike Collins on topics ranging from Diagnostics, Epidemiology and control, Pathobiology, Microbiology, Molecular biology, Public health and Crohn's disease, Immunology, Food Safety and Industry Paratuberculosis Forum. For more information regarding this meeting, please see: www.icp2012.com.au

Interstate movement requirements now only a click away

Information about the interstate movement requirements for regulated animal health conditions is now only a click away. Book mark the following link and use it as a ready reference whenever you wish to check the movement requirements for livestock.

<http://www.animalhealthaustralia.com.au/programs/jd/movement-requirements-for-stock.cfm>

Movement of carrier and diseased stock is one of the more common ways disease moves around the country. Following the movement requirements of each state is a sound biosecurity practice... and it's the law.

JOHNE'S DISEASE & MAP STATISTICS



Photos left to right: Rebecca Ogrady

Number of known infected herds and flocks September 2010.

Source: JD01 NAHIS

CATTLE

Number of known infected cattle herds.

	Dec 09	March 10	Sep 10
NSW	114	117	117
SA	59	60	59
TAS	16	16	16
VIC	964	964	970
WA	0	0	0
TOTAL	1153	1157	1162

SHEEP

Number of known infected sheep flocks.

	Dec 09	March 10	Sep 10
NSW	1286	1286	1286
SA	50	48	44
TAS	64	64	64
VIC	595	600	611
WA	31	36	40
TOTAL	2026	2034	2045

GOATS

Number of known infected goat herds.

	Dec 09	March 10	Sep 10
NSW	8	8	1
SA	1	1	1
TAS	3	3	0
VIC	10	11	4
WA	0	0	0
TOTAL	22	23	6

DEER

Number of known infected deer herds.

	Dec 09	March 10	Sep 10
NSW	1	1	8
SA	1	1	1
TAS	0	0	3
VIC	4	4	9
WA	0	0	0
TOTAL	6	6	21

Number of assessed herds and flocks in MAPs as of September 2010.

Alpaca	MN1	MN2	MN3	Total
NSW	3	19	54	76
Qld	0	0	0	0
SA	0	3	11	14
Tas	0	0	2	2
Vic	1	2	3	6
TOTAL	4	24	70	98

Cattle	MN1	MN2	MN3	Total
NSW	63	94	123	280
Qld	0	0	0	0
SA	36	80	94	210
Tas	14	34	22	70
Vic	51	67	84	202
TOTAL	164	275	323	762

Goat	MN1	MN2	MN3	Total
NSW	10	10	5	25
Qld	0	0	0	0
SA	2	4	4	10
Tas	4	3	1	8
Vic	2	0	0	2
TOTAL	18	17	10	45

Sheep	MN1	MN2	MN3	Total
NSW	26	38	138	202
Qld	0	1	0	1
SA	15	24	118	157
Tas	2	2	14	18
Vic	8	8	49	65
TOTAL	51	73	319	443

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