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OVINE JOHNE'S DISEASE (OJD)

PROPERTY DISEASE MANAGEMENT PROGRAM (PDMP)

INFORMATION

This circular replaces circular AI 2004/032.

A Property Disease Management Program (PDMP) is a program to reduce the risk of OJD:

- on the property itself,
- to the locality around the property, and
- to other landholders who might purchase or agist stock from the property.

An OJD risk management plan is a written plan of strategies to:

- avoid becoming infected with OJD, or
- minimise infection if it occurs.

A PDMP should be based on a risk management plan that has been tailored to the particular circumstances of infection or suspected infection on a property.

Strategies for PDMPs

1 Infected flock profile

Knowledge of the apparent prevalence and age/mob distribution of infection in the flock will always assist in implementing an effective PDMP.

An infected flock profile (IFP) involves a progressive assessment of apparent distribution and prevalence of infection, based on items such as flock history, flock/property management, on-farm testing results, abattoir monitoring and tracing investigations.

In some cases the flock history and the original investigation on the property that confirmed infection, will give a good indication of prevalence and distribution. In other cases, further testing and investigation will be required.

2 Isolation of infection

The PDMP should include measures aimed at containing the infection, such as:

- isolating any sheep/mobs that might be shedding bacteria,
- running lower risk sheep, e.g. approved vaccinates, along boundaries,
- cropping, or grazing with non-susceptible species, around infected mobs or along boundaries,

- taking steps to minimise straying and run-off.

3 Selective culling

Monitoring of all mobs and culling of clinical cases should be mandatory in all PDMPs, primarily on welfare grounds but also for disease control.

Selective culling of mobs with evidence of shedding will reduce overall contamination and challenge to other sheep.

Lambs and weaners appear to be particularly susceptible to infection. Therefore strategic culling of any sheep that were exposed to infection at a young age, and were not vaccinated at the time, is recommended.

Culling of the highest risk groups on a property may provide a reduction in overall flock challenge within 12 months. This will increase the effectiveness of other management tools such as vaccination or pasture spelling.

4 Vaccination

Vaccination is a vital tool that can be used with the aim of both containing and minimising infection in a flock.

Vaccine trials in Australia indicate that Gudair[®] Vaccine, when administered to lambs in infected flocks by 16 weeks of age, reduces:

- mortalities,
 - shedding of the Johne's bacteria, and
 - the overall number of sheep that are shedding,
- by at least 90%.

Vaccine appears to work most effectively if given to lambs or older sheep before exposure. Therefore it is recommended that all restocker lambs are vaccinated at marking, and that older unexposed sheep, such as purchased rams, are vaccinated at least 2 weeks before being moved to infected land.

Vaccination does not appear to be as effective if given after a sheep has been exposed to infection. Nevertheless the Australian vaccine trials have demonstrated that some efficacy can be expected in any sheep that has not had prolonged exposure to high challenge.

Successive vaccination of each year's drop of restocker lambs will result in a fully vaccinated flock within 4-5 years.

Where adult non-vaccinates are being retained and there is evidence that they may have had some exposure but not necessarily at a high level, vaccination of these sheep may still be a sound disease control strategy.

5 Decontamination of land

It is generally accepted that destocking land for 15 months, including two summers, will remove most infective bacteria. Short term destocking, e.g. 6 months including one summer, will remove a significant number of infective bacteria.

The ability to segregate portions of a property offers management flexibility, and the option of progressive land decontamination.

Progressive land destocking and decontamination within properties, or between separate land parcels comprising a property, may be combined to advantage with other management tools.

6 Breeding strategies

Various specialist breeding techniques can be used to reduce exposure of young animals to contamination, such as multiple ovulation embryo transfer (MOET), juvenile in-vitro embryo transfer (JIVET) and lamb snatching, although most of these techniques are highly resource intensive.

Nevertheless, disease elimination and genetic recovery may be effected in one generation by using artificial breeding techniques, provided:

- recipient stock are isolated from potential sources of infection, and
- recipient stock and the land they use are free of infection.

7 Segregating test-negative mobs

Animals from infected flocks that are at least four years of age and are faecal culture and/or biopsy negative are unlikely to be infected. Segregating such animals from subsequent exposure, e.g. moving them onto decontaminated land or into sheds, will provide a nucleus of low-risk animals which may be used as a breeding sub-flock. Preliminary observations in NSW indicate that by establishing a test-negative breeding sub-flock and applying further minimal disease breeding strategies, it may be possible to re-establish an uninfected age group within two generations.

8 Grazing/watering/management strategies

Susceptibility to infection appears to be highest in very young animals, and seems to be related to the degree of challenge and the amount of stress to which the lambs/weaners are exposed. These factors are interrelated; for example, early weaning may reduce exposure but increase stress and susceptibility.

Challenge to young animals may be reduced by lambing on to decontaminated or low-contamination pastures, and/or by removing lambs as quickly as possible from infected ewes. Stress may be reduced by providing good nutrition and shelter, controlling internal parasites and preventing other diseases.

Particular care needs to be taken when recommending pasture management for OJD control. Many of the recommendations may jeopardise parasite control programs. Producers need to consider implementing strategies to optimise concurrent control of both OJD and internal parasites.

Contaminated water supplies represent a significant risk. Fencing off of low-lying swampy ground is recommended for both OJD and internal parasite control. Where possible, reticulated above-ground water supplies should be provided.

APPROVED

**BRUCE CHRISTIE
DIRECTOR, ANIMAL AND PLANT BIOSECURITY**

For:
Property *Owner/Manager name*

Property address

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<i>PIC</i>	<i>RLPB</i>	<i>Date</i>

Submitted to:
Name
Position

Ovine Johne's disease (OJD) is a wasting disease that can cause significant mortalities in all types of sheep, but especially in fine-wool merinos. It transmits very easily between neighbouring flocks and over long distances by movement of infected animals.

Animals become infected by eating pasture or drinking water that is contaminated with Johne's bacteria. The disease has a long incubation period, often 1 to 2 years, but eventually a number of infected animals will develop clinical disease. This means that they start to rapidly lose condition, and usually die within the next 2 to 3 months. There is no cure for the disease. Infected animals, and especially clinical cases, shed large numbers of Johne's bacteria in their dung, which then contaminate pasture and water and pass the infection on to other stock.

All flocks in eastern Australia are potentially at risk of being infected by OJD. Because of the long incubation period, your flock may already be infected and you may not realise it. This document is designed to help you to protect your property and stock from OJD, and to minimise the impact of the disease on both you and your neighbours if your sheep are already infected.

The strategies to prevent the disease entering your flock, and to minimise the impact of the disease if your flock is already infected, can be divided into two categories.

1. Reduce the risk of the disease entering your flock by
 - ⇒ Only purchasing low risk sheep
 - ⇒ Avoiding sheep straying on and off your property
 - ⇒ Vaccinating to increase the immunity of your flock
2. If already infected, reduce the level of infection in your sheep by
 - ⇒ Increasing their resistance to infection e.g. vaccination, and
 - ⇒ Reducing their exposure to the Johne's bacteria

The following pages contain more information for each of these strategies. **A column has been left blank for you to describe how each strategy will be applied to your flock.** Remember, your flock is unique. It is likely that the importance of each strategy will vary from flock to flock.

Objective 1 Reduce the risk of infection entering your flock			
Strategy	Activity	✓	<i>How this will be applied on your property</i>
Buy in or agist lower risk stock	Only purchase rams from assured vaccinating studs		
	Only purchase restockers which were vaccinated as lambs		
	Only purchase restockers from lower risk flocks eg assured flocks		
	Vaccinate any non-vaccinated restockers on arrival		
	Follow the same rules if bringing in agistment stock		
Reduce neighbour risk	Maintain fences to prevent sheep straying on and off your property		
	Encourage neighbours to vaccinate		
Increase flock immunity	Start a vaccination program in your own flock to increase immunity to the disease		
Objective 2: If already infected, reduce the level of infection			
Increase resistance to infection	Vaccinate all restocker lambs at marking		
	Test to monitor level of infection		
	Vaccinate any older sheep which have not had high exposure		
	Optimise natural immunity by ➤ ensuring adequate ewe and lamb nutrition ➤ ensuring good weaner nutrition and growth ➤ an effective worm control program		

Reduce exposure to Johne's bacteria	Prepare 'low risk' lambing & weaning paddocks. Six weeks destocking over warmer months has been shown to dramatically reduce contamination levels		
	Graze young sheep separately from older sheep		
	Yard younger sheep before older shedding sheep, or use portable yards for young sheep		
	Cull any test-positive or 'high risk' mobs from your flock		
	Dispose of clinical sheep as soon as possible		
	Fence off wet areas & avoid grazing with young sheep		
	Reticulate water from a clean source (e.g. bore water) to avoid sheep watering out of contaminated dams		
	Avoid feeding supplements on the ground		
	Only purchase in or agist low risk (vaccinated) restockers		
	Minimise sheep straying by maintaining boundary fences		
	Encourage neighbours to vaccinate		
	Progressively destock and decontaminate sections of land		

Record here contact numbers, further management plan details, use in other species etc:

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The Importance of Vaccination

The National OJD Program vaccine trials currently indicate that the best strategy producers with infected flocks can adopt is to vaccinate all restocker lambs at lamb marking. This should be the backbone of any management plan. However, overseas experience suggests that it is also very important to adopt additional strategies that reduce exposure to contaminated sites, particularly in susceptible lambs & weaners.

Within the higher prevalence areas of NSW, all producers are encouraged to undertake vaccination programs to reduce the overall level of environmental contamination. This should improve both the productivity and trade potential of these areas, while at the same time significantly reducing the risk of the disease being spread to lower prevalence areas.

Remember, the use of vaccine in your flocks has several benefits including; a reduction in disease prevalence (by lowering or preventing mortalities & reducing shedding), protection of your neighbours and catchments, improved restocker trading potential, improved access to local roads etc.

The Predicted Impact of Vaccination within a Flock

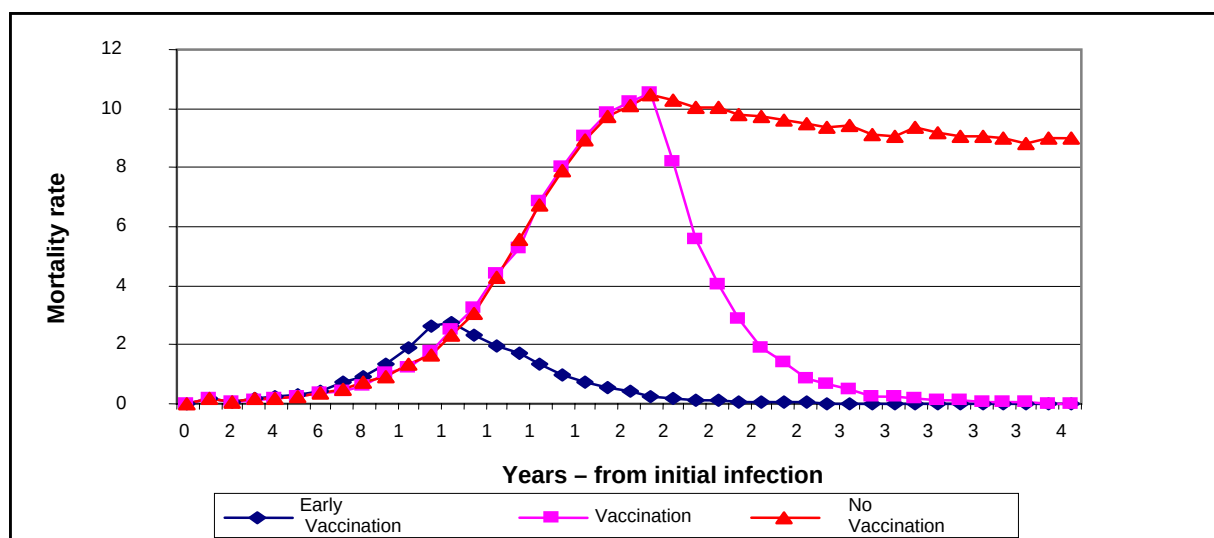
The graph below was produced by computer modelling using several assumptions on the spread of OJD within a flock and the effectiveness of vaccination. It predicts the impact that vaccination will have on the level of OJD-related losses within a flock under 3 different vaccination options:

- No vaccination
- Vaccination commencing after full expression of OJD
- Early intervention with vaccine before significant losses commence

The important messages for producers from this model are:

- Losses from OJD can take many years to appear after initial infection.
- Vaccination commenced after losses become apparent will reduce the impact of the disease.
- It is best to intervene early to prevent high levels of farm contamination and escalating losses.

Figure 1: The predicted impact of vaccination on OJD-losses in an infected flock



Additional Strategies

In some situations, and particularly in lower prevalence areas of New South Wales, other strategies to both minimise the impact of OJD and optimise vaccine efficacy should be considered. These include: selective culling of clinical cases and test-positive mobs, land segregation to minimise exposure of younger animals, and whole or part property destocking/decontamination.