

Ovine brucellosis

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What is Ovine Brucellosis?

Ovine brucellosis (OB) is an infectious bacterial disease of sheep caused by *Brucella ovis*. It is present in many sheep flocks in New South Wales.

OB occurs in all districts, in any sheep breed and causes considerable economic loss in many flocks, through ram wastage, low lamb-marking percentages and extended lambing periods.

Infection causes inflammation of the male reproductive organs, in particular the epididymis in rams, resulting in infertility and sterility in some affected rams. In some flocks over 50 per cent of rams are affected. OB has occasionally been associated with abortion in ewes, and increased perinatal mortality.

OB infection can be overlooked in a ram mob because infected rams generally do not show any signs of ill health. Abnormalities will only be detected by scrotal palpation of a group of rams. Suspicion of infection can be confirmed with blood testing done by your veterinarian.

There is no vaccine or other preventive treatment available and infected rams cannot be cured. Eradication of the disease from infected flocks requires identification of infected rams and culling them.

When to suspect OB infection

The first clue may be a reduction in lambing percentages, or a longer lambing period, depending on how reproduction is managed in the flock. Remember that in an infected flock, not all rams are affected and infection does not make all rams infertile. Ram libido is not affected. There may also be other significant factors causing lamb mortality. The picture on each infected farm will be different.

OB should be suspected in any case where lambing performance is below par, and can be easily investigated with an examination of the ram mob. Scrotal palpation is a good screening test and can be followed up with blood testing if abnormalities are found. Contact your veterinarian for advice.

Spread of infection

Movement of infected rams is the primary way that OB spreads between properties. This includes introduction of infected rams, but strays are also a major risk.

There is the potential for introduced ewes from an infected flock to spread infection, but this is less likely and can be managed by isolating non pregnant ewes for one month before joining; or with pregnant ewes, lambing them in isolation and not joining them for four months post lambing.

Infection is spread within the ram mob during joining when clean and infected rams mate with the same ewe, and also between rams during the non-joining period. When rams are not working they should be protected from stray sheep (or straying themselves) by being isolated in securely fenced internal paddocks, with age groups separated if possible.

Examination of rams

With a basic knowledge of anatomy it is possible to examine rams to ensure they are healthy and fit for joining. Producers should check their rams whenever they are being handled for normal management procedures to ensure any problems are detected early.

[Link to video demonstrating scrotal palpation of rams](#)

OB is not the only disease process which can cause lumps or other abnormalities of the testes, so it is important to consult a veterinarian to get an accurate diagnosis of the cause if problems are detected. Cheesy gland (caseous lymphadenitis) and Actinobacillosis can cause lumps similar to OB but do not have the same devastating impact on flock reproductive performance.

Not all rams that are infected with OB will have obvious lumps at the time they are examined because of the way the disease progresses through a group. Palpation is a useful mob screening test, but blood testing should be used to confirm OB and to detect all exposed rams within a mob. Seek advice from your veterinarian.

All rams should be palpated prior to purchase and again on arrival on farm.

Technique for palpation

Rams can be examined while they are either in a standing or sitting position. The neck of the scrotum is grasped between the thumb and forefingers, feeling for any swelling or lumps. Any lesions in the spermatic cord or the head of the epididymis will be felt in this area. Figure 1 shows the tail of the epididymis at the bottom of each testis.

Figure 1 Scrotal palpation



In infected rams, the obvious lesions that can be palpated occur in the testes and epididymides.

The infection first affects the epididymides, causing inflammation, and swelling of the surrounding tissues.

In most rams, the epididymides are completely blocked for a period, causing sperm to build up behind the blockage.

In some rams, the blockage is permanent, resulting in a further swelling of the tail of the epididymis. In others, the blockage may break down and the swelling may regress so that the ram, although infected, may feel normal.

Detectable lesions first occur in the tail of the epididymis, which becomes enlarged and inflamed.

In some cases, the testes may also be inflamed. The disease can affect one or both testes, with the tail of the epididymis being the site most commonly affected.

Rams with chronic infections may have a grossly enlarged tail of the epididymis and a shrunken testicle. In other rams, the lesions may regress.

Figure 2 Palpating the tail of the epididymis

The tail of the epididymis is palpated between the thumb and forefingers.

The tails should be firm with no hard swellings, and they should be similar in size.

The demarcation between the testicle and the tail of the epididymis should be obvious.

Figure 3 Palpation of the testes

The testes are slipped between the thumb and fingers feeling for any hardening, abscesses, injuries or differences in size between the two sides.

The testes should feel firm and be uniform in size.

Figure 4 Infected ram 1

An infected ram affected on both sides.

On the left, the testicle is shrunken and the tail of the epididymis is shrunken and hardened. On the right, the testicle is also shrunken with a marked enlargement of the tail of the epididymis. The head of the epididymis on the right (near the thumb) is also enlarged.

Figure 5 Infected ram 2



The testicle and epididymis on the right felt normal.

The testicle on the left is shrunken and the tail of the epididymis is hardened and shrunken also.

Figure 6 Infected ram 3



Testes and epididymides of a ram that was excreting organisms in the semen, with lesions of the testes and tail of the epididymis on the left.

Again, the affected testis is shrunken and the tail of the infected epididymis is twice the size of the normal side on the right.

Effect of ovine brucellosis on flock fertility

The infection in the epididymides and accessory sex glands leads to reduced semen quality and in some rams, sterility. The effect on flock fertility will depend on the number of rams infected and the severity of the lesions in the infected rams.

In many flocks, the full effects of the disease are not obvious because not all rams are infected and also because most graziers replace part of their ram flock each year, introducing fertile rams.

In other flocks, ovine brucellosis has little effect because there are other conditions affecting the lamb marking percentage to a greater extent, for example feral pig predation.

In flocks where ovine brucellosis is a problem, three main effects are seen.

1. The lambing period is extended, often causing problems with flock management. When infected rams of low fertility serve ewes on heat, the chance of conception is low and many of these ewes will usually return to service 17 days later. In some affected flocks, more than half the ewes return to service. If ewes are only joined for 6 weeks, then many ewes may not get in lamb.
2. The lamb-marking percentage is reduced, when a high percentage of clinically affected rams is used. It is usually seen in flocks when replacements are made only every two to three years or in those flocks where the replacement rams are infected at the time of purchase, for example, rams from infected studs or rams bought out of saleyards. Many rams offered in saleyards are cull rams because of age or abnormalities reducing fertility, or are infected with ovine brucellosis. These rams are unsuitable for breeding.
3. Ram wastage is high, with infected rams being culled after one or two years in the flock.

Spread of infection between rams

Rams are infected by exposure to infected semen or to vaginal discharges from infected or aborting ewes. Infection can be spread from ram to ram directly or via the ewe, in several ways:

- When rams are running with ewes, infected rams will inseminate infected semen into the vagina of the ewe. Other rams serving the same ewe in the same heat period will be exposed to infection.
- Infected rams can inseminate infected semen into the rectum of other rams, exposing them to infection. Sodomy is very common in some groups of young rams, so that rapid spread can occur.
- If rams run with ewes for extended periods, rams can be exposed to infection from ewes that have recently aborted and are excreting the organisms.
- It has been demonstrated experimentally that rams can be infected by intranasal inoculation of infected semen. The sniffing and nosing behaviour of rams in ewe flocks could also provide a means of spread through a ram flock.

In stud flocks, ovine brucellosis is a bigger problem in the British and composite breeds of rams, because they are sexually active at a younger age than Merinos. However, it can cause problems in any stud flock where older infected rams and the young rams are run together, exposing the young rams to infection.

The incidence is always higher in flocks where small numbers of ewes graze with the ram flock when they are not being joined, for example, killers or cull sheep.

In these situations, a number of rams are likely to serve any ewe on heat, resulting in rapid spread of infection through the ram flock.

Diagnosis of ovine brucellosis

Diagnosis is based on the careful manual examination of the scrotal contents, and on the results of a blood test. Careful palpation of all rams in the flock (as shown in the photos) will show whether clinical abnormalities are present.

If more than 5 per cent of rams have abnormalities, ovine brucellosis is the most likely cause.

Any rams with abnormalities should be checked by your veterinarian. A blood test will be used to check if the ram is infected with OB. When the incidence of rams with abnormalities is low, only those with lesions will normally be blood-tested, to check if infection is present in the flock.

A single negative blood test does not always mean a ram is free of infection.

In some rams the blood test may not become positive until up to 7 weeks after infection. Rams from an infected flock can be incubating the disease and give a negative blood test. If tested 6 to 7 weeks later, then they will be positive.

There are cases recorded where blood-test negative rams bought from infected studs have subsequently developed ovine brucellosis, because they were incubating the disease when they were first blood-tested.

In some cases, examination of semen at a laboratory may be necessary to diagnose infection.

Eradication of ovine brucellosis

Eradication of confirmed ovine brucellosis is based on eliminating infection in older rams and preventing the infection of young rams. It is achieved by a combination of manual examination, blood-testing and removal of all infected rams as soon as they are detected.

In an infected stud flock, the stud owner should seek advice from their veterinarian on an eradication program. This will involve

- A clinical examination of all rams on the property, including the weaner rams. All rams with epididymitis or other clinical abnormalities are culled and sold for slaughter.
- A blood test of all remaining rams on the property. All positive rams are culled and sold for slaughter as soon as possible after blood results are received.
- The blood test is then repeated every 30 days until two consecutive negative tests are obtained.

In heavily infected commercial flocks, it may not be possible to sell all infected rams and replace them with young rams in the one year. In these flocks, infected rams which are not showing severe clinical lesions may be kept for another joining provided they can be kept segregated from the other rams up to and during the joining period. They should be sold immediately after joining. If an infected ram group has to be joined, then it should be joined to the older ewes at a higher percentage than usual, so that the effect of the lowered fertility will be minimised.

Preventing reinfection

Ongoing flock management should aim to reduce the chance of re-infection by

- Weaning ram lambs early and keeping them segregated from all older ram groups. This is particularly important in flocks where the ewes are re-joined 2 to 3 months after the completion of lambing, when some ram lambs can start to show an interest in the ewes.
- Wean prior to joining.
- Avoid running rams with lambing ewes. If a ewe aborts due to ovine brucellosis, then rams may be exposed to infection by sniffing or serving the ewe shortly after she aborts.
- Ensure rams are kept in paddocks where there is no risk of contact with stray rams. All clinical cases and rams positive to the blood test should be removed as soon as they are identified. The longer these rams remain on the property, the greater the chance of a breakdown in the eradication program.
- Ensure introduced rams come from properties free of infection. Flocks accredited in the NSW Ovine Brucellosis accreditation scheme are the safest choice. If the status of the stud of origin is not known, then the ram should be kept isolated for 60 days and then blood-tested.

Tips for buying rams

Buy replacement rams only from studs that belong to the NSW Ovine Brucellosis Accreditation Scheme.

If rams are purchased at a ram show or sale, ensure that the stud of origin is accredited under a state ovine brucellosis scheme and that the show or sale is only open to rams from accredited flocks. A negative blood test on a ram from an infected flock does not guarantee freedom from disease.

There is no blood test equivalent for Accredited Flock status.

Never purchase rams from saleyards.

These rams are somebody else's culls and are there for a reason. Unfortunately there are still graziers who buy cheap and often diseased rams at saleyards for use in their flocks.

Surplus rams should be sold for slaughter unless they originate from an Ovine Brucellosis Accredited flock or from a flock which has tested negative for the disease within the previous 30 days. Stud owners should take similar precautions.

Any rams returning from shows and sales must be kept segregated from all other sheep for at least 60 days unless the show or sale has been restricted to rams from flocks free of infection. After 60 days, the rams should be blood tested to ensure that they were not exposed to infection at the show or sale.

New South Wales Ovine Brucellosis Accreditation Scheme

The New South Wales Ovine Brucellosis Accreditation Scheme, which commenced in January 1981 provides ram buyers with a list of studs from which they can purchase rams free of ovine brucellosis.

The scheme is voluntary and requires participants to follow strict biosecurity guidelines to maintain disease free flocks. There are requirements for regular manual palpation and blood testing of rams to ensure that biosecurity practices are working well. There are three levels of accreditation as flocks progress through the testing regime. More information can be found at

<http://www.dpi.nsw.gov.au/content/agriculture/livestock/sheep/health/ovine-brucellosis-scheme>

Acknowledgments

This Primefact has been adapted from version 2, written by Dr John Plant, former Program Leader Flock Health NSW Agriculture and John Seaman, former Senior Veterinary Officer with NSW DPI.

For updates go to www.dpi.nsw.gov.au/factsheets

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