



Ovine brucellosis

Doug Harris, Swan Hill

July, 1998

AG0365

ISSN 1329-8062

This Agriculture Note describes ovine brucellosis and its damaging effects.

Introduction

Ovine brucellosis (OB) is a bacterial disease of sheep found throughout Australia and characterised by infertility in rams. In countries without control procedures as many as 75% of ram flocks and 80% of rams within infected flocks can be infected. The prevalence of OB in Australia has been reduced by the operation of OB-free accreditation programs for registered flocks and other regulatory and voluntary control measures. Two-thirds of registered flocks in Victoria are OB-free accredited. OB exists in between 15% and 60% of untested ram flocks, depending on region, farmer awareness of the problem and their ability to keep rams within property boundaries.

Nature of infection

The causative bacterium, *Brucella ovis*, is confined to sheep. Infection can be spread from ram to ram directly or via the ewe. Ewes rarely become infected but can infect clean rams by exposing them to infected semen from a recent previous mating. By contrast, rams usually become permanently infected and excrete bacteria periodically in the semen. Sodomy is the most common way that rams become infected.

Obvious lesions can be palpated in the testes and epididymides of about 40% of infected rams. The percentage tends to be lower in recently infected flocks. Rams in chronically infected flocks tend to have more gross lesions and the lesions are more distorted in shape. Most OB lesions are in the tail of the epididymis although lesions in the testes are also common. Both sides can be affected, but unilateral lesions are more common. Infection causes inflammation and swelling. Swelling in the epididymis, which functions as a tube for the transport of semen, can cause a partial or complete blockage and a build-up of semen that increases the size of the swelling. Affected testes can be swollen, or shrunken, hard and irregular in shape.

Most infected rams without obvious scrotal lesions have microscopic lesions in the epididymides or testes, or lesions in non-scrotal tissues such as the accessory sex glands.

Most scrotal lesions, but not all, are due to OB. Abscesses or infected wounds can be distinguished from OB because

they usually discharge pus. Swelling due to an injury or hernia will usually affect only one ram. However some causes of lesions (eg. *Actinobacillus seminis*) can affect several rams and cannot be palpably distinguished from OB.

Effect on flock fertility

Infected rams usually produce semen of lower quality, making them either subfertile or sterile, depending on the site and severity of the lesions. The effect on flock fertility will also depend on the percentage of infected rams and flock breeding management.

In flocks joined for a restricted period, say six to eight weeks, a reduction of up to 30% in lamb marking percentage is likely if more than 10% of the rams have OB.

In flocks joined for extended periods, ewes that fail to conceive because of low semen quality will return to service at 17 day intervals and many will eventually conceive. This will result in an *extended lambing period*, with attendant problems of inefficient feed utilisation, the simultaneous underfeeding and overfeeding of ewes in the flock at any given time (due to ewes being at different stages in the pregnancy/lactation cycle), higher ewe and lamb death rates (due to metabolic disorders and mismothering), decreased wool value (more variable in length and quality) and less efficient marketing of prime lambs (variable weight and condition score). In these flocks lamb marking percentage can be a very inadequate indicator of breeding efficiency.

The management of infected ram flocks is very important. If the presence of infected rams is ignored, the patterns of low lamb marking percentages or extended lambing periods can be repeated year after year, and accepted as normal. If rams with palpable lesions or that react positively to irregular ram-flock blood tests are culled, without completing an eradication program, *the turnover and cost of rams will be high*, and the problem of poor fertility will remain. Eradication is the only real solution. The effects of OB are often insidious and unrecognised, especially in areas where marked fluctuations in fertility occur due to variation in ewe nutrition, clover disease, predation by foxes, or other circumstances.

Breed differences in susceptibility to OB are seen in some regions. For example, in the Mallee the prevalence of OB infection is less in Merino than in non-Merino ram flocks,

and the proportion of infected rams is less in infected Merino flocks. However all breeds are susceptible.

Diagnosis

Systematic scrotal palpation

This is a vital step in examining rams for soundness and monitoring them for OB. This should be done by the farmer as a normal part of the preparation of a ram team for mating and when rams to be purchased are being examined. The detection of any lesions, irregularities or differences between the contents of the two sides of the scrotum that cannot be otherwise explained should result in either confirmatory blood testing for OB or, in the case of rams being considered for purchase, in the rejection of all rams from that source. OB-free accreditation is a valuable insurance, but not a guarantee, that the rams being offered for sale are OB-free.

Blood testing

Blood testing detects antibodies that indicates exposure to OB infection. Culling the positive reactors and the small percentage of infected rams that develop scrotal lesions without a positive blood test reaction is the usual basis for eradicating OB from infected flocks.

Semen examination

This can reveal sperm abnormalities or *Brucella ovis* organisms. It can be useful to detect the very small proportion of infected rams that do not develop gross lesions or a positive blood test.

Control

Since 1974, OB control measures in Victoria have included a voluntary accreditation scheme for ram breeders, flock or ram OB-status requirements to enter shows and sales, and interstate movement controls. Commercial flock testing has been limited; testing has usually been in response to a low lamb marking percentage, and often without following through to eradication.

The OB-free accreditation of stud flocks requires two successive negative tests of all rams (including teasers) at an interval of not less than 60 days nor more than 180 days. The first test includes all rams over the age of six months; the second is confined to rams over the age of 12 months that have been used, or are intended for use, on the property. Testing is by a veterinary surgeon and involves blood sampling and a manual examination. When positive reactors to the blood test are found, they are removed from the flock and the remaining rams retested until at least three consecutive negative flock tests are obtained. The first two negative tests are to be no less than 60 days apart and the third negative test is to be post-joining and between six months and eight months after the second negative test.

Repeated flock testing is necessary to eradicate OB because rams take between 10 and 60 days, and sometimes longer after exposure to infection, to show a positive blood test.

In infected commercial flocks a process of eradication similar to that for OB-free accreditation is recommended. That is, obtaining two negative flock tests at least 30 days and 90 days after removal of the last infected ram, is a practical procedure that usually achieves eradication. It is good insurance to monitor flock freedom by manual palpation.

Once OB-freedom is established in a flock, it is important to maintain that status.

- *Replacement rams* should only come directly from OB-free accredited flocks and have no palpable scrotal lesions. Rams described as "tested negative" must be regarded as having a suspect status unless it is known that the test was a blood test, that it was conducted recently, that all rams on the property were tested and negative, that there was no recent history of OB on the property, and that boundary fences around the property were ram-proof.
- *Bought ewes* should not be joined with OB-free rams unless it is known that no rams of positive or unknown status have been with the ewes in the previous three weeks.
- *Agisted sheep* can expose clean sheep to infection.
- *Straying sheep*, especially rams, are the main reason for the very high prevalence of infection in areas such as the Mallee. Rams should be excluded from paddocks with inadequate boundary fences, to prevent them getting out. However it is more difficult to prevent stray sheep from getting in. Commonly a ram will get in and then leave after introducing infection. "Rogue" rams, especially non-Merino rams, are known to travel many kilometers within a few days, visiting many flocks along the way.

Secure boundary fences are essential to maintain OB-freedom, especially in areas with a high prevalence of OB.

The recent proclamation of the Mallee as a Control Area for OB is an industry-driven initiative to increase the productivity and profitability of sheep enterprises by systematically eradicating OB from farms in the area and preventing its reintroduction. The Victorian Farmers Federation resolution to create the Control Area is backed by regulations under the Livestock Disease Control Act 1994. If successful this model could form the basis for a similar statewide program.

Further information

Further information on any aspect of this Agnote can be obtained by contacting Animal Health staff at your local DPI office.

The advice provided in this publication is intended as a source of information only. Always read the label before using any of the products mentioned. The State of Victoria and its employees do not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for any error, loss or other consequence which may arise from you relying on any information in this publication.