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NSW DEPARTMENT OF
PRIMARY INDUSTRIES

Cheesy Gland Caseous Lymphadenitis in Sheep

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Belinda Walker, Veterinary Officer,
Division of Animal Industries

Cheesy gland or caseous lymphadenitis (CLA) in sheep is a bacterial disease of sheep causing abscesses in lymph nodes of the body and internal organs, especially the lungs. The main cost of the disease to the sheep industry is through the loss of wool production that occurs in affected sheep and losses through condemnation and trimming of carcases at abattoirs.

An abattoir survey conducted by NSW Agriculture in 1995 showed that 97% of flocks studied in NSW were infected with cheesy gland. This is even worse than in other states. Similar surveys have found a cheesy gland prevalence of 91% in Victoria, and 88% in Western Australia. Most sheep producers do not realise that the disease is so common.

CAUSE

Cheesy gland is caused by the bacterium *Corynebacterium pseudotuberculosis*. The organism is usually filtered from the bloodstream by the lymph nodes, where it becomes trapped. A toxin is produced which destroys the lymph node tissue. Large abscesses then form.

The pus within these abscesses gradually dries out and becomes "cheesy" in appearance hence the common name cheesy gland.

EFFECTS OF DISEASE

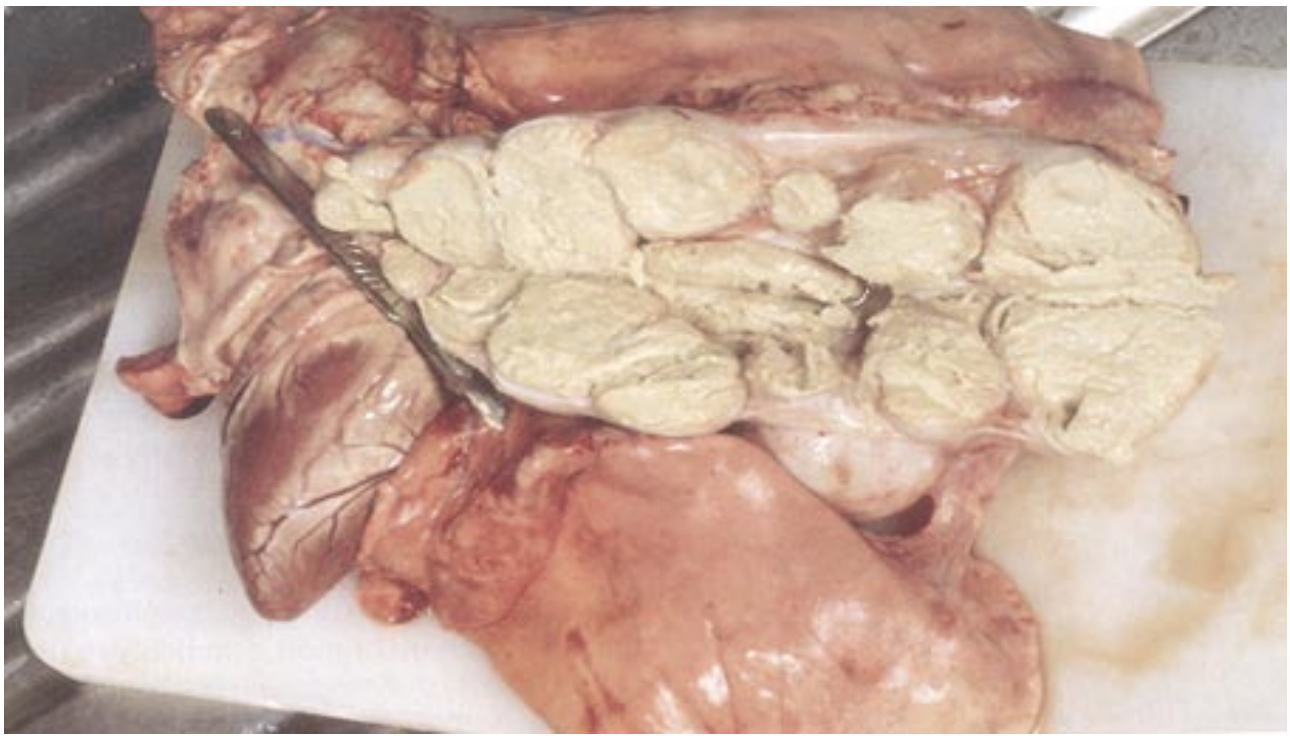
Abscesses may form in any lymph node in the body, but occur most commonly in the superficial lymph nodes of the shoulder and the flank. These may occasionally rupture, but are more often cut open at shearing.

Abscesses may also occur in the lungs, liver, spleen and kidneys. In sheep with infected lungs abscesses may burst into the air sacs. Infective material is then coughed up.

While abscesses are forming and the sheep are fighting the infection there is usually a fever, but this often goes unnoticed. During this period there is decreased wool production (see economic significance below).

Severe chronic infection may result in illthrift and emaciation in adult sheep, with subsequent poor reproductive performance. Cheesy gland

A carcase showing an example of cheesy gland, detected during inspection at the abattoir.



This photo shows severely infected lymph nodes between the lungs. A producer could be unaware of this infection.

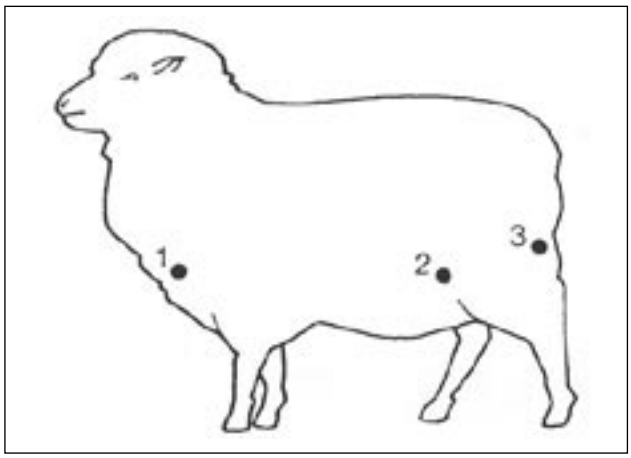
can also occasionally cause mastitis in ewes, and has been suspected of causing uterine infections. Ram fertility can also be affected by abscesses forming in or near the testes.

ECONOMIC SIGNIFICANCE

Research done in Western Australia has shown that an average of 0.2–0.25kg wool, or 4–7% of clean fleece weight is lost in the year of infection. Because sheep are usually infected at their first or second shearing, this loss is incurred when the wool is at its finest, and therefore most valuable.

Further losses occur due to condemnation and trimming of carcases at abattoirs. Some 75% of a meat inspector's time on the sheep chain is spent checking for and removing cheesy gland. This adds considerably to killing costs.

Lymph nodes where Cheesy Gland commonly occurs – point of the shoulder (1) and in the flanks (2 and 3).



METHODS OF SPREAD

The main method of spread is thought to be from sheep with infected lungs. These sheep cough onto fresh shearing cuts on sheep confined with them after shearing. Pus from abscesses cut open at shearing is also a source of infection.

Protection from wind and sunlight prolongs the survival of the bacteria. Research has demonstrated that holding the sheep under cover for an hour after shearing almost doubles the risk of infection.

Dipping off shears, when the dip becomes contaminated with pus, is also important in the spread of cheesy gland.

Plunge or shower dipping increases the chance of infection 5–8 fold. Infection can occur even if no cuts are present. The bacteria are able to pass through intact skin, and into the blood, even if sheep are dipped several months after shearing. (Presumably in this situation, coughed up infected material must be sufficient to contaminate the dipping fluid.)

Spread occurs via the bloodstream, and the lymphatic system.

The importance of dipping in the spread of infection is shown by the combined results of the surveys from three States. In flocks not treated at all for lice, the prevalence of cheesy gland was half that found in flocks where dipping was necessary. (Table 1.)

Table 1. Prevalence of CLA associated with different lice control practices

Lice control method	Producers using this method %	Average CLA prevalence for this method %
None	6	14
Plunge dip	37	29
Shower dip	39	31
Blackline	22	27

An unexpected finding was that CLA prevalence when backlines were used was similar to that of other methods. This may relate to the fact that if backlines are to be used, sheep are held together for longer after shearing, allowing more opportunity for the disease to be spread through coughing.

VACCINATION PROGRAM

Vaccination against cheesy gland is very effective.

Survey data from three States show that a full vaccination program reduced the level of cheesy gland in their flocks to an average of 3 per cent (see Table 2). The average prevalence found over all flocks sampled in the surveys was 29 per cent, with a range of 0–100 per cent.

Table 2. The average CLA prevalence associated with using different CLA vaccination programs

Cheesy gland vaccination program used	Resulting incidence of cheesy gland %
Complete program 2 shots plus annual boosters	3
Incomplete program No vaccination	29
1 shot as lamb, no booster	33
1 shot as lamb plus booster	31
2 shots as lamb, no booster	22

The vaccine used is combined with 5-in-1 vaccination against clostridial disease. It is commonly known as 6-in-1.

Also available is a CLA vaccine combined with a pulpy kidney and tetanus 2-in-1 vaccine. This is known as 3-in-1. The latter vaccine may be used in areas where other clostridial diseases – black disease, blackleg, swelled head of rams, and malignant oedema – are not a problem.

Because combined vaccination is being performed in an effort to control more than one type of disease, there may be a conflict of interest when it comes to timing booster injections.

- The best time to give a booster to a ewe to protect lambs from pulpy kidney (5-in-1 component) is several weeks before lambing.
- The best time to give a booster to protect the ewes from cheesy gland (6-in-1 component) is several weeks before shearing.

These dates do not often coincide. In most enterprises, vaccination of ewes to protect lambs against pulpy kidney is given the highest priority. Losses from pulpy kidney are more obvious and are seen to be the bigger problem. This may well be the correct approach on many properties, particularly where ewes are lambing on lush pastures.

However, the hidden cost of cheesy gland should not be forgotten. Shearing is the time of greatest risk, so where possible the booster vaccination should be given at least three weeks before shearing rather than at shearing. Boosters

Vaccinate lambs under the loose skin at the base of the ear.

at shearing do not allow time for adequate immunity to develop and will not give full protection from cheesy gland.

Even boosters given several months before shearing will give better protection against cheesy gland than boosters given at shearing. This fact may allow for some compromise in timing 6-in-1 vaccination, so that pulpy kidney protection and cheesy gland protection are both adequate.

The most practical program for cheesy gland would be for lambs to be vaccinated at marking and again at weaning, followed by an annual booster 4–6 weeks before shearing.

WARNING

As with most vaccination programs it is critical that two doses of vaccine are given close together to establish good immunity in the first place.
Lambs must be vaccinated twice before their first shearing if protection is to be adequate.

Depending on how much of a problem there is with pulpy kidney, and the timing of lambing and shearing, it may be possible to give the annual booster at the summer drench, or at crutching.

A single dose of 6-in-1 at marking is useless as protection against cheesy gland. This was the most common practice according to our survey. After a couple of weeks lag time, a single dose of vaccine will give at best a few weeks protection against clostridial disease. This practice is a waste of time and money in a wool production enterprise.

The program adopted for your situation is best discussed with your veterinarian.

OTHER CONTROL MEASURES

Other logical steps that should be taken to reduce spread of the disease, are:

- Shear young sheep first.
- Ensure good hygiene in the shearing shed.
- To reduce risk from close contact, release sheep from the yards as quickly as possible after shearing and any other management practices (such as backlining).
- Avoid wet dipping off shears unless correctly vaccinated, several weeks before shearing.

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