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S G. Gherardi
S. S. Sutherland
N. Monzu

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'DERMO', FLEECE ROT AND BODY STRIKE on sheep

By S. G. Gherardi, Research Officer, Sheep and Wool Branch; S. S. Sutherland, Microbiologist, Animal Health Laboratories; and N. Monzu, Entomologist

Blowfly strike is one of the major problems confronting the sheep industry in Australia, with an estimated total cost of control exceeding $100 million each year.

Sheep are susceptible to five types of strike: body, breech, poll, pizzle and wound. Body strike, which occurs less regularly than breech strike, is of greater economic importance because its sporadic occurrence from year to year makes it difficult to predict and control. Outbreaks of body strike after rain can affect large numbers of sheep and inflict severe production losses.

In eastern Australia fleece rot is generally considered to be the main predisposing factor to blowfly strike, but in Western Australia evidence suggests that dermatophilosis—or 'dermo'—is the more important factor.

Dermatophilosis

Dermatophilosis ('lumpy wool' or 'dermo') is caused by a bacteria Dermatophilus congolensis which attacks the sheep's skin. The infective stage of the organism, the motile (free-swimming) zoospore, must penetrate the fleece, the protective wax covering the wool and skin and the outer-most layer of the skin. Field infections are only possible when these protective barriers are naturally deficient or have been damaged at shearing.

The products resulting from the infection combine with the wool fibres to form lumpy lesions or scabs. Under dry conditions, the lesions generally heal and the scabs will eventually lift, leaving normal, wool-producing skin beneath. With chronic lesions which can take up to a year or more to heal, a persistent lesion develops along the whole length of the staple.

Dermatophilosis is widespread and particularly prevalent on young Merino sheep in the medium (350 to 550 millimetres) and high (above 550 mm) average annual rainfall areas of Western Australia.

Sheep can become infected on the woolled areas either as lambs immediately after birth and up to lamb shearing or as weaners or hoggets between lamb and hogget shearing. Older sheep are generally less affected except when they are moved from low to high rainfall areas. Lesions are found predominantly on a sheep's backline, but they may extend over the sides or neck. Sheep which are not affected on the woolled areas may have lesions on the face and ears.

Dermatophilosis lesions reduce fleece and skin values, but the major economic cost is that the lesions attract blowflies, making the sheep susceptible to body strike. Where the lesions...
are generalised, particularly on lambs, they can restrict the animal's movement, resulting in loss of condition and even death.

**Fleece rot**

Fleece rot is the name given to a superficial dermatitis of the sheep's backline. It can affect young and old sheep and is caused by prolonged wetting and subsequent multiplication of bacteria particularly *Pseudomonas aeruginosa*. The withers are the most commonly affected, with the shoulder, neck, sides and loins less affected.

The prolonged wetting inflames the skin and results in the production of a watery exudate which accumulates in the fleece, binds the fibres together and forms matted bands. The bacteria can produce yellow, brown, green, blue or red pigments which cause the characteristic staining seen in active fleece rot lesions. With time these pigments disappear, leaving brownish lesions.

For fleece rot to develop the skin must remain wet for up to four to five days. Fleece rot, therefore, is more prevalent in the higher rainfall areas, particularly in very wet seasons. Warm weather may also be important as fleece rot can be seen in spring, autumn and in wet summers.

**The research**

In 1979, the Department of Agriculture started a programme to examine the roles of dermatophilosis and fleece rot and their association with body strike on sheep.

Techniques were developed for rearing the Australian sheep blowfly (*Lucilia cuprina*) in the laboratory and for exposing sheep to flies in a controlled environment.

These studies showed that wet dermatophilosis lesions were sufficiently attractive to stimulate female blowflies to lay their eggs, and that the lesions provided enough protein to allow the hatched larvae to develop at 14 of the 16 affected sites exposed. Contrary to the belief of previous workers, strikes occurred when fleece rot was not present at these sites.

Field trials were undertaken at Mt Barker Research Station in 1979. Two hundred and thirty seven lambs were inspected before and after they were struck. Forty per cent of the lambs infected with dermatophilosis and 10 per cent of those infected with fleece rot were struck. Twenty seven per cent of the lambs infected with dermatophilosis plus fleece rot were struck.

Dermatophilosis lesions alone proved sufficiently attractive to blowflies to cause body strike in sheep.

A large scale field investigation on the south coast in 1981-83 examined the association between dermatophilosis and fleece rot with body strike on sheep. Before the spring and autumn blowfly strike seasons, flocks of lambs and hoggets were inspected for dermatophilosis and fleece rot. All resultant body strikes were related to the previously recorded lesions.

Dermatophilosis was more prevalent than fleece rot or both dermatophilosis plus fleece rot in three of the four periods studied (Table 1). However in spring 1982 fleece rot was more prevalent.

This greater occurrence of dermatophilosis was associated with a high incidence of strike within the sheep studied. More strikes occurred on sheep infected with dermatophilosis than those infected with fleece rot (Table 2). The most strikes, however, were on sheep with both dermatophilosis plus fleece rot, particularly in lesions where both infections were evident. It appeared that fleece rot was only important in strike when it occurred in association with dermatophilosis.

<table>
<thead>
<tr>
<th>Season and year</th>
<th>Dermatophilosis Average (range)</th>
<th>Fleece rot Average (range)</th>
<th>Dermatophilosis plus fleece rot Average (range)</th>
<th>Neither Average (range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring 1981 (10)*</td>
<td>25.7 (1.6-84.9)</td>
<td>5.3 (0-16.4)</td>
<td>2.6 (0-8.0)</td>
<td>66.3 (14.2-94.9)</td>
</tr>
<tr>
<td>Autumn 1982 (11)</td>
<td>19.6 (0-60.0)</td>
<td>11.2 (0-31.1)</td>
<td>9.1 (0-29.7)</td>
<td>60.1 (30.3-100)</td>
</tr>
<tr>
<td>Spring 1982 (10)</td>
<td>8.1 (0-26.8)</td>
<td>13.7 (0-26.6)</td>
<td>4.0 (0-14.4)</td>
<td>74.1 (53.6-100)</td>
</tr>
<tr>
<td>Autumn 1983 (8)</td>
<td>21.1 (2.6-59.2)</td>
<td>0.5 (0-1.1)</td>
<td>0.9 (0-2.8)</td>
<td>77.4 (39.0-97.5)</td>
</tr>
</tbody>
</table>

*Number of flocks inspected.
Strike prevalence

Because there are two distinct blowfly strike periods in spring and autumn, it is possible to speculate on the potential of the skin and fleece conditions present in predisposing sheep to body strike.

During autumn-winter lambing, dermatophilosis lesions can develop on susceptible lambs over the wet months and the lambs may be struck during the following spring strike wave. Fleece rot lesions can develop in susceptible lambs over the warmer spring, provided their skin is kept continuously moist for four to five days. Fortunately, the openness of lambs’ fleeces promotes rapid drying of the skin, producing conditions unfavourable for the development of fleece rot. Observations of strikes on lambs have shown that dermatophilosis lesions are more attractive for egg-laying and strike by blowflies than fleece rot lesions.

Following spring shearing, all lifted dermatophilosis and fleece rot lesions are removed, reducing the potential susceptibility of the weaners to strike.

Any active dermatophilosis lesions at shearing will remain in the fleece and in most cases lift during summer. These lesions, when present in the tip of the fleece, can become susceptible to strike after a very small amount of rainfall during summer and autumn. These lifted lesions, as well as any new dermatophilosis and fleece rot lesions that develop, will make weaners susceptible to strike during the autumn strike period.

Hoggets are also susceptible to body strike in spring before shearing. The prevalence of dermatophilosis is lower in hoggets than in lambs if lesions have occurred before lamb shearing. Where the lesions have occurred after lamb shearing, there is more dermatophilosis in hoggets.

Current research

Follow-up research will involve a more detailed description of dermatophilosis and fleece rot lesions to provide a measure of their relative susceptibility to strike. In addition to the previous information collected on position, area and stage of development of lesions, observations are also being made on the size and the density of scabs within individual dermatophilosis lesions and their location along the staple, and the width and location of the fleece rot band along the staple.

The above observations, in conjunction with measurements of amount and type of rainfall, maximum temperature and wind speed and information on the presence of the Australian sheep blowfly, should provide the necessary information for predicting an imminent strike period. This would provide farmers with the information required for the strategic use of insecticide to prevent body strike on sheep.

Acknowledgements

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Table 2. The percentage incidence of body strike in sheep infected with dermatophilosis and fleece rot on the south coast.

<table>
<thead>
<tr>
<th>Season and year</th>
<th>Dermatophilosis</th>
<th>Fleece rot</th>
<th>Dermatophilosis plus fleece rot</th>
<th>Neither</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring 1981 (5)*</td>
<td>7.0</td>
<td>0.7</td>
<td>9.0</td>
<td>0.1</td>
</tr>
<tr>
<td>Autumn 1982 (4)</td>
<td>8.7</td>
<td>1.1</td>
<td>11.9</td>
<td>0.2</td>
</tr>
<tr>
<td>Spring 1982 (6)</td>
<td>6.1</td>
<td>0</td>
<td>9.3</td>
<td>0.2</td>
</tr>
<tr>
<td>Autumn 1983 (1)</td>
<td>4.4</td>
<td>0</td>
<td>25.0</td>
<td>0</td>
</tr>
<tr>
<td>Overall</td>
<td>7.3† (121)‡</td>
<td>0.5 (3)</td>
<td>11.1 (64)</td>
<td>0.2 (6)</td>
</tr>
</tbody>
</table>

* Number of flocks on which strikes were recorded. † Percentage of total number of affected sheep struck. ‡ Total number of sheep struck.

References


