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Mycotic dermatitis (lumpy wool) of sheep

Erratum
CORRECTION "Mycotic Dermatitis (Lumpy Wool) of Sheep"—July Journal of Agriculture. Page 185, column 2, line 3 should read—"at the rate of 32,000 units per lb. of body weight."
MYCOTIC DERMATITIS (LUMPY WOOL) OF SHEEP

MYCOTIC dermatitis is a common disease of the skin and overlying wool of sheep (and other herbivorous animals). The photographs show the typical crusts and scabs which result from infection of skin, hair and wool follicles by the mycotic dermatitis organism.

Eventually, dense horny projections of altered wool, matted together by the products of inflammation, form in the fleece. These are usually on the back or sides but sometimes on the legs and feet, and in the hair around the lips.

The organism

The infecting organism is a bacterium (not fungus as the term “mycotic” implies) which survives mainly in small areas on the haired skin on the ears and face of some sheep in most flocks, as flattish, light-coloured scabs.

By M. R. GARDINER*

The external symptoms of lumpy wool: matted furrows in the wool on the back and flanks, and wool readily detached from the skin.

Originating from mildly affected animals, the disease is a nuisance in many sheep flocks, with economic consequences if left unchecked.

This article reviews the causes of lumpy wool infection and sets out control measures.

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Under most conditions the organism does not survive for long in the soil, so that infection is invariably from chronically infected sheep.

Motile, highly active cells are liberated about 2 hours after an infected scab is wetted, and more and more of these cells become available during the next 24 hours. To produce lumpy wool infection, these motile cells must penetrate the surface layer of the woolled skin, on the same sheep or on another animal.

**Mode of infection**

Penetration of skin by motile cells is normally prevented or hindered by the hair or fleece, the thin layer of waxy material covering the skin, and the outside layer of skin (epidermis).

One or more of these barriers must be breached before an animal can become infected. Infection involves one or more of the following:

*Age.* Young lambs are deficient in skin surface wax and are therefore very susceptible to infection.

*Prolonged rain or wetting.* This may disperse or disrupt the waxy layer and soften the superficial skin cells enough to allow infection to enter. Infection coinciding with rain run-off channels in the fleece is sometimes seen extending from developed lumpy wool lesions located higher up on the back.

*Shearing.* This removes the protective hair or wool and may damage the skin.

*Scalding.* This is due to softening and dissolving of the surface of the skin by irritating agents such as a dipping fluid that remains too long in the fleece.

*Biting insects.* These can mechanically introduce infectious material into the skin. Rabbits have been experimentally infected from the attachment of infected ticks and from the activity of both biting and non-biting flies, and severe outbreaks of lumpy wool in lambs have often followed mosquito waves that occur after long wet periods or after flooding. Insect plagues after wet weather can coincide with an increase in susceptible sheep with rain-damaged skin.

Lumpy wool lesions wet from prolonged rain or from delayed drying after dipping are attractive to flies, which may then transmit the infection to other sheep that have become susceptible. Most active infection in sheep begins in late spring and early summer when biting insects are most prevalent.

*Grass seeds and prickly plants.* Outbreaks of mycotic dermatitis on the legs and feet are often associated with pastures containing prickly plants or heavily infested with grass seed. These puncture the skin, allowing the infective motile cells to enter.

*Resistance and immunity.* After the organisms have started the inflammation, the sheep usually...
develop a resistance reaction, which makes it less susceptible to further infection and brings about earlier healing. Older sheep are, therefore, usually more resistant than young ones.

**Relationship of dipping to mycotic dermatitis**

There is no evidence that dipping or spraying can transmit the disease, even if the fluids are contaminated with the lumpy wool organism. It has been reported in South Australia that outbreaks of lumpy wool are seldom seen in sheep dipped within a week or two of shearing even though shearing cuts are common. There are a number of reports, however, of outbreaks in flocks dipped 2 or more months after shearing. These cases are almost certainly due to retention of water in the fleece with resulting scald and infection from insects.

Transmission by close contact between infected and susceptible sheep is supported by some experimental evidence but natural spread by this means is probably unimportant. Well-known trials carried out in Australia some years ago were unsuccessful in spreading the disease by close confinement of infected and clean sheep which were wetted frequently.

**Economic consequences of mycotic dermatitis**

Changes in the wool of infected sheep are usually economically unimportant as far as the fleece itself is concerned since the hard, scabby crusts readily scour out, but the value of a badly affected fleece may be reduced.

The more harmful results of the disease are:
- Wet and active lesions are attractive to flies and may result in body blowfly strike.
- Active mycotic dermatitis can make the fleece more susceptible to secondary bacterial damage (fleece rot) which can greatly reduce its value.
- Young lambs may die from uncomplicated mycotic dermatitis or secondary infections.
- Active lesions may interfere with shearing.

**Control and treatment**

Treatment by spraying with zinc sulphate and other anti-fungal solutions has been shown to have little effect.

Infected sheep can be cured by the intramuscular injection of streptomycin (or dihydrostreptomycin) at the rate of 32 mg. per lb. body weight together with procaine penicillin at the rate of 320,000 units per lb. of body weight. Penicillin by itself has no value but it does increase the killing effect of streptomycin on the organism. A 110 lb. sheep should receive 3.5 grams of streptomycin (or dihydrostreptomycin) and 3½ million units of procaine penicillin. A good rule of thumb is to use 1 ml. per 11 lb. of body weight of a product containing ½ gram streptomycin and 250,000 units procaine penicillin per ml.

Any control programme for mycotic dermatitis must first consider the economic consequences of the disease. If, as appears to be mostly the case, the disease does not have much effect on flock health or on wool returns, treatment with antibiotics would probably not be justified except in severe outbreaks in young lambs or where secondary blowfly attack is likely. Most cases of lumpy wool will resolve and only a few are so extensive towards shearing time that action has to be taken. Such affected sheep should be treated about 8 weeks before shearing so that the scabs will lift and make efficient shearing possible.

In any control programme for mycotic dermatitis the following facts should be kept in mind:
- There are probably always some sheep in any flock that are chronically infected on the face and ears.
- These infected sheep must become thoroughly wet before the organism of mycotic dermatitis can be liberated and infect the woolled skin of sheep.
- Infection is most commonly transmitted by flies and other biting insects.
- Sheep are only susceptible to infection if the protective barriers of wool, wax and surface skin are breached.
- Dipping, in itself, is probably unimportant in transmitting infection but may result in scalding of the skin, which makes infection from other sources easier.
- Irritating chemicals should not be used in dips, and sheep should be protected from skin damaging agents such as grass seeds and prickly plants.