Diseases following upon lamb marking

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DISEASES FOLLOWING UPON LAMB-MARKING

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LAMB-MARKING is an essential feature of the flockowner's annual programme and includes ear-marking, tail-docking and the castration of male lambs. Because these operations result in the infliction of wounds or the destruction of tissues, they provide ideal sites for the entry and multiplication of disease germs unless precautions are taken to guard against infection.

The principal diseases which are apt to occur following marking operations are tetanus, arthritis, gangrene and caseous lymphadenitis (cheesy gland). Tetanus and gangrene can cause serious mortalities in lambs, while the other two diseases can be responsible for deformities and can seriously impair the animals' growth.

TETANUS

The micro-organisms or germs which cause tetanus are widely distributed as spores in the soils of cultivated lands and in animal droppings. For this reason, lamb-marking should never be carried out in old sheepyards, stockyards or other places where animal manure is, or has been, plentiful. The soil, and the dust rising from such yards can be heavily contaminated with tetanus spores and upon gaining access to a wound, the spores multiply rapidly and produce a deadly toxin or poison which affects the nervous system and causes the muscular contractions which are typical of this disease.

Unlike most other germ infections, the tetanus organisms themselves do not invade the live tissues and do not enter the bloodstream. They remain localised in the wound, inhabiting the dead tissues where they thrive and multiply in the absence of air. It is the poison which they produce which invades the bloodstream and causes the symptoms.

Method of Infection.

The tetanus spores have no ability to move and are carried from the surrounding sheep yards or paddocks to the wound or the wool around the wound in the dust and dirt. Sheep marked in sheep yards, where
there are usually greater numbers of spores, naturally have more chance of the spores becoming attached near the wound. This is especially so if the yards are dusty at marking time or the lambs are allowed to lie down.

Once these spores are present, nothing happens unless they become buried in the moist inflamed tissues of the marking wound. Here the spores, which are the sleeping stage, become active and multiply rapidly, resulting in a large number of tetanus germs all giving off their poison into the bloodstream of the lamb.

**Symptoms.**

These are usually seen from three to 21 days after the tetanus spores have gained entrance to the dead tissue.

The earliest symptom seen is a stilted gait, this being due to muscle contraction causing the sheep to be unable to bend its joints. This condition progresses until the stage is reached where the animal is unable to stand, so that a sheep affected by tetanus is almost invariably found stretched out on its side. The legs are rigidly extended and the head and neck bent backwards. Due to contraction of the jaw muscles, the jaws are locked together and the mouth cannot be opened, a symptom commonly known as “lock-jaw.”

The third eyelid, which is found in the inside corner of each eye and is not usually visible, is commonly seen half-way across the eyeball. If this symptom is seen and the lamb is stiff all over, there is little doubt that the lamb is suffering from tetanus. However, in some cases lambs will die from tetanus without the third eyelid becoming visible.

**Post Mortem.**

Nothing abnormal can be seen on opening a sheep which has died from tetanus.

**Treatment.**

Once the toxin has reached the nervous system and symptoms are present, treatment is of little value. The disease is usually fatal, death occurring within a few hours to a few days of the appearance. Recovery can occur even after symptoms have developed but such recoveries are rare.

**Prevention and Protection.**

Normally if lambs are marked in temporary yards where there are very few tetanus spores and then placed into a fresh green paddock, few cases of tetanus should be seen. When a sharp knife is used for marking and a clean cut is made, the resulting wound heals quickly with little moist dead tissue in which tetanus spores, even if present, can “come to life” and multiply. If, however, much bruising of tissue occurs due to using a blunt knife, or if a dressing such as Stockholm tar is placed on the wound, there is delayed healing and much moist inflamed tissue in which the spores can develop.

On some properties, no matter what precautions are taken, cases of tetanus still occur and cause death. On these properties, the farmer has a choice of two products to prevent tetanus.

1. **Tetanus Anti-toxin.**—If 1 cc. of the commonly prepared anti-toxin is given as an injection under the skin, then the lamb will immediately be protected from tetanus toxin for at least two weeks. The anti-toxin is taken up by the bloodstream and immediately neutralises any toxin present in the blood. The cost of the anti-toxin is approximately 16s. per 100 sheep and the injection can be easily given with an automatic syringe and needle at marking time.

2. **Tetanus Toxoid.**—This product is a vaccine, which, if given as a 1 cc. injection under the skin confers to the lamb, a strong and lasting immunity. The immunity in this case builds up gradually over a period of 14 days from the time of injection. Consequently, it provides little protective value if injected at marking time as many cases of tetanus could occur before the immunity is built up. The cost of the toxoid is approximately the same as the anti-toxin.

If it is desired to give immediate protection at marking and also immunity for a year, 1 cc. of tetanus anti-toxin can be injected at one site and 1 cc. of tetanus toxoid at another site on the lamb.

The use of rubber rings with the resultant dead tissue, provides conditions somewhat similar to those produced by the blunt knife. On some properties, rubber rings have been used successfully for years without any cases of tetanus resulting, but on other properties, tetanus has become a
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source of alarming losses and owners have had to resort to the use of anti-toxin at the same time as marking to prevent losses. No matter which method of marking is used, a close watch should be kept on the lamb flock for at least three weeks following marking. Should cases of tetanus occur, it is advisable to administer anti-toxin to all the marked lambs. This provides an immediate protection to all unaffected lambs and prevents further losses.

**ARThRITIS**

This condition results from organisms, which are present in the soil, gaining entrance to the bloodstream by way of tailing and castration wounds. The organisms having gained entrance to the bloodstream show a predilection for the joints, especially those of the limbs, in which they set up inflammatory changes causing arthritis.

Two common types are seen in sheep in Western Australia.

1. **Suppurative type**—so called because the cavities of the affected joints are full of pus.
2. **Non-Suppurative type**—in which there is marked lameness, but often no swelling of the affected joints. This is by far the most common type seen in Western Australia.

**Symptoms.**

**Suppurative type.**—Usually occurs within two to three days of marking. Intense lameness with swelling of one or more joints is seen. In acute cases, large amounts of pus form, and the joint may burst, resulting in a discharge of pus. Frequently however, death occurs as the result of a toxaemia. In those cases which do recover, there is usually some permanent deformity resulting from the damage to the joint.

**Non-Suppurative type.**—This form commonly occurs 10 to 14 days after marking. Affected lambs are dull, cease to feed and spend much time lying down. When forced to move, they are obviously in much pain. If one leg only is affected, there is a distinct limp, while if two or more limbs are affected the gait becomes very stiff and cramped.

Externally, the affected joints often appear normal in appearance, although sometimes there is slight heat and swelling present. The joints commonly affected are the knee, hock and stifle joints.

In affected flocks, nearly all the lambs may develop the disease, while in others only occasional cases are seen.

Deaths from arthritis are not common, and losses of over 5 per cent. of the flock during the acute stage of the disease are rarely seen. The majority of the affected lambs make a complete recovery from a few days up to three weeks after the onset of symptoms. In a small percentage of cases, affected lambs become chronically lame and may cease to thrive. In the chronic cases, the affected joints are
usually enlarged and often the ends of the bones are joined together, so that the joint remains permanently stiff.

**Post Mortem.**

*Suppurative type.*—The affected joint cavities are full of yellow-green pus, and the ends of the bones which are normally smooth are eroded and very rough. Small abscesses may also be found in the liver or kidneys.

*Non-Suppurative type.*—On opening the affected joints, there is an excess of cloudy fluid and usually some roughening of the ends of the bones forming the joint surfaces. In chronic cases the tissues around the joint are thick and tough, while the joint surfaces are rough and uneven with (sometimes) adhesions present between their surfaces.

**Treatment.**

In the suppurative form of arthritis, early treatment with penicillin injections will kill the infective organism and help to bring about recovery of the affected lambs.

The majority of lambs affected with the non-suppurative type recover without treatment. As commonly nearly the whole of the flock is affected during an outbreak, and as any treatment used is expensive, treatment during the acute stage is of doubtful value. In sheep of special value, penicillin injections have proved useful if given before irreparable damage has been done to the joint.

**Prevention.**

As there is no protective vaccine for arthritis, the only means of prevention is to avoid the bacteria getting in through the marking wounds. The bacteria are usually more plentiful around the sheep yards and many cases can be avoided by marking in temporary yards in the paddock.

On some properties where the knife is used, cases are still seen even though every precaution is taken at marking. In these cases, the use of rubber rings may decrease the incidence of arthritis. Any owner changing over from the use of the knife to rubber rings should, however, be well aware of the increased possibility of deaths due to tetanus and gangrene infections.

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**Gangrene**

This is a wound infection caused by germs commonly known as gas-gangrene bacteria, which are commonly found in the soil and surroundings of the sheep yards. Ideal conditions for their development and growth are in dead or inflamed tissue which is still moist, such as a stump of a tail which has not healed properly or in the inflamed area surrounding a rubber ring. The gas-gangrene bacteria once established, multiply rapidly and gradually invade the normal healthy tissue adjoining the dead or inflamed part. They cause swelling and discolouration with much gas formation in the affected tissues. Toxins are produced which when absorbed into the general bloodstream, cause a blood poisoning which results in the death of the animal.

**Symptoms.**

If seen before death, the affected lambs are depressed and show some evidence of muscle tremors or a stiff gait in the hind legs. A close examination will show the skin around the wound to be a greenish-black colour. The area under the skin will be swollen and filled with gas so giving it a soft doughy feel.

**Post Mortem.**

Examination of a dead sheep will reveal a gangrenous condition of the muscle and the skin around the wound. When cut open the tissues around the wound will be seen to be full of gas bubbles and a reddish-brown or greenish-black fluid will come away.

**Treatment.**

This is not usually practicable in flock lambs, but with very valuable animals, penicillin injection to kill the infection and an anti-toxin to neutralise the absorbed toxins will increase the animal's chance of survival.

Opening of the swelling and washing out with hydrogen peroxide followed by the sprinkling of sulphonilamide powder into the wound is a cheap and fairly efficient method of treatment.

**Prevention.**

If normal hygiene measures are used at marking, no cases of gangrene should be seen.
Severe mortalities have been seen in lambs in which a ring has been placed around the tail and the tail cut off one-half inch below the ring, leaving one-half inch of dead tissue for the organisms to grow in. Other mortalities have been seen where the marking wounds have been dressed, using a piece of germ-laden wool to apply the medicament.

CASEOUS LYMPHADENITIS  
(CHEESY GLAND)

The bacterial micro-organisms causing this disease are usually present in large numbers in the soil and droppings around the sheep yards and at marking time they can gain entrance through the skin wounds. The bacteria enter the tissues and are usually arrested by the lymph (drainage) glands where they multiply rapidly to form abscesses. These abscesses which are full of yellow-green pus, usually become encased in fibrous tissue. When this occurs, the purulent material becomes calcified and the abscess remains in this form for the duration of the life of the sheep. Sometimes, however, they break through the skin and discharge their pus contents, then heal over. Occasionally organisms break out and enter the lymphatic system, only to be arrested in another gland where an abscess forms as already described. In rare cases, the organisms get into the bloodstream and are taken to the chest cavity where they multiply, growing into large abscesses and can cause death of the sheep.

Symptoms.

The only symptom seen in the live sheep is a swelling under the skin in cases where the superficial glands are involved. The glands commonly affected after marking are the flank glands and the thigh glands. At slaughter, the abscesses are readily seen when the skin has been removed. The abscesses can easily be taken out and if cut they are seen to contain a considerable amount of yellow-green pus which will be quite soft in a recent case, but hard and dry in an older case.

These abscesses are a source of considerable economic loss in connection with fat lamb production as the removal of affected glands at abattoirs prevents the acceptance of the carcass for export.

Prevention.

If hygienic methods are used and the lambs are marked away from the sheep yards, this disease should not be a problem. When rubber rings are used, very few cases of cheesy gland are seen.
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