Infectious abortion diseases in sheep

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There are increasing signs that infections causing abortion in sheep are an important source of lambing losses in Western Australia. The organisms responsible may cause losses at any time from the 60th day of pregnancy to a week after birth.

This article discusses the symptoms, effects and control of infectious abortion and associated losses, and outlines a research project started this year to investigate them.

ALTHOUGH Australia is the world's leading sheep producing country the reproductive efficiency of our flocks is surprisingly low. At least a third of the ewes mated in Australia each year fail to produce a lamb that survives to marking. This represents a loss of about 20,000,000 lambs a year.

In Western Australia this loss is at least 2,000,000 lambs a year—and about half of these are lost around lambing time.

This enormous wastage in itself indicates the national importance of the problems of pregnancy in sheep. It is a wastage we cannot afford if we are to produce more wool more economically to meet the competition from synthetic fibres.

Infections Can Cause Losses
During the past decade or so work carried out in many sheep-raising countries has shown that abortions and lamb losses soon after birth are commonly associated with infectious agents. Observations in England and New Zealand have indicated that over 37 per cent. of all lambs lost at about the time of birth suffer from some kind of infection.

Infectious abortion in sheep has probably been present in Australia for many years, but has not been recognised because of our rather extensive systems of husbandry.

Many farmers do not realise that they have a breeding problem in their flocks. The pressure of other work at lambing time often stops them from paying much attention to lambing ewes, so that they cannot be fully aware of how many lambs they are losing. Few keep records accurate enough to allow the number of lambs that die before marking to be determined.
ASES IN SHEEP

DEFINITIONS

The following definitions are given so that the exact meaning of terms used in this article will be readily understood:

Abortion: The expulsion of a visible foetus or lamb before it is capable of independent life.

Premature Birth: The expulsion of a lamb before full term that is capable of independent life.

Stillborn: A lamb born dead at full term.

Dystocia: A difficult birth.

Uterine Inertia: Failure of the muscles of the uterus to expel the lamb at full term.

Uterine Prolapse: An eversion of the uterus—that is, turning inside-out of the birth bag.

Perinatal Mortalities: Death of lambs just before and during birth, and within seven days of birth.

Neonatal Mortalities: Death of lambs within the first three or four days of life.

Post-abortion: Occurring after abortion.

Most of these terms are well known to farmers whose flocks have suffered from breeding troubles.

SYMPTOMS

It is not possible to consider the infectious agents responsible for abortion separately from those responsible for lambs born dead or dying after a normal pregnancy. The possible causes of one are also possible causes of the other. The time of abortion may vary.

Losses which could be caused by abortion are often blamed on predators such as foxes, and nothing is done about them.

For these reasons, certain specific types of abortion may occur without farmers becoming alarmed, and the significance of abortion in sheep cannot be assessed until it appears in epidemic form.

Infectious ovine abortion may be manifested by:

- The loss of lambs early in pregnancy without wool and hair covering (i.e., between 60-112 days).
- Loss of lambs with wool and hair later in pregnancy.
- Premature births.

If losses continue later in pregnancy they are referred to as perinatal mortalities and are manifested by:

- Stillbirths.
- Dystocias (difficult births).
- Weak full-term lambs that die within a few hours to three days after birth.
The term "abortion" is clearly far more embracing in sheep than in cattle, and it is more accurately an infectious abortion and perinatal lamb mortalities syndrome (or series of symptoms or signs).

Infectious abortion in sheep may occur at any time in the last six weeks of pregnancy but the great majority of cases occur two to three weeks before term, and merge imperceptibly into premature births, stillbirths and the production of weak, full-term lambs. The most characteristic signs are abortion in the last stages of pregnancy.

The younger ewes in a flock are those most likely to be affected.

Infectious abortion should not be confused with clover disease. Briefly, the main characteristics of clover disease are:

- Ewe infertility—failure to conceive.
- Dystocia due to uterine inertia.
- Heavy ewe and lamb mortalities.
- Lactation in maiden and non-pregnant ewes.
- Uterine prolapse.
- Lactation in wethers.
- "False bladder" in wethers.

Although these two diseases overlap to some extent, the pattern of losses is clear-cut. The most characteristic signs of infectious abortion producing diseases are abortion in the last weeks of pregnancy and premature births, while clover disease is associated with problems at full term such as dystocia, stillbirths, ewe and lamb mortalities. However, at times these two conditions may co-exist in the same flock and may lead to some confusion.

CAUSE AND SPREAD OF INFECTION

Most of the infectious agents causing abortion in sheep are acquired by the intake of feed or water contaminated by infected sheep. Organisms are excreted in large numbers from the vagina at the time of abortion and cause contamination of the soil, feed and possibly water. Fortunately these organisms cannot survive for long outside the animal body.

After ingestion by susceptible ewes the disease organisms enter the bloodstream and invade the pregnant uterus, where they grow in the placental tissues (afterbirth) and cause the death and premature expulsion of the lamb.

The cycle is then repeated by other ewes becoming infected.

Fresh outbreaks of disease in clean flocks are probably caused, in most cases, by the introduction of "carrier" sheep which harbour the infection in an inapparent form. These readily convey the infection to susceptible clean sheep grazing with them.

The important causes of infectious abortion of sheep are vibriosis, brucellosis, enzootic virus abortion, salmonellosis, toxoplasmosis, listeriosis and leptospirosis. Whether these all occur in Western Australia has yet to be determined and one of the aims of the present research project is to answer this question.

In nearly all of these infections evidence suggests that one attack of the disease confers an immunity against that particular organism, since the trouble is rarely experienced in the same flock in successive seasons.

AFTER-AFFECTS

The effect of abortion on the ewe varies. Most animals recover within a few days but some may remain dull and in poor condition for several weeks and some may die.

The after-effects of abortion are usually confined to a discharge from the uterus for a few days and may be accompanied by a temporary loss of condition due to a mild secondary uterine infection. The placenta, or afterbirth, which is normally expelled two to three hours after birth, is often retained for two or more days although sometimes the membranes are expelled partially covering the lamb.

Some 5 to 10 per cent. of the aborting ewes may die as the result of development of septic metritis (a very severe infection of the birth bag.) They usually die within a few days but sometimes only after several weeks of "fading away." Recovery is usually slower in ewes retaining the placenta.

No practical economic form of treatment is known that is likely to arrest the course of these diseases in infected flocks. Treatment of valuable individual sick ewes, however, is feasible.
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CONTROL

Control measures are based on preventing the ewe-to-ewe transmission of infection.

Any procedures that bring or tend to bring ewes together during pregnancy will favour the ewe-to-ewe transmission of these infecting organisms and help the spread of abortion, so should be avoided where possible. These include dam or soak watering, hand feeding and yarding for any purpose.

What part vermin play—foxes and crows—is not known at present, but evidence is accumulating which suggests that they may be implicated in spreading an outbreak.

Breeding flocks should be regularly checked at least once a day and kept under as close observation as possible. Remember that many of the earlier abortions go unnoticed.

Ewes should be carefully watched for any warning signs of abortion such as—

• Fly strike around the vulva (the discharging fluids readily attract blowflies).
• Vaginal discharges.
• Visible afterbirth hanging out.
• Sick or even dead ewes.

The first sign of trouble may be simply finding an aborted lamb.

The aborted fluids, the afterbirth and lamb, and all post-abortion vaginal discharges contain many millions of the causative microorganisms.

Above all else, these infected fluids and tissues should be kept away from the water and feed of the other pregnant ewes.

All lambs dead for any reason (aborted, premature or stillborn, etc.) and afterbirth, should be burnt or buried or dropped into a 44 gallon drum containing disinfectant.

All watering points should be elevated, and all yarding procedures kept to an absolute minimum.

If possible, isolate aborted, aborting or suspect aborting ewes in a special paddock for about 30 days, or at least until all discharges have ceased. Close the paddock for an additional 30 days after the end of lambing before re-stocking it.

WARNING

About half the agents which cause infectious abortion in sheep can be transmitted to man and are therefore a danger to human health. Strict hygiene should be observed in handling affected animals or animal tissues.

SURVEY AND RESEARCH PROJECT

The Department of Agriculture's Animal Health Laboratory is holding a preliminary survey to determine the incidence of infectious abortion and to identify the micro-organisms responsible.

It is hoped that the results of this survey will show the relative importance of infectious causes of abortion in sheep and how they fit into the overall picture of losses due to abortion and perinatal lamb mortalities. Other important information to be gained will be an estimate of the breeding efficiency of the sheep industry in the State and an indication of those aspects of breeding problems which are most in need of research.

First, with the help of the Farmers' Union and agricultural and farm advisers, a questionnaire dealing with breeding problems is being sent to all sheep breeders. If enough answers are received we should be able to give a representative picture for each of the major sheep breeding districts. Even negative answers will help achieve this aim.

Second, farmers are requested to report without delay, any abortions or suspected abortions, to their nearest Government veterinary surgeon, stock inspector, agricultural adviser, or private veterinary surgeon.

Specimens such as the aborted lamb, afterbirth, and possibly the ewe, will then be collected for forwarding to the Animal Health Laboratory at South Perth, where
veterinary pathologists will attempt to identify the organisms responsible. The quicker these specimens arrive the better. In fact it is best to bring them direct to the Animal Health Laboratory. The chances of making a diagnosis in an outbreak of abortion increase with the number of specimens examined and the _fresher_ they are the better.

Knowledge of the existence of abortion in several flocks in a district at the same time is invaluable to the Animal Health Laboratory so it is important that every outbreak should be reported. Such reports may give valuable information on the spread of infections.

The success of this project depends on your co-operation in reporting promptly, any breeding or suspected breeding problem in your flocks, and in returning a completed Infectious Abortion Survey questionnaire to the Animal Health Laboratory, Department of Agriculture, Jarrah Road, South Perth.
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