

NADIS Health Bulletin



Knowledge transfer to farmers

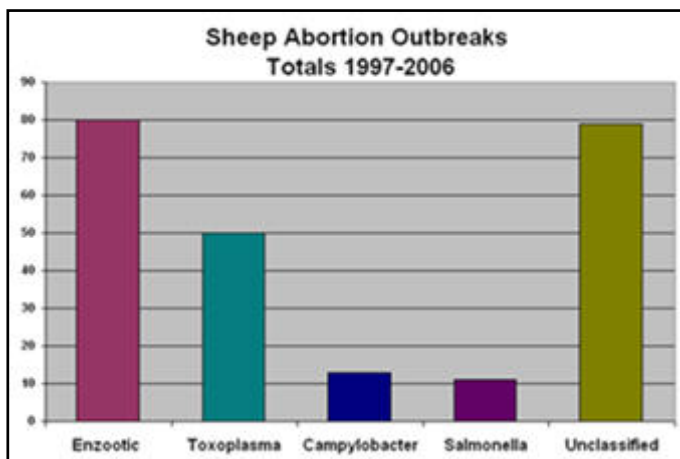
February 2007 - Infectious abortion in sheep

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Infectious causes of abortion are most common after day 120 of pregnancy. While sporadic losses are variably attributed to overcrowding, competition during feeding (Fig 1), handling procedures or movement, an abortion rate in excess of two per cent is suggestive of an infectious aetiology and veterinary investigation is strongly recommended. The farmer must isolate all suspect aborted sheep (Fig 2) and remove all aborted material. The risk to human health must be stressed to those attending sheep. Appropriate hygiene precautions must also extend to the household where infection could arise from the farmer's contaminated clothing and footwear.



Fig 1: Overcrowding and competition at the food trough are uncommon causes of abortion



Sample collection

The minimum requirements for laboratory submissions for abortion investigation include the foetus(es) or foetal stomach content, a piece of placenta, and a maternal serum sample (collected by the veterinary surgeon). It is important to collect aborted material throughout the outbreak as more than one agent may be present within the flock and such knowledge is essential when formulating treatment, control and prevention strategies.



Fig 2: All suspect aborted sheep must be isolated

The common infectious causes of abortion include:

- Chlamydial abortion: enzootic abortion of ewes (EAE), *Chlamydia abortus* infection
- Toxoplasmosis
- *Salmonella* serotypes
- *Campylobacter fetus intestinalis*
- *Listeria monocytogenes*

Chlamydial abortion

Disease is transmitted by the oral route following exposure of susceptible sheep to high levels of infected uterine discharges/aborted material. Infection does not result in clinical signs unless the ewe is more than six weeks from the due lambing date, infection remaining latent until the subsequent pregnancy. Live lambs born to infected ewes, and lambs fostered on to aborted ewes, may acquire infection during the neonatal period and develop placental infection and/or abort if bred during their first year.

In common with all infectious causes of abortion, aborted ewes must be isolated and aborted material and infected bedding removed and destroyed. Ewes that give birth to dead/weakly full-term lambs should also be isolated. Lambs fostered on to aborted ewes should not be retained for future breeding (Fig 3)

Freedom from *C. abortus* infection is best achieved by maintaining a closed clean flock with strict biosecurity although there have been situations where infected material has been transmitted between neighbouring farms by birds/foxes. Various accreditation schemes operate offering breeding female replacements from flocks declared free of *C. abortus* infection. This accredited status is achieved by serological survey of a statistically representative sample of the whole flock, and all aborted and barren ewes. Careful consideration must be given to establishing a clean but susceptible flock when the health status of neighbouring flocks sharing common boundaries cannot be guaranteed.

Purchase of *C. abortus* infected carrier sheep presents the greatest risk to a clean flock with infection transmitted following abortion. Infection of susceptible sheep, typically occurring following direct contact with aborted material or uterine discharges, can lead to an abortion storm the following year with up to 30 per cent of ewes aborting. Once infection becomes endemic in a flock, losses are largely confined to one-



Fig 3 : When EAE is present within the flock, lambs fostered on to aborted ewes should not be retained for future breeding.

crop ewes which acquired infection at their first lambing which may give an annual abortion rate of 5 to 10 per cent thereafter.

Vaccination offers an excellent means of control for farms buying breeding replacements from non-accredited sources, and in those flocks with an endemic *C. abortus* problem. In the UK there is a choice of either inactivated or live *C. abortus* vaccines with administration before the start of the mating period. Vaccination of sheep already infected with *C. abortus* will not prevent abortion but may reduce the incidence. Vaccination against *C. abortus* may appear expensive (£3.00 per dose) but this cost must be divided over three years. This cost should be viewed against the average cost of female breeding replacements in the UK of £40-55 for 6 month-old sheep and £65-100 for 18 month-old sheep (2005 prices). The cost of abortion is variably quoted as £20 to £65 per aborted ewe.

Toxoplasmosis

Toxoplasma gondii infection during pregnancy can result in embryo/early foetal loss, foetal death and abortion/mummification (Fig 4), and birth of weakly lambs. The parasite is the second most common cause of ovine abortion in the UK. Embryo/early foetal loss is then manifest as an increased barren rate, often above 8 to 10 per cent when 4 per cent is acceptable and 2 per cent the target after a 6 week breeding period. Often the highest number of barren sheep is within the youngest age group.

Toxoplasma infection during mid pregnancy results in abortion or production of weakly live lambs near term often with a small mummified foetus which has a dark brown leathery appearance (Fig 4).

Vaccination using a live attenuated vaccine is available and provides excellent immunity to natural infection and is administered at least three weeks before the breeding season.

The vaccine may appear expensive (£3 per dose) but as a single vaccination effectively provides lifelong immunity, this cost should be divided over the sheep's productive life with a



Fig 4: Toxoplasma gondii infection during pregnancy can result in embryo/early foetal loss, foetal death and abortion/mummification.

realistic cost of 50 to 60 pence per pregnancy or as little as 30 pence per lamb born.

Salmonella serotypes

Salmonella montevideo, *Salmonella dublin* and *Salmonella typhimurium* have been associated with abortion and death in pregnant ewes. Wild birds have been incriminated in the transmission of certain salmonella serotypes, particularly *S. montevideo*. Cattle are frequently symptomless carriers of *S. dublin*. Cattle, especially calves, and human sewage are common sources of *S. typhimurium*.

Abortion is the main presenting feature with *S. montevideo*. Sheep affected with *S. typhimurium* and *S. dublin* may simply be found dead with autolytic lambs present *in-utero* which have not been aborted. Profuse dysentery is often observed in other sheep with *S. typhimurium* and these ewes are very depressed. The economic consequences of salmonella abortion can be devastating with ewe losses as high as 10 to 20 per cent.

All feed must be stored in vermin-proof bins but this is rarely achieved on many farms. Wherever possible, water should be supplied from a mains supply with ponds and surface water fenced off (Fig 5). If possible pregnant sheep should be managed separately from cattle.



Fig5: Surface water can be a source of infection and should be fenced off wherever possible

Campylobacteriosis

Campylobacters are a cause of abortion where sheep are managed intensively leading to heavy contamination and unhygienic environments during late gestation. Such dirty conditions can quickly build upon around big bale silage/hay feeders (Fig 6). The common presentation is abortion during late gestation although some lambs are carried to full-term and are born weakly and succumb during the neonatal period. Infection is by the faeco-oral route largely following introduction of carrier sheep into the flock

Sheep should be managed in clean environments and not subjected to unhygienic conditions especially during late gestation (Fig 6). Particular attention should be paid to the feeding and water troughs/areas. Purchased sheep must be managed as a separate group until well after lambing has ended.



Fig6: Sheep should be managed in clean environments and not subjected to unhygienic conditions especially during late gestation. Particular attention should be paid to the water troughs and feeding areas

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A better understanding of disease control and prevention will save you money and improve animal health and welfare.

Test your knowledge on the NADIS Animal Health Quiz – [CLICK HERE](#)

The following questions are amongst those to be found in the quiz:-

- 1) The most common cause of abortion in the UK is:
- A overcrowding
 - B mouldy silage
 - C bad weather
 - D bacteria and other infectious agents
 - E poor nutrition
- 2) Above what abortion rate is an infectious cause likely:
- A 1%
 - B 2%
 - C 4%
 - D 6%
 - E 10%

(Answers at bottom of page 2)

NADIS Health Bulletins are designed to improve farm income, animal health and welfare by promoting disease control and prevention.

Discuss how health planning can improve the profitability of your farm with your veterinary surgeon.

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