



## Clostridial Diseases of Livestock

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*Blackleg, pulpy kidney (enterotoxaemia), black disease, tetanus, and malignant oedema cause death of sheep and cattle throughout Victoria. Other animals, particularly goats, are also susceptible. Individual properties sometimes have substantial losses. This is despite the availability of vaccines against these diseases which, when used properly, will provide good protection.*

### The clostridial family of bacteria

Clostridial organisms of various types are found in the soil, where they can survive for a long time. In fact, when conditions are favourable, the blackleg organisms can even multiply in the soil.

Most clostridial organisms can also occur quite naturally in the gut of healthy animals. They live there causing no trouble, pass in the manure, and consequently contaminate the soil.

When conditions are favourable for the uncontrolled growth of clostridial organisms they produce powerful toxins (poisons). The effects of the toxins are usually fatal.

### Diagnosis

The most important thing to do when sudden deaths of stock occur is to get an accurate diagnosis.

This is important for two reasons:

Firstly, the possibility that the disease is anthrax should be considered. Animals suspected of dying from anthrax should not be moved or opened in any way.

Many of the clostridial diseases can look like anthrax and so should be approached with caution.

If anthrax is suspected the local district veterinary officer should be contacted immediately.

Clostridial diseases are usually fatal. Death occurs rapidly with pulpy kidney, black disease and blackleg, but takes several days to weeks with tetanus.

In severe outbreaks, many animals die suddenly. Occasional deaths may also be due to these diseases. These are often undiagnosed.

Secondly, an accurate diagnosis is needed to decide whether vaccination is necessary.

### Treatment

Treatment with antitoxins and large doses of antibiotics is expensive and usually not successful.

### Control

The major factor in controlling these diseases is to develop satisfactory immunity within the animal at risk through vaccination.

The vaccination program undertaken in a herd or flock must take into account the principles of immunity, the diseases likely to occur and economic factors.

### The principles of immunity

Passive immunity is transferred from the mother to the offspring in the first milk (colostrum). If the mother is boosted with 5-in-1 vaccine about one month before the offspring is due to be born the level of protection and period of time for which the young animal is protected is increased.

Active immunity requires a primary course of two doses of vaccine 4 to 6 weeks apart to give a reasonable period of protection. The first dose only primes the animal's immune system – hence the need for a second dose.

The first dose is usually given at marking time, when the protection from the mother's milk is starting to decline.

Annual boosters are required to maintain the protection, as well as providing antibodies in the colostrum to protect the young until they are old enough to be vaccinated. Boosters should be given strategically before high-risk periods.

### The diseases likely to occur

The diseases likely to occur will vary from district to district and season to season. Owners should check with their local district veterinary officer or veterinary practitioner for advice regarding their own situation.

In general, the high-risk times are when energy rich, abundant feed is available.

**Table 1. Clostridial diseases**

Disease	Species affected	Predisposing causes	Features and comments
Black disease	Sheep mainly Cattle rarely	Damage to the liver by young migrating liver fluke.	Sudden death, particularly in sheep. Plug of yellowish dead tissue in the liver usually on the surface but occasionally deeply embedded, with signs of liver fluke damage. Rapid decomposition of the carcass.
Blackleg	Cattle, sheep	Damage to muscles, such as bruising following yarding. In sheep blackleg tends to follow an injury, such as at vaccination, shearing, castration and mulesing.	Sudden death. Affected animals are usually in good condition. May be swelling of a leg, the leg may crackle when touched. Rapid decomposition and bloating of the carcass. The carcass should be disposed of to prevent infection of other animals.
Malignant oedema and gas gangrene	Sheep mainly Also cattle and goats	Deep wounds such as dog bites, crow attacks and lambing injuries.	Soft swelling followed by a discharge from the wound. Death usually occurs after 1-2 days. Treatment can be attempted through the use of antibiotics and cleaning of the wound.
“Swelled head”	Rams	Rams fighting, especially young rams.	Specific type of malignant oedema. Extensive swelling of the head. Death after 48 hours, though some recover if treated early.
Enterotoxaemia (pulpy kidney)	Sheep, cattle and goats, particularly young animals	High levels of starchy food in the diet and slowing of gut movement.	Death is extremely rapid, occurring in 2-3 hours in young animals, and up to 24 hours in older animals, with convulsions prior to death. Rapid carcass decomposition gives rise to “pulpy kidneys”. Usually seen as outbreaks in sheep, and the death of just a couple of animals in other species.
Tetanus (lockjaw)	Horses and pigs most susceptible Cattle, sheep and goats	In sheep, particularly following use of rubber rings for marking, dog bites and shearing wounds. In horses, nail pricks in the hoof. In cattle after calving. In pigs after castration. Any deep penetrating wounds.	Signs appear 3-10 days after injury in lambs, and longer in other animals. Clinical signs include general body stiffness and muscular spasms, sensitivity to sound and movement, third eyelid protrusion, and restricted jaw movement. Most cases die within 3-4 days.

### Economic factors

Economic factors include the value of the stock, the cost of vaccination and degree of risk the owner is willing to accept. Five-in-1 costs about 11 cents per sheep dose or 22 cents per cattle dose (2007 prices).

These costs are cheap insurance against the death of valuable stock.

Five-in-1 vaccine is also available in combination with cheesy gland vaccine (for sheep), leptospirosis vaccine (for cattle), anthelmintics, vitamins such as Vitamin B12, and trace elements such as selenium.

### Storage and handling of vaccine

- keep vaccine cool

- buy only vaccine which has been stored in a cool place according to the manufacturer's directions
- always carry vaccine in a cool, insulated container, removing it only for use
- purchase quantities of vaccine sufficient for use on the day as vaccine deteriorates overnight
- follow recommended vaccination procedures strictly

### Acknowledgement

This Information Note was originally developed by Neil Farquhar, and the previous version was published in September, 1998.

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