

# Clostridial diseases

Five diseases that are usually fatal to cattle are included in this group of clostridial diseases - tetanus, malignant oedema, blackleg, enterotoxaemia and black disease. These diseases are not directly transmissible to humans from cattle.

## ***Causes and clinical signs***

| <b>Cause</b>                            | <b>Clinical signs</b>  |
|---|--|
| Tetanus (Cl. tetani)                    | Infection usually enters via a deep puncture wound or from dehorning and castration wounds. Clinical signs include: muscle stiffness and tremor; whole body rigidity; protrusion of the third eyelid; convulsions and death. Tetanus antitoxin should be used to provide immediate temporary protection if castrating or dehorning cattle that are not already vaccinated with tetanus toxoid. |
| Malignant oedema (Cl. septicum)         | Usually caused by infection of a deep wound. Clinical signs include: swelling at the site of infection; fever; muscle tremor and weakness; and death within 48 hours.  |
| Blackleg (Cl. chauvoei)                 | Usually affects young, fast-growing cattle. Bacteria may enter muscle through small wounds or after bruising. Clinical signs include: fever with gassy swelling at the site of infection; or sudden death.   |
| Enterotoxaemia (Cl. perfringens type D) | Usually affects calves when conditions in the gut favour rapid growth of the bacteria i.e. introduction of grain rations. Is often associated with bloat. Clinical signs include: bellowing, mania, diarrhoea, convulsions, paralysis, blindness or sudden death.  |
| Black disease (Cl. novyi type B)        | Usually occurs in cattle with liver fluke. Clinical signs include severe liver disease, which is highly fatal within one to two days.  |

## ***Human health***

Tetanus is a potentially fatal disease in humans. Therefore, it is important that all people on dairy farms are routinely vaccinated for tetanus. The bacteria may be common on dairy farms and infection is usually acquired via a deep puncture wound.

## ***Potential risk***

Clostridial bacteria present a significant disease risk in dairy cattle because the bacteria:

- are common in the environment
- are very long lived
- multiply rapidly in infected cattle
- produce powerful toxins that are often fatal
- often affect well-grown animals, because younger calves often have some temporary protection from drinking colostrum.

## ***Prevention and control***

A vaccination program can provide long-term immunity to clostridial diseases. A five-in-one vaccination protects against all five clostridial diseases - tetanus, malignant oedema, blackleg, enterotoxaemia and black disease.

### ***Vaccination program:***

- give an initial vaccination at three to six months of age
- give a second dose four to six weeks later
- give an annual booster.

All unvaccinated or introduced cattle should get: the two priming vaccinations four to six weeks apart (before being introduced into the herd); and then an annual booster.

### ***Enterotoxaemia:***

- The two priming vaccinations may only give immunity for three months. It is recommended that vaccination against enterotoxaemia be repeated at appropriate intervals depending on local and seasonal conditions e.g. less than three months before a high-risk period, such as feeding grain during drought or lot feeding.
- It is important to follow the advice given for the specific vaccine being used because recommendations for different manufacturers vary.
- Using a combined leptospirosis-clostridial vaccine (seven-in-one) will improve the efficiency and economy of the vaccination program.

### ***Vaccination costs***

The cost to vaccinate a herd can vary significantly. Prices can be affected by:

- number of cattle to be vaccinated - larger herds generally cost less per head
- regional pricing
- prices set by the vaccine supplier
- sale price - buying on special can significantly reduce the overall cost.

It is important to compare the different brands and various retailers to ensure you get the most economical vaccination program.

### **Combined leptospirosis and clostridial vaccines (based on 2003 prices)**

Using a seven-in-one vaccine (combined leptospirosis and clostridial vaccine) saves time and labour because it requires only one injection instead of two.

- \$1 per dose of a seven-in-one vaccine for 100-cow herd with 208 doses a year costs \$208 annually.

Therefore the program would break-even if an average cow (valued at \$1000) was saved every five years by a seven-in-one vaccination (does not include labour, materials or facility costs).

### **Vaccine costs for clostridial diseases (based on 2003 prices)**

- \$0.25 per dose of a clostridial five-in-one vaccine for 100-cow herd
- if herd includes 100 cows, 3 bulls, 25 heifers, plus 40 heifer calves (calves require two doses) 208 doses a year @ \$0.25 a dose (\$52 annually).

Therefore the program would break-even if an average cow (valued at \$1000) was saved every 19 years from any of the clostridial diseases by vaccination (does not include labour, materials or facility costs).

### ***Important considerations***

- Follow the manufacturer's instructions.
- Store and handle vaccines correctly to ensure their effectiveness is not reduced.
- Adhere to safety precautions for workers handling vaccines and associated equipment.
- Dispose of used equipment carefully and avoid environmental contamination.
- Vaccinate animals in good health to optimise the immunity gained.
- Vaccination does not provide instant protection - generally full protection doesn't occur until up to four weeks after the initial doses.

*Source: Queensland Department of Agriculture, Fisheries and Forestry; 2009*