Vaccinating Heifers to Help Prevent Disease

This Infosheet covers:

- The use of vaccination to aid in control of clostridial diseases, leptospirosis, bovine viral diarrhoea (BVD) and salmonellosis.

Key points

- When grazing heifers off farm, it is important that your vaccination programme is shared with, and understood by, your contract grazier so that it is carried out correctly.
- Vaccination for Clostridia is very effective at preventing disease. All unvaccinated animals are at risk and outbreaks can cause significant losses.
- Leptospira typically do not cause clinical disease in animals but they are a significant human health hazard. Vaccination is an important control method.
- Bovine viral diarrhoea is a highly infectious viral disease which can cause significant economic losses. Vaccination forms a part of prevention programmes.
- Salmonella can cause stock deaths and can be transmitted to humans. Vaccination is not completely protective but will lessen the frequency and severity of the disease when it is present.

Introduction

Vaccination is an important management tool to help prevent cattle diseases, including: clostridial diseases, leptospirosis, BVD and salmonellosis.

Some vaccinations can be administered solely by farmers while others require veterinary involvement.

When grazing heifers off farm it is important that the vaccination programme is shared with, and understood by, the contract grazier so that it is carried out correctly. Different vaccination programmes may be required on different properties e.g. home farm versus off-farm grazing, because of their particular conditions.

Clostridial diseases

Clostridia are a group of toxin-producing bacteria that can cause a range of diseases which often result in sudden death. Most require some kind of injury before the bacteria can cause infection, such as bruising or a wound. All unvaccinated animals are at risk and outbreaks can cause significant losses.

Clostridia are commonly found in soil, water, decaying plant matter, and in the intestines of healthy animals which may be on the same grazing property. Several species of Clostridia can cause cattle diseases in New Zealand including: Clostridium chauvoei, C. tetani, C. septicum, C. perfringens and C. novyi, and they cause the diseases: blackleg, pulpy kidney, malignant oedema, tetanus and black disease.

Vaccination is very effective and, if done correctly, should prevent losses.
Vaccination programme

New-born calves can be protected by vaccinating pregnant cows to increase the antibodies in their colostrum and, so long as the calf receives adequate colostrum in the first 24 hours of life, short-term immunity will be passed on to the calf.

Otherwise standard vaccination protocol for calves and other unvaccinated animals require two doses:

- a primary challenge,
- a booster 4-6 weeks later.

Often calves are given their first vaccination at the time of procedures that cause skin or muscle trauma, such as disbudding or ringing/castration, as these procedures increase the risk of clostridial infection. Although they can be successfully vaccinated at any age, maternal antibodies (obtained from colostrum) may interfere with the vaccine when calves are under 12 weeks old. If applying a non-standard vaccination programme and calves are given their first dose when they are younger than 12 weeks old should, therefore, receive booster shots at 4 weekly intervals until they are over 12 weeks old.

Annual booster vaccinations are recommended.

Vaccine options

- The 5 in 1 vaccines contain the five most common Clostridia (C. chauvoei, C. tetani, C. septicum, C. perfringens and C. novyi). For most farms this vaccine will be adequate.
- The 6 in 1 vaccines contain the five Clostridia (as above), as well as L. sordelii, which has been implicated in unexplained deaths, though no proven cases have been found in New Zealand. If unexplained animal deaths occur, discuss your situation with a veterinarian before vaccinating stock.
- Most Clostridia vaccines also come in a selenised form (containing the mineral selenium) and they can include levamisole for parasite control. Only use selenised vaccines after consultation with a veterinarian and when you know that animals are selenium-deficient.

Leptospirosis

Leptospirosis (lepto) is a disease caused by Leptospira bacteria. It is zoonotic (can be transferred to humans), a significant health hazard, and one of the most commonly acquired occupational diseases in New Zealand. Before lepto vaccines were widely used in dairy cattle, working on a dairy farm carried a high risk of contracting the disease. An average of 100 cases are still notified every year and many more probably go unreported.

Leptospira infect the host through their mucous membranes e.g. eyes, mouth and nose, and through breaks in the skin. In the host animal the bacteria generally do not cause clinical disease but instead colonise the kidneys, multiply there, and then are shed through the urine. As heifers move to grazing and interact with more animals the risk of being exposed to Leptospira increases. When Leptospira infect another species, such as people, they generally cause clinical disease (or death, but infrequently).
Vaccination, provided it is done correctly, prevents Leptospira from colonising the kidneys and urinary shedding. It is crucial that vaccination occurs before the animal comes in contact with Leptospira, as contact will lower the effectiveness of the vaccine, and that the vaccination status is continually maintained. Therefore, vaccinating heifers before they move farm is critical for vaccine effectiveness.

Factors which increase the risk for cattle:
- stagnant water;
- feed contaminated by rats;
- unvaccinated cattle, sheep, goats, deer and pigs e.g. grazing bush blocks can increase the risk of exposure;
- a history of lepto infections on the property and/or of poorly implemented vaccination programmes.

Vaccination programme
Calves require two doses:
- a primary sensitiser when they are 12 weeks old,
- a booster 4-6 weeks later.
Calves may require a first vaccination at one month old if the farm, or situation they are in, is high risk, e.g. there is a history of lepto infections on the property. In high risk situations a third vaccination is required before they are six months old. This is because the calf may have picked up maternal antibodies from their mother’s colostrum which can interfere with the vaccine in the first weeks of life.
An annual booster vaccination is required and it is important that the time between annual vaccinations does not exceed 13 months.
Consult with your veterinarian when developing a vaccination plan as they will be able to assess the risk on a property.

Vaccine options
There are two types of vaccine available; one will protect against two strains of Leptospira while the other protects against three.

Bovine viral diarrhoea (BVD)

Bovine viral diarrhoea (BVD) is a highly infectious viral disease which can spread via bodily fluids e.g. nasal discharges, uterine secretions (birth fluids, placenta), urine, milk, semen, faeces and saliva. BVD causes reduced growth rates, reproductive losses, an increase in disease in general, and lowers milk production. There is no treatment for BVD, prevention is the only option.

BVD is a very complex disease that is easily transferred between cattle, and management requires an integrated on-farm plan, particularly if stock move around geographically. The initial step is to carry out a risk assessment of the farm and stock; your veterinarian should be involved in this process. The information can then be used to decide if vaccination is needed, which animals to vaccinate, which vaccine to use and when to administer the vaccine. Contract graziers should find out the BVD status of the stock’s home farm.
**Vaccination programme**

Calves require two doses:

- a primary injection when they are 12 weeks old,
- a booster 4 weeks to 6 months later (depending on the brand of vaccine used). Your veterinarian should prescribe appropriately.

Heifers and mature cows require an annual booster vaccination which should be given 2-4 weeks prior to the mating start date (MSD), regardless of when the calf vaccines were given. If heifers were not vaccinated as calves, then they will require two vaccinations, with the last injection 2-4 weeks prior to the PSM.

Bulls for mating require an annual booster vaccination administered at least 90 days prior to mating. If not vaccinated as calves they require a two injection course with the second 90 days before mating. A contract grazier receiving bulls from a stock owner should check their BVD status prior to their arrival on the property.

**Vaccine options**

Two types of vaccine are available:

- One provides 12-month protection against infection in the cow and 6-month prevention of foetal infection to minimise the chance of creating a persistently infected (PI) animal (but this protection is not 100%).
- The other protects against BVD and some respiratory diseases, but has no label claim for the prevention of foetal infection and subsequent PI formation.

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**Salmonellosis (Salmonella)**

Salmonella are bacteria that colonise the intestinal tract and can cause an infectious diarrhoea that, if untreated, may result in death. Salmonella are zoonotic organisms, so can cause disease in people as well. Whenever Salmonella is suspected extra hygiene precautions should be taken to prevent any spread of infection.

Heifers are particularly vulnerable to salmonellosis because of their developing immune systems. However, if cases of salmonellosis are infrequent, or never seen, then vaccination is unlikely to be warranted.

Infected animals usually have profuse diarrhoea that may contain blood and mucus. Some animals become carriers, shedding Salmonella in the faeces during times of stress. Death is commonly caused by dehydration or acute toxaemia, but some animals die from septicaemia before any clinical signs are seen.

**Factors which increase the risk for cattle:**

- Sudden changes in diet or high mineral intakes.
- Other infections e.g. BVD, liver fluke and infectious bovine rhinotracheitis (IBR).
- Stress e.g. due to low feed levels, extreme weather and transporting.
- Infected effluent spread on pasture, or feed or water infected with contaminated faeces. Salmonella can survive in dried faeces from one season to the next.

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**More information**

• Age. Young stock are often more severely affected.
• Calf sheds e.g. due to overcrowding or previous outbreaks.
• Rodents and birds, which can transfer the disease in their urine and/or faeces.

Vaccination is not completely protective but will lessen the frequency and severity of the disease. Where the risk of Salmonella infection is high, and outbreaks are common, vaccination is likely to be a cost-effective preventative measure. Vaccinations can also be given during an outbreak to lessen the effects on individual animals, and number of cattle affected.

**Vaccination programme**

To protect new-born calves when this disease has been a problem on-farm, vaccinate pregnant cows between 8 and 3 weeks prior to calving and then ensure calves are fed adequate colostrum from vaccinated cows within the first 24 hours of life.

Two doses are required for calves:
• a primary dose,
• a booster 3-4 weeks later.

Annual boosters are required for ongoing protection. Calves can be vaccinated from 3 months of age.

Your veterinarian can assess the risk of salmonellosis on your farm and advise if vaccination is worthwhile.