FACT SHEET

Cattle vaccines

stock sense
health | welfare | biosecurity

Victorian Farmers Federation

UNDERSTANDING VACCINATING AND IMMUNITY

Protecting your herd from production-limiting diseases involves a coordinated herd health program. A key component of most health programs is a strategic vaccination plan. In order to achieve the maximum level of protection a vaccine can offer. It is important to have a basic understanding of how vaccines function and how the immune system responds to a vaccine.

When an animal from a herd that has not been exposed to a specific pathogen (disease-causing agent) or a 'naïve herd' first comes into contact with a pathogen, and cannot generate an immune response quick enough, it will be susceptible to the disease. If conditions in the animal are suitable, the immune system will suppress the disease and over time will recover from infection. If an animal recovers from disease, specific cells in the immune system are programed to remember and recognise parts of that specific pathogen known as antigens. An antigen is anything the body identifies as foreign or not part of itself such as a bacteria or virus. The body recognises these antigens as a threat, stimulating the development of antibodies which work to protect the body from the bacteria or virus.

HOW VACCINES WORK

Vaccines expose an animal to a specific pathogen, misleading the body into thinking it has encountered the actual bacteria or virus creating memory cells for the antigens belonging to that specific pathogen. The body is then able to recognise when it is under attack from the same pathogen and will generate a quick response before the pathogen can cause disease and will therefore develop immunity.

Vaccines generally fall into two categories, live or killed vaccine.

LIVE VACCINES

Live vaccines include a small amount of bacteria or virus that has been modified so it does not cause clinical disease. The virus or bacteria in the vaccine can sometimes replicate in the body, supplying the vaccinated animal with a mild form of the disease to stimulate life-long immunity. Live vaccines usually require a single dose providing longer lasting immunity than killed vaccines. However, their potency is short lived and must be used soon after being mixed on-farm. Some live vaccines, if not used specifically as directed, can be harmful to pregnant cows and may cause abortions. Live vaccines should only be considered on properties where the disease is an issue. If animals from an uninfected property are vaccinated, this will introduce the virus on to the property. This may then require the establishment of a vaccination program to protect future stock, resulting in unnecessary costs to the producer.

KILLED VACCINES

Killed vaccines are the most common form and do not require on-farm mixing and have minimal risk to pregnant animals. The vaccines described in this fact sheet are killed vaccines with most vaccines of this type requiring two doses. The first dose stimulates the antibodies however, the level produced is often small and protection generally only lasts a few weeks before immunity declines, hence a second vaccination is require to boost immunity (Figure 1). An annual booster every 12 months following is generally recommended to 'top-up' the immunity levels against a specific pathogen or disease.

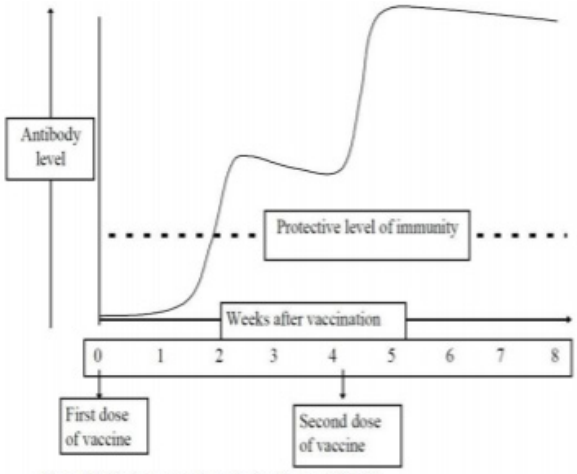

Figure 1. Antibody response to vaccination *(Source: DPI NSW)*

WHY VACCINATE

There are numerous cattle vaccines commercially available. Common diseases of cattle such as clostridial and reproductive diseases can cause significant economic losses and animal welfare issues. However, some of these common diseases can be prevented by vaccinating. Points to consider before introducing a vaccination program include:

- Herd health history and the frequency of a particular disease in your herd.
- Disease occurrence in your area
- Management practices increasing risk of disease such as supplementary feeding, castration, dehorning.
- Cattle handling and vaccine storage facilities
- Personal capability of correctly administering vaccines

It is strongly recommended you consult with your local vet or animal health advisor before carrying out a vaccination program.

GENERAL VACCINATION PRINCIPLES

- Ensure you have safe cattle handing facilities such as a cattle crush or race where the animal can be restrained or allowed limited movement during the vaccination process.
- Handle and store vaccine according to label specifications.
- Ensure that vaccination equipment is clean and in good working order.
- Ensure needles are clean and sharp. Replace frequently.
- Blunt needles can lead to incorrect application of vaccine, impacting on the efficacy of the vaccine and increasing costs due to product wastage.
- Be sure to dispose of blunt needles correctly and with caution. Blunt needles should be placed in a container before disposing to prevent handling injuries.
- Needles and the vaccination site should be clean, free from mud, manure or blood to prevent infection and abscesses forming at the injection site.
- Ensure vaccination equipment is calibrated to the correct dosage according to label specifications.
- Most vaccination programs require two doses for the vaccine to be effective and establish immunity.
- Vaccination can be achieved via subcutaneous injection (under the skin), intramuscular injection (into the muscle) or by intravenous injection (into the vein).

TAKE HOME MESSAGES:

- Read vaccine labeling thoroughly to ensure you are administering the appropriate dosage, using clean and suitable equipment e.g. needles and record your activities either manually or electronically.
- Try to grasp a good understanding of how the vaccine works and develop a management plan around this.
- Find out from your local livestock health department the potential disease pathogens present in the area so that you can vaccinate accordingly.

- Vaccination technique will vary depending on the vaccine you are using.
- Subcutaneous injection is the most common method of vaccination

Figure 2 Subcutaneous injection should be given high on the neck (*Photo: DPI New South Wales*).

Figure 3 Inject into the 'tented' skin without the needle passing through the fold of skin (*Photo: DPI New South Wales*).

Subcutaneous injection (under the skin)

- This is a common delivery method for most vaccines.
- Ensure the injection site is clean before injecting.
- Disinfectants should not be used with live vaccines as they can inactivate the vaccine.
- A 16 gauge, 1 /2 inch needle is recommended.
- Ensure needles are clean and sharp.
- It is always best to discard the used needle after each vaccination session.
- The recommended injection site is high on the neck (Figure 2).
- To inject, lift a fold of loose skin with your free hand, and inject into the 'tented' skin (Figure 3).

- The needle should not pass through the fold of skin.
- If you are unsure if an animal has received the full dose, inject again.

ADDITIONAL MANAGEMENT

To get the most out of your vaccination program, most programs should be accompanied by strategic management practices depending on the disease you are vaccinating against. Management practices may include grazing strategies, nutrition management, animal husbandry procedures and biosecurity practices. For more information on biosecurity practices refer to the VFF biosecurity resource.

For more information, please contact Stock Sense by emailing stocksense@vff.org.au

FURTHER LINKS

Zoetis

https://www.zoetis.com.au/livestock-solutions/southern-beef/index.aspx?gclid=EAIaIQobChMI4_-2reeb8gIVUpJmAh1lMQEgEAAYASAAEgKzWvD_BwE

Department of Primary Industries Victoria

https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0010/111250/beef-cattle-vaccines.pdf

Meat and Livestock Australia

https://www.mla.com.au/research-and-development/Animal-health-welfare-and-biosecurity/Husbandry/Vaccinating

https://www.mla.com.au/globalassets/mla-corporate/research-and-development/program-areas/animal-health-welfare-and-biosecurity/210517-vaccination-for-beef-cattle-in-southern-australia.pdf