Biobos IBR
MARKER VACCINE

Novel vaccine

Differentiates
Infected from
Vaccinated
Animals

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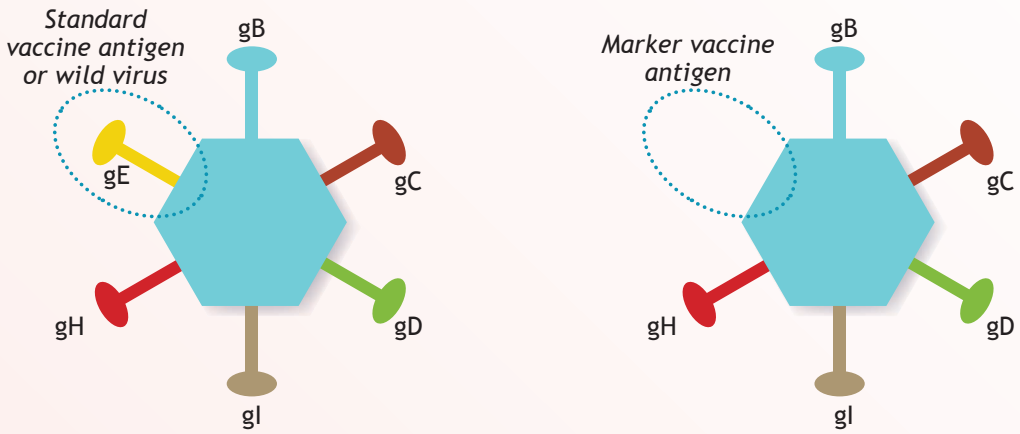
IBR Marker Vaccines



Immunodominant glycoproteins expressed on surface of IBR antigen

Marker vaccines differentiate infected from vaccinated animals (DIVA principle)

- Have a missing gene in their DNA

Testing using standard IBR ELISA test shows the animal has had an antibody response to gB

- If positive = natural infection OR vaccinated
- If negative = uninfected and not vaccinated

Testing using selective IBR ELISA test for gE

- If positive = natural infection OR vaccination with standard vaccine
- If negative = uninfected naive animal OR vaccinated with IBR marker vaccine

Features

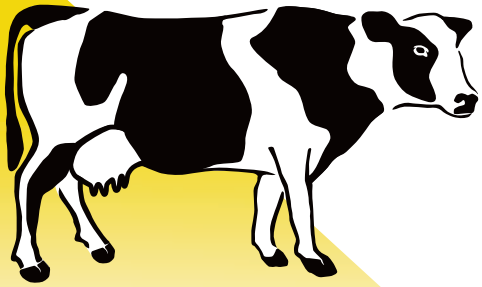
- Monovalent IBR marker vaccine for cattle
- Innovative technology to enable use of DIVA principle (Differentiating Infected from Vaccinated Animals)
- Award winning European manufacturer
- Modern tissue-friendly and efficacious adjuvant
- Non-GM, inactivated vaccine in 100ml plastic bottles

Benefits

- Excellent efficacy against new infections, resulting in substantially reduced viral shedding
- Latency of bovine herpesvirus maintained in previously infected cattle
- Specific ELISA test used to differentiate field infected from vaccinated animals
- High quality modern vaccine from Europe
- Highly effective antibody and cell-mediated immune response
- Operator and animal friendly
- Convenient for NZ herd use

Vaccination with Biobos IBR marker

- Reduces clinical signs of disease when animals exposed to natural infection
- Reduces shedding of virus when infected, by up to 10,000 times compared with naive animals
- Reduces reactivation of latency in previously exposed animals, reducing shedding of virus
- Prevalence of viral antigen in the environment is much lower due to reduced viral replication and spread
- Results in fewer infected cattle



Summary - IBR and bovine herpesvirus

- Infectious Bovine Rhinotracheitis (IBR) is a highly infectious and contagious upper respiratory tract disease caused by BoHV-1
- IBR can be accompanied by profuse oculo-nasal discharge
- Infectious Pustular Balanoposthitis (IPB) and Infectious Pustular Vulvovaginitis (IPV) cases have been reported throughout New Zealand
- BoHV-1 infected animals remain latent carriers of the herpesvirus
- Reactivation of latency can occur during periods of stress, meaning the virus is likely to be shed often without clinical signs
- Reduced reproductive performance in the form of lower early in-calf rates is seen from BoHV-1 in New Zealand, but this is not associated with abortion per se
- BoHV-1 can predispose to more severe respiratory disease and/or death especially if followed by secondary bacterial infection
- BoHV-1 can cause severe, systemic disease in neonatal calves, although presentation is uncommon in New Zealand
- Vaccination can be used to limit spread of the virus
- The primary immune response acquired following BoHV-1 natural exposure or vaccination can control re-excretion by a latent carrier

About IBR in NZ

Infectious Bovine Rhinotracheitis (IBR) is caused by bovine herpesvirus-1 (BoHV-1). Large amounts of virus are shed in respiratory, ocular and reproductive secretions of infected cattle, and BoHV-1 is readily transmitted. The incubation period for BoHV-1 in naïve animals is two to six days. Cattle are the principal reservoir and usual source of infection.

In common with other herpesviruses, infection with BoHV-1 results in life-long, latent infections in the nervous tissue. Latent infections are unidentifiable clinically but can be reactivated by stress or corticosteroid therapy. Re-excretion of the virus is usually clinically silent but the amount of secreted virus can be high and last for several days. Thus, transmission of BoHV-1 is perpetuated by direct contact between newly infected cattle as well as by virus shedding due to reactivation of latent infection.

BoHV-1 eradication campaigns have been implemented in several European Union countries. These tend to employ vaccination (typically using marker vaccines at six monthly intervals), serological testing and movement control.

Under New Zealand conditions, bovine herpesvirus infection often results in subclinical disease or presents with relatively minor clinical signs. Mild disease tends to affect a large number of animals within a short time. Clinical signs include milk drop, depression, inappetence, rise in temperature, fever, coughing and profuse nasal discharge. In addition, conjunctivitis with profuse ocular discharge may sometimes be seen. The clinical course in affected animals is usually resolved within seven to 14 days.

More severe disease does occur in New Zealand, with many animals in an affected herd showing signs of an upper respiratory tract infection accompanied by a significant drop in milk production. In this presentation, commonly two-year-old dairy heifers are affected after exposure to the virus when entering the dairy herd.

Older cows can also be affected, however, infections with BoHV-1 are rarely fatal unless complicated by secondary bacterial infection. Latent infections or reactivation of latency are always features of infection with this virus.

Prevention via vaccination before higher risk periods is recommended. Vaccination programmes can protect against the effect of transient infection (and therefore prevent symptoms that occur in even mild infections such as fever, inappetence, depression and nasal discharge). In addition, the primary immune response acquired following a BoHV-1 natural exposure or a vaccination programme is able to successfully control the reactivation of a latent carrier.

All bulls should be vaccinated well before the start of mating. This means if the bull was naïve (and mixed with an infected or latently infected animal(s)) he will not succumb to transient infection. If the bull is latently infected he will not infect the herd or naïve members of the herd (as reactivation of latency will be controlled)

The recommendation to vaccinate calves against bovine herpesvirus can also be justified. This is especially the case if calves are to be transported long distances or co-mingled with animals from other farms. Again, this minimises any impact of transient infection. It also controls latency reactivating (if the calf is already a carrier) and, therefore, spreading virus to naïve members of the group. Calves sent to grazing are often under significant stress from numerous factors (nutritional, social, infectious challenge, parasitic challenge and so on), therefore, insurance by vaccinating to minimise the impact of disease is generally cost effective for dairy farmers.

In the event of an outbreak, hygiene measures are the best method available in New Zealand to limit spread. In practice, this requires the isolation of clinically affected animals, as the protective response from vaccinating naive animals with two doses of inactivated vaccine in the face of a rapidly spreading IBR outbreak typically takes too long to provide economic benefit.

Description

Each 2mL vaccination dose contains inactivated bovine herpesvirus type 1 (BoHV-1)

Also contains adjuvant and preservative

Action

In general, a viral particle of bovine herpesvirus type 1 (BoHV-1) consists of several dozen glycoproteins. Six of these glycoproteins are considered immunodominant (i.e. the level of antibodies produced against these six glycoproteins is significantly higher than against other glycoproteins). These are glycoproteins B, C, D, E, H, and I. The Biobos IBR Marker vaccine contains a vaccine strain of BoHV-1 missing the gE expression gene. The term "marker" vaccine used in the literature in connection with IBR means a "gE negative" vaccine, i.e. a vaccine containing BoHV-1 with a missing gene for glycoprotein E (gE).

The administration of this vaccine enables the distinction of vaccinated animals (with the Biobos IBR marker vaccine) from infected animals. In combination with diagnostic ELISA testing, cattle vaccinated with Biobos IBR marker vaccine (gE-) can be differentiated from cattle that have been naturally infected (gE+).

Indications

For active immunisation of cattle to reduce intensity and duration of clinical symptoms caused by infection with bovine herpesvirus type 1 (IBR) virus and to reduce excretion of the field virus.

Dosage

CATTLE: Administer 2 mL, by intramuscular injection into the anterior half of the neck.

Initial vaccination should be given from three months of age or older to avoid interference by maternal antibodies. Give booster vaccination three weeks after first (sensitiser) vaccination.

Onset of immunity is 3 weeks following booster vaccination. Booster vaccination can be repeated at six monthly intervals.

Special Precautions

Vaccinate healthy animals only. Safe for use in pregnant and lactating cattle.

Hypersensitivity reaction may occur in rare circumstances. Begin with appropriate adrenaline and supportive treatment immediately.

Withholding Times

Nil

Other Information

Store in a refrigerator (2°C – 8°C). Do not freeze. Protect from light.

A partially used pack should be discarded after 28 days.

Restricted Veterinary Medicine, ACVM Registration Number: A 11239

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