**CattleMaster® 4+VL5**

**PRODUCT DESCRIPTION:** CattleMaster® 4+VL5 is for vaccination of healthy cattle, including pregnant cows, to prevent infectious bovine rhinotracheitis caused by infectious bovine rhinotracheitis (IBR) virus, bovine viral diarrhea caused by bovine viral diarrhea (BVD) Type 1 virus, parainfluenza 3 (PI3) virus and bovine respiratory syncytial virus (BRSV), campylobacteriosis caused by Campylobacter fetus, and leptospirosis caused by Leptospira canicola, L. grippotyphosa, L. jarrei, L.icterohaemorrhagiae, and L. pomona.

**DIRECTIONS:** Vaccination of healthy cattle, including pregnant cows, is recommended. Aspecifically rehydrated the freeze-dried vaccine with the liquid component provided, shake well, and administer 5 mL intramuscularly. In accordance with Beef Quality Assurance guidelines, this product should be administered in the muscular region of the neck.

**SAFETY AND EFFICACY:** In safety studies of the fractions of CattleMaster® 4+VL5, no adverse reactions to vaccination were observed and vaccinated pregnant cattle delivered normal, healthy calves.

The latency and subsequent excretion of the IBR virus fraction of CattleMaster® 4+VL5 was determined in a safety study in which cattle were inoculated intramuscularly with the attenuated, temperature-sensitive IBR virus component and subsequently given corticosteroid to reactivate latent herpesvirus. Vaccination resulted in a characteristic serological response that remained unaltered even after corticosteroid treatment, indicating a lack of viral reactivation. Also, no BVDV was recovered from normal weights collected postinfection or postcorticosteroid treatment, nor was it transmitted to nonvaccinated sentinel calves concomitant with the vaccines for the duration of the study. Further, no BVDV DNA or latency-related RNA was detected in trigeminal or isocerebral spinal dorsal root ganglia collected after the administration of corticosteroids. Both nucleic acids were detected in a single cervical ganglia sample, suggesting a direct or proximate intramuscular injection. BVDV given by IM injection could not be reactivated from trigeminal ganglia, the primary site of BVDV latency, demonstrating a lack of efficient viral reactivation in those sensory neurons. Excluding possible injection into nerve tissue from which reactivation was not observed, the BVD fraction of CattleMaster® 4+VL5 given by the IM route showed no propensity to establish latent herpesvirus infections.

**Efficacy of each fraction of CattleMaster® 4+VL5 was demonstrated in challenge-of-immunity studies.** Cattle vaccinated with any fraction of CattleMaster® 4+VL5, followed by challenge with a disease-causing strain of IBR virus, showed no signs or had significantly lower clinical signs than nonvaccinated control cattle. Serologic studies also demonstrated no immunologic interference among the fractions of CattleMaster® 4+VL5. Antibody response was not significantly different between cattle vaccinated with an individual fraction and cattle vaccinated with the combined fractions.

**PRODUCT DESCRIPTION: IBR, BVD, PI3, and BRSV-viruses are commonly associated with respiratory diseases and/or reproductive failure in cattle. IBR virus infection is characterized by high temperature, excessive nasal discharge, conjunctivitis and ocular discharge, swollen nose (“red nose”), increased rate of respiration, coughing, loss of appetite, and depression. Cattle infected during pregnancy may abort.

A characteristic of IBR virus (BHV1) is that it establishes a latent infection in sensory neurons, typically trigeminal ganglia or isocerebral spinal root ganglia. From these sites of latency, it can be reactivated when an infected animal is stressed or injured. Subsequently, the virus is shed by contact to other cattle.

BVD virus may be transmitted in nasal secretions, saliva, blood, feces, and/or urine, and by direct contact with contaminated objects. It invades through the nose and mouth and replicates systemically. Infection during pregnancy may result in abortus, fetal resorption, or congenital malformation of the fetus. Moreover, if susceptible cows are infected with noncytopathic BVD virus during the first trimester of pregnancy, their calves may be born persistently infected with the virus. Exposure of those calves to certain strains of cytopathic BVD virus strains may precipitate BVD-related disease. Clinical signs of BVD include loss of appetite, anorexia in the mouth, polyarticular arthritis, elevated temperatures, diarrhea, dehydration, lameness.

BVD virus usually localizes in the upper respiratory tract, causing elevated temperature and moderate nasal and ocular discharge. Although clinical signs typically are mild, PI3 infection weakens respiratory tract immunity. Invasion and replication of other pathogens, particularly Pasteurella spp., is thereby facilitated and may result in pneumonia.

BRSV is the etiologic agent of a specific viral respiratory disease of cattle of all ages, including nursing calves. Infection is characterized by rapid breathing, coughing, loss of appetite, discharge from the nose and eyes, fever, and swelling around the throat and neck. In an acute outbreak, death may follow within 48 hours. Similar signs, clinically, BRSV infection may be indistinguishable from other viral infections associated with the bovine respiratory disease complex. BRSV infection, like PI3, facilitates invasion and replication of other respiratory pathogens. Excavation of clinical signs has been documented when concurrent BRSV and BVD or IBR infection exists.

Campylobacter fetus (lucibrosus) is a bovine venereal disease transmitted during breeding, either through coitus or artificial insemination with contaminated objects. Although the disease is often subclinical, in cows it causes temporary infertility, irregular estrus cycles, delayed conception, and occasionally, abortion.

Leptospirosis may be caused by several serovars of Leptospira, of which L. canicola, L. grippotyphosa, L. hepatica, L.icterohaemorrhagiae, and L. pomona are the most common affecting cattle. Cattle-specific localization in the kidneys, are shed in the urine, and cause anemia, bloody urine, fever, loss of appetite, and prostration in calves. Signs are usually subclinical in adult cattle. Infected pregnant cows, however, often abort, and dairy cows may exhibit a marked decrease in milk production. Leptospira spp. are known zoonotic pathogens.

**REFERENCES:**


2. Store at 2°–7°C. Prolonged exposure to higher temperatures and/or direct sunlight may adversely affect potency. Do not freeze.

3. Good animal husbandry and herd health management practices should be employed.

4. Avoid possible maternal antibody interference with active immunization, calves vaccinated before the age of 6 months should be revaccinated after 6 months of age.

5. Revaccination: Annual revaccination with a single dose is recommended.

6. Good animal husbandry and herd health management practices should be employed.
Leptospiraspp. are known zoonotic pathogens. Leptospirosis may be caused by several serovars of Leptospira, disease caused by porphyrophilus (Pl) and bovine respiratory syncytial virus (BRSV), campylobacteriosis (vibriosis) caused by Campylobacter fetus, and toxoplasmosis caused by Toxoplasma gondii. L. canicola, L. grippotyphosa, L. pomona, and cultures of the 5 leptospires are identified above. The liquid component is used to rehydrate the freeze-dried component. Viral antigens are propagated on an established cell line. This product is administered with aluminum hydroxide to enhance immune response.

DISEASE DESCRIPTION: IBR, BVD, P3, and BRSV-viruses are commonly associated with respiratory disease and/or reproductive failure in cattle. IBR-virus infection is characterized by high temperature, excessive nasal discharge, conjunctivitis and ocular discharge, influenza-like ("red nose"), increased rate of respiration, coughing, loss of appetite, and depression. Cattle infected during pregnancy may abort.

A characteristic of IBR-virus (IBV) is that it establishes a latent infection in sensory neurons, typically trigeminal ganglia or iliosacral dorsal root ganglia. From these sites of latency, it can be reactivated when an infected animal is stressed or injured. Subsequently, the virus is shed and transmitted by contact to other cattles.

BVD virus may be transmitted in nasal secretions, saliva, blood, feces, and/or urine, and by direct contact with contaminated objects. It invades through the nose and mouth and replicates systemically. Infection during pregnancy may result in abortion, fetal resorption, or congenital malformation of the fetus. Moreover, if susceptible cows are infected with non-lytic BVD virus during the first trimester of pregnancy, their calves may be born persistently infected with the virus. Exposure of those calves to certain strains of pathogenic BVD strains may provoke BVD-viral disease. Chronic BVD infection of BVD includes loss of appetite, anorexia in the mouth, profuse salivation, elevated temperature, diarrhea, dehydration, and lameness. BVD virus usually localizes in the upper respiratory tract, causing elevated temperature and moderate nasal and ocular discharge. Although clinical signs typically are mild, PI infection weakens respiratory tissues. Invasion and replication of other pathogens, particularly Pasteurella spp., is thereby facilitated and may result in pneumonia.

BRSV is the etiologic agent of a specific viral respiratory disease of cattle of all ages, including nursing calves. Infection is characterized by rapid breathing, coughing, loss of appetites, dis-charge from the nose and eyes, fever, and ascending around the throat and neck. In an acute outbreak, death may follow within 48 hours after onset of signs. Clinically, BRSV infection may be indistinguishable from other viral infections associated with the bovine respiratory disease complex. BRSV infection, like PI, facilitates invasion and replication of other respiratory pathogens. The latency and subsequent excretion of the IBR virus fraction of CattleMaster 4+VL5 was determined in a safety study in which cattle were inoculated intramuscularly with the attenuated, temperature-sensitive IBR virus component and subsequently given corticosteroids to reactivate latent herpesvirus. Vaccination resulted in a characteristic serological response that remained unaltered even after corticosteroid treatment, indicating a lack of viral reactivation. Also, no BVDV was recovered from nasal washes collected pretreatment or posttreatment treatment, nor was it transmitted to nonvaccinated control calves commingled with the vaccinees for the duration of the study. Further, no BVDV SRA or latency-related RNA was detected in trigeminal or iliosacral spinal dorsal root ganglia collected after the administration of corticosteroids. Both nucleic acids were detected in a single cortical ganglion sample, suggesting a direct or proximate intranasal injection. BVDV given by IM injection could not be reactivated from trigeminal ganglia, the primary site of BVDV latency, demonstrating a lack of efficient viral replication in those sensory neurons. Exciting possible injection into nerve tissue from which reactivation was not observed, the IBR virus of CattleMaster 4+VL5 given by the IM route showed no propensity to establish latent herpesvirus infections.

Efficacy of each fraction of CattleMaster 4+VL5 was demonstrated in challenge-of-immunity studies. Cattle vaccinated with any fraction of CattleMaster 4+VL5, followed by a challenge with a disease-causing strain of BRSV, showed no signs or had significantly lower clinical signs than non-vaccinated control cattle. Serologic studies also demonstrated no immunologic interference among the fractions of CattleMaster 4+VL5. Antibody response was not significantly different between cattle vaccinated with an individual fraction and cattle vaccinated with the combined fractions.

DIRECTIONS: 1. General Directions: Vaccination of healthy cattle, including pregnant cows, is recommended. Aspecifically rehydrate the freeze-dried vaccine with the liquid component provided, shake well, and administer 5 mL intramuscularly. In accordance with Beef Quality Assurance guidelines, this product should be administered in the muscular region of the neck.

2. Primary Vaccination: Healthy cattle should receive 2 doses administered 2–4 weeks apart. To avoid possible maternal antibody interference with active immunity, calves vaccinated before the age of 6 months should be revaccinated after 6 months of age.

3. Revaccination: Annual revaccination with a single dose is recommended.

4. Good animal husbandry and herd health management practices should be employed.

PRECAUTIONS:
1. Store at 2°–7°C. Prolonged exposure to higher temperatures and/or direct sunlight may adversely affect potency. Do not freeze.

2. Use entire contents when first opened.

3. Sterilized syringes and needles should be used to administer this vaccine. Do not sterilize with chemicals because traces of disinfectant may inactivate the vaccine.

4. Burn containers and all unused contents.

5. Do not vaccinate within 21 days before slaughter.

6. Contains gentamicin as preservative.

7. The occurrence of hypersensitivity reactions may occur up to 18 hours post vaccination. Owners should be advised to observe animals during this period. While this event appears to be rare overall, dairy cattle may be affected more frequently than other cattle. Animals affected may display excessive salivation, incoordination, and/or dyspnea. Animals displaying such signs should be treated immediately with appropriate therapy.

8. In the event of vaccine reactions, the veterinarian should be notified.

REFERENCES:

2. Efficacy of each fraction of CattleMaster 4+VL5 was demonstrated in challenge-of-immunity studies. Cattle vaccinated with any fraction of CattleMaster 4+VL5, followed by a challenge with a disease-causing strain of BRSV, showed no signs or had significantly lower clinical signs than non-vaccinated control cattle. Serologic studies also demonstrated no immunologic interference among the fractions of CattleMaster 4+VL5. Antibody response was not significantly different between cattle vaccinated with an individual fraction and cattle vaccinated with the combined fractions.