Poster Session

Single Subcutaneous Dose of a Combination Vaccine Containing Bovine Herpes Virus-1 (BHV-1) Provides Protection Against an Intranasal BHV-1 Challenge 72 Hours Later

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Introduction

Bovine herpesvirus 1 (BHV-1) is associated with several disease syndromes in cattle. The BHV-1 respiratory infections can result in several clinical manifestations that range from inapparent to severe respiratory disease, infectious bovine rhinotracheitis (IBR). Signs include pyrexia, anorexia, conjunctivitis with lacrimal discharge, dyspnea and nasal discharge. BHV-1 respiratory infection in calves and feedlot cattle can lead to the bovine respiratory disease complex (BRDC), with secondary bacterial infections that cause significant economic losses to the livestock industry.

Vaccination programs are a routine practice in US feedlot operations to protect cattle against BHV-1 associated disease. Unfortunately, many calves are not vaccinated prior to weaning or commingling into backgrounding lots, feedlots or pasture operations. These animals are at increased risk of BHV-1 infection and are predisposed to secondary bacterial pneumonia. The time from vaccination to onset of protection can play an important role in subsequent management of newly arrived cattle against IBR.

An experiment was conducted to determine the onset of protection against an intranasal BHV-1 challenge following a subcutaneous injection of a commercial modified-live virus (MLV) vaccine containing attenuated BHV-1.

Materials and Methods

Forty-three (43) steers were randomly assigned to one of four treatment groups. Three groups were vaccinated subcutaneously with a commercial MLV combination vaccine containing BHV-1, while the fourth group served as non-vaccinated controls. Animals were challenged intranasally 96, 72 or 48 hr after vaccination with IBR vaccine (Coopers strain). Calves were assessed for clinical signs of IBR infection, including viremia, for 14 days following challenge. Body weights were taken before challenge, 14 and 29 days after challenge.

Results

Calves vaccinated 72 and 96 hr prior to an intranasal challenge had reduced number of days of depression, respiratory distress, nasal and ocular discharge when compared to non-vaccinated controls (NVC) and animals vaccinated 48 hr prior to challenge. In addition, only one animal from each group vaccinated 72 or 96 hr prior to exposure had body temperatures >105.0F, whereas 10/10 NVC had a rectal temperature of 105F one or more days post-challenge.

All vaccinated animals had less viral shedding than the NVC, shedding 0.5-1 log less virus by day six post-challenge. Vaccinated animals also had greater weight gains than the NVC. However, animals vaccinated 72 or 96 hr prior to challenge gained 40-75% more weight during the study period.

Significance

This study provides evidence that a single subcutaneous dose with a commercially available multivalent MLV vaccine containing attenuated BHV-1 results in protection against an IBR challenge given 72 or 96 hours prior to exposure as evidenced by increased body weight and decreased clinical signs, body temperatures and viral shedding. In addition, the MLV vaccine given 48 hours prior to exposure resulted in a decreased febrile response and increased average daily gain when compared to NVC after an intranasal challenge.

Subcutaneous administration of this commercially available MLV vaccine in non-vaccinated calves at weaning or at arrival to feed yards will provide increased weight gain as early as 48 hr, and decreased clinical signs and viral shedding as early as 72 hr prior to an IBR exposure as the result of commingling of calves within pens.

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