

# Efficacy of a Combination Modified-Live Viral Vaccine in Protecting Cattle from Experimental Infection with Bovine Herpesviruses-1 isolated from Recent “Vaccine Breaks”

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## Introduction

In recent years there has been a reported increase in “vaccine breaks”, or apparent failure of bovine herpesvirus-1 (BHV-1) vaccines to protect feedlot cattle. In order to address the possibility that current vaccines derived from the Cooper isolate of BHV-1 do not protect calves from infection with recent virulent field isolates of BHV-1 for weeks or months after vaccination, two randomized controlled trials were conducted in BHV-1 seronegative cross-bred beef calves.

## Materials and Methods

Either 8, or 59 days, after weaning, 20 calves received a commercial parenteral combination modified-live viral vaccine containing Cooper-derived BHV-1; 10 calves received the same vaccine without BHV-1 (controls). All calves were group challenged via aerosol delivery with one of two recent field isolates of BHV-1, either 30 days or 97 days after vaccination. Clinical signs, immune responses and nasal shedding of virus were monitored for 10 days after challenge. Calves were then euthanized and tracheal lesions were assessed.

## Results

Vaccination elicited significant increases in BHV-1-specific IgG antibodies that cross-neutralized distinct

BHV-1 isolates; control calves remained BHV-1 seronegative. Challenge with BHV-1 resulted in moderate to severe upper respiratory tract disease in both groups of control calves; both groups of vaccinated calves had significantly less severe signs of clinical disease and reduced severity of characteristic tracheal lesions that were associated with anamnestic antibody responses. Vaccinated calves maintained weight after challenge; control calves lost weight. Correspondingly there was significantly less BHV-1 shed in nasal secretions of both groups of vaccinated calves, and less severe tracheal lesions.

## Significance

These results again demonstrate that there are expected minor differences amongst BHV-1 isolates over time; however, the combination modified live BHV-1 vaccine derived from the Cooper isolate of the virus provided significant clinical protection from experimental infection with recent virulent BHV-1 isolates for at least 97 days after vaccination.