Efficacy of an Inactivated BRSV Vaccine Against a Virulent BRSV Experimental Challenge in Young Calves

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Introduction

The objective of this study was to determine the efficacy of a vaccine containing inactivated Bovine Respiratory Syncytial Virus (BRSV) against a highly virulent BRSV challenge in calves.

Materials and Methods

In this study seventeen, 3 month-old, calves were used. All calves were seronegative (<1:6) for neutralizing antibodies to BRSV. Calves were randomized into two groups, vaccinates (n=8) and controls (n=9).

On Day 0 and Day 21, vaccinates received 5 mL of an experimental vaccine containing BRSV killed virus at a minimal protective dose. Controls received a placebo. All calves were challenged intranasally with a highly virulent BRSV field strain on Day 42. BRSV serum antibody titers were determined on samples collected at Days 0, 21, 42 and 50. Clinical signs, rectal temperatures and nasal swabs for virus isolation were collected daily from 3 days pre- to 8 days post-challenge. Any calves dying or requiring euthanasia during the clinical scoring period were necropsied and their lung lesions scored. On Day 8 post-challenge all remaining calves were necropsied and lung lesions were scored for percent pneumonic tissue.

Results and Conclusion

All vaccinated calves demonstrated high serum IgG antibodies to BRSV and BRSV-specific interferon-gamma on the day of challenge. After challenge, 66% (6/9) of controls died or required euthanasia, whereas no mortality occurred (0/8) in the vaccinated animals. Viral shedding, clinical scores, hyperthermia and lung lesions were significantly (p=0.0001) reduced in the vaccinated calves, compared to control calves. This study demonstrates that the inactivated BRSV vaccine is highly protective against a virulent BRSV challenge in young calves.