

# Effect of Genistein on Bovine Herpesvirus 1 Infections

## *In vivo*

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### Introduction

Finding natural antivirals to feed to cattle in their receiving diets following shipping and other stressors is important to help limit bovine respiratory disease complex (shipping fever). Previously, we had demonstrated that bovine cells treated with the naturally occurring soya isoflavone, genistein, produced 10-1000 times less virus than untreated cells. In this study, we established a level of genistein to treat calves with *in vivo* and then challenged them with bovine herpesvirus 1 (BHV-1; IBR). Calves that received genistein produced as much virus but shed virus for a shorter period of time and also had less severe clinical signs.

### Materials and Methods

Eight Holstein calves (200-400 lb; 91-182 kg) were used in the study: four control animals that were fed milk twice a day and four Holstein steer calves that were treated twice a day with a dose of 25 $\mu$ M of genistein in 1 quart of milk. The material was administered in a bottle by suckling to bypass the rumen and increase

absorption. Calves had blood levels of 10-15  $\mu$ M genistein. The calves were fed the genistein for two days prior to challenge. The calves were infected intranasally with the Cooper strain of BHV-1 at a level of  $1 \times 10^7$  TCID<sub>50</sub> per calf. Nasal secretions and serum were collected daily from Day 2 to Day 14. Clinical scores (respiration, body temperature, attitude, anorexia, nasal discharge, ocular discharge, cough) were taken from Day 2 to Day 14 post-challenge.

### Results and Conclusions

High titers of virus were recovered from both the treated and untreated calves. The level of virus decreased faster in the treated calves and the clinical scores were slightly lower. Genistein does not appear to protect and/or reach high enough levels in the respiratory epithelial cells to prevent initial infection but it does appear to limit infection. Antibody and interferon assays are currently underway to determine the effect genistein has on the innate and acquired immune response. Another genistein clinical trial with a BVDV challenge is underway.