

Comparison of Acute-phase Protein Responses of Cattle in Naturally Acquired Respiratory Disease: Relationships to Vitamin E Supplementation and Antimicrobial Therapy

J. N. Carter, PhD¹; G. L. Meredith, MS²; D. R. Gill, PhD¹; A. W. Confer, DVM, PhD, DACVP² (corresponding author and presenter)

¹Department of Animal Science, College of Agricultural and Natural Sciences

²Department of Veterinary Pathobiology, College of Veterinary Medicine
Oklahoma State University, Stillwater, OK 74078

Introduction

Bovine respiratory disease continues to be a major problem in shipped cattle. Development of an analytical tool for predicting severity of respiratory disease and as a prognostic tool would be valuable to bovine practitioners. Measurement of acute-phase proteins as a screening test for overall health status of groups of cattle has potential for assessing severity of infection.

Materials and Methods

Shipped feedlot cattle were used to study the effects of dietary supplementation with vitamin E for various lengths of time (0, 7, 14, or 28 days) after receiving. In addition, four acute-phase proteins were measured in serum or plasma on days 0, 7 and 28 of feeding; at the time of treatment for respiratory disease with antimicrobial drugs; and upon completion of treatment. These were fibrinogen (Fb), haptoglobin (Hp), serum amyloid A (SAA) and a-1 acid glycoprotein (AGP). Acute-phase protein concentrations were

correlated with vitamin E treatment, clinical disease, and response to treatment.

Results and Conclusions

Compared to serum concentrations for the Control group, vitamin E supplementation was associated with decreased serum concentrations of SAA and AGP by Day 14 and with decreased serum concentrations of Hp, SAA, and AGP on Day 28. Serum Hp concentrations remained significantly lower in cattle that were never recognized as sick compared to those that were treated for respiratory disease. For cattle treated for respiratory disease, serum Fb, Hp, and SAA concentrations were significantly lower for cattle after effective antimicrobial treatment than they were at the time of initial treatment. In addition, serum Hp values were significantly lower at the time of initial treatment in cattle that responded to one round of treatment, compared to those that required two or more treatments for respiratory disease. Potential value of the acute-phase protein assays and ratios will be discussed.