Abstract

American Journal of Veterinary Research

August 2000, Vol. 61, No. 8, Pages 858-861

doi: 10.2460/ajvr.2000.61.858

In vitro evaluation of intraluminal factors that may alter intestinal permeability in ponies with carbohydrate-induced laminitis

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Objectives—To study the in vitro effects of cecal contents incubated with corn starch on colonic permeability in horses.

Animals—4 healthy adult ponies.

Procedure—Mucosal specimens were obtained from the right ventral colon and mounted in Ussing chambers. Changes in short circuit current, conductance, and large-molecule permeability in response to addition of cecal contents and cecal contents incubated with corn starch were evaluated for 120 minutes.

Results—Incubation of cecal contents with corn starch for 8 hours resulted in a decrease in cecal content pH and an increase in lactic acid concentration. These changes were similar to those reported in vivo for ponies given corn starch. Exposure of colonic mucosa to cecal contents incubated with corn starch resulted in an increase in tissue conductance and permeability of technetium Tc 99m pentetate, compared with mucosa exposed to cecal contents alone.

Conclusions and Clinical Relevance—In vitro exposure of colonic mucosa to cecal contents incubated with starch resulted in increased paracellular permeability. Fermentation of excessive amounts of carbohydrate in the intestinal lumen of horses may directly induce increased intestinal permeability associated with carbohydrate-induced laminitis. (Am J Vet Res 2000;61:858–861)

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David M. Hood , Gordon W. Brumbaugh , Ilka P. Wagner . (2002) Effectiveness of a unique dihydropyridine (BAY TG 1000) for prevention of laminitis in horses. American Journal of Veterinary Research 63:3, 443-447

Online publication date: 1-Mar-2002.

Abstract | PDF (112 KB) | PDF Plus (109 KB)