CELMANAX™

EFFECT OF CELMANAX™ LIQUID ON THE INFECTIVITY OF *CRYPTOSPORIDIUM* SPOROZOITES IN PORCINE INTESTINAL CELLS *IN VITRO*

Christopher D. Mateo, DVM, Ph.D., Robin Bauterbaugh, and Kysa Gilkerson, Rural Technologies, Inc., Brookings, SD

Introduction: CELMANAX™ is a yeast culture product which has been improved to express more of the functional carbohydrates associated with the yeast culture fermentation process. One of the functional carbohydrates associated with this production process is Galactosamine. N-acetyl galactosamine has demonstrated an ability to interfere with *Cryptosporidium* spp. ability to attach to intestinal epithilium[1]. Inhibition of *Cryptosporidium* sporozoites to adhere to and penetrate host cells in the presence of sugars and complex carbohydrates has been reported.[2] In a previous study, CELMANAX significantly inhibited the attachment of *C. parvum* sporozoites to bovine epithelial cells *in vitro*[3]. In this study, the effect of CELMANAX on infectivity of *Cryptosporidium parvum* sporozoites in porcine cells is investigated.

Objective: To determine the efficacy of CELMANAX LIQUID to inhibit infection of *Cryptosporidium parvum* sporozoites in porcine intestinal cells *in vitro*.

Materials and Methods: This investigation was done at Rural Technologies, Inc., Brookings, South Dakota, an independent testing facility. The experiment was set up in four replicates. *C. parvum* sporozoites were pre-incubated with Negative Saline Control (PBS), Positive Control (Bovine Submaxillary Mucin–(BSM)) or with 2, 20 or 40 mg/mL CELMANAX LIQUID for 1 hr. The treated sporozoites were then allowed to infect live porcine intestinal cells (IPEC-J2). IPEC-J2 cells were then stained with a FITC-lectin and infection was observed under a fluorescent microscope. The number of *Cryptosporidium*-infected cells was divided by the total cells in a field to determine infectivity rate.

Results: Ability of *Cryptosporidium* sporozoites to infect porcine intestinal cells decreased with increase in CELMANAX concentration in a cell monolayer assay (Figure 1). A 90% decrease in infection was noted with 40mg/mL CELMANAX treatment (Figure 2). The experiment was repeated many times giving the same overall results; however, the standard deviation was always higher than desired.

Conclusions: The results from this study suggest that CELMANAX LIQUID inhibits the binding and infection of *C. parvum* sporozoites to porcine intestinal cells *in vitro* in a dose-dependent manner.

Figure 1: **Effect of CELMANAX™ LIQUID on *Cryptosporidium* infection in IPEC-J2 cells - Fluorescence microscopy**

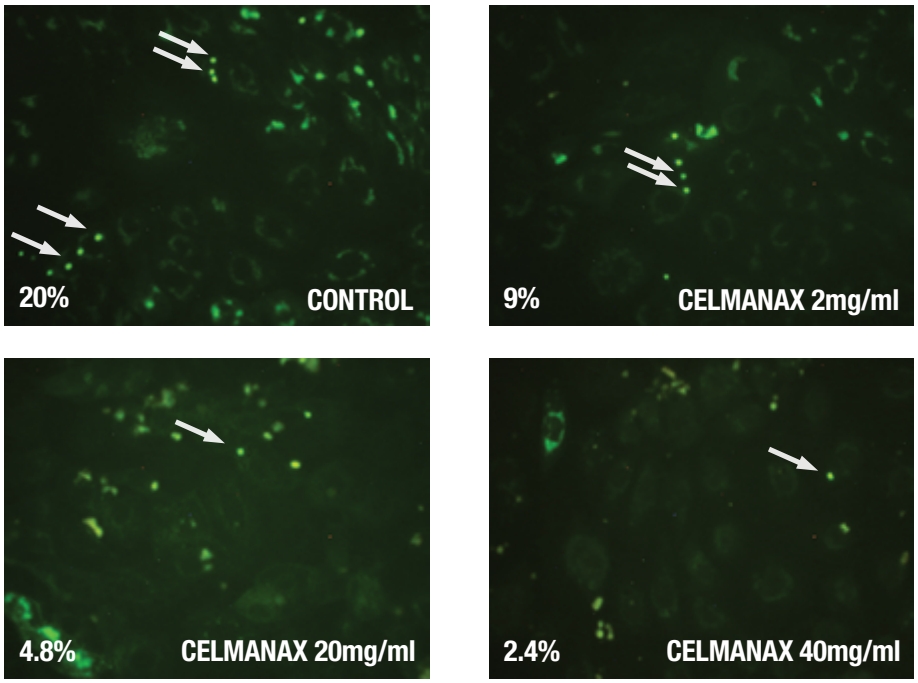
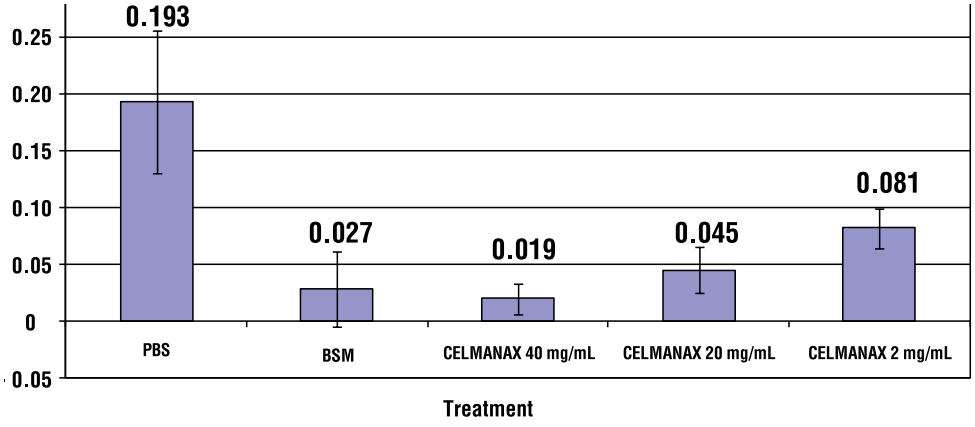


Figure 2: **Effect of CELMANAX LIQUID on *C. parvum* Infectivity Rate**



[1]Hashim *et al* (2006) *Infection and Immunity* 74:99–107

[2]Chen and LaRusso (2000) *Gastroenterology* 118:368-79

[3]Vi-COR™ Research Bulletin #38

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