

Health of Holstein Bull Calves Fed a Fermentation Extract of *Aspergillus Oryzae*

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The objective was to determine whether dietary inclusion of a fermentation extract of the fungus *Aspergillus oryzae*, used as a direct fed microbial, would improve health in Holstein calves from birth thru 1wk post weaning. Calves were randomly assigned to a treatment, control (CON; n = 27) or direct fed microbial (DFM; n = 25). Calves were housed and fed individually. Calves assigned to DFM were fed 2 g of DFM daily. Liquid DFM was delivered in milk replacer for the first 4 wk of the trial; solid DFM was top-dressed on texturized grain thereafter. Calves were fed non-medicated milk replacer twice daily and were weaned upon consumption of 0.91 kg of grain for 3 consecutive days or on d 45 of the study. Calves had ad libitum access to grain and water. Fecal scores were recorded daily. On a weekly basis, DFM calves scoured more frequently than CON. All medical interventions were recorded. Treatment for respiratory ailments were more frequent in CON than DFM. Medical costs per calf from 0 thru 4wk ($\$43.01 \pm 2.40$) and 5 thru 8wk ($\11.18 ± 2.40) did not differ by treatment. For 8wk calves, jejunal lymph nodes were collected upon slaughter for flow cytometric analysis of CD4 and CD8 T cell populations as a measure of immune function. The CD4 cell population as a percentage of total observed cells was greater in DFM calves. Treatment did not affect CD8 cell population as a percentage of total observed cells. Flow cytometric results indicate that DFM may affect the adaptive immune system through effects mediated by CD4 cells. Overall, calves fed DFM scoured more frequently, but were treated less often for respiratory ailments leading to no effect on medical costs. CD4 cell population of jejunal lymph nodes was greater in DFM calves, warranting further research.

Key words: dairy calf, direct fed microbial, T cells