Effect of Direct-Fed Microbial Dosage on the Fecal Concentrations of Enterohemorrhagic
*Escherichia coli* in Feedlot Cattle

Brandon E. Luedtke,¹,² Joseph M. Bosilevac,¹ Dayna M. Harhay,¹ and Terrance M. Arthur¹

²Department of Biology, University of Nebraska at Kearney, Kearney, Nebraska.

Abstract
Contamination of beef products by Shiga toxin–producing *Escherichia coli* is a concern for food safety with a particular subset, the enterohemorrhagic *E. coli* (EHEC), being the most relevant to human disease. To mitigate food safety risks, pre-harvest intervention strategies have been implemented with the aim to reduce EHEC in cattle. One class of interventions that has been widely used in feedlots is direct-fed microbials (DFMs), which can contain various dosing rates of probiotic bacteria. Here we compare the use of two different doses of a commercially available DFM on total EHEC load in a commercial feedlot setting. The DFMs used were the standard $10^9$ *Propionibacterium freudenreichii* and $10^6$ *Lactobacillus acidophilus* colony forming units (CFUs)/head/day dose of Bovamine® (Nutrition Physiology Company, Guymon, OK) and the higher dose, Bovamine Defend™ (Nutrition Physiology Company), which is dosed at $10^9$ *P. freudenreichii* and $10^9$ *Lactobacillus acidophilus* CFUs/head/day. To analyze the total EHEC fecal concentration, 2200 head of cattle were assigned a DFM feed regimen lasting approximately 5 months. At harvest, 480 head of cattle were sampled using rectoanal mucosal swabs. A quantitative polymerase chain reaction assay targeting ecf1 was used to enumerate the total EHEC fecal concentration for 240 head fed the low-dose DFM and 240 head fed the high-dose DFM. No significant difference ($p > 0.05$) in the fecal concentration of total EHEC was observed between the two doses. This suggests that using an increased dosage provides no additional reduction in the total EHEC fecal concentration of feedlot cattle compared to the standard dosage.


The study reported here in this Research Brief was not funded by the beef checkoff, but is made available to expand the usefulness of this checkoff-funded website for those interested in beef safety.