

Effects of reducing dietary protein on the formation of intestinal microbial metabolites and performance of early-weaned pigs

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Post-weaning diarrhea may be associated with intestinal microbial metabolites (ammonia, amines, volatile fatty acids [VFA]) that are influenced by dietary crude protein (CP) content. Three experiments were conducted to determine effects of a low-protein, amino acid (AA)-supplemented diet on ileal AA digestibility, performance and concentration of microbial metabolites in the ileum and cecum of pigs weaned at 14 d of age.

In Exp. 1, 10 piglets fitted with an ileal T-cannula were assigned in a cross-over design to two diets containing 24 or 20% CP and crystalline AA were added to meet AA requirement (NRC 1998). Diets were fed at 2.5 × ME requirement for maintenance. Reduced dietary CP decreased apparent ileal digestibility of all non-essential and most essential AA, except for Lys, Met and Thr. Dietary CP level did not affect ileal digesta pH and ammonia N, amines and VFA concentrations. In Exp. 2, 8 piglets fitted with a cecal T-cannula were assigned to two diets, similar to Exp. 1. Reduced dietary CP did not affect cecal digesta pH but decreased ammonia N, total VFA, and putrescine concentrations by 28 to 39%. In Exp. 3, 32 piglets were fed two diets, similar to Exp. 1, at ad lib according to a randomized complete block design. Dietary CP did not affect performance and diarrhea was not observed during the 3-wk study.

Implications:

Reducing dietary CP with AA addition markedly reduced the production potentially-harmful microbial metabolites in the cecum but not the ileum without influencing growth performance and incidence of diarrhea.