

Impact of highly oxidized dried distillers grains with solubles (DDGS) at increasing dietary vitamin E levels on nutrient digestibility and DE and ME content in diets for growing pigs

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A study was conducted to evaluate the effects of feeding diets containing highly oxidized DDGS with 3 levels of vitamin E on DE and ME content, and apparent total tract digestibility (ATTD) of energy, N, C and S in diets for growing pigs. The DDGS source used in this study contained the highest thiobarbituric acid reactive substances (TBARS) value and peroxide value (5.2 ng/mg oil and 84.1 meq/kg oil, respectively) among 30 other DDGS sources (mean values = 1.8 ng/mg oil and 11.5 meq/kg oil, respectively). Growing barrows (n=54) were assigned randomly to one of 6 dietary treatments in a 2 x 3 factorial design. Pigs were fed corn-soybean meal (CON) or diets containing 30% DDGS with 3 levels of vitamin E: none supplemented, NRC (11 IU/kg), or 10X NRC (110 IU/kg). Pigs were housed individually in metabolism cages for a 5-d adaptation period followed by a 3-d total collection of feces and urine. Feed, feces and urine were analyzed for GE, N, C and S to calculate the corresponding ATTD, daily balance, as well as DE and ME content of diets. The DE and ME content of DDGS diets were lower ($P < 0.05$) than CON (3,285 vs. 3,347 and 3,180 vs. 3,247 kcal/kg, as-fed basis, respectively). Dietary inclusion of 30% DDGS reduced dietary ATTD of GE (84.3 vs. 89.2%, $P < 0.001$), N (84.1 vs. 88.7%, $P < 0.001$) and C (85.0 vs. 90.0%, $P < 0.001$), but improved ATTD of S (86.8 vs. 84.6%, $P < 0.001$) compared to CON. Nitrogen absorbed tended to be lower ($P < 0.10$), and C absorbed and retained were lower ($P < 0.05$) in DDGS diets than CON. Intake, fecal and urinary excretion of S, and S absorbed and retained were higher ($P < 0.01$) in DDGS diets than CON. There was no significant interaction between dietary DDGS and vitamin E level, or effects of vitamin E on nutrient digestibility or dietary energy value in this study. In conclusion, feeding diets containing 30% highly oxidized DDGS decreased the ATTD of GE, N and C, but improved the ATTD of S in diets. Supplementation of vitamin E in the diet did not counteract the negative effects of DDGS on nutrient digestibility.

Key words: ATTD, DDGS, pig, vitamin E