Effects of frequent introduction and removal of dried distillers grains with solubles (DDGS) in growing-finishing swine diets on backfat fatty acid composition

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Crossbred pigs (n=216; BW = 51.3 ± 3.1 kg) were assigned randomly to one of four dietary treatments to evaluate the effects of switching between diets with or without DDGS during the growing-finishing phase on fatty acid composition of backfat. Treatments included a corn-soybean meal control diet with 0% DDGS (CON); CON with 20% DDGS (D20); CON and D20 diets alternated bi-weekly (D20S); and CON with a diet containing 40% DDGS alternated bi-weekly (D40S). Diets were fed in three phases. For D20S and D40S, there were 5 two-week feeding periods during the feeding trial and pigs started and ended the trial consuming DDGS. Pigs were harvested (BW=112 kg) at a commercial abattoir and backfat samples (n=80) were removed from the loin adjacent to the 10th rib 24 h postmortem and evaluated for fatty acid composition. Dietary treatment had no effect on C14:0, C18:3, C20:0, or C22:0, but CON pigs had higher concentrations of C16:0 than pigs in the D20S (P=0.005) and D40S (P<0.001) diets (27.8, 26.7, 26.5%). Pigs fed CON had a higher percentage of C18:0 than those fed D20 (P=0.02) and D40S (P=0.007; 16.5, 15.1, 14.8%). Feeding CON and D20 resulted in higher C18:1 percentages than D20S (P<0.0001 and P<0.004, respectively) and D40S (P<0.0001 and P< 0.002, respectively; 41.5, 40.7, 39.3, 39.1%). As expected, pigs fed CON had lower C18:2 concentrations than pigs from all other treatments (P<0.001; 11.3, 14.5, 16.4, 17.1%). Interestingly, D20 pigs had lower C18:2 concentrations than D20S (P=0.004) and D40S (P<0.001) pigs. Compared to all other treatments, pigs fed CON had higher total saturated fatty acid concentrations (SFA; P=0.005), as well as lower unsaturated fatty acids (UFA; P<0.001) and polyunsaturated fatty acids (PUFA; P<0.0001). Similar to C18:2 results, pigs fed D20 had lower PUFA concentrations than D20S (P=0.005) and D40S (P<0.001) pigs. These results indicate that bi-weekly alternating between corn-soybean meal and 20 or 40% DDGS diets results in higher C18:2 and PUFA concentrations in backfat compared to feeding 20% DDGS diets continuously during the grower-finisher period.

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