

EFFECTS OF FEEDING CORN DRIED DISTILLERS GRAINS WITH SOLUBLES (DDGS) ON PORK FAT QUALITY

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Two experiments were conducted to determine the effects of feeding increasing levels of corn DDGS on growth performance, carcass and pork fat quality of growing-finishing pigs. In the first experiment, 512 pigs (22.1 ± 0.54 kg BW) were blocked into 2 groups and allotted to 1 of 4 dietary treatments. Dietary treatments consisted of corn-soybean meal diets with no supplemental fat containing 0% (D0), 10% (D10), 20% (D20), or 30% (D30) DDGS. Overall ADG (0.92 ± 0.01 kg) was not different among dietary treatments, but ADFI was linearly reduced and G:F was linearly increased with increasing dietary DDGS levels. Dressing percentage, loin marbling and firmness, and belly firmness were linearly reduced ($P < 0.01$), while percentage of fat-free lean was linearly increased ($P < 0.05$) with increasing dietary DDGS levels. Dietary DDGS level had no effect ($P > 0.1$) on subjective loin color score, drip loss, ultimate pH of loins, and backfat and belly fat Japanese color scores. There were no differences in ADG, ADFI, G:F, dressing percentage, loin marbling, loin muscle firmness, or belly firmness between pig fed the D0 and D10 diets. Polyunsaturated fatty acids, particularly linoleic acid (C18:2), linearly increased ($P < 0.01$) in belly fat and backfat. The C18:2 content of loin intramuscular fat increased linearly ($P < 0.01$), but to a lesser degree than the increase in C18:2 content of backfat and belly fat as dietary DDGS levels increased. Iodine value (IV) of backfat, belly fat, and loin fat increased linearly ($P < 0.01$) from 58.4 to 72.4, 61.5 to 72.3, and 54.8 to 57.7, respectively, as dietary DDGS level was increased from 0 to 30%. Loin lipid oxidation measured on day 0, 14, 21, and 28 of retail storage was not different among pigs fed increasing levels of DDGS ($P > 0.1$). Results from loin sensory taste tests showed no diet effects ($P > 0.05$) for flavor, off-flavor, tenderness, juiciness, and overall acceptability. Similarly, bacon flavor, off-flavor, crispiness, and overall acceptability were not different among dietary DDGS levels ($P > 0.05$), but bacon fattiness and tenderness ($P < 0.05$) were linearly reduced with increasing dietary DDGS levels. The second experiment was conducted to evaluate the effects of feeding diets containing no supplemental fat and 0, 15, or 30% DDGS, and DDGS withdrawal from the diet 0, 3, 6, or 9 weeks prior to slaughter on growth performance, pork quality, and pork fatty acid composition for grower-finisher pigs. A total of 432 pigs (29.8 ± 0.2 kg BW) were randomly allotted to one of 9 dietary treatment combinations. Adding 15 or 30% DDGS to the diets had no effect ($P > 0.05$) on ADG, ADFI, and G:F except for a slight reduction in ADG (0.87 vs. 0.92 ; $P < 0.05$) for pigs fed 30% DDGS diets with a 0 wk withdrawal compared to those pigs fed the control diets. Dietary DDGS level and withdrawal interval had no effect ($P > 0.05$) on carcass quality, loin quality, and Japanese pork fat color score. Belly firmness score was lower ($P < 0.05$) in pigs fed 30% DDGS and 0 wk withdrawal compared to pigs fed the control diets. Linoleic acid content (C18:2) and IV of belly fat increased with increasing DDGS level ($P < 0.01$). Withdrawal of DDGS from the diet for 0 to 9 wk prior to slaughter resulted in a linear reduction ($P < 0.01$) in C18:2 and IV of belly fat in pigs fed the 15% DDGS diets (C18:2 = 14.6, 13.3, 12.6, and 10.9%; IV = 67.3, 64.4, 64.1, and 62.7 for 0, 3, 6, and 9 wk withdrawal, respectively) and 30% DDGS diets (C18:2 = 17.3, 16.1, 14.2, 12.4; IV = 71.2, 68.2, 64.5, and 62.7 for 0, 3, 6, and 9 wk withdrawal, respectively). These results suggest that adding up to 30% DDGS to growing-finishing pig diets may slightly reduce ADG, but G:F is unaffected or improved. Linoleic acid content and IV increase in pork fat with increasing dietary DDGS level, but feeding diets containing up to 30% DDGS has no effect on shelf life of pork loin or consumer preference for cooked loins and bacon. Reductions in C18:2 content and IV can be achieved in a little as 3 wk of withdrawing DDGS from the diet.