

Effects of Reducing Dietary Energy Density by Modifying Fat or Fiber Inclusion on Growth Performance and Carcass Characteristics of Finishing Pigs

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This experiment evaluated the response of finishing pigs to reduced dietary energy density, achieved either by lowering the inclusion of added fat or by increasing the inclusion of fibrous ingredients. A total of 1,194 crossbred boars and gilts [Pietrain × (Landrace × Large White)] with an initial body weight (BW) of 75.1 ± 6.87 kg (mean ± SD) were housed in 96 single-sex pens, blocked by BW, and randomly assigned to 4 dietary treatments. Each pen contained 10-13 pigs, with 24 pens per treatment. Pigs were fed the experimental diets for 42 d and individually weighed on d 0, 23 and 42. All diets contained 0.85% standardized ileal digestible lysine and 2,421, 2,324, 2,321, and 2,221 kcal net energy (NE), respectively. Energy reduction was achieved by either decreasing added fat from 2.50% to 0.60%, including 20% wheat middlings while maintaining 2.50% fat, or combining 20% wheat middlings with reduced fat inclusion (0.60%). The first 2 diets contained 12.7% neutral detergent fiber, whereas the latter two contained 16.0%. Following the 42-d growth study, pigs were marketed over a 4-wk period, and carcass characteristics were collected. Performance data were analyzed using a linear mixed model including treatment and sex as fixed effects and block as a random effect. Carcass data were analyzed with treatment and sex as fixed effects, hot carcass weight as a covariate, and pen and marketing group as random effects. Increasing added fat, regardless of fiber inclusion, decreased ADFI (2.07 vs. 2.01 kg; $P = 0.006$). Fiber inclusion reduced daily NE intake (4.85 vs. 4.61 Mcal; $P < 0.001$) and ADG (0.782 vs. 0.752 kg; $P = 0.006$). FCR increased as dietary energy density decreased ($P < 0.001$), being lowest in diets with added fat and no wheat middlings. Energy conversion ratio decreased with the reduction in dietary energy ($P = 0.023$). Increasing fiber, regardless of fat inclusion, reduced the digestibility of ash, protein, organic matter, and gross energy ($P < 0.001$). Fat digestibility was highest in the diet containing added fat and no wheat middlings, differing significantly from the other treatments ($P < 0.001$). Final BW and hot carcass weight did not differ among treatments ($P = 0.193$ and $P = 0.109$, respectively). However, fiber inclusion tended to reduce carcass yield ($P = 0.052$), increased carcass leanness (64.3 vs. 64.6%; $P = 0.003$) and decreased backfat thickness (13.40 vs. 13.02 mm; $P = 0.016$). Reducing dietary energy by lowering added fat increased feed intake, resulting in similar energy intake and growth performance but a poorer feed efficiency, without affecting carcass characteristics. In contrast, reducing dietary energy by

including 20% wheat middlings decreased energy intake and growth rate, worsened feed efficiency, and reduced carcass yield and fat deposition.