

Diets formulated at similar digestible energy but different estimated net energy affect growth and body composition of weaned pigs

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Theoretically, net energy (NE) has advantages for diet formulation over DE and ME as it accounts for metabolic utilization and partitioning of energy used for body tissue growth. Studies in the weaned pig are needed to verify the value of NE employed under practical circumstances. This experiment evaluated the growth, body composition and whole body nutrient deposition in weaned pigs fed diets with similar DE but increasing NE content. A total of 256 weaned pigs (20±1 d; 6.8±1 kg) were used in a 28-d growth study including measurements of body composition. Diets with similar CP content (26.7%) but increasing fat (HiCP1, HiCP2, HiCP3) or declining CP but similar fat (MedCP, 23.1%; LoCP, 19.9%) were formulated to a similar DE (3.53 Mcal/kg), lysine/DE content and ideal protein ratios. NE content increased from 2.24 to 2.40 Mcal/kg. Growth rate was highest for HiCP1 and MedCP, intermediate on LoCP and HiCP2, and lowest on HiCP3 (P<0.005). Carcass protein content and protein deposition (PD) were similar on HiCP1, HiCP2 and MedCP but depressed on LoCP and HiCP3 (P<0.05). Carcass lipid content was highest on the LoCP diet (P<0.05). Maximum body growth rate, and protein deposition rate were observed at DE and NE intakes of 3.16 and 2.02 Mcal/d, respectively. Conversely, higher DE and NE intakes (3.35 and 2.09 Mcal/d, respectively) were required before maximum lipid deposition (LD) was achieved.

Implications:

Contrary to previous assumptions, these weaned pigs were able to consume sufficient energy to achieve maximum PD capacity; indeed, additional energy was consumed in some instances, the additional energy being utilized for increased LD. In this respect, the nature of growth in weanling pigs was similar to that observed in the growout period. DE did not predict animal performance very well, but further work with NE is required before the pork industry can adopt it in place of DE.