

# Increasing Energy Intake with Daily Amino Acid Intake Held Constant or at the Same Ratio with Energy on Pig Performance

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Formulating swine diets to maximize energy intake should ensure that intake of other nutrients and, in particular amino acids, is well managed so as not to limit performance. Thus, performance and carcass composition of 126 PIC barrows within 30 to 60 (Exp. 1) and 80 to 110 kg body weight ranges (Exp. 2) consuming increasing energy with amino acids maintained at a constant daily intake or at the same dietary concentration relative to digestible energy intake (DE<sub>i</sub>) were investigated. Pigs were penned individually and fed one of seven dietary treatments (ad lib or 87%, 74% and 61% of ad lib each with amino acid intake maintained at a constant daily intake or at the same dietary concentration relative to DE<sub>i</sub>). Feed intake was adjusted weekly. Body weight was determined weekly and pigs were scanned by Real Time Ultrasound at the start and end of experiments to estimate rates of protein (PD) and lipid (LD) deposition. Carcass data was collected at the end of Exp. 2.

Average daily gain, PD and LD decreased with decreasing DE<sub>i</sub> and were unaffected by amino acid intake (P>0.10). In Exp. 1, feed efficiency (FE) was similar (P>0.10) among treatments with DE<sub>i</sub> ranging from ad lib to 74% of ad lib intake. In Exp. 2, pigs fed at 100% and at 61% of ad lib intake had the highest and lowest FE, respectively, compared to the other treatments (P<0.05). Those fed at 87% and 74% of ad lib intake had similar and intermediate FE. Amino acid intake relative to DE<sub>i</sub> did not affect (P>0.10) FE in both experiments. Carcass data showed no advantage of either amino acid regimen. As expected, low DE<sub>i</sub> pigs had leaner and higher yielding carcasses. Grower and finisher pigs respond similarly to increasing DE<sub>i</sub> whether intake of amino acids is held at a constant daily level or maintained at a constant ratio to energy.

**Implication:** Restricting energy intake improves carcass yield but the benefits are completely offset by much slower growth. Swine diets designed to maximize energy intake can be fed without any negative effects on overall performance provided amino acid intake meets requirements.