



Australasian Pork Research Institute Ltd APRIL

PROJECT SUMMARY

Project Number and Title: A3A-102 Review of relationships between energy intake and performance and body composition changes in 60-108 kg pigs with modern genetics using a DXA scanner

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Aims and Objectives: Quantifying energy requirements for expressing lean tissue deposition potential in finisher pigs will help nutritionists set daily energy allowances to maximise lean tissue growth without excessive fat deposition. The experiment aimed to quantify the relationship between energy intake (range from 26 MJ/d to 44.5 MJ digestible energy/day) and lean tissue deposition rate in 60-110 kg pigs with modern genetics using a DXA scanner.

Experimental design (if applicable): Intact male and female pigs with modern genetics (Primegro™ Genetics, Corowa, NSW, Australia, as of 2019) were fed seven different amounts of digestible energy (DE) of a wheat-based diet containing 14.3 MJ DE/kg [25.8, 29.0, 32.6, 35.3, 38.5, 41.5 and 44.2 MJ DE/d (*ad libitum*) for males, and 25.8, 28.9, 32.0, 35.6, 38.3, 40.9 and 44.5 MJ DE/d (*ad libitum*) for females] between 60 kg and 108 kg live weight. The amount of feed intake in the *ad libitum* group was measured as actual voluntary feed intake. Body composition of anaesthetised pigs was measured using the Dual Energy X-ray Absorptiometry (DXA) method when individual pigs reached 108 kg, and lean, water, protein fat and ash gain rates were calculated. Pigs were slaughtered on the 2nd day post-DXA scan, and commercial carcass traits were measured. The linear, quadratic and piece-wise regression (where applicable) models were compared and used to describe the relationship between energy intake and outcome variables.

Key Findings: Results showed that the lean tissue deposition rate followed a linear response to the increased dietary energy intake in both male and female pigs, which agreed with the previous study (King et al. 2004). Carcass backfat thickness (at 108 kg live weight) increased linearly in male, but not female pigs, in response to the increased dietary energy intake.

Applications to Industry:

Unrestricted feeding in female pigs should be considered, because the lean tissue deposition rate of female pigs increased linearly in response to increased dietary energy allowance, and feed restriction did not affect carcass backfat thickness in female pigs when slaughtered at a fixed live weight.

Feed restriction can linearly reduce carcass backfat in male pigs slaughtered at a fixed body weight; however, the economics of feed restriction should be evaluated in each production system by considering mortality rate and penalties on carcass backfat.