

Does variation in food intake affect carcass composition in the growing pig?

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Variation in performance and carcass quality is a very real but often hidden cost to the pig industry (Payne *et al.* 1999). Part of this variation can be attributed to the effect that season, ambient temperature in particular, has on feed intake and hence fat and protein deposition. Another possibility, as suggested by Edwards (1999), is that some of the variation in carcass quality may be related to daily fluctuations in nutrient intake. There are many reasons why food intake of an individual pig might vary from one day to another, such as a blockage in the feeder or competition for feeder space. Edwards (1999) used the AUSPIG simulation model to predict the effect when feed intake was restricted to 36% of its normal intake (0.76 vs 2.09 kg/d), and then followed by a day of engorgement (3.42 kg/d), with this pattern being repeated on a daily basis. Fat deposition was increased from 194 to 236 g/d while protein deposition declined from 155 to 90 g/d.

The hypothesis for this experiment was, therefore, that the fat to lean ratio in pigs at slaughter (100 kg liveweight, LW) will increase if their nutrient intake fluctuates during the growing period. Sixty individually housed female pigs (Landrace x Large White) from a high-health status commercial herd were allocated to one of four treatments. For the purpose of calculating feed restriction levels, pigs were treated as sub-groups of four. Pigs were fed *ad libitum* throughout (High), or at 85% (Low) of their partner on the High treatment, or

restricted to 70% on one day and then 100% the following day with this pattern repeated throughout the experiment (Daily), or restricted to 70% for three consecutive days and then 100% for the next three days (3-Daily). Composition of diets was the same for all treatments and the diet was changed at 50 and 70 kg LW.

Average daily gain (ADG) reflected the differences in food intake, and pigs on the High treatment had a significantly higher P2 reading (depth of subcutaneous fat) than any other treatment (Table 1). While not significant, the two groups whose feed intake was varied on either a Daily or 3-Daily cycle tended to have a higher P2 than for the Low group. The feed restrictions imposed in this experiment were less than those simulated by Edwards (1999), and whether this was sufficient to alter fat and protein deposition will depend on more detailed analysis of body composition that is currently being undertaken.

Edwards, A.C. (1999). Feed processing and feeding management to enhance nutrient utilization in commercial livestock production. *Recent Advances in Animal Nutrition in Australia* 12, 137–144.

Payne, H.G., Mullan, B.P., Trezona, M. and Frey, B. (1999). Variation in pig production and performance. In: *Manipulating Pig Production VII*, pp. 13–26 (ed. P.D. Cranwell). Australasian Pig Science Association, Werribee, Victoria, Australia.

Table 1 Effect of fluctuations in food intake on pig performance.

	High	Low	Daily	3-Daily	P	I.s.d.
LW start (kg)	29.4	30.3	29.8	29.8	0.874	2.16
LW end (kg)	103.7	104.6	104.1	104.2	0.708	1.47
ADG (g)	943 ^a	825 ^b	839 ^b	828 ^b	0.001	64.9
Food intake (kg/d)	2.90 ^a	2.51 ^b	2.49 ^b	2.47 ^b	0.001	0.132
FCR	3.15	3.06	3.00	3.01	0.406	0.194
P2 (mm)	14.9	11.9	12.7	12.9	0.021	1.96

^{a,b,c,d} Within columns, means with a common superscript are not statistically different ($P > 0.05$)