

SELECTION FOR EFFICIENT LEAN GROWTH ON RESTRICTED FEEDING: 2. GROWER PERFORMANCE

C.P. McPhee, N.H. Nguyen* and L.J. Daniels**

Queensland Department of Primary Industries, Animal Research Institute, Yeerongpilly, Q4105, Australia.

*School of Veterinary Science and Animal Production, University of Queensland, Q4072, Australia.

**Queensland Department of Primary Industries, Research Station, Biloela, Q4715, Australia.

Large White pigs, selected by McPhee *et al.* (1988) for lean growth rate on a restricted feeding scale displayed a reduction in fat and an increase in lean growth rate, when compared with an unselected control on *ad libitum* feeding. There were also increases in appetite and apparent rate of glycogen depletion with fasting (McPhee *et al.* 1995). These responses were consistent with a change in the partitioning of metabolizable energy toward lean and away from fat deposition and an increase in maintenance heat production.

To examine this hypothesis further, two lines of 36 sows and 6 boars were newly formed by sampling within Large White litters. These are being divergently selected for high and low liveweight gain over a 6-week period starting at 50 kg weight. Over this test period, pigs of both lines are all fed the same total amount of grower food, restricted to an estimated 80% of average *ad libitum* intake. Measurements are made of liveweight and ultra sonic P2 backfat thickness. Selection intensities are 2 out of 24 males and 6 out of 24 females for high or low liveweight gain in the high and low lines respectively. Pigs are also sampled from the lines for comparison on *ad libitum* feeding over the same 6 week period. Data from the progeny of first to third generation selected parents were subject to REML analysis (Genstat 5 1997) with line, feed and sex and their interactions as fixed and batch and sire within line as random effects. In Table 1 the means of the high and low lines fitted for each of the measured traits are presented.

Table 1. Means of traits of growing pigs of the high and low selection line measured on two feeding levels.

Feeding levels	Restricted		<i>Ad libitum</i>		^a s.e.d
	High	Low	High	Low	
Selection Line					
Weight gain (kg/d)	0.77	0.72	0.95	0.93	0.01
Food intake (kg/d)	2.11	2.10	2.66	2.77	0.002
Food conversion ratio	2.76	2.95	2.83	3.01	0.03
Fat at P2 (mm)	11.5	12.1	12.1	12.7	0.02
Number of pigs	747	616	278	200	

^aStandard error of difference

Relative to the low line, the high line grew faster with lower food conversion ratio and fat. On *ad libitum* feeding, food intake was also reduced. This contrasts with an increase in intake found by McPhee *et al.* (1988) when selection was for increased lean gain on restricted feeding instead of the liveweight gain of the present study. The contributions of changed energy partitioning favouring lean over fat and reduced maintenance to the responses here have yet to be determined.

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References

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