

Genetic Response to Growth Rate Selection in Pigs Measured on Two Feeding Levels

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From the findings of McPhee *et al.* (1988), there is an expectation that selection in the growing pig for bodyweight gain measured on restricted feeding will result in favourable responses in the rate and efficiency of growth of lean pork on different levels of feeding. This paper examines this in two lines of Australian Large White pigs which have undergone 3 years of selection for high and for low growth rate over a 6-week period starting at 50 kg liveweight. 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. Although not used in selection, P2 fat depth is measured ultrasonically at the

end of test. Pigs from the lines are also grown on *ad libitum* feeding for comparison with those on restricted feeding. Breeding values for growth rate, food conversion ratio, fat and food intake were estimated using PEST (Groeneveld 1990). Genetic parameters used in these estimates were taken from Nguyen *et al.* (1999) for restricted fed pigs and from Nguyen (pers. comm.) for *ad libitum* fed pigs. Changes in average breeding value for all traits over three years of selection were similar in magnitude but opposite in direction in the high and low lines. The base means and absolute responses averaged for the two lines on restricted and *ad libitum* feeding are given in Table 1.

Table 1. Means of traits of growing pigs and the average absolute response per line in their breeding values to three years of selection.

Feeding levels Selection Line	Restricted			<i>Ad libitum</i>		
	Mean	Response	^a s.e	Mean	Response	^a s.e
Weight gain (kg/d)	0.75	0.026	0.002	0.94	0.014	0.004
Food intake (kg/d)	2.11	0.000	0.000	2.70	0.098	0.025
Food conversion ratio	2.86	0.107	0.007	2.92	0.124	0.024
Fat at P2 (mm)	11.8	0.065	0.011	12.4	0.546	0.156
Number of pigs		2120			542	

^astandard error of response

Relative to the low line, the high line exhibited an increase in growth rate and reductions in food conversion ratio, fat and food intake. Responses on restricted relative to *ad libitum* feeding were significantly higher for growth rate and lower for fat. Applying economic values calculated by McPhee and Macbeth (2000) valued high line gains from selection at \$93/sow/yr on *ad libitum* feeding and \$101/sow/yr on restricted feeding. This indicates that a restricted feeding regimen during performance testing is suitable for selecting breeding pigs whose descendants are grown on both restricted and *ad libitum* feeding although the contribution of different traits varies with feeding level.

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