

RATE, EFFICIENCY AND COMPOSITION OF GROWTH OF MICE SELECTED FOR HIGH  
GROWTH RATE UNDER *AD LIBITUM* AND RESTRICTED FEEDING

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INTRODUCTION

Selection for rapid growth on *ad libitum* feeding has been extensively studied in mice. It almost always results in increased in appetite, fatness and both the rate and efficiency of growth. Results of studies of selection for growth rate on restricted levels of feeding appear confused. Most report similar changes to those on *ad libitum* feeding (McPhee *et al*, 1979), but some have found an improvement in the efficiency of growth unaccompanied by rises in appetite and fatness (Hetzl and Nicholas, 1978).

METHODS

In this experiment, three lines of mice were compared. Line *A* was selected for high 3 to 6 week growth rate on *ad libitum* feeding, Line *R* was selected on a restricted feeding scale which prevented appetite variation being expressed, and Line *C* was maintained as an unselected control. After six generations, mice from all three lines were grown from 3 to 9 weeks of age on both levels of feeding. Comparisons were made of growth rate, voluntary food intake, food conversion efficiency (gain/intake) and carcass components and these are given in Table I.

RESULTS

TABLE 1: Comparison of Lines for Growth and Carcass Traits on  
Two Levels of Feeding

Feeding Level	Line	Daily Gain (g)	Daily Intake (g)	Gain/Intake	Fat %	(Protein + Moisture) %
<i>Ad libitum</i>	A	0.64	6.99	0.092	16.9	79.2
	R	0.53	6.36	0.083	10.3	85.6
	C	0.43	6.79	0.065	10.6	85.3
Restricted	A	0.39	4.99	0.079	17.0	79.8
	R	0.45	5.00	0.090	15.0	81.2
	C	0.36	5.02	0.072	15.4	80.4
	s.e.*	0.02	0.11	0.004	0.090	0.6

\* Standard error of each line x feed level sub-class mean

The most striking aspect of the results in Table 1 are the significant interactions between lines and feeding levels ( $p < .05$ ). Overall, *A* and *R* mice were faster and more efficient growers than *C* mice but *R* mice grew faster and more efficiently than *A* mice on restricted feeding whereas *A* mice were the most efficient and fastest growers on *ad libitum* feeding. Line *A* mice had highest and *R* mice lowest appetites on *ad libitum* feeding and this reflected in their carcass compositions at 9 weeks of age. Line *A* mice had the highest percentage of fat and lowest percentage of protein + moisture and *R* mice the converse.

Thus both *A* and *R* mice enjoyed similar improvements in the rate and efficiency of growth, but only the *A* mice suffered undesirable increases in appetite and fatness. In agreement with Hetzel and Nicholas (1978), these findings favour restricted over *ad libitum* feeding as a performance testing regime for genetic improvement in the efficiency of lean growth in pigs.

#### REFERENCES

- HETZEL, D.J.S. and NICHOLAS, F.W. (1978). *Proc. Aust. Soc. Anim. Prod.* 12th Biennial Confer. 12: 194.
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