GROWTH CURVE ANALYSIS OF MICE SELECTED FOR LARGE AND SMALL BODY SIZE

A.C. Parratt[1], R.B. Roberts[2] and J.S.F. Barker[3]

[1] Animal Sciences Group, University College of Agriculture, Lincoln College, Canterbury, New Zealand.

[2] ARC Animal Breeding Research Organisation, West Mains Road, Edinburgh, Scotland.

[3] Department of Animal Science, University of New England, Armidale, N.S.W. 2351

Roberts (1981) described changes in food consumption and efficiency in lines of mice selected for 6 week weight. Part of these data are studied here, using non-linear growth equations to analyse changes in the total growth curve resulting from selection.

Mice were taken at 3 weeks of age from three replicates each of large, control and small lines at the 17th generation of selection (Falconer 1973). Eight lines provided 11 male mice each and one replicate of the large line 10. Mice were housed and fed individually, with weight and feed intake recorded weekly. The trial was not terminated until the surviving mice were 75 weeks old. Although not all mice survived to this age, 81 of the 98 were still alive after one year.

The Compertz and Logistic equations were fitted to all data available on each individual. In addition to the parameters estimated from each equation, age and weight at the point of inflection were estimated.

Line means and standard errors for each parameter and the age and weight at points of inflection are presented in Table 1. Selection has resulted in significant correlated responses in the parameters of both models. Particularly noticeable are the large changes in mature weight (A) and increase in the maturing rate parameter (K) in both the small and large lines. Increases in K are associated with early maturing individuals. The result is consistent with information on weight and age at the point of inflection. Both large and small line mice attain maximum growth rate earlier, but with the large line at heavier weights and the small line at lighter weights. The results indicate that if selection was to be carried out for K, mature weight would also need to be considered so as to avoid undesirable changes in the overall growth pattern.

TABLE 1: Means and Standard Errors of Growth Curve Parameters for
(1) Gompertz and (2) Logistic Models

Line	Parameters			Point of Inflection Traits	
	A (gms)	B	K (days-1)	Age (days)	Weight (gms)
(1)					
Large	47.00(1.13)	2.21(0.23)	0.038(0.006)	20.88(0.44)	17.29(0.42)
Control	36.71(0.97)	1.64(0.12)	0.022(0.006)	22.92(0.29)	13.36(0.33)
Small	25.81(0.69)	1.88(0.06)	0.029(0.006)	22.14(0.46)	9.50(0.25)
(2)					
Large	46.91(1.14)	6.93(0.76)	0.045(0.006)	21.65(0.41)	23.46(0.57)
Control	36.92(0.92)	4.34(0.63)	0.025(0.007)	21.91(0.38)	18.46(0.45)
Small	25.71(0.69)	5.70(0.58)	0.035(0.006)	19.11(0.31)	12.85(0.35)

REFERENCES

FALCONER, D.S. (1973). *Genet. Res.* 22: 291-321.

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