

THE INFLUENCE OF GROWTH RATE SELECTION UPON PER HECTARE PRODUCTIVITY OF BEEF COWS

J.F. GRAHAM, H.M. KNOWLES and A.J. CLARK

Dept of Food and Agriculture, Pastoral and Veterinary Institute, Private Bag 105, Hamilton, Vic. 3300.

Selection for weight gain in the beef breeding herd is now more widespread and accurate because of the use of Breedplan. Growth rate selection produces an increase in liveweight at all ages (Parnell *et al.* 1991); it also increases both the size and feed maintenance requirements of the breeding cow. This paper reports the preliminary results of an experiment examining the effect of growth rate selection on the per hectare productivity of autumn calving cows.

In 1974, an Angus herd at Trangie Research Centre, N.S.W. was divided into 3 closed selection lines. One line was randomly chosen to form a control line (C), the others being allocated either to a high (H) or low line (L) based on their individual growth from birth to yearling age. Bulls and replacement heifers were selected within each line solely on their growth rate.

At the Pastoral and Veterinary Institute, Hamilton, cattle from the H, C and L lines are each set stocked at 0.8, 1.2, 1.6 and 2.0 cows/ha, with 2 replicates of 4 cows per plot. Plots are maintained after calving in autumn with 100% calves at foot, and calves are weaned at 9 months of age. Data from years 1989 and 1990 using a 280 day weaning weight adjusted for sex, age of calf and age of dam using a 24 h fasted liveweight are shown in Fig. 1 (analysis of data using actual weaning weights produced similar results).

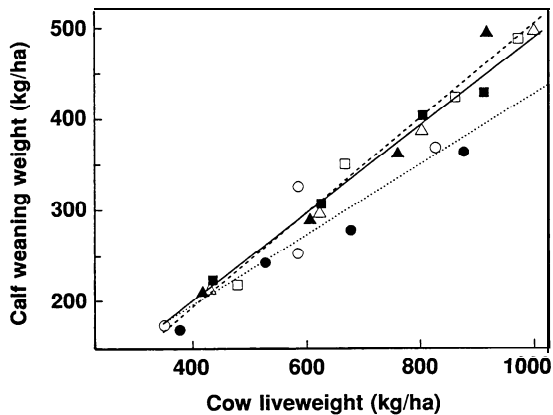


Fig. 1. The relationship between total calf weight (kg/ha) and total cow liveweight (kg/ha) (at weaning) of the high (— $y = 4.69 + 0.49x$, $r^2 = 0.98$, s.e. = ± 15.30), control (--- $y = -16.19 + 0.52x$, $r^2 = 0.98$, s.e. = ± 18.21), and low (..... $y = 43.85 + 0.38x$, $r^2 = 0.88$, s.e. = ± 28.73) selection lines for years 1989 (■, ▲, ●) and 1990 (□, △, ○).

The relationship shown in Fig. 1 as a measure of efficiency of the 3 lines indicates no significant difference between the H and C lines, however the slope of the L line is significantly different to the C and H lines, $P < 0.05$ and $P < 0.10$ respectively. The preliminary results from the study indicate that weaning weight per hectare from a given cow liveweight per hectare of pasture is not greater with the H line than the C line. This result is contrary to that of Parnell *et al.* (1990) who found that H line cows were 5% more efficient than the C line in converting feed energy into calf growth when fed high concentrate rations in a feedlot. Their L line cows were 8% less efficient than the C line. Our results on pasture did indicate that as cow liveweight per hectare increased, the L line tended to become less efficient than the other 2 lines.

PARNELL, F? F., HERD, R. M., PERRY, D. and BOOTLE, B. (1991). *Proc. Aust. Assoc. Anim. Breed. Genet.* 9: 182.