SOME ASPECTS OF GROWTH RATE AS IT IS RELATED TO REPRODUCTIVE EFFICIENCY IN DAIRY CATTLE

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ABSTRACT

The purpose of the study reported in this thesis was to evaluate whether liveweight, measured in Friesian yearlings immediately before the breeding season commenced and in parous cows of the same breed just before calving for the herd began, was related to reproductive performance during the first four weeks of the mating period. Should such a relationship be confirmed 'target weights' which would ensure a high level of reproductive efficiency could be established for animals of this breed under normal husbandry conditions in New Zealand. A pre-requisite to the investigation was that the method(s) used should be easily applied in a commercial farming situation.

Body weight measurements for 184 yearlings (5 herds) and 288 parous cows (4 herds) which were at least three-quarter bred Friesian were taken at the times indicated above and related to submission rates (S.R.) and pregnancy rates (P.R.) during the first four weeks of the following breeding season. The cows were bred by artificial insemination with heat checks being made by experienced stock men; yearlings were mated to young bulls fitted with chin ball mating harnesses. P.R. and the dates of conception were confirmed by both pregnancy examinations at the conclusion of the breeding period and by subsequent calving information.

Reproductive performance in the yearling heifers was high with S.R. averaging 94% (range 88-100%) and P.R. 86% (range 71-100%) for the five herds. The majority of the heifers were judged to be in good body condition with mean body weights for the herds ranging between 231 ± 27 and 277 ± 22 kg (mean $\pm$ S.D.). Differences in liveweight between herds were probably related to management during rearing although age variation and minor differences in the amount of Friesian 'blood' in each herd could have been contributing factors.

When individual herd effects were removed a positive but non-significant linear relationship between liveweight and S.R. was achieved with the yearlings. From the six points plotted on the regression it was noted that the lightest group of animals had a submission rate of 76%

whereas all other groups had submission rates in excess of 94% thus suggesting a threshold effect. The minimum liveweights for the lightest yearling groups exceeding a 90% submission rate varied from 204-229 kg depending on the herd.

While a positive relationship between liveweight and pregnancy rate was noted in the yearling data this was neither linear nor significant - further investigations seem warranted to resolve this particular issue because of its importance in breeding management. The significant differences noted between herds in yearling pregnancy rates may have been due to differences in fertility of the bulls used.

The reproductive performance of the three year-old and mature age groups of parous cows was satisfactory (S.R. averaged 87 and 86% and P.R. 69 and 65% respectively) but that of the two year-old cattle poor (S.R. 67% and P.R. 56%). Marked differences occurred between herds. Apart from the possible influence of liveweight before calving on these parameters of performance analysis of the reasons for herd differences was beyond the scope of this study and not attempted.

Differences in liveweight of the different age groups of cows both within and between herds was marked and, apart from the relationship with age, could most likely be attributed to management during the late autumn and winter period before calving began. Any association between liveweight and subsequent reproductive performance was however generally poor and inconsistent and in retrospect it was concluded that the method that had been used for investigating any possible relationship was unsatisfactory. A future investigation in which variables are more effectively controlled has been suggested.

Two year-old heifers experiencing their first lactation continue to be a problem group particularly under New Zealand dairy husbandry conditions. Careful management commencing during rearing and extending through first mating, calving and second breeding is required if a high level of reproductive efficiency in this age group is to be achieved.

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