The influence of an extra flush of pasture before and during mating on the performance of beef cows on hill country

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ABSTRACT

The effects of an extra 'flush' of pasture around mating *v* recommended pasture allowance levels for beef cows after calving through mating were compared in 1979 and 1980 on cows which had been fed to maintain live weight from 8 weeks prior to and up to calving.

Cow live weight after calving was positively associated with increasing feed levels although the differences were small to non-significant by weaning. There were no reproductive responses to feeding better than the allowance of 10 kg DM/cow/d from calving to mating and 16 kg DM/cow/d thereafter to weaning. Cows fed 16 kg DM/cow/d had a higher pregnancy rate (100 *v* 90%) than those fed 12 kg DM from calving to mating regardless of flushing treatment in 1979.

More reliable reductions in interval to first oestrus can probably be achieved by delaying calving date.

Treatment had no effect on calf weight at weaning.

INTRODUCTION

Competition between the beef cow and other stock for pasture is probably greatest in the early spring when the suckling cow is most sensitive to nutrition (Smeaton *et al.*, 1979). Response to nutrition after calving appears to be conditioned by nutrition before calving (Wiltbank *et al.*, 1962). High nutrition after calving had little effect on cows well fed before calving but had a marked beneficial effect on cows poorly fed before calving. Most spring calving beef cows in New Zealand would likely be in the latter situation, especially at high stocking rates. The objective of the present work was to investigate the advantages which might accrue to similarly treated cows given an extra 'flush' of feed before and during mating.

EXPERIMENTAL

In each of 1979 and 1980, about 100 mixed-age cows were randomised on to 1 of 2 nutrition levels immediately after calving and divided into 2 further sub-groups 3 weeks before mating to determine the effects of offering cows a flushing allowance of 20 kg DM/cow/d around mating. Details are shown in Fig. 1. All treatments were balanced for breed (Angus, Hereford x Friesian), calving day and immediate post-calving live weight. From 8 weeks prior to calving the cows had been restricted to maintain live weight only on an allowance of 8 kg DM/cow/d.

Herbage allowance, live weight changes and reproductive data were measured.

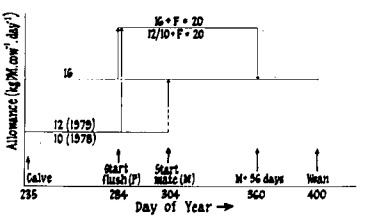

FIG. 1 Trial design.

RESULTS AND DISCUSSION

In both years (Table 1) pasture allowance after calving affected weight at mating and 56 days later ($P<0.001$). By weaning these differences were non-significant in 1979 and had decreased to 15 kg ($P<0.05$) in 1980. After adjustment for post-calving live weight ($P<0.001$), year born was not significant and neither was breed except on 2 occasions in 1980 at 'mating + 56 days' and weaning ($P<0.01$). These responses are similar to those observed in other trials. Nicoll (1979) also found cow live weight to be the most sensitive parameter responding to feeding level after calving through mating. The cows on the 'flushing' treatments in the present experiment showed rapid live weight gain to recover pre-calving live weight. The decline in live weight by all treatments as the season advanced was similar to that

TABLE 1 Effect of treatments on live weight.

Year	1979				1980			
Pasture Allowance kg DM/cow/d	12	16	12 + F*	16 + F	10	16	10 + F	16 + F
Cow live weight (kg) at:								
Calving		416					405	
Joining	433	446	445	457	418	440	429	444
Joining + 56 days	452	461	478	487	443	451	457	465
Weaning	437	443	443	452	438	448	452	453
First oestrus	429	443	443	454	416	437	426	441
Conception	445	457	463	470	422	443	435	452
SED's = 5 to 7								
Calf live weight (kg) at Weaning	167	168	173	172	158	156	160	163
SED = 5								

* F = Flushed

observed by Nicoll (1979) and was probably due to declining pasture quality.

Live weight at first oestrus and at conception was affected by treatment in both years ($P<0.001$) (Table 1). However, there was only 1 effect of treatment on interval to first oestrus and conception (Table 2). In 1979 a treatment x year born effect on interval to first oestrus occurred ($P<0.01$, not shown in Table 2), not because of any specific treatment response, but because the variation in interval appeared much greater between age groups in the non-flushed treatments than in the flushed groups. There was a calving-day effect in both years ($P<0.001$, 1979; $P<0.05$, 1980) similar to that of Knight and Nicoll (1978). For every day later that a cow calved, the interval to first oestrus decreased by 0.4 and 0.3 days respectively. Similarly, the interval from calving to conception was reduced by 0.3 days in 1979 and 0.5 days in 1980 for every day later calved ($P<0.01$). Breed was non-significant after the above adjustments. The absence of response by the cows to the flushing treatments was most interesting. Beef cows suckling calves on pasture are obviously capable of shorter intervals to first oestrus than the 68 days recorded here. Reardon *et al.* (1978) observed intervals of 49 to 60 days in cows well fed before and after calving. Morris *et al.* (1978) observed no response to post-partum feeding provided the cows were fed to maintain live weight. Pleasants and Barton (1979), obtained a similar effect. In the present trial, variations in reproductive performance appeared to be independent of nutrition and live weight (over the respective ranges tested).

The percent of cows pregnant was not affected by treatment in either year (Table 2) except 1979 where the cows on a post-calving allowance of 12 kg DM/cow/d (lighter) had a lower pregnancy rate than those on 16 kg DM/cow/d (heavier) regardless of subsequent treatment ($P<0.05$). Lamond (1970) and Meaker (1975) noted a similar positive relationship between body mass and conception.

Calf weaning weight (Table 1) was not affected by dam nutrition in either year, a result similar to that of Nicoll (1979). However in both years it was affected by several covariates, the most important of which were calf birth weight ($P<0.001$) and calving day ($P<0.001$). Calves were 1.3 to 1.5 ($\pm$ SE = 0.5) kg heavier for every extra kg at birth and 0.84 kg heavier for every day born earlier. Male calves were 11 to 12 ($\pm$ SED 4) kg heavier than females ($P<0.01$) and

TABLE 2 Effect of treatments on reproductive parameters.

Year	1979				1980			
Pasture Allowance kg DM/cow/d	12	16	12 + F	16 + F	10	16	10 + F	16 + F
Interval (days) calving to:								
First oestrus	65	71	67	71	69	72	72	63
Conception	96	97	91	95	85	87	86	88
SED's = 4 to 5								
Pregnancy rate (%)	83	100	96	100	89	100	100	96

Hereford x Friesian-cross calves were 24 (± SED 6) kg heavier than Angus calves ($P < 0.01$) (all Angus sired).

In most New Zealand trials reviewed (Smeaton *et al.*, 1979) reproductive responses have occurred where there was differential pre-calving conditioning or where severe nutritional deprivation extended the interval to first oestrus well beyond 60 to 70 days and depressed pregnancy rate below 90%. Apparently to reduce interval to first oestrus and improve the other reproductive parameters, cow conditions before calving and/or nutrition after calving would have to be markedly better than any of the treatments in the present trial.

Farmers whose beef cows have delayed onset of oestrus and low pregnancy rates under the regime suggested by Smeaton *et al.* (1979) (the low allowance treatments in each year of the present work) would likely get more reliable improvements by calving later. Efforts to feed them better than above are unlikely to achieve any useful results. Calving later would also reduce the managerial problems of feeding in the early spring. Although birth day has an important effect on calf weaning weight farmers utilising this response and calving as early as possible to ensure heavy calves for the annual weaner sales must realise this can compromise cow reproductive performance and the requirements of other stock.

ACKNOWLEDGEMENTS

To Miss R. Winter for records and Nutrition Section staff for assistance with field work.

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