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Reproductive performance of beef cows following temporary removal of calves

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ABSTRACT

Calves were removed for 48 hours from cows at 2 localities in 1978. Removal shortened the interval from calving to first oestrus at both localities. It shortened the interval from calving to conception and advanced the 1979 calving date at the locality which had the better level of nutrition. Weaning weights of the removed calves were depressed at both localities. The intervals from calving to first oestrus were affected at both localities by dam age and breed, 1978 calving date and condition score at removal.

INTRODUCTION

The reproductive performance of beef cattle is often unsatisfactory because of a prolonged interval between calving and first behavioural oestrus (Knight and Nicoll, 1978; Morris *et al.*, 1978). This post-partum anoestrus interval (PPI), can be reduced by a number of factors (Tervit *et al.*, 1977), one of which is the temporary removal of suckling calves.

METHOD

The trial was conducted in 1978 at Tokanui and Goudies under the experimental conditions shown in Table 1. Cows at both localities were mixed breed and age and at removal (R), were separated from their calves and placed for 48 hours in an adjacent paddock. They were then rejoined and allowed to mother-up for about 2 days before joining the control (C) cows and calves which had been grazing some distance away. Where mothering-up difficulties were experienced, cows and calves involved were penned in yards and small paddocks until the

problem was rectified. The data were subjected to χ^2 and least squares analysis.

RESULTS

The first removal at Tokanui and at Goudies increased the proportion of cows showing oestrus during the 7 days after the start of separation (23% TRI; 5% TC, $P < 0.001$, 8% GR; 3% GC, $P < 0.05$). In all treatments more cows had shown oestrus by 21 days but there was no effect of removal on this response. More older cows than young cows at both localities showed oestrus during the 7 and 21 days subsequent to removal.

There was no effect at either locality of removal on the proportion of cows inseminated during the first 7 or 21 days of AI. Cow age however affected the AI pattern with more older cows being inseminated during the first 7 and 21 days at Goudies ($P < 0.01$, $P < 0.001$, respectively) and the first 21 days at Tokanui ($P < 0.05$).

TABLE 1 Experimental conditions

Locality	No. cows	Calf removal dates and (treatment code)	At Removal		Mating	
			Av. days post partum of dams	Av. dam condition score	Starting date (duration days)	Type
Tokuani (T)	94	9 - 11 Oct (TR1)	35	7.0	30 Oct (53)	Artificial
	93	18 - 20 Oct (TR2)	42	7.2		
	91	— (TC)	—	7.1		
Goudies (G)	209	8 - 10 Nov (GR)	44	4.7	20 Nov (63)	Artificial and natural
	214	— (GC)	—	4.7		

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The mean intervals from calving to first oestrus, conception and the mean 1979 calving dates are shown in Table 2. Calf removal shortened the PPI at both localities (T, $P < 0.05$; G, $P < 0.05$). There was a treatment x cow age interaction at Goudies ($P < 0.05$) with the older cows showing greater reduction in PPI after removal. Calf removal also shortened the interval from calving to conception at Tokanui ($P < 0.05$) and caused an earlier 1979 calving date at that locality ($P = 0.06$). It tended to advance calving date at Goudies ($P = 0.13$) where there was also a treatment x cow age interaction ($P < 0.05$) with the older cows calving earlier after removal.

TABLE 2 Oestrus, conception and calving dates

Treatment	Mean interval (days \pm SE) from calving to		1979 calving date (\pm SE, days)
	First oestrus	Conception	
TR1	55.8	72.3	Aug 27
TR2	58.6	75.9	Aug 28
TC	62.0 (± 2.0)	78.4 (± 2.1)	Sept 1 (± 2.3)
GR	76.5	80.5	Sept 20
GC	82.4 (± 2.6)	83.5 (± 2.4)	Sept 27 (± 4.7)

The PPI were also affected at both localities by: dam age ($P < 0.001$); dam breed (T, $P < 0.01$; G, $P < 0.001$); 1978 calving date and condition score at removal (Table 3). The interval from calving to conception was affected at Tokanui by calving date (Table 3) and at Goudies by: dam age ($P < 0.001$); dam breed ($P < 0.001$); calving date and condition score (Table 3). The dam age effects were mainly due to first and second calvers having long PPI and conception intervals and the breed effects to Jersey and Friesian crossbred animals having short intervals compared to exotic crossbreds.

Removal did not affect calf survival but decreased weaning weights of calves at both localities (163.5, 156.5, 169.5 kg for TR1, TR2, TC, $P < 0.001$; 149.2, 153.8 kg for GR, GC, $P < 0.05$). There was a treatment x dam age interaction at T ($P < 0.01$) with 3- and 4-year-old and 8- and 9-year-old cows weaning light calves after TR2.

TABLE 3 Other factors affecting PPI and calving to conception intervals 1978.

Change in interval	Effect on interval from calving to:	Locality	
		T	G
Per day later that cows calved (d)	First oestrus	-0.5***	-0.9***
	Conception	-0.9***	-1.0***
Per unit increase in condition score (d)	First oestrus	-2.5*	-8.8***
	Conception	+1.0ns	-2.5*

DISCUSSION

Calf removal increased the incidence of oestrus during the subsequent 7 days and shortened the PPI at both localities. It also shortened the interval to conception at Tokanui. Such positive effects have not always been reported overseas and the technique has a reputation for variable results. In agreement with others (Amos *et al.*, 1980) the technique was more effective at the locality where the cows were in better condition.

The decreased weaning weights of the removal calves was unexpected as other workers have not reported any effect of removal on calf weight. The effect at Tokanui was mainly due to low weaning weights after TR2. Here removal was accompanied by heavy rain for almost the entire 48 hours and at rejoining the cows and calves were covered in mud and took some time to mother-up. No ready explanation can be given for the low weights at Goudies. However, during mothering-up of cows and calves in the yards it was observed that the cows had identified their calves but would not let them suckle. Perhaps this phenomenon was more widespread and resulted in decreased milk production and calf growth rates. In any event, the decreased weaning weights counteracted any advantage the technique had on reproductive parameters.

In agreement with other N.Z. studies (Knight and Nicoll, 1978; Morris *et al.*, 1978; Montgomery *et al.*, 1980; Montgomery, 1981) the present study showed a significant negative relationship between calving date and PPI and, not surprisingly, a negative relationship between calving date and interval to conception. Because of this farmers should carefully consider the calving date of their herd since the late calving cows have short PPIs. The present study also highlights the importance of having animals in good condition near mating so that short intervals to oestrus and conception occur.

In conclusion, the present study shows that removal can decrease the interval from calving to onset of oestrus and conception and advance the subsequent calving date. However, since these advantages were counteracted by reduced calf weaning weights, the technique cannot be recommended for routine use. Instead effort should be directed towards improving reproduction through better timing of calving and management of stock.

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