

Failure to induce ovulation by short-term calf removal in lactating beef cows on dry-lot

A.W. Lishman*

Department of Animal Science, University of Natal, P.O. Box 375, Pietermaritzburg, 3200 Republic of South Africa

G.O. Harwin†

Production Division, Stock Owners Co-op Ltd, Howick

†Deceased

*To whom correspondence should be addressed

Received 7 July 1984

Beef heifers were fed during late pregnancy to produce cows in poor, average, and good condition at calving late in winter. The animals were fed on dry-lot for the major part of the experiment. At 50 days of age half the calves were removed from their dams for 7 days, but no cows were induced to ovulate. The remaining calves were temporarily weaned for one week at 80 days of age. Only two cows exhibited oestrus shortly after calf removal.

Vleisbeesverse is gedurende laatdragtigheid gevoer om koeie in maer, gemiddelde, en goeie kondisie te kry ten tye van kalwing laat in die winter. Die diere is grotendeels op kraal gevoer. Die helfte van die kalwers is op 'n ouderdom van 50 dae tydelik gespeen vir 7 dae, maar geen van die koeie het geovuleer nie. Die oorblywende kalwers is ook vir 'n week tydelik gespeen toe hulle 80 dae oud was. Slegs twee koeie was kort hierna bronstig.

Keywords: Temporary weaning, beef cows, ovulation, dry-lot

The low calving rate of many beef herds is of national importance when considering increased production from a relatively fixed cattle population. The greatest wastage of potential weaners can be traced to cows failing to be mated during the limited annual breeding period (Reynolds, 1967; Inskeep & Lishman, 1978). This, in turn, is a consequence of a delay in the return to reproductive cyclicity after parturition and is influenced by both nutrition and suckling of the calf (Chenoweth, 1984).

Considerable interest is being shown world-wide in methods whereby the inhibitory influence of suckling can be overcome. The findings have been reviewed by Chenoweth (1984), who noted that weaning stratagems are likely to have their greatest beneficial effect on first-calf heifers. However, inadequate feeding of such breeding females and weaning too soon after calving will reduce the response.

A trial was conducted using 45 yearling *Bos taurus* (Aberdeen Angus, Sussex, and Hereford crossbreds) type heifers which had been inseminated with Brahman semen so

as to begin calving during the second week in August. During late pregnancy (May) the pregnant heifers were randomly divided, after blocking for livemass and date of service, into three groups (15/group) and fed for approximately three months on high, medium, and low planes of nutrition. These levels of feeding were intended to provide for a wide range in the body condition of the heifers at calving. The diets consisted of varying amounts of maize or kikuyu silage, veld hay, and NPN lick. After calving all the cows received 4 kg per day of a maize silage-chicken litter-molasses mixture with NPN lick and veld hay supplied *ad lib*.

At 50 days post-partum the calves were removed from half the cows while suckling was not interrupted for the remaining cows (controls). For the 7 days that the calves did not suckle they were held approximately 1 km from the cows where they received concentrate and hay. Throughout the winter – early summer period the experimental animals were maintained on dry-lot except that the calves had access to an adjacent kikuyu pasture. All animals were turned out to grazing in mid-December.

Regular determinations of bodymass and body condition (five-point scale with 0 = thin and 5 = fat) were made, the latter being judged by two independent observers. The ovaries of all the cows were palpated per rectum at 50 days post-partum and again 7 days later to check for ovulations or changes in size distribution of ovarian follicles. Observations for oestrus (standing to be mounted by other cows) occurred throughout the daylight hours.

The nutritional levels that were applied succeeded in achieving differences in body condition at 50 days after calving (Table 1). However, the change in bodymass was not according to expectation with the medium and low levels resulting in similar gains during pregnancy.

Table 1 Bodymass and body condition characteristics of cows prior to and during lactation

Measurement	Nutritional level		
	High	Medium	Low
Change in bodymass (kg) during last 3 months of gestation	47,0 ± 3,8	2,5 ± 3,1	-3,0 ± 3,6
Bodymass (kg) : n = 47			
7 days before calving commenced		392,6 ± 5,5	
50 days post-partum		324,6 ± 6,4	
80 days post-partum		328,0 ± 5,9	
Number of cows with body condition ^a			
Good		9	
Average		18	
Poor		18	

^aAssessed 50 days post-partum on a five-point scale: Good = >2,5; Average = 2–2,5; Poor = <2.

Not a single cow ovulated or showed oestrus following temporary removal of the calf, and no marked growth in follicles was evident. This result was unexpected in view of the success obtained by Symington & Hale (1967), Holness, Hopley & Hale (1978) and Holness, Hale & Hopley (1980) who interrupted suckling for similar periods.

Since there was no measurable response at 50 days post-partum the treatment groups were switched so that when the calves were 80 days old, those cows which earlier served as

controls had their calves removed for 7 days. Checks for ovulation and oestrus were conducted as before. Only two cows exhibited oestrus and ovulated 5 days after removal of their calves. A further two cows showed oestrus 29 and 33 days after suckling was interrupted. None of the cows which continued to suckle their calves ovulated or exhibited oestrus. Possible reasons for the failure of the cows to respond to calf removal include the confinement to dry-lot for an extended period (Warnick, Koger & Dixon, 1977), the absence of stimulation by bulls (Chenoweth, 1984) or inadequate body-mass (Meaker, Coetsee, Smith & Lishman, 1980).

Based on the average bodymass of the lactating cows at 80 days post-partum (Table 1) at least 50% of them should have ovulated and exhibited oestrus by this time (Meaker, *et al.*, 1980). A similar conclusion is reached when body condition is used as measure of the physiological status of the cows (Van Niekerk, 1982). However, this occurred only 30 days after the cows had been removed from dry-lot when 26 of the 45 cows had a corpus luteum within the ovary. A further possible explanation of the lack of positive response is that the total removal of the calves may have imposed undue stress on their dams (Symington, Gregor & Hale, 1967). The use of nose-plates to reduce this stress was not shown to be beneficial (unpublished data) although Holness, *et al.* (1978; 1980) had obtained positive results with this method of weaning. Clearly, the circumstances under which suckling can be manipulated to promote early onset of reproductive activity in the lactating beef cow need careful examination. Furthermore, the limiting factors require detailed elucidation before temporary weaning can become a useful tool for on-the-farm application.

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