Effect of pre-partum exercise on reproductive performance of first calving Hereford x Friesian heifers.

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(Funded by C.Alma Baker Trust)

Beef-bred heifers have often exhibited incidences of dystocia of around 0-15%. Anecdotal evidence suggests that cattle which are exercised more rigorously (i.e. hill country grazing) have less dystocia problems. The suggestion is that exercise may lead to cattle which are fitter at calving, in turn leading to beneficial effects on calving performance.

Eighty Hereford x Friesian 15 month heifers from the Animal Research Unit at Massey University were randomly divided into two treatments (Control and Exercise). Twenty heifers from each treatment (n=40) were synchronised using CIDR+Cidrol treatment prior to mating (3 Nov 1998, P0) to obtain a reasonable number of heifers calving during an 11 day observation period. The CIDR's were removed after 10 days and 4 Charolais bulls were joined with the heifers for approximately 2 cycles of mating. The Control and Exercise cattle weighed 328±6 and 321±6 kg respectively (NS) at mating. Both treatments were grazed together at pasture until the start of the exercise treatment.

On 22 June 1999 (P211) the cattle were weighed (415±7 vs 413±7 kg for Control vs Exercise treatments respectively, NS) and blood sampled. The cattle were separated into their treatment groups and grazed separately from day 211 of pregnancy (P211) until P277, during which time the Exercise treatment animals were walked approximately 5 km per day along farm lanes, at a nominal rate of 5 km/hour. Further blood sampling and weighing took place on 5 July (P224) and 5 August 1999 (P255). Blood serum was analysed for magnesium, creatinine kinase (CK) and Non Esterfied Fatty Acid (NEFA) status. The cattle were visually condition scored on P255 using a 1-5 score system with the controls at 2.77±0.06 vs the exercise group at 2.53±0.05 (P<0.005). Liveweights (P255) were 447±7 vs 437±7 kg for controls and exercise groups respectively (NS)

Beginning immediately prior to calving (P280) the cattle were observed continuously for 11 days to record the times at which various stages of parturition occurred were recorded. These included cervical seal displacement, water bag observed, 1st sight of calf, and calf delivery. Intervals between these events were calculated. Calving difficulty (CS) was recorded on a scale of 1-5 (1= no assistance, 5=Cesarian). Calves were tagged, and weighed at birth. To avoid inconsistencies, assistance was given after 2 hours from first indication of calving. Sixteen Exercise and 17 control cattle calved during this period and the reproductive data reported is for these animals only.

Creatine-kinease (CK) and NEFA levels were not significantly different at any measurement. CK ranged from 373-1531 IU/l and NEFA from 025-0.77mmol/l. Magnesium levels were significantly different on P224, 13 days after the start of the exercise regime (0.80 vs 0.89±0.01 mmol/l for Exercise and Controls respectively, P<0.001) however there was no difference on P277, day 44 of exercise.

Table 1. Duration of parturition (minutes) for the 17 Control (C) and 16 Exercise (E) cattle which calved between 30 Aug – 9 Sept 1999.

Time from	C	E	P value
Seal to Water break	66±14	62±15	NS
Water break to Calf seen	20±4	10±4	NS
Calf seen to Calf Drop	85±7	76±15	NS
Total Time	171±14	148±15	NS

No significant differences in the duration of parturition stages or total time were found. A trend was exhibited with Exercise cattle tending toward less time required for parturition (148 vs 171 minutes). Calving scores indicated that 50% (8 out of 16) of Exercise cattle required some form of assistance (CS 2-4) vs 76% (13 out of 17) of Controls, however this difference was not significant. Calf birth weight was 43.3±0.7 vs 41.4±0.8 kg (NS) for Control and Exercise treatments respectively.

The tendency toward less assisted calving's and shorter duration of parturition was observed however insufficient number of cattle were observed to identify significant differences.

SAS. 1985. SAS User Manual, Cary, SAS Institute inc.
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