

**THE COMPARISON OF SUPPLEMENTS FOR YOUNG CALVES
GRAZING AUTUMN PASTURE**

**A thesis presented in partial fulfilment of
the requirements for the degree of
Master of Agricultural Science
in Animal Science at
Massey University, New Zealand.**

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ABSTRACT

Thirty two autumn-born calves (sixteen bull and sixteen heifer calves) were used to compared the effects of alternative supplements on performance, health, herbage intake and feed efficiency of young calves.

1. Four bull and four heifer calves in each of four blocks, which had previously received milk ad libitum, were randomly allocated to each of the four treatments at 5-6 weeks of age. The supplements of liquid milk, dry milk and concentrates were calculated to provide 11.28 MJME metabolisable energy (ME) (for ruminants) and 175 g crude protein (CP) daily and were fed for 5 weeks. Supplements were offered once a day and amounts eaten were measured. The control group was weaned directly onto autumn pasture.

2. Calves were grazed in the same paddocks, predominantly ryegrass and white clover, divided into four equal areas by two electric wires. Individual paddocks were used in rotation for 4-5 days and calves offered a daily herbage allowance of approximately 60 g DM per kg liveweight. After the experimental period the calves were grazed on pasture together in two mobs, bulls in one and heifer calves in the other, and liveweights measured until about 33 weeks of age.

3. The DM intake of supplement and herbage by individual calves were estimated indirectly using faecal markers (Chromic oxide and Polyethylene glycol).

4. Calf growth rates at various stages were measured. Feeding of supplements significantly ($P < 0.001$) increased the liveweight gains of young calves grazing autumn pasture (control 257.1 g/d). Among the supplemented calves, calves receiving liquid milk had a significantly ($P < 0.05$) higher liveweight gain (653.6 g/d) than those supplemented with soya bean concentrate (507.1 g/d) and dry milk (473.5 g/d).

Liveweight gain of calves after the supplemental period (10-33 weeks of age) were not significantly different between treatment groups.

5. There was no significant ($P < 0.05$) difference between the liveweights of supplemented and non supplemented calves at 33 weeks of age but that for calves given the dry milk supplement was significantly ($P < 0.05$) lower than those for the other supplemented groups.

6. All supplements significantly ($P < 0.001$) depressed herbage DM intake of young calves. The depression of herbage DM intake per unit of supplement DM intake (substitution rate) for calves given dry milk supplement was significantly higher than those for calves consuming soya bean and liquid milk supplements. Total DM or OM intakes (g/d) of calves with soya bean supplement were significantly higher than for the other groups whereas there was no significant difference between those for milk supplements (dry and liquid milk supplements) and the non-supplemented calves.

7. Liveweight gain of calves during the supplemental period (5-10 weeks of age) were positively correlated ($r = 0.76$) to the ratio of ME to CP intake (KJME/gCP) and amount of supplements DM intake ($r = 0.65$).

8 The ME in rations containing milk supplements were estimated to have been used with greater efficiency for growth (K_g) than that from the soya bean concentrate or herbage diet.

9 A number of unexplained complaints (eg. red urine, hard faeces and swelling neck) were found in calves fed with dry milk supplement.

10 The use of markers (Chromic oxide and Polyethylene glycol) to estimate food intakes of calves has potential as judged by the results of this experiment.

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