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.

KASET WITTAYANUPARPYUENYONG

1987

Massey University Library. Thesis Copyright Form

Title of thesis: The comparison of supplement for young calves grazing autumn pasture

(1) (a) I give permission for my thesis to be made available to readers in the Massey University Library under conditions determined by the Librarian.

(b) ~~I do not wish my thesis to be made available to readers without my written consent for _____ months.~~

(2) (a) I agree that my thesis, or a copy, may be sent to another institution under conditions determined by the Librarian.

(b) ~~I do not wish my thesis, or a copy, to be sent to another institution without my written consent for _____ months.~~

(3) (a) I agree that my thesis may be copied for Library use.

(b) ~~I do not wish my thesis to be copied for Library use for _____ months.~~

Signed Kaut w-yun yong

Date 19/6/1987.

The copyright of this thesis belongs to the author. Readers must sign their name in the space below to show that they recognise this. They are asked to add their permanent address.

NAME AND ADDRESS	DATE

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 individaul 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.

ACKNOWLEDGEMENTS

The author is indebted to his supervisor, Dr. G.F. Wilson, for guidance, encouragement, assistance and patience throughout his masterate studies.

The author also owes a great debt to Prof. B.R. Watkin for enabling him to study in New Zealand.

Acknowledgement is also made to :

Members of the Animal Science Department for their interest in the project and their encouragement and help during all phases of the study.

The staff of No. 1 Dairy Farm, Massey University and especially Mr. David Hislop who made the calves available and the work easier.

Ms's G.A. Rumbal, M.F. Scott, C.A. Butts, R.A Watson and Y.F. Moore for their help with chemical analyses.

Mrs. Siree Chanprasert for carefully typing the manuscript.

Mr. Vinich Sereeprasert for his advice on computing.

The Dairy Farming Promotion Organization of Thailand (DPO) for allowing the author to study in New Zealand and to the New Zealand Government for a BAP scholarship.

Finally, special acknowledgement must be given to my wife, Saranya, both for her moral support and patience.

TABLE OF CONTENT

LIST OF TABLES

LIST OF TABLE (cont.)

TABLE OF FIGURES AND PICTURE

LIST OF APPENDICES