AN ASSESSMENT OF A "CONTROLLED RELEASE" CHROMIUM DEVICE FOR MEASUREMENT OF INTAKE IN CALVES

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

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1988

ABSTRACT

Twelve Friesian male calves were used, in three blocks each with 4 calves, to assess the efficiency of a Controlled Release Device (CRD) designed to provide chromic oxide as a faecal marker.

Animals were weighed at the start and at the end of each replicate, after initial weight measurements calves were randomly allocated to one of 4 treatments (grass only, soya and grass, powdered milk and grass and liquid milk, carbohydrate concentrate and grass). Cut pasture was offered *ad libitum* while supplements were restricted at fixed levels and provided 11.28 MJME (metabolisable energy) and 175 g crude protein (CP) per calf daily.

After a 5-day preliminary period, two 5-day collection periods followed. The CRDs were administered by use of a 'balling gun' which introduced the device gently to the rumen. Collection of faecal and urine samples commenced 24h after administration of devices.

Faecal grab samples were collected from calves (*per rectum*) daily at 10.00 am, 01.00 pm and 04.00 pm while a 24 h representative faecal sample was taken every morning from the total day's collection. Daily faecal total collection was subsequently bulked for a 5-day sampling period.

A daily release of chromium (Cr) from CRDs was found to be 133 mg d^{-1} (obtained by measuring the amount of Cr 'loss' from three capsules which were regurgitated) which compares with the expected 130 mg d^{-1}.

There were no significant variations in Cr concentration between times within a day. Marked fluctuations in Cr concentration were noticed in Period 1 (first 5-days) of each block while concentration reached a more steady plateau in Period 2 of each block.

Similarly there were varying Cr release rates (RR) between days however, no statistical significance was shown because of the small number of calves within treatment

(n=3). The daily RR was found to be largely influenced by the amount of dry matter intake but not highly influenced by the type of ration.

The amount of Cr yield (recovery rate) was not statistically different from 100%. In real terms however, Cr recovery from calves which were on the liquid milk treatment was generally low. Such a recovery was associated with the fluid nature of the diet such that it could not intimately mix with the marker.

Two methods of digestion were compared for the Cr concentration assays. A significantly higher ($p < 0.001$) Cr concentration was obtained from faecal samples which were digested using a "high" bromate (HB) compared with "low" bromate (LB) digestion. Also within duplicate variations in Cr concentration were largely eliminated by using HB.

Supplementation considerably improved ration digestibility, Soya (0.77), powder milk (0.79) and liquid milk (0.83) as compared with grass only ration (0.74) there was also a favourable response in the nitrogen retention (NR) of the calves on the liquid milk diet which were superior, while the grass-fed calves performed relatively poorly. The response may be associated with high efficiency with which digestible energy (DE) from the milk supplement was utilized for liveweight gain.

ACKNOWLEDGEMENTS

It is my pleasure to acknowledge the guidance of my Supervisor, Dr G.F. Wilson.

I also wish to thank the following who gave very valuable assistance in various ways.

D. Hislop of No. 1 Dairy Farm (Massey University) for making calves available, B. Parlane of Animal Physiology Unit for facilitating conduct of the entire experiment, R. Watson and J. Rumball for their help during chemical analyses, R. MacKenzie of Chemistry Department for doing the tiresome spectrophotometry work and X. Wang for statistical assistance.

I am also quite grateful to my fellow post graduate students and other members of staff of the Animal Science Department who accepted to be involved at different stages of this work.

Appreciation is also due to S. Ryan for continuous encouragement and keeping an eye on language quality.

Many thanks to Trish Fleet for typing this thesis.

A lot of congratulations are accorded to my wife, Todo, for putting up with loneliness during the whole period of my study in New Zealand.

Lastly I am thankful to both the New Zealand and Tanzania Governments for the financial support offered towards this study.

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