

A COMPARISON OF ONCE-DAILY AND TWICE-DAILY FEEDING OF MILK REPLACERS TO DAIRY CALVES

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Summary

Thirty-two Friesian calves less than one week old were purchased at a country market and fed a milk replacer at two rates, the feed being given as either one or two feeds only. Lucerne hay was available *ad libitum* from the start of the trial with restricted access to crushed oats after one month. The mean body weights of the once-daily fed calves were higher than those of the twice-daily fed calves. The incidence of scouring was lower in the once-daily fed calves.

I. INTRODUCTION

Feeding calves twice-daily has been generally recommended in Australia (Laffan 1960). Once-daily calf feeding techniques have been developed overseas under conditions of intensive indoor rearing, using early weaning onto high protein concentrates, and have the advantage of greatly reducing labor costs.

Burt (1966) and Wilson (1968) found that intensively reared calves may be successfully fed a milk substitute once daily from 4 days of age to early weaning at 32 days.

When Willett, Albright and Cunningham (1969) compared the growth of barn-housed calves fed once or twice daily on a milk replacer given at a rate of 10 per cent of the bodyweight, they found no differences in bodyweights, heart girth or wither heights. They recorded no increase in digestive or health disorders with once daily feeding. However, Wooden, Speicher and Huber (1968) observed reduced vigour, more pneumonia and slightly more scours in once daily fed calves.

The climatic conditions in Australia permit calves to be reared extensively since less protection is required from the weather and greater use can be made of pastures and conserved fodders. Calves can be reared successfully to weaning age on milk replacers using portable shelters in a paddock (Radcliffe and White 1968).

This trial was designed to compare the growth rates of calves when fed equal amounts of milk replacer, either in one or two feeds per day, until weaning onto pasture at ten weeks of age.

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II. MATERIALS AND METHODS

Thirty-two Friesian calves under one week of age were bought at the Murray Bridge calf market on June 3, 1969. They were transported to the Northfield Research Centre and the following morning they were each fed 1.7 l. of a 5 per cent glucose solution at 39°C. The calves were identified with plastic ear tags, weighed and allotted by restricted randomisation according to bodyweight to one of four treatments. There were four animals in each of the two replicate groups per treatment. The treatments, which consisted of two feeding rates and two feeding frequencies, were factorially arranged as shown in Table 1, and the calves were fed a milk replacer* according to the rates given. The daily milk replacer intake of the once daily and twice daily fed calves was isocaloric within each feeding rate. The milk replacer was fed at 39°C from buckets. Lucerne hay was available *ad libitum* from the start of the trial. A restricted intake of crushed oats was given to all calves after the fourth week at the rate of 227 g/calf/day.

Each group of calves was housed in a portable yard 4.6 x 3.0 m. A moveable corrugated iron shed 3.6 x 2.1 m with the northern face open was provided adjacent to each yard. Hay racks, two 3-unit calf feeding bails and automatic water bowls were provided in each yard. To lessen the possible incidence of scouring, the yards were shifted to new sites after two weeks. They were again moved five weeks later.

Animals were inspected for health status only at feeding times. When scouring was recorded, feeding was discontinued for the following day. If scouring continued, 1.7 l. of a 5 per cent glucose solution at 39°C was fed twice daily until the faeces were normal. Sulphadimidine was administered on the third day if scouring continued. When the faeces were normal, a half ration of the milk replacer was fed on the next day, once or twice according to treatment, and the full ration continued from the following day.

All calves were weighed at weekly intervals until weaning at ten weeks. They were then grazed as one herd on immature barley grass and fed *ad libitum* cereal

TABLE 1

Volume of milk replacer in litres given to calves at each feed

Day	Once Daily*		Twice Daily†	
	Treatment 1	Treatment 2	Treatment 3	Treatment 4
1-7	2.27	2.27	1.70	1.70
8-14	2.84	2.84	2.13	2.13
15-21	2.84	3.41	2.13	2.56
22 to weaning	3.41	4.55	2.56	3.41

* 15 per cent milk replacer suspension.

† 10 per cent milk replacer suspension.

* "Denkavit", manufactured by Hall Sandford and Co., Mitcham South Australia, for Denkavit (Austialia) Pty. Ltd., Melbourne, Victoria.

hay and a concentrate of crushed oats containing 5 per cent meatmeal. They were weighed 7 and 17 days after weaning to ascertain if any treatment affected their growth immediately after weaning.

The bodyweight data and lucerne hay consumption figures were examined by analysis of variance.

III. RESULTS

The growth curves in Figure 1 show that mean bodyweights of the once daily fed calves were higher than those of the twice daily fed calves.

The once daily fed calves were significantly heavier than the twice daily fed calves in weeks 2, 3, 5, 6, 7 and 9 of the experiment. The calves fed at the higher feeding rate were significantly heavier in the week prior to weaning and at weaning; but there were no significant differences between the mean post-weaning calf weights.

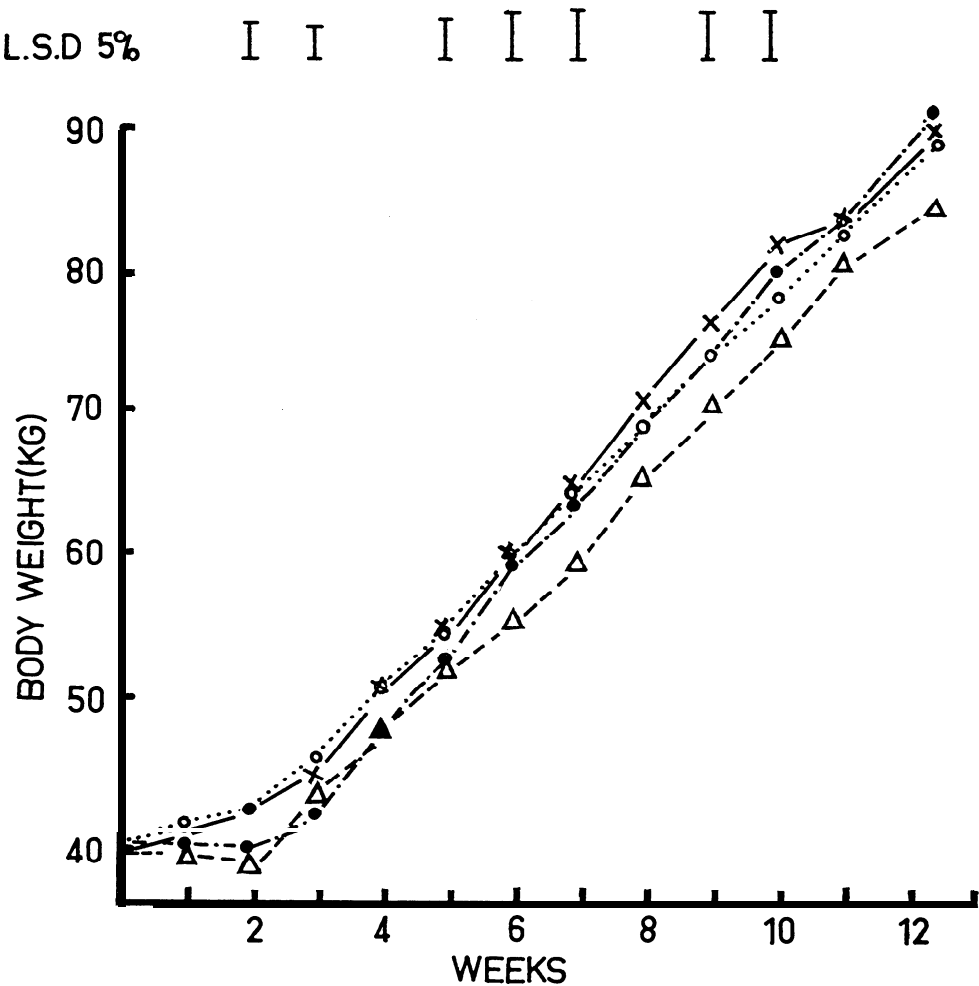


Fig. 1.—Mean bodyweights of calves in the four treatments which were fed once-daily low rate (○.....○), once-daily high rate (×——×), twice-daily low rate (Δ——Δ) and twice-daily high rate (●——●).

The mean lucerne hay consumption was 74 kg/calf and there were no significant differences between the treatment means.

The total incidence of scouring for treatments 1, 2, 3 and 4 were 2, 5, 14 and 5 animal scour days respectively. One death, recorded in treatment 3, was due to colibacillosis.

IV. DISCUSSION

This trial has shown that once daily feeding can be satisfactorily used to rear calves using an extensive management system, and that the indoor housing and individual pens used by overseas workers are not essential to successful use of once daily feeding.

The significantly lower bodyweights recorded in the twice daily fed groups were considered due to higher scouring incidences in these treatments. Similar reductions in the bodyweights of scouring calves have been found by Dalton, Fisher and McIntyre (1965).

It might be anticipated that the less frequent observation of calves fed once daily could result in greater health problems due to delayed detection and treatment of disease. However, increased disease incidence was not evident in this trial.

It has been suggested that over-feeding occurs when a calf receives a volume of fluid greater than the volumetric and enzymic capacity of its abomasum (Roy 1964). Once daily feeding of calves on the same volume of fluid as those fed twice daily could result in overfeeding and the consequent health problems observed by Wooden, Speicher and Huber (1968). It is probable that the reduced daily volume of liquid given in the once daily feeding, achieved by raising the milk replacer concentration, was effective in reducing scouring incidence. This contrasts with the finding of Pettyjohn, Everett and Mochrie (1963) who found increased scouring in calves with increasing milk replacer concentration.

The principal advantage of once daily feeding is the reduction in labour required to rear the animals. Labour and capital costs are further reduced when calves are reared in open paddocks with portable shelters rather than in individual pens in enclosed sheds.

With the techniques used in this trial, it was estimated that 24 calves could be fed once daily in 60 min. This is a similar rate to that quoted by Pitman (1968) who also indicated that to feed the same number of calves twice daily took 100 min. It has been observed that a farmer can feed calves at the rate of 100/h.

Once daily feeding has the additional advantage that the time selected for feeding can be related to the routines established for other farm enterprises.

Although rearing calves for veal is unlikely to be profitable (Radcliffe and White 1969), calves are being reared commercially to at least the yearling' vealer stage. The labour costs of rearing these calves to weaning age can be reduced by once daily feeding.

V. ACKNOWLEDGMENTS

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