

Computerised machine rearing systems for group housed dairy-bred bull calves

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Introduction There are numerous calf rearing systems but the last decade has seen increased interest in the use of computerised machine feeders for group reared calves in place of systems based on bucket rearing with individual housing. Automated machines are expensive but are becoming more common due to reductions in labour and advances in technology allowing regulation of milk intakes (Hepola, 2003). The objective of this experiment was to evaluate the effect of rearing dairy-bred bull calves on either a computerised machine or twice a day milk feeding system to weaning at 6 weeks old.

Materials and methods Thirty six Holstein-Friesian bull calves were assigned in a randomised block designed experiment to weaning on either a twice a day milk feeding system or computerised machine (DeLaval CF150). The calves started the trial at 1 day of age and were individually penned on straw. From days 1 to 4 they were fed colostrum. The twice a day milk fed calves (Bucket) were individually housed and fed a whey based milk replacer (DM 938g/kg, 218g crude protein/kg, 181g/kg Ether Extract [Wynngold Calf Milk Replacer, Wynnstay Group plc]) mixed at 125g per litre of water at 40°C twice per day in buckets. From 5 to 7 days they were fed 4 litres per day and from day 8 to 28 milk was fed at 5 litres per day. Thereafter the milk feeding rate was gradually reduced to weaning at 42 days old. The computerised machine fed calves (Machine) were group housed and fed the same milk powder at an identical daily feed rate available throughout the day with a maximum intake of 60% of milk available in the first feed with the remainder available 2 hours later. From day 4 the calves on both treatments received *ad libitum* concentrates (Start 'n' Wean pellets, Wynnstay Group plc) plus straw and water. The behaviour of the calves was recorded by video over a series of 24 hour periods. The individually reared bucket fed calves were thus unable to cross suckle. The calves were moved into group pens at weaning. The data was analysed by ANOVA with calves blocked according to weight.

Results There were no significant differences in live weight, DLWG (see table 1), feed intakes or health of the calves.

Table 1 Effect of milk feeding system on liveweight (kg)

	Bucket	Machine	s.e.d	Sig
Start weight	45.2	47.3	2.15	NS
3 week weight	53.5	55.1	1.83	NS
Weaning weight	61.6	62.7	2.35	NS
11 week weight	102.1	102.2	4.06	NS

Table 2 Effect of milk feeding system on behaviour

Characteristic	Bucket	Machine	s.e.d	Sig
Cross sucking - mouth	0	1.67	0.0007	*
Cross sucking - navel	0	0.33	0.374	NS
Cross sucking – ear and other	0	2.67	0.016	*
Looking	10	4.33	0.027	*
Tactile contact	1.3	3.7	0.336	NS
Play	1.3	3.7	0.011	*
Idle standing	27	14	0.055	=0.072
Lying down	95	110	0.803	NS
Restlessness	23.3	11	0.004	*
Grooming	4	2.33	0.346	NS
Licking	3.33	2.33	0.417	NS
Feeding	14.3	27	0.006	*

The machine fed calves recorded significantly higher ($p < 0.05$) incidence of mouth, ear and other body part sucking, play and feeding. The individually reared bucket fed calves recorded significantly higher ($p < 0.05$) incidence of looking and restlessness compared to the group reared machine fed calves. The time spent attending each calf for feeding, bedding and checking was 152 and 71 minutes from start to weaning for the bucket and machine systems respectively. If labour is valued at £10 per hour this costs £25.34 and £11.90 per calf, a reduction of £13.44 in rearing costs for the machine fed calves.

Conclusions There were significant differences in behaviour between the two treatments with the machine reared calves recording significantly higher incidence of body part sucking, play and feeding. The bucket reared calves recorded significantly higher incidence of looking and restlessness compared to the machine reared calves. Does the latter indicate that the machine reared calves were 'more content'? Labour inputs were reduced by 53% with the machine reared calves. The DeLaval CF150 feeder costs approximately £3,000 and this would be recouped by rearing over 223 calves.

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References

Hepola, H. 2003. Milk feeding systems for dairy calves in groups: Effects on feed intake, growth and health. *Applied Animal Behaviour Science* 80, 233-243.