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Animal Science Research Centre - Beef Unit Trial Results – 2013 (c)

Evaluation of feeding high (750g/day) or standard (500g/d) levels of milk replacer on the performance of artificially reared beef calves to 12 weeks

Introduction:
Utilising the correct Calf Milk Replacer (CMR) feeding programme to achieve optimum growth rates whilst maintaining health and development and allow a smooth transition from milk to solid feed is vital for the success of any effective calf rearing programme. Extensive work has been undertaken to look at the effects of CMR intakes on the growth of calves although these differ in methods and conclusions. However commercially artificially reared dairy-bred calves are commonly fed 500g of CMR per day usually split into two feeds per day. The objective of this experiment was to evaluate the effect of feeding a standard (500g) or high (750g) level of CMR on calf performance to 12 weeks on a twice-a-day bucket rearing system.

Materials & Method:
40 Sept/Oct 2012 born Holstein (30) and Continental x Holstein (10) bull calves purchased at a mean age of 19.6 days. This would therefore be similar to purchasing calves from markets. The calves were randomized according to age, breed and weight to the following treatments and housed in individual pens:

High — Calves fed warm whey and vegetable protein based milk replacer (Volac Enerlac [20% CP, 20% Oil]) mixed at 37^{o}C at 187.5g plus 812.5ml of water to make 1 litre of mixed milk and fed at 2 litres twice per day (4 litres per day) to supply 750g CMR per day. Milk feed rates were gradually reduced from day 36 to weaning at day 42. Total CMR feed rate was 27.9kg per calf.

Standard — Calves fed warm whey and vegetable protein based milk replacer (Volac Enerlac [20% CP, 20% Oil]) mixed at 37^{o}C at 125g plus 875ml of water to make 1 litre of mixed milk and fed at 2 litres twice per day (4 litres per day) to supply 500g CMR per day. Milk feed rates were gradually be reduced from day 36 to weaning at day 42. Total CMR feed rate was 19.1kg per calf.

The calves were offered *ad lib* 18%CP early weaning concentrates (Start 'n' Wean, Wynnstay Group Plc) fresh water and straw. They were moved into group pens at weaning until 12 weeks.

Results:

Table 1: Live weights (kg)

Treatment	500g	750g	Sig
Start	49.6	50.0	NS
3 weeks	60.6	64.4	*
Weaning	76.5	79.0	NS
12 weeks	129.4	134.6	NS
Increase in livewt	79.6	84.8	NS

NS = not significant, * = P<0.05

The calves fed 750g/day of CMR recorded significantly higher 3 week weights and gained an extra 4.8kg in weight from start to 12 weeks. There were no differences in last rib girth or wither height measurements.

Table 2: Daily live weight gains (kg)

Treatment	500g	750g	Sig
Start - 3 weeks	0.52	0.69	*
Start - weaning	0.63	0.70	NS
Wean - 12 weeks	1.26	1.32	NS
Start -12 weeks	0.96	1.01	NS

The calves fed 750g/day of CMR recorded significantly higher DLWGs from start to 3 weeks.

There were no differences in coat bloom or faecal scores, or incidence of health (hydration score, cough score, nasal discharge, ear score and eye discharge score) between the treatments.

Table 3: Feed intakes (kg) and Feed Conversion Ratio (FCR)

Treatment	500g	750g	Sig
Milk replacer	19.1	27.9	
Concs - start to wean	36.4	29.9	=0.124
Concs - wean to 12 weeks	139.2	146.0	
Concs - total	175.6	175.9	
FCR	2.44	2.41	

Table 4: Financial performance – feed costs per calf and per kg gain (£)

Feed costs (£/calf)	500g	750g
CMR @ £1,600/t	30.56	44.64
Concs @ £347/t	60.93	61.03
Feed costs/calf	91.49	105.67
Feed cost per kg gain (£)	1.15	1.25

Feed costs were increased by £14.18 per calf and by 10p/kg gain with the 750g/day CMR feed rate. Subsequent performance to slaughter will be evaluated.

Discussion & Conclusions:

- The calves reared on 750g/day of CMR significantly exceeded the recognised growth targets for purchased bucket reared calves at 12 weeks of 119-122kg
- The calves fed 750g/day of CMR recorded significantly higher (P<0.05) DLWGs from start to 3 weeks and 3 week weights. By 12 weeks the 750g fed calves had gained an extra 4.8kg in weight.
- The calves fed 500g/day of CMR having recorded lower DLWGs to weaning did not exhibit compensatory growth.
- Concentrate intakes were reduced (P=0.124) from start to weaning with the 750g/day CMR feed rate, however they were higher from weaning to 12 weeks resulting in similar overall concentrate feed rates.
- Feed costs per calf were increased by £14.18 and by 10p/kg live weight gain with the 750g/day CMR, however this could be negated by earlier slaughter of the bulls.

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