

# Evaluation of skim and whey based milk replacers on the performance of artificially reared bull calves

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## Introduction:

Many commercial calf rearers believe that when artificially reared calves are fed skim rather than whey-based milk replacers that performance is improved with calves having a better coat bloom. Skim-based powders however are usually more expensive than whey-based milk replacers and typically cost some £150 more per tonne. As a result of this price differential the majority of milk powders on the feed market are whey-based. The objective of this experiment was to investigate the effect of feeding either a skim or whey-based milk replacer on the performance of artificially reared dairy-bred bull calves to 12 weeks of age.

## Materials and Method:

40 Holstein and Continental x Holstein bull calves assigned in a randomized block design according to breed and weight to the following treatments:

### Skim

Calves fed warm skim-based milk replacer ('Elite' supplied by 'The Calf Company' containing 300g/kg skim powder, 213g CP/kg and 191g oil/kg) mixed at 40°C at 125g per 850 ml of water fed twice per day at 4 litres/day. From day 8 milk was fed at 5 litres/day. The calves were gradually weaned at 46 days (6½ weeks).

### Whey

Calves fed warm whey-based milk replacer ('Premium Plus' supplied by 'The Calf Company' containing 215g CP/kg 171g oil/kg) mixed at 40°C at 125g per 850 ml of water fed at the same rate as the skim-based powder.

Fresh water, 18% CP early weaning concentrates (Start 'n' Wean, Wynnstay Group Plc) and straw were offered *ad lib* from 7 days old to both treatment groups. The calves were individually penned and moved into group pens at weaning.

## Results:

Table 1: Live weights (kg) and coat bloom score at 12 weeks

	Skim	Whey	s.e.d	Sig
Start	50.9	51.1	2.07	NS
Weaning	72.9	74.8	3.92	NS
12 weeks	115.8	119.8	6.54	NS
Coat bloom score (1-5)	3.15	2.97	0.224	NS

Coat bloom score scale of 1 = dull, 3 = normal, 5 = shiny

Table 2: Daily live weight gains (kg)

	Skim	Whey	s.e.d	Sig
Start - 3 weeks	0.33	0.30	0.074	NS
Start - weaning	0.52	0.56	0.067	NS
Wean - 12 weeks	1.02	1.07	0.083	NS
Start - 12 weeks	0.77	0.82	0.064	NS

There were no significant differences in faecal scores, wither height and girth measurements or incidence of health disorders between the treatments.

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

	Skim	Whey	s.e.d	Sig
Concs - start to wean	20.1	21.7	3.4	NS
Concs - wean to 12 weeks	111.0	123.0		
Concs - total	131.1	144.7		
FCR (inc 25.1kg milk powder)	2.41	2.47		



## Conclusions:

- Calf performance was very good, both achieving and exceeding the MLC (1999) target for rearing calves to 12 weeks of 115kg.
- There were no significant differences in DLWG for feeding calves on either a skim or whey-based milk replacer. The calves reared on the whey-based powder gained an extra 3.8kg in live weight to 12 weeks of age.
- Concentrate intakes from start to weaning were not significantly different. However the calves on the whey-based milk replacer recorded higher intakes from weaning to 12 weeks and overall consumed an extra 13.6kg more concentrates per calf. The increased concentrate intake with the whey fed calves could be due to improved rumen development. The higher concentrate intake would explain the increased (+3.8kg) live weight gain to 12 weeks.
- The skim fed calves recorded a higher coat bloom score but this was not statistically different.
- Based on the prices prevailing at the time of the study with skim-based and whey-based milk replacers costing £1,425/t and £1,285/t respectively and concentrates costing £192/t, the total feed costs per calf to 12 weeks were £61.97 and £60.03, and the feed costs per kg LWG were 95.5 and 87.4p for the skim and whey treatments respectively.

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