

## Effect of prestarter concentrate feeding system on calf performance

S J Morrison, A F Carson, D J Kilpatrick

Agri-Food and Biosciences Institute, Hillsborough, United Kingdom

Email: [steven.morrison@afbini.gov.uk](mailto:steven.morrison@afbini.gov.uk)

**Introduction** The decision on when to wean calves is often based on the level of solid food intake (Morrison *et al.*, 2009). If pre-starter concentrates encourage early dry food intake, as demonstrated with pigs, earlier weaning may be possible. Therefore the objective of this study was to examine the impact of a pre-starter feeding system, designed to encourage dry feed intake and reduce the age at weaning, on calf health and performance.

**Material and methods** Thirty-nine calves (Holstein-Friesian and Holstein-Friesian crosses) were assigned to one of three rearing systems based on gender, genotype and birth weight. The three treatments were: (1) milk offered twice daily until 6 weeks of age with calves weaned over a 5-day period (TAD); (2) milk offered twice daily until day 14 then once daily with abrupt weaning at 5 weeks (OAD) and (3) as for OAD treatment with addition of prestarter (PRE). Calves commenced the study at 5 days of age and were fed individually using teated buckets. Starter concentrate was available at all times for calves on the TAD and OAD treatments and from day 15 onward for calves on the PRE treatment. Prestarter concentrate was available at all times with PRE calves with all calves having access to drinking water. The prestarter contained whey, toasted soya seed, palm oil, wheat flour, oat flakes, yeast and vegetable extracts. A skim-based milk replacer containing 220 g crude protein and 180 g fat/kg DM was mixed at a rate of 140 g/l and offered at 4 l/day until weaning commenced for calves on the TAD treatment. Calves on the OAD and PRE treatments were offered 4, 4.5, and 3 l/d of milk replacer from days 5-7, 8-14 and 15-35 respectively and post-weaning all calves were offered *ad libitum* grass silage and concentrate. Calf performance and feed intakes were recorded. Intakes were analysed by ANOVA with fixed effects for sex, genotype, birth weight and feeding system. Weekly live weights and body size data were analyzed by repeated measures analysis using the Genstat REML procedure. This fitted a model with week as the time factor and fixed effects for sex, birth weight and feeding system and a week by fixed term interaction.

**Results** Milk replacer intake for each treatment is presented in Table 1. Rearing system had no effect on starter intake or total intake until day 42, although calves offered the TAD tended ( $P < 0.10$ ) to have an increased total intake compared with OAD calves. Rearing system had no effect on calf live weight (Figure 1), however calves offered the PRE and TAD systems had a greater body size and condition score throughout the study compared with OAD calves.

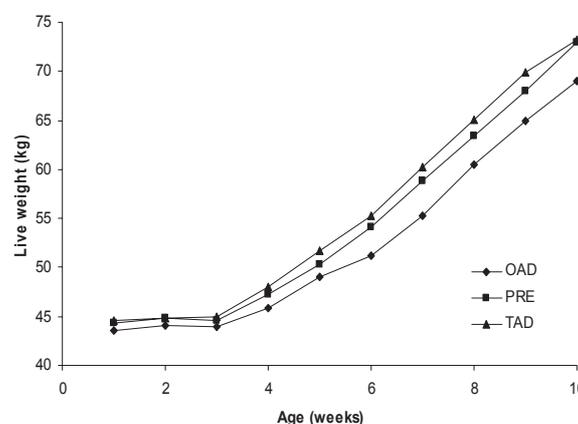
**Table 1** Effect of rearing system on total intake of dietary components and calf growth and development

	Feeding system			SED	Sig.
	TAD	OAD	PRE		
Intake until day 42 (kg DM)					
Milk replacer	18.63 <sup>b</sup>	14.35 <sup>a</sup>	14.38 <sup>a</sup>	0.09	***
Starter concentrate	12.77	13.71	14.84	1.59	NS
Prestarter concentrate	-	-	0.77	-	
Silage intake <sup>1</sup>	0.047 <sup>a</sup>	0.187 <sup>b</sup>	0.103 <sup>a</sup>	0.038	**
Total DMI	31.48	28.21	30.09	1.634	NS
Growth and development					
Live weight (kg)	55.8	52.7	54.9	1.97	NS
Withers height (cm)	79.6 <sup>b</sup>	78.0 <sup>a</sup>	79.2 <sup>b</sup>	0.60	*
Heart girth (cm) <sup>2</sup>	84.1 <sup>b</sup>	82.0 <sup>a</sup>	83.4 <sup>ab</sup>	0.78	*
Body condition score	2.35 <sup>b</sup>	2.17 <sup>a</sup>	2.29 <sup>b</sup>	0.05	*

<sup>1</sup>Total intake from day 35 to 42 for OAD/PRE calves and only day 42 for TAD calves

<sup>2</sup>Heart girth is the circumference of the calf's body behind the front legs

<sup>abc</sup> values with different superscript are significant different ( $P < 0.05$ )



**Figure 1.** Effect of rearing system on calf live weight

**Conclusions** Feeding system had no effect on total dry matter intake however the quantity of milk replacer within the diet was reduced with once daily feeding systems. Offering prestarter to calves fed once daily improved body size development resulting in calves that were similar in size and stature to those offered milk replacer twice daily throughout the 42 day period.

## References

Morrison, S. J., Carson, A. F., Matthews D. and Mulholland, M. 2009. Proceedings of British Society of Animal Science Annual meeting, 84