

Animal Science Research Centre - Beef Unit Trial Results – 2010 (b)

Effect of early weaning concentrate pellet size on the performance of artificially reared dairy-bred bull calves

Introduction:

In pursuit of early dry feed intakes with artificially reared calves it has been traditional in the UK to manufacture a pelleted calf starter feed using a small extrusion die (2.5-3.5 mm). This is significantly smaller than the pellet size used for adult ruminants (6-8mm). There are economic consequences for both the farmer and the feed producer. For the farmer, achieving a higher concentrate intake enhances rumen maturity and minimises growth retardation at and around weaning. For the feed producer the time lost in the feed mill due to extrusion press die changes increases feed production costs. The objective of this experiment was to investigate the effect of feeding either a 3mm or 6mm size early weaning concentrate on the performance of artificially reared dairy-bred bull calves to 12 weeks.

Treatments: There were 40 Holstein and Beef x Holstein bull calves per treatment.

3mm Calves individually housed and fed warm (37°C) Wynngold Bloom milk replacer (23% CP, 20% Oil) mixed at 125g per litre of water twice per day at 4 litres per day. At 8 days the milk was increased to 5 litres per day. Early weaning concentrates - 3mm size pellet (Start 'n' Wean, Wynnstay Group Plc) were offered from the start. The calves were gradually weaned at 42 days and moved into a group pen until 12 weeks.

6mm An identical milk replacer feed rate to 3mm treatment group was given to the calves which were offered 6mm size early weaning nuts manufactured to an identical formulation to the 3mm pellet.

Results:

Table 1: Daily live weight gains (g)

	3mm	6mm	s.e.d	Sig
Start - 3 weeks	0.22	0.24	0.431	NS
3 weeks - weaning	0.56	0.57	0.762	NS
Start - weaning	0.39	0.41	0.506	NS
Weaning - 12 weeks	1.02	1.17	0.714	*
Start - 12 weeks	0.71	0.79	0.537	=0.133

NS = not significant, * = $P < 0.05$, ** = $P < 0.01$

Table 2: Live weights (kg) and last rib girth measurement at 12 weeks (cm)

	3mm	6mm	s.e.d	Sig
Start	51.6	51.4	1.70	NS
Weaning	68.0	68.4	3.06	NS
12 weeks	110.9	117.4	5.61	NS
Last rib girth	131.1	134.4	4.78	NS

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

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

	3mm	6mm	s.e.d	Sig
Concentrates - start to wean	22.3	31.2	3.40	**
Concs - wean to 12 weeks	125.0	138.0		
Concs - total	147.3	169.2		
FCR (kg feed: kg livewt gain)	2.84	2.89		

Concentrate intakes from start to weaning were significantly higher ($P<0.01$) for the calves fed the 6mm nut and overall consumed an extra 21.9kg more concentrates.

Table 4: Feed costs per calf (£ - January 2010)

	3mm	6mm
21.4kg Wynngold Bloom @ £1,400/t	29.96	29.96
3mm Start 'n' Wean @ £235/t	34.61	
6mm Start 'n' Wean @ £230/t		38.68
Feed costs/calf (£)	64.57	68.64
Feed costs per kg gain (£)	1.09	1.04

Discussion and Conclusions:

- Overall performance was very good and the calves fed the 6mm nut exceeded the MLC (1999) target for rearing calves to 12 weeks of 115kg.
- The calves offered the 6mm nut recorded a significantly higher ($P<0.05$) DLWG from weaning to 12 weeks old and gained an extra 6.7kg in live weight from start to 12 weeks however this was not statistically different.
- Concentrate intakes from start to weaning were significantly higher ($P<0.01$) with the 6mm nut and overall consumed an extra 21.9kg more concentrates per head. It could be assumed that the increased concentrate intake with the 6mm nut fed calves resulted in improved rumen development indicated by higher but non-significant last rib girth measurement. The higher concentrate intake would explain the increased live weight gain to 12 weeks. This increased concentrate intake should minimise any growth check at weaning and could facilitate earlier weaning since many calf rearers wean calves when eating 1kg of concentrates per day.
- There were no differences in calf coat bloom or faecal scores.
- Feed costs were increased by £4.07 per calf with the 6mm nut however feed costs per kg gain were reduced from £1.09 to £1.04 based on the feed prices prevailing at the time of the study.

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Reference

Marsh, S.P. and Lingham, T. 2011. Effect of early weaning concentrate pellet size on the performance of artificially reared dairy-bred bull calves. *Proceedings of the British Society of Animal Science*. Paper 85

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