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

Teat versus bucket feeding systems for calves

Introduction:

In a recent survey on rearing systems for artificially reared calves (Volac, 2009) some 83% of farms feed milk via a bucket which is assumed to involve a restricted quantity of milk fed either once or twice per day to individually housed calves. Of the 83% of farms feeding milk via a bucket 29% feed milk from buckets with a teat therefore 71% of these farms feed milk from buckets without teats.

Milk is digested in the abomasum and closure of the oesophageal groove results in the milk bypassing the undeveloped rumen directly into the abomasum for efficient digestion. A number of factors stimulate the closure of the oesophageal groove and it is recognised that feeding milk from a teat at head height optimizes closure.

The objective of this experiment was to investigate the effect of rearing dairy-bred beef calves on calf milk replacer (CMR) from either a bucket with a teat at head height or from a bucket without a teat placed on the floor on performance and health to 12 weeks.

Materials & Method:

48 Jan/Feb 2013 born Holstein (44) and British Blue x Holstein (4) bull calves at 3 to 30 days old (mean 15.6 days). The calves were randomized according to age, breed and weight to the following treatments and housed in individual pens:

Teat Calves fed warm whey and vegetable protein based CMR (Volac Enerlac [20% CP, 20% Oil]) mixed at 37°C at 187.5g per 812.5ml of water and fed at 2 litres twice per day (4 litres i.e. 750g CMR per day) via a teat from a Wydale feeder offered at head height. Milk feed rates were gradually reduced from day 36 to weaning at day 42.

Bucket Calves fed the same CMR at the same feed rate via a bucket placed on the floor.

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

Results:

Table 1: Daily live weight gains (kg)

DLWG (kg)	Teat	Bucket	s.e.d	Sig
Start - 3 weeks	0.46	0.51	0.075	NS
Start - weaning	0.58	0.57	0.096	NS
Wean - 12 weeks	1.04	1.01	0.072	NS
Start -12 weeks	0.81	0.79	0.065	NS

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

The teat fed calves gained an extra 1.4kg in weight from start to 12 weeks as shown in table 2 but this was not statistically significantly different.

Table 2: Live weights (kg)

Livewt (kg)	Teat	Bucket	s.e.d	Sig
Start	46.8	46.7	2.37	NS
3 weeks	56.5	57.4	3.11	NS
Weaning	71.1	70.8	4.45	NS
12 weeks	114.7	113.2	7.11	NS

Calf health was determined using recognised scoring systems with lower scores indicating normal (better) health status. The following health scores were recorded; hydration score (Ely & Guthrie, 2000); cough score, nasal discharge and eye discharge score (Linderoth, 2007); ear score and faecal scores (McGuirk, 2009).

Table 3: Calf health scores

Health score	Teat	Bucket	s.e.d	P value
Start	1.62	1.67	0.334	0.880
Week 1	2.52	2.10	0.496	0.406
Week 2	2.11	1.84	0.416	0.534
Week 3	1.97	2.18	0.465	0.656
Week 4	1.93	2.30	0.326	0.272
Week 5	1.68	1.95	0.427	0.155
Week 6	1.78	2.31	0.549	0.350
Week 12	1.45	1.98	0.255	0.052

It can be noted that there was a gradual improvement in health status of the calves on the teat system from week 1 which resulted in an improved health status by 12 weeks ($P=0.052$).

Incidence of health disorders which necessitated treatment was also recorded. It can be seen from table 4 that there was a 100% increase in the incidence of bloat on the bucket system.

Table 4: Incidence of disorders and disease (number of calves treated)

Treatments	Teat	Bucket
Scour	14	13
Respiratory	9	12
Bloat	2	4

Feed intakes and FCRs are shown in table 5. Based on the feed costs prevailing at the time of the study with CMR @ £1,600/t and starter concentrates @ £347/t the feed costs per calf to 12 weeks were £94.17 and £91.50 for the teat and bucket systems with feed cost per kg gain of £1.39 and £1.38 respectively.

Table 5: Feed intakes (kg) and Feed Conversion Ratio (FCR)

Feed intakes (kg)	Teat	Bucket	s.e.d	Sig
Milk replacer	28.3	28.3		
Concs -start to wean	18.3	19.0	3.44	NS
Concs - wean to 12 weeks	122.6	114.2		
Concs - total	140.9	133.2		
FCR	2.49	2.43		

Discussion & Conclusions:

- Calf performance was very good achieving 12 week weights similar to the recognised targets for artificially reared calves.
- The teat fed calves recorded improved ($P=0.052$) health scores at 12 weeks. This is in agreement with 'the science of calf husbandry'.
- There was a marked increase in incidence of bloat with the bucket reared calves. Fortunately this was quickly identified and treated otherwise this could have had a significant effect on calf performance with potential mortality.
- The calves fed milk via a teat gained an extra 1.4kg in weight to 12 weeks.
- It is recommended that artificially reared calves are fed milk via a teat at head height.

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