

Effect of weaning system on the performance of dairy calves fed using computerised milk and concentrate dispensers

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Introduction Feeding milk or milk replacer can be a labour intensive practice, therefore both feed and labour costs can be minimized by weaning at an earlier age (Gleeson *et al.*, 2007). Basing the decision to wean calves on concentrate intake, Greenwood *et al.* (1997) reduced weaning age by almost 14 d without impacting on calf performance. Group housing of calves has increased in popularity, but until the recent development of computerized feeders, managing calves in groups did not enable weaning based on individual calf concentrate intake. Consequently, the objective of the present study was to investigate the effect of weaning method on performance and feed intake of Holstein-Friesian calves reared from 5 d of age using computer-controlled feeders.

Material and methods Group-housed Holstein Friesian calves ($n = 77$), were randomly assigned to milk feeding systems with either (1) weaning at 8 weeks (Standard) or (2) weaning based on concentrate intake (Auto). Calves commenced the study at 4 days of age and were fed using computerized milk and concentrate dispensers. For Treatment 1 calves, milk replacer was offered at a rate of 500 g/d from 4 to 51 days of age and then reduced in equal steps from day 51 to weaning at day 56. For Treatment 2 calves, milk replacer was offered at a rate of 500 g/d until concentrate intake averaged 500 g/d for 4 consecutive days at which stage the computer-controlled programme automatically reduced milk replacer intake. When calves on the auto treatment consumed an average of 1.5 kg/d of concentrate over a 4-d period, milk replacer feeding was finished. Calves that did not achieve a concentrate intake of 500 g/d and initiate the auto weaning facility before day 51, were weaned following the standard treatment. Calf performance, health and feed intakes were recorded and both feed and economic efficiency determined. Weekly milk and concentrate intakes were analyzed by repeated measures analysis of variance using the Genstat REML procedure. This fitted a model with week as the time factor and fixed effects for sex, birth weight and weaning system plus the week by fixed terms interactions. Live weight and body size data were analyzed both separately and together for male and female calves, with males removed from the study at week 10. Female calf live weight and body size from week 10 onward were analyzed by ANOVA with week 1 value used as a covariate.

Results Total milk and concentrate intake until weaning was 23.1 and 21.9 kg DM/calf respectively, for calves on the standard treatment and 18.6 and 17.0 kg DM/calf respectively for calves on the auto treatment (Table 1). Weaning age was reduced by 8 days on the auto treatment, resulting in calves that were lower in live weight (-7.6 kg, $P < 0.001$) at weaning. However at 40 wk of age, weaning treatment had no effect on heifer live weight.

Table 1 Performance of calves weaned at a fixed age or based on concentrate intake

| Performance parameters | Weaning system | | SED | Sig. |
|---|----------------|----------|-------|-------|
| | Auto | Standard | | |
| Milk replacer intake until weaned (kg) | 18.6 | 23.1 | 0.53 | *** |
| Concentrate intake until weaned (kg DM) | 17.0 | 21.9 | 1.53 | ** |
| Weaning age (day) | 47.2 | 55.0 | 1.17 | *** |
| Live weight at weaning (kg) | 59.3 | 66.9 | 1.31 | *** |
| Feed cost until weaning (£) | 30.07 | 37.56 | 0.93 | *** |
| Gain : kg DM | 0.59 | 0.64 | 0.028 | 0.088 |
| Gain : £ feed | 0.68 | 0.75 | 0.030 | * |
| Live weight at 40 weeks of age (kg) | 226 | 234 | 7.7 | NS |

Conclusions When using computerized feeders, weaning calves based on the level of concentrate intake as opposed to calf age reduced the age and live weight at weaning, although differences in live weight disappeared post-weaning. Efficiency of liveweight gain until weaning was lower with calves weaned based on concentrate intake however overall feeding costs were reduced compared with calves weaned at a fixed age.

References

- Gleeson, D.E., O'Brien, B. and Fallon, R.J. 2007. *Journal of Applied Research in Veterinary Medicine* 5, 97-104
 Greenwood, R.H., Morrill, J.L. and Titgemeyer, C.E. 1997. *Journal of Dairy Science* 80, 2542-2546