

Delaying Greater Milk Replacer Feeding Level and Gradual Weaning Programs

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Weaning is perhaps the greatest change a calf endures after birth and colostrum feeding. There are numerous factors leading up to weaning that affect how calves do in the weaning process and afterwards. Several of these variables were evaluated in a study at the University of Guelph in Ontario, Canada (Parsons et al., 2021).

This study was done at a mechanically ventilated commercial calf raising operation with 84 male Holstein calves sourced from several area dairy farms. Calves were about 3 to 7 days old upon arrival and were sourced over a 2-day period in October 2018. Calves were housed in individual pens about 3.25 x 4 feet. Pens had rubber slatted floors with no bedding. Calves stayed in these individual pens until the end of the 59-day study and then were moved into group pens.

The milk replacer contained 21% protein 19% fat and was fed in teat buckets. Various behavioral and health observations were made and recorded. Calves had free access to water through nipple dispensers in each pen. A commercial somewhat textured starter was fed which contained 60% veal starter pellet, 16% whole corn, 16% steam flaked corn, 5% chopped straw, and 3% molasses. It averaged nearly 18% CP on a dry matter basis with 16.5% NDF, 7.6% ADF, and 1% starch.

The study was a 2 x 2 factorial with moderate and lower milk feeding levels and 2 or 4 step weaning programs. From arrival to the end of weaning, calves on the Low Milk (LM) program were fed a total of 55 lb milk replacer during the entire milk feeding phase. All calves received the same milk program from d 1 to 12 (4–5 liters/day), with the milk replacer concentration slowly increasing from d 1 (115 g/L) until d 15 (140 g/L). Offered milk replacer increased starting day 13 for calves on the Moderate Milk (MM) treatment (total 77 lb fed), compared with calves on the LM treatment. The MM treatment offered milk replacer peaking at 9 L/d (d 25–29), compared with LM treatment, offering milk replacer which peaked at 5 L/d (d 9–29). Calves were calculated (NRC 2001) to average 1 lb daily gain under the LM treatment and 1.65 lb under the MM treatment. All calves were gradually weaned according to their randomly assigned weaning treatment from days 30 to 45 by either a 2-step or a 4-step weaning program, depending on their assigned treatment. Beginning day 46, calves received no more milk and were monitored in the postweaning phase until day 59.

	Moderate Milk	Low Milk	2-Step Weaning	4-Step Weaning
Prewaning, days 13 to 29				
Initial Body weight, lb	109.9	113.6		
Starter intake, lb/day	0.77	1.08	0.88	0.97
ME intake, Mcal/day	4.47	4.05	4.19	4.34
MR intake, lb/day	1.59	1.21	1.41	1.41
Weaning, days 30 to 45				
Starter intake, lb/day	2.71	3.41	3.00	3.15
ME intake, Mcal/day	6.81	7.00	6.71	7.11
MR intake, lb/day	1.26	0.86	1.03	1.10
Daily gain, lb	1.56	2.11		
Postweaning, days 46 to 59				
Starter intake, lb/day	4.89	5.24	4.95	5.17
Total DMI, lb/day	4.89	5.24	4.95	5.17
ME intake, Mcal/day	7.32	7.87	7.42	7.75

Moderate versus Low Milk Replacer Treatments

Initial body weights were similar while during the weaning period (days 38 to 46) calves gained more for low (LM) versus moderate (MM) milk replacer feeding. During the preweaning period (days 1 to 37), calves fed more milk replacer ate less starter as noted in a meta-analysis by Gelsinger et al. (2016). In spite of more calculated metabolizable energy (ME) intake during the preweaning period, this did not affect daily gain (data not shown in paper).

During the weaning period, there was more starter intake for calves on the low milk replacer treatment, reflecting the inverse relationship between milk replacer amount fed and starter intake. Consequently, the resultant daily gain was greater during this period for the low milk replacer treatment.

Weaning Treatments

There were no differences during the weaning period between the two weaning treatments although there were slight differences in milk replacer and starter intakes.

During the weaning period, calves did consume more milk replacer and ME. But no differences in daily gain resulted (figure in paper).

During the postweaning period, there were no significant differences in starter or ME intake although there was some numerical advantage in both for the 4-step weaning treatment.

There is much more data analysis in the report, but I just featured the overall results. Respiratory scoring was also done but showed little difference among treatments during the study. Blood sampling for β -hydroxybutyrate (BHB) was done as an indicator of rumen development. This is based on the premise that as rumen papillae development is stimulated most by rumen butyrate levels, the metabolism of butyrate after absorption would be reflected in BHB blood levels.

The Bottom Line

The weaning transition period (2 weeks before and 2 weeks after full weaning) is what I term the 3rd critical period for calves (The first two are calving conditions and then the first 2 weeks of life). This study found that as more milk replacer was fed (77 vs 55 lb) over a 45 day period before full weaning, calves ate less starter but with little differences in daily gain. Varying the weaning process from a 2-step vs 4-step procedure from days 30 to 45 likewise had little overall effect. The key to successful weaning is to have adequate starter (preferably textured) intake for 2 to 3 weeks before initiating weaning; and then have continued good starter intake to avoid a slump postweaning. A 2018 NAMHS study (Shivley et al.), showed this is a national problem as Holstein calves daily gained 1.6 lb before weaning, but slumped to 1.3 lb postweaning.

References

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