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Giving calves access to water starting at birth recommended

Bottom Line

with
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WATER intake is critical to calf performance (Kertz et al., 1984; *Feedstuffs*, March 10, 2014), but it is still an issue, at times, to get calf and dairy operations to provide water in a timely manner.

There was little difference between when U.S. dairy producers began first feeding water in the 2014 versus 2007 National Animal Health Monitoring System (NAHMS) reports. In 2014, the average age was 17 days (Figure).

That is part of the unfortunate picture in which producers wait too long to begin feeding water and starter but cannot wait to begin feeding hay — and that picture is worst for smaller dairy farms.

The average age at weaning increased from eight weeks in 2007 to nine weeks in the 2014 NAHMS report. This was undoubtedly due to the daily feeding rate of milk/milk replacer increasing from four quarts to six quarts — a 50% increase.

Given that change, what would the impact be of feeding water after birth rather than waiting until 17 days of age? That question was the basis for a study at Iowa State University by Wickramasinghe et al. (2019).

This trial used 30 Holstein heifer calves. All calves were bottle-fed at least four quarts of colostrum within four hours of birth. The colostrum had been pooled, frozen and then thawed before it was fed to individual calves. Calves were individually housed in an indoor facility with straw-bedded pens. The trial was conducted between Aug. 22 and Oct. 8, 2017.

After colostrum, calves were then bottle fed pasteurized milk at 4.4 lb. at each of three daily feedings until they were 14 days old. From 14 to 42 days, calves were fed 7 lb. at each of the three feedings and then were fed only 7 lb. once daily for seven days until fully weaned at day 49. All calves were fed from the same batch of milk each day until weaning.

A commercial texturized calf starter (18% crude protein) was fed free choice until the end of the 10-week trial. All calves were fed the same batch of this starter.

The two water feeding treatments started at different days of age — either after birth or not until 17 days of age. Each calf had a plastic water bucket with a capacity of about seven quarts. Water was provided at 0700 with full buckets that were checked for water level at 1400 and 2200 hours. Daily water intake was measured each morning before fresh water was fed. A separate set of water buckets was used to calculate and adjust water intake for evaporation.

Daily temperatures were logged within the barn. Water and starter buckets were separated by a metal divider to avoid cross-contamination between these two sources — still somewhat of an unrecognized problem that reduces intake of both water and starter when this contamination occurs.

At 65 days of age, all calves were moved to another set of individual pens that allowed for total fecal collection and digestibility measurements.

The high level of milk feeding (Table 1) greatly limited starter intake, especially prior to the beginning of weaning at 42 days of age.

On the other hand, Kertz et al. (1984) used the traditional level (Kertz et al., 1979) of feeding only two quarts of milk replacer twice daily for three weeks and then one-half of that feeding level for a week before full weaning at a month of age. That resulted in only about 0.75 lb. of daily gain and put the focus on starter intake for rumen development. Consequently, limited liquid milk replacer intake provides little water intake in the milk replacer and puts further emphasis on free water intake.

Additionally, as I have noted before (*Feedstuffs*, March 10, 2014), the water-to-starter intake ratio is about 4:1. In a study by Quigley et al. (2006), that ratio was only 2:1 before weaning but quickly jumped to 4:1 and above after weaning.

In this study, water from milk provided most of the water for starter intake because of the very high milk feeding lev-

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1. Effect of water feeding treatment on intake

	Water at birth	Water at age 17 days	P <
Water intake, lb./day			
Days 0-16	1.65	0	0.001
Days 17-42	1.81	2.87	0.001
Days 43-49	4.14	4.44	—
Days 50-70	11.58	11.71	—
Milk intake, lb./day			
Days 0-16	13.8	13.0	0.012
Days 17-42	18.1	17.5	0.035
Days 43-49	6.28	6.06	—
Days 50-70	—	—	—
Starter intake, lb./day			
Days 0-16	0.044	0.044	—
Days 17-42	0.13	0.13	—
Days 43-49	1.45	1.54	—
Days 50-70	5.20	5.00	—
Total water intake, lb./day			
Days 0-16	13.63	11.36	0.001
Days 17-42	17.53	18.12	0.012
Days 43-49	9.73	9.86	—
Days 50-70	12.07	12.31	—

2. Effect of water feeding treatment on growth

	Water at birth	Water at age 17 days	P <
Preweaning, days 0-42			
ADG, lb./day	1.45	1.34	—
During weaning, days 43-49			
ADG, lb./day	0.49	0.82	—
Postweaning, days 50-70			
ADG, lb./day	2.40	2.27	—
Follow-up at 5 months of age			
Bodyweight, lb.	440.2	411.6	0.048
ADG, lb./day	2.93	2.66	—

els. Only for the week of lower milk feeding during weaning did starter intake and free water intake increase dramatically — closer to a ratio of 3:1. However, it is puzzling why water intake did not increase further to around 3:1 or 4:1 relative to starter intake after calves were fully weaned.

As shown in Table 2, there was a numerical decrease in preweaning average daily gain (ADG) for calves delay-fed water until 17 days of age versus those fed water beginning after birth (1.34 lb. versus 1.45 lb.), but then there was a numerical increase in ADG during the week of weaning (0.82 lb. versus 0.49 lb. per day). For the 20 days after full weaning, there was a numerical increase in ADG (2.40 lb. versus 2.27 lb.) for calves fed water beginning after birth versus those that were not fed water until 17 days of age.

Interestingly, at five months of age, calves fed water starting right after birth had increased bodyweight ($P < 0.05$) and ADG versus those delayed in the first feeding of water until 17 days of age.

Hip height and body length were greater ($P < 0.05$) postweaning (50-70 days) for calves fed water right after birth than for those that were not fed water until 17 days of age. Digestibilities and severity and days with scours/diarrhea did not differ between the two treatments, except for increased digestibilities of acid detergent fiber ($P < 0.047$) and neutral detergent fiber ($P < 0.078$) and feed efficiency ($P < 0.057$) postweaning.

Using more calves per treatment would have helped in detecting significant differences in this trial.

The Bottom Line

Waiting until 17 days after a calf is born to begin feeding water did not have major effects on starter intake and performance, most likely due to high milk feeding levels (six to nine liters daily) and, subsequently, lower starter intake.

However, during the postweaning period (50-70 days), calves had greater hip height, body length, fiber digestibilities and feed efficiency when free water was provided right after birth. At five months of age, these calves had 29 lb. greater bodyweight.

References

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