



December 2006

AG/Dairy/2006-01pr

Watch the Drinking Water Quality of Calves Reared in Individual Hutches

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Introduction

Those involved in livestock production have often observed the relationship between drinking water intake, dry matter intake and performance. Hutches commonly used for the rearing of dairy calves are equipped with individual drinking water vessels or buckets. It is a common observation that the quality of water in these vessels are poor even in otherwise well-managed calves. It was the objective of this study to determine if the frequency of cleaning and rinsing of drinking water vessels in calf hutches would affect the performance of the calves.

Materials and Methods

Twenty-four Holstein bull calves ages 2 to 7 days were purchased from a single commercial dairy for each of three years (72 calves). Calves were purchased each year in four sets of six calves each the first week of September, December, March, and June. Calves were housed in individual polyethylene hutches for 60 days after purchase. While in the hutches calves received commercial milk replacer at the rate recommended by the manufacturer twice per day at 0500 and 1700. Each hutch was equipped with two buckets, one for feed and the other for water. A balanced concentrate mix (16% crude protein, 75% total digestive nutrients) composed mainly of dry-rolled barley fortified with soybean meal and vitamin-mineral premix was available in one bucket at all times. Drinking water



buckets were managed using three different methods: 1) cleaned, rinsed daily; 2) cleaned, rinsed each 7 days; or 3) cleaned, rinsed each 14 days. Two hutches were randomly assigned to each of these three drinking water management methods. Any drinking water bucket contaminated with fecal material was cleaned and rinsed immediately. Otherwise, management was as described above. Hutches were heavily bedded with wood shaving initially. Small amounts were added thereafter to keep the hutch clean and calves comfortable.

All calves were weaned after 60 days in the hutches. One week prior to weaning, calves were preconditioned: castrated (Elastrator), hot-iron dehorned, and vaccinated for clostridial and

respiratory diseases common to the area. Vaccines were boosted as recommended by the manufacturer. After weaning, the six calves in each group were placed in a common pen and remained together as a group until sold at 160 to 170 days of age. During this post-weaning period, calves were offered a choice of alfalfa hay (18.0% crude protein, 60% total digestible nutrients) and a concentrate mix (14% crude protein, 78% total digestible nutrients) composed mainly of dry-rolled barley, corn silage, soybean meal and vitamin-mineral premix. Calves

were weighed as they were placed in the hutches, at weaning and when they were sold.

Results and Discussion

The effect of drinking water bucket management on the performance of Holstein bull calves reared in hutches from birth to weaning (60 days) is summarized in Table 1.

Table 1. Average daily gain and body weight of Holstein bull calves from birth to weaning (60 days) as affected by frequency of cleaning and rinsing of drinking water buckets.

Season	cleaning/rinsing interval			Average	Weaning weight, lbs.
	Daily	7-days	14-days		
----- Daily gain, lbs. -----					
Summer	1.43	1.41	1.34	1.39	171
Fall	1.65	1.54	1.43	1.54	180
Winter	1.50	1.43	1.41	1.45	175
Spring	1.65	1.54	1.41	1.54	180
Average	1.54	1.47	1.41		
Weaning Weight, lbs.	181	176	172		

The magnitude of differences in daily gain and 60-day weaning weights are not great. Calves whose water buckets were cleaned and rinsed daily weighed only 5 and 9 pounds more at weaning than those whose water buckets were cleaned and rinsed at 7 and 14-day intervals, respectively. However, it must be remembered that 9 lbs. accounts for just over 5% of the total body weight of these young, light calves. Also notice that season had an effect on the performance of the calves. Those reared

during summer and winter months gained about 7 pounds less than those reared during spring and fall months, which is about 4% of total body weight.

A summary of effects of drinking water bucket management during 60 days of hutch rearing on the performance of the Holstein bull calves from birth to sale weight (160-170 days) is presented in Table 2.

Table 2. Performance of Holstein bull calves from birth to sale weight (160-170 days) as affected by drinking water bucket management during the hutch-rearing phase (first 60 days).

Season	cleaning/rinsing interval			Average	Sale Weight, lbs.
	Daily	7-days	14-days		
----- daily gain, lbs. -----					
Summer	2.35	2.24	2.13	2.24	458
Fall	2.68	2.57	2.49	2.57	512
Winter	2.40	2.42	2.40	2.40	484
Spring	2.64	2.53	2.38	2.53	505
Average	2.53	2.44	2.35		
Weaning Weight, lbs.	506	491	476		

These calves were 160 to 170 days of age when marketed and even though management of the calves was identical for approximately the last 100 days, differences in drinking water bucket management during the first 60 days while calves were in hutches resulted in differences in daily gain and sale weight at sale. Only minor differences in the daily gain and sale weight of calves whose drinking water buckets were cleaned and rinsed daily or each 7 days could be detected. Differences were not significant. However, when the cleaning/rinsing interval was increased to 14 days, daily gain and sale weight were significantly reduced. Compared to calves whose drinking water buckets were cleaned/rinsed daily or at 7-day intervals, those whose bucket were cleaned/rinsed each 14 days weighed 30 and 15 pounds less when sold, respectively. These differences were not simply a carryover of weight differences observed during the 60-day hutch-rearing period. Calves whose drinking water buckets were changed daily weighed 9 pounds more than those whose water buckets were changed at 14-day intervals by the end of the hutch-rearing period (Table 1). However, there was a 30-pound difference in the sale weight of these calves approximately 100 days later. Thus, factors associated with drinking water bucket

management during the hutch-rearing phase affected the performance of calves during the next 100 days during the post-weaning growth period. Reductions in water intake resulting from stagnant, contaminated water in the buckets that were cleaned/rinsed at 14-day intervals may have resulted in lower concentrate intake, impeded gastro-intestinal tract development, or health/behavioral issues that reduced daily gain during the next 100 days. Calves whose water was only cleaned at 14-day intervals also had more health problems. Also notice the seasonal effect. Calves started in the summer or winter gained less and weighed less at sale than those started in spring or fall.

Implications

Frequent cleaning/rinsing of drinking water buckets of hutch-raised calves will increase daily bodyweight gain by over 7 percent during the hutch-rearing period and through the next 100-day growth period. Although daily cleaning/rinsing of water buckets is preferred, intervals between cleaning should not exceed 7 days.

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This publication is issued in furtherance of Cooperative Extension work. Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Noelle Cockett, Vice President for Extension and Agriculture, Utah State University.