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Sodium Bicarbonate and Feed Flavor Supplements for Calves Fed Forage Sorghum Silage¹

Keith Bolsen and Dirk Axe

Summary

High-moisture forage sorghum silage was fed to 108 steer calves to measure the effect of sodium bicarbonate and feed flavor (Omniflavor®) on calf performance. Overall performance was similar for all three rations by the end of the 94-day trial, but at days 29 to 56, when weather conditions were extremely cold, bicarbonate and Omniflavor each gave improved rate and efficiency of gains.

Introduction

Researchers and cattlemen alike have experienced low dry matter (DM) intakes and poor conversions for calves fed forage sorghum silages that have high moisture contents (less than 30% DM).

Research conducted at the Hays Branch Experiment Station (Kansas Agriculture Expt. Sta. Bull. 556) showed that steers fed sorghum silage rations supplemented with 100 gm of sodium bicarbonate (NaHCO_3) consumed 4% more DM and gained 8% faster than steers not receiving bicarbonate. Similar results were reported by South Dakota researchers.

Flavoring compounds are sometimes used in the feed industry to improve palatability or acceptability of a feed. In previous trials at Manhattan (Report of Progress 427) flavors did not increase silage intakes but improved both rate and efficiency of gains.

Our objective was to measure the effect of NaHCO_3 and a feed flavor on intake and utilization of high-moisture forage sorghum silage.

Experimental Procedures

The silage was Asgrow Titan R forage sorghum, harvested in the dough stage at about 25% DM during the last week of September in 1982. It was fed to 108 steer and heifer calves in a 94-day growing trial that began on December 21, 1982 and ended on March 25, 1983. Six pens of six calves received each of the following supplements: (1) sodium bicarbonate, at 112 gm per calf daily; (2) Omniflavor, at 2.0 lb per ton of ration (air-dry basis); and (3) control (no bicarbonate or flavor).

¹The feed flavor, Livestock Omniflavor Cream®, is produced by Agrimerica, Inc., Northbrook, IL 60032. Partial financial assistance was provided by Agrimerica.

The silage was full-fed and all calves received 2.0 lb of supplement daily. The supplements were top-dressed onto, and partially mixed with, the silages in the bunk. Composition of the supplement is shown in Table 15.1. The rations were formulated to provide 12.5% crude protein, .5% calcium, and .35% phosphorus (DM basis) and 150 mg of monensin and 25,000 I.U. of vitamin A per calf daily.

Feed offered was recorded daily for each pen and the feed not consumed was removed, weighed, and discarded every 2 days for the first 2 weeks of the trial; every 3 days for the next 2 weeks; and every 7 days thereafter.

Results and Discussion

Overall performance by the steers is shown in Table 15.2. Although NaHCO_3 and Omniflavor each improved rate and efficiency of gains by about 2.5%, these differences were not statistically significant. Dry matter intakes were similar for the three rations.

Calves were weighed at 28 and 56 days to determine if NaHCO_3 and Omniflavor influenced interim performance. Shown in Figure 15.1 are gains vs. days on feed. During days 0 to 28, calves fed the three rations made nearly identical gains. Days 29 to 56 were a period of extremely cold weather and NaHCO_3 and Omniflavor both improved gains by 23 and 18%, respectively. During days 57 to 94, calves fed the control ration compensated, and made the fastest gains.

Shown in Figure 15.2 are DM intakes vs. days on feed. When compared to the control, Omniflavor increased DM intakes during days 0 to 28 but decreased intakes during days 57 to 94. Dry matter intake was not affected by NaHCO_3 at any time during the feeding trial.

In previous sorghum silage trials (Report of Progress 427), feed flavor improved calf performance (rate and efficiency of gain) by only 1.1% in the first trial but by 7.7% in the second trial. The flavor used was Ultra Sweet Livestock Omniflavor, fed at higher rates than in the current trial.

The response to NaHCO_3 was considerably less than the 8.4% improvement obtained last year using yearling steers fed corn silage (Report of Progress 427).

Table 15.1. Composition of the Control, Sodium Bicarbonate, and Omniflavor Supplements Fed With the Forage Sorghum Silage.

Ingredient	Supplement		
	Control	NaHCO ₃	Omniflavor
	lb/ton		
Soybean meal	1265	1310	1271
Rolled sorghum grain	414	94	392
Sodium bicarbonate ¹	—	275	—
Omniflavor ²	—	—	16
Urea	125	125	125
Salt	42	42	42
Dicalcium phosphate	85	85	85
Limestone	35	35	35
Tallow	20	20	20
Trace mineral premix	5	5	5
Vitamin A ³	+	+	+
Rumensin-60 ⁴	+	+	+

¹ Added to provide 112 gm/calf daily.

² Added to provide 2.0 lb/ton of air-dry ration.

³ Added to provide 30,000 IU/calf daily.

⁴ Added to provide 150/mg calf daily.

Table 15.2. Performance by Calves Fed the Control, Sodium Bicarbonate, and Omniflavor Supplements (94 Days).

Item	Supplement		
	Control	NaHCO ₃	Omniflavor
No. of calves	36	36	36
Initial wt., lb	437	430	433
Avg. daily gain, lb	1.15	1.18	1.18
Avg. daily feed, lb ¹	10.61	10.57	10.61
Feed/lb of gain, lb ¹	9.25	9.00	9.04

¹ 100% dry matter basis.

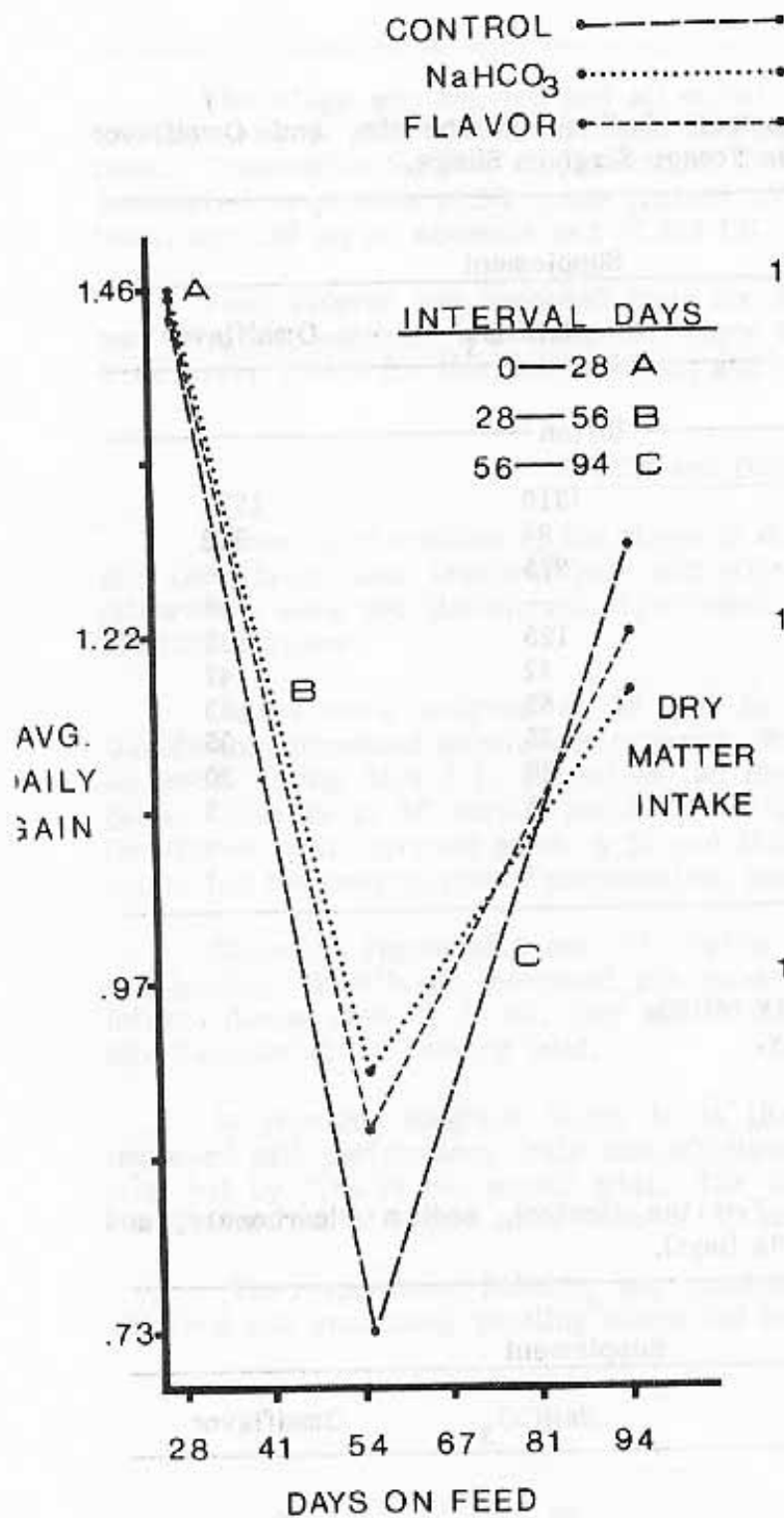


Figure 15.1. Average daily gain vs. days on feed for the calves fed the three rations.

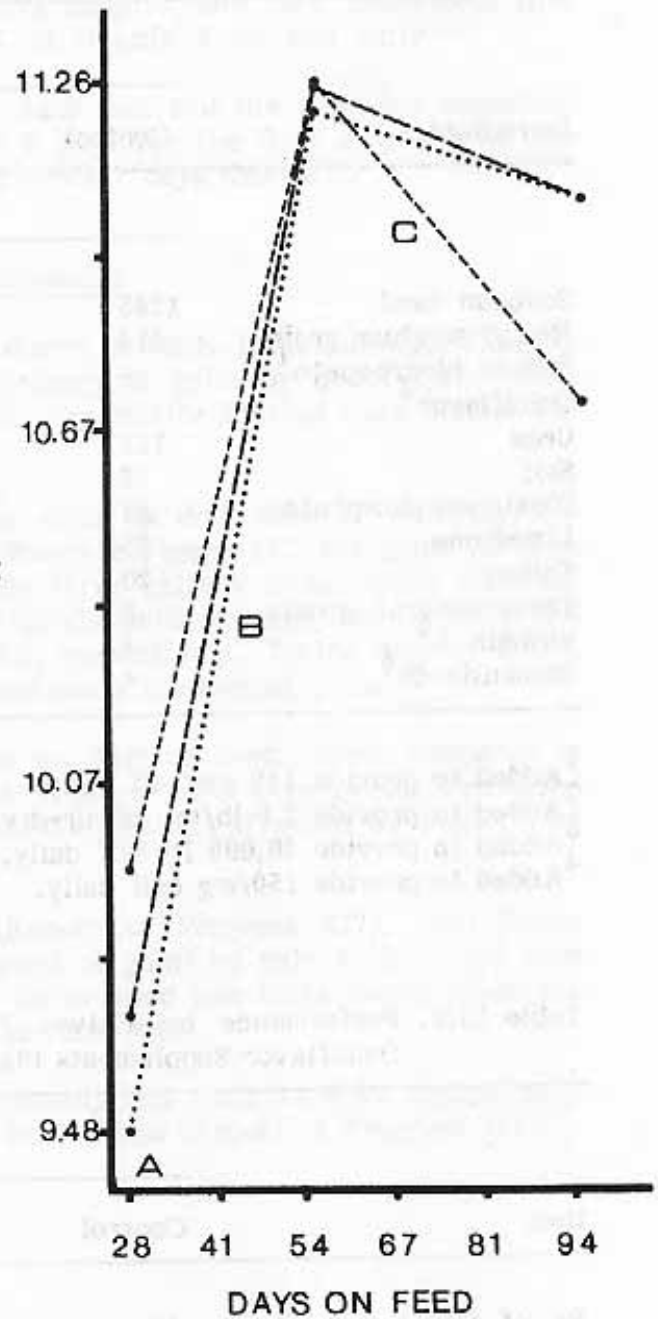


Figure 15.2. Dry matter intake vs. days on feed for the calves fed the three rations.