Kansas Agricultural Experiment Station Research Reports

Volume 0
Issue 1 *Cattleman's Day (1993-2014)*

Article 1062

1985

Sodium bicarbonate and sodium bentonite supplements for cattle fed corn or sorghum silages

D. Axe

K. Bolsen

K. Jacques

See next page for additional authors

Recommended Citation

Axe, D.; Bolsen, K.; Jacques, K.; and Harmon, D. (1985) "Sodium bicarbonate and sodium bentonite supplements for cattle fed corn or sorghum silages," *Kansas Agricultural Experiment Station Research Reports*: Vol. 0: Iss. 1. https://doi.org/10.4148/2378-5977.2465

Sodium bicarbonate and sodium bentonite supplements for cattle fed corn or sorghum silages

Abstract

Supplementing forage sorghum silage rations with sodium bicarbonate (NaHCO3) improved performance of growing cattle over the control supplement. However, neither NaHCO 3 nor sodium bentonite supplementation to corn silage rations improved cattle performance.

Keywords

Cattlemen's Day, 1985; Kansas Agricultural Experiment Station contribution; no. 85-319-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 470; Beef; Sodium bicarbonate; Sodium bentonite; Corn silage; Sorghum silage

Authors

D. Axe, K. Bolsen, K. Jacques, and D. Harmon

Sodium Bicarbonate and Sodium Bentonite Supplements for Cattle Fed Corn or Sorghum Silages[1,2]

Dirk Axe, Keith Bolsen, Kate Jacques, and Dave Harmon

Summary

Supplementing forage sorghum silage rations with sodium bicarbonate ($NaHCO_3$) improved performance of growing cattle over the control supplement. However, neither $NaHCO_3$ nor sodium bentonite supplementation to corn silage rations improved cattle performance.

Introduction

Beef cattle research with sodium bicarbonate ($NaHCO_3$) has involved mainly high concentrate feeding programs with little emphasis on silage-based rations for growing/backgrounding cattle. In two previous trials at Manhattan, addition of $NaHCO_3$ to high silage rations has improved rate and efficiency of gain (Reports of Progress 427 and 448). Sodium bentonite (colloidol clay), an inert material, is not new to the cattle feeding industry, but results have been inconsistent. These trials further evaluated $NaHCO_3$ and sodium bentonite supplements for growing cattle fed forage sorghum and corn silage rations.

Experimental Procedures

Trial 1. Forage sorghum silage (Pioneer 947) was fed to 36 individually housed calves for 84 days, beginning November 17, 1983. Eighteen calves per treatment received supplements containing either no additive (control) or $NaHCO_3$ fed at l.0% of the ration dry matter (DM) intake (approximately 43 grams per calf daily). The silages were full-fed and all calves received 1.8 lb of supplement daily (DM basis). The rations were formulated to provide 12.5% crude protein, 150 mg of Rumensin® per calf daily, and NRC recommended amounts of calcium, phosphorus, and vitamins A, D, and E.

Trial 2. Drought-stressed and irrigated whole-plant corn silages were fed to light weight yearling steers and heifers for 84 days, beginning February 9, 1984. Eight pens of four cattle were fed supplements with: 1) no additive (control), 2) $NaHCO_3$, and 3) sodium bentonite. $NaHCO_3$ was fed at 1% of the ration DM intake (about 66 grams per animal daily), and sodium bentonite, at 2% of the ration DM intake (about 132 g per animal daily). Silages were full-fed and all cattle received

[1]The sodium bicarbonate and partial financial assistance. were provided by Church and Dwight Co., Inc., Piscataway, NJ.

[2]The sodium bentonite was supplied by American Colloid Co., Skokie, IL.

1.8 lb of supplement daily (DM basis). Rations were formulated to provide 12% crude protein, 200 mg of Rumensin® per animal daily, and NRC recommended amounts of calcium, phosphorus, and vitamins A, D, and E.

Supplements in both trials were top-dressed and partially mixed with the silages in the bunk. All calves were weighed individually on two consecutive days at the start and at the end of the trials. Intermediate weights were taken at 28 and 56 days.

Results

Shown in Table 25.1 are performance results of the cattle in trial 1. The 0 to 84 days results show that $NaHCO_3$ improved rate of gain (8.8%), feed intake (2.0%), and efficiency of gain (7.5%) over the control supplement. However, the differences were not statistically significant. During days 0 to 28, the $NaHCO_3$ supplement gave an advantage in performance and during days 29 to 56, a period of extremely cold weather, $NaNCHO_3$ produced a significant response in gain and feed/gain over the control supplement. A similar response was observed a year earlier (Report of Progress 448) under comparable cold weather conditions. There was some compensating performance for cattle fed the control supplement in the final 57 to 84 days.

Shown in Table 25.2 are performance results for trial 2. In general, neither $NaHCO_3$ nor sodium bentonite supplementation gave a performance advantage over the control supplement. Cattle fed sodium bentonite gained slower ($P<.05$) and were 4.7% less efficient than those fed the control.

Table 25.1. Performance by Cattle Fed Control and $NaHCO_3$ Supplements in Trial 1

Item	Control	$NaHCO_3$
No. of Calves	18	18
Initial Wt., lb	467	467
Final Wt., lb	553	560
	0 to 28 days	
Avg. Daily Gain, lb	1.37	1.45
Avg. Daily Feed, lb[1]	9.85	9.97
Feed/lb of Gain, lb[1]	7.6	7.1
	29 to 56 days	
Avg. Daily Gain, lb	.52[b]	.83[a]
Avg. Daily Feed, lb[1]	11.86	12.25
Feed/lb of Gain, lb[1]	31.8[b]	18.6[a]
	57 to 84 days	
Avg. Daily Gain, lb	1.16	1.05
Avg. Daily Feed, lb[1]	12.87	12.85
Feed/lb of Gain, lb[1]	12.3	15.8
	0 to 84 days	
Avg. Daily Gain, lb	1.02	1.11
Avg. Daily Feed, lb[1]	11.48	11.71
Feed/lb of Gain, lb[1]	11.8	10.9

[a b]Values in the same row with different superscripts differ ($P<.05$).

[1] 100% dry matter basis.

Table 25.2. Performance by Cattle Fed Control, $NaHCO_3$, and Sodium Bentonite Supplements in Trial 2

Item	Control	$NaHCO_3$	Sodium Bentonite
No. of Cattle	32	32	32
Initial Wt., lb	482	474	476
Final Wt., lb	673	663	659
	0 to 28 days		
Avg. Daily Gain, lb	1.69	1.72	1.77
Avg. Daily Feed, lb[1]	12.66[a]	13.00[ab]	13.21[b]
Feed/lb of Gain, lb[1]	7.6	7.6	7.5
	29 to 56 days		
Avg. Daily Gain, lb	2.37	2.28	2.17
Avg. Daily Feed, lb[1]	14.75	14.98	14.96
Feed/lb of Gain, lb[1]	6.3	6.6	7.1
	57 to 84 days		
Avg. Daily Gain, lb	2.82	2.73	2.59
Avg. Daily Feed, lb[1]	15.57	15.41	15.93
Feed/lb of Gain, lb[1]	5.5[a]	5.6[a]	6.1[b]
	0 to 84 days		
Avg. Daily Gain, lb	2.28[a]	2.25[ab]	2.18[b]
Avg. Daily Feed, lb[1]	14.51	14.34	14.61
Feed/lb of Gain, lb[1]	6.4	6.4	6.7

[ab] Values in the same row with different superscripts differ ($P<.05$).

[1] 100% dry matter basis.