FMC Corporation
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S-Carb and Sodium Bicarbonate: Comparative Effects on Acid/Base Status

Recent articles in both scientific and popular press have questioned the potential differences in mode of action between buffers. One of the aspects that has been discussed is the potential to induce alkalosis. In a study run by FMC the effects of feeding S-Carb (sodium sesquicarbonate) or sodium bicarbonate on acid/base balance and rumen fiber disappearance were evaluated. Rumen cannulated steers were used for this study. For the duration of the experiment, the steers were fed a 45% concentrate ration. The buffer levels used on a dry matter basis, were:

Treatments Used

	Low	Medium	High
S-Carb	0.67%	1.68 %	3.35%
Sodium Bicarbonate	0.75%	1.87 %	3.73 %

The steers were adapted to the treatment ration for 7 days prior to a 5 day collection period. Venous blood gasses were drawn by jugular puncture. The acid/base status shown by the blood gasses was:

BLOOD GAS ANALYSIS BY TREATMENT

		Low	Medium	High
S-Carb	pH	7.346	7.358	7.332
	pCO2	51.1	52.3	55.5
	HCO3	26.9	28.3	28.0
Sodium Bicarbonate	pH	7.363	7.344	7.334
	pCO2	51.8	51.6	54.9
	HCO3	28.6	27.1	28.0

There were no significant differences between buffer treatments on acid/base balance. At the highest levels of each buffer, both groups showed signs of metabolic alkalosis. At the levels commonly used in dairy or feedlot rations, no disturbance of acid/base balance was observed.

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Rumen disappearance was evaluated using alfalfa hay and nylon bags. The sample containing nylon bags were suspended in the rumen for 24 hours. The residue was rinsed, dried and weighed. The results are shown below:

PERCENT RUMEN DISAPPEARANCE

	Low	Medium	High
S-Carb	39.2 %	38.5 %	29.7 %
Sodium Bicarbonate	38.9 %	36.9 %	33.1 %

Increasing levels of both buffers showed depression in rumen disappearance. This agrees with past research that indicated a depression in fiber digestibility with high levels of buffers.

To summarize, in this study both S-Carb (sodium sesquicarbonate) and sodium bicarbonate fed at abnormally high levels can induce alkalosis and depress rumen disappearance. There was no difference between buffers observed in any parameter. The results of this experiment would tend to support the conclusion that both S-Carb and sodium bicarbonate exhibit similar modes of action.

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