



Colorado State University  
Department of Animal Sciences  
Fort Collins Colorado 80523

COMPARISON OF BUFFERS FOR LACTATING DAIRY COWS

Dawson C. Jordan  
Professor and Extension Dairy Specialist  
Colorado State University  
Fort Collins, Colorado

INTRODUCTION

Research has demonstrated that buffers in high producing early lactation cows can enhance feed intake, improve milk production and improve butterfat test. This is true in nearly all types of rations, but especially true in diets high in silages and high moisture ingredients that create higher concentrations of weak acids. Diets that are fermented rapidly in the rumen may depress dry matter intake, milk yield and butterfat content. Such diets also contribute to increased risks of ketosis, acidosis, fatty livers and abomasal displacement. In larger herds under group management regimes, cows often go from an all roughage dry cow ration to a low roughage, high concentrate diet within the first week of lactation. Formulation of rations using buffers can improve yields, improve health and return profits above costs to the dairymen.

BUFFER COMPARISON

In order to compare the merits of a new buffer, sodium sesquicarbonate, to the generally used sodium bicarbonate buffer we established a control ration to meet all the cows' requirements for 1400 pounds of body weight, 90 pounds of milk daily at 3.5% butterfat test and allowed for 10% energy increase for activity. This ration was high in corn silage (41.5% dry matter) as the only roughage source, and high in concentrates (58.5% dry matter). The concentrates were composed of high moisture ear corn, whole cottonseed and brewer's dried grain. The composition of the ration was as follows:

<u>Ingredient</u>	<u>lbs/day/as fed</u>
Corn silage (32% DM)	67.75
High moisture ear corn (70% DM)	8.06
Whole cottonseed	12.00
Brewer's dried grain	10.01
Soybean oil meal (44 Sol)	4.00
Ground limestone	.48
Trace mineral salt	<u>.17</u>
	102.47

Twenty-four second or greater lactation cows and six first lactation cows were blocked by previous 305-day, 4% fat corrected mature equivalent milk production. They were assigned to one of three treatment groups~ontrol with no added buffer; .75% sodium sesquicarbonate (SSC), or .75% sodium bicarbonate (SB) added on a dry matter basis.

The rations were fed as a total mixed ration three times a day free choice, not allowing a cow to clean her feed trough between feedings. The rejected feed was weighed back at the end of each day and recorded. The ration was fed each cow for an 84-day period beginning on day 4 after freshening.

The cows were milked three times per day through a 6x6x4 trigon milking parlor with Bou-Matic electronic milking equipment. Milk weights were recorded at each milking. Milk samples were taken once during each 28-day period for butterfat determination.

## RESULTS

Table 2. Summary of 84-day Buffer Comparison Trial

Treatment	No. Animals	Dry matter daily intake	Milk Prod. Daily	Fat Prod. Daily	% Fat	4%
Control	9	39.70	73.62	2.740	3.722	70.56
SSC	10	42.76	75.17	2.965	3.944	74.57
SB	10	42.29	76.86	2.935	3.806	74.59

The results of the comparison are shown in Table 2. A statistical analysis of the data shows that there were no highly significant differences between treatments. The data, however, does show that cows on both buffers ate more pounds of dry matter, produced more pounds of milk and fat daily which resulted in a higher level of 4% fat corrected milk daily.

The group receiving the sodium bicarbonate produced more pounds of milk, but the group receiving sodium sesquicarbonate had a higher average percent butterfat test, resulting in both buffer groups having equal levels of 4% fat corrected milk produced per day.

## CONCLUSION

The conclusion reached following this trial is that both sodium bicarbonate and sodium sesquicarbonate can be used as an effective buffer on an equal basis.

The trial shows that the dairyman can use both buffers with equal results. He should, however, consider them on the basis of cost to his dairy ration and purchase the one that allows him to formulate the best least cost ration for his needs.