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Effect of Supplementation of Buffer salt on Milk Production in Dairy cows

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Abstract

Alteration in feeding methods by addition of buffer salt (Sodium bicarbonate) alters the rumen pH and improves rumen microbial population which in turn enhances the milk yield and milk quality. Hence Krishi Vigyan Kendra, Kancheepuram, District, Tamil Nadu, conducted a nutritional management practice of proven methods to enhance the production and productivity in dairy cattle during the year 2007.Two technologies on feed additives (T1) which included Sodium bicarbonate @ 2%, of concentrate mixture and (T2) as Farmers practice were demonstrated it was evident that supplement of bicarbonate had superior effect on burning the excess acid in rumen and prevented the accumulation of lactate and allowed better fiber digestion by strengthening reducing condition of ruminal environment.

Keywords: Dairy Cows, Milk Yield, Buffer Salt.

Livestock is an integral part of the livelihood of India's rural population. Rural farming mainly depends on dairy cattle, small ruminants and poultry. Better nutritional management plays pivotal role in maintaining the production and productivity of animals. In Tamil Nadu, normally cattle are fed with green, dry fodder and concentrate feed. Animals in peri urban area are mainly fed with cereal based concentrate feed and gruel. Feeding of animals with more of cereal based feed results in reduction in ruminal pH and alteration in rumen micro flora. Sub-acute ruminal acidosis, reduction in quality and quantity of milk were the major factors affecting milk production. Reduction in fat and SNF content of milk leads to low milk price and less economic returns. Hence to prevent this study was carried out.

Materials and Methods

To minimize the occurrence of ruminal acidosis, dairy nutritionists usually choose to supplement dietary buffers, especially where feeding conditions include large amounts of easily fermentable carbohydrates. Sodium bicarbonate is commonly used as an exogenous buffer in stabilization of ruminal pH in cows that potentially suffer from ruminal acidosis. In this study, two technologies (T1) which included Sodium bicarbonate @ 2% of concentrate mixture (40 g to 60 g of sodium bicarbonate/d according to level of concentrate feeding) and (T2) Farmers Practice were demonstrated. In farmers' practice no feed additives were fed to the animals apart from regular feeding**.** The study was conducted during the year 2007. Feeding of cattle with regular diet including green, dry fodder and concentrate feed was followed in all groups.

Results and Discussion

Supplementation with Sodiumbicarbonate (@2% concentrate feed) had better effects and it had substantially increased yield of 0.93 and 1.20 lit of milk more than farmers practice respectively. This study suggested therefore that feeding of bicarbonate had superior effect on burning the excess acid in rumen and prevented the accumulation of lactate and allowed better fiber digestion by strengthening reducing condition of ruminal environment. The observations were in accordance with the reports of Marden *et al* (2008). Sharma (2015)observed that poor knowledge about the nutritive raw feed ingredients (28%), shortage of skilled and committed

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Table I. Lactational Performance of the dairy cows supplemented with Buffer salts

S.No	Milk Yield (Lit)		Fat %		SNF %	
	T1	T2	T1	T2	T1	T2
1.	4.1	4.6	3.7	4.1	7.4	8.1
	4	4.2	3.3	4.2	7.2	7.9
	3.9	4.4	3.6	3.9	7.5	8.2
	3.9	4.3	3.5	3.7	7.3	7.7
	3.975 ± 0.05	4.375 ± 0.09	3.525 ±0.08	3.975 ± 0.11	7.35 ± 0.06	7.975 ± 0.11
2.	3.7	4.6	3.1	4.3	7.2	7.9
	3.8	4.2	3.2	3.9	7.4	8.2
	3.6	4.4	3.6	3.8	7.5	7.8
	3.4	4.1	3.4	4.1	7.3	8.1
	3.625 ± 0.09	4.325 ± 0.11	3.325 ± 0.11	4.025 ±0.11	7.35 ± 0.06	8 ±0.09
3.	3.5	4.2	3.5	4.2	7.4	8.2
	3.8	4.5	3.6	4.4	7.2	8.3
	3.4	4.3	3.4	4.3	7.5	7.8
	3.2	4.6	3.2	3.9	7.3	7.9
	3.475 ± 0.13	4.4 ± 0.09	3.425 ± 0.09	4.2 ± 0.10	7.35 ± 0.06	8.05 ± 0.12
4.	3.3	4.3	3.3	4.3	7.3	8.3
	3.6	4.2	3.6	3.8	7.5	7.8
	3.8	4.5	3.4	4.1	7.4	8.1
	3.9	4.6	3.5	3.9	7.2	7.9
	3.65 ± 0.13	4.4 ± 0.09	3.45 ± 0.06	4.025 ± 0.11	7.35 ± 0.06	8.025 ±0.12
5.	4.1	4.5	3.3	3.9	7.3	7.9
	3.4	4.4	3.4	4.1	7.4	8.1
	3.7	4.3	3.7	4.3	7.5	8.3
	3.6	4.6	3.5	3.8	7.2	7.8
	3.7 ±0.15	4.45 ± 0.06	3.475 ± 0.09	4.025 ±0.11	7.35 ± 0.06	8.025 ±0.12
6.	4.1	4.6	3.2	3.7	7.3	8.3
	4	4.5	3.1	3.8	7.5	7.8
	3.9	4.4	3.3	4.4	7.4	8.1
	4	4.8	3.4	3.9	7.2	7.9
	4 ± 0.04	4.57 ± 0.08	3.25 ±0.06	3.95 ± 0.16	7.35 ± 0.06	8.02 ± 0.12
7.	3.7	4.6	3.3	3.9	7.3	7.9
	3.8	4.3	3.2	4.1	7.5	8.1
	3.6	4.2	3.6	4.2	7.6	8.2
	3.4	4.8	3.4	3.8	7.4	7.8
	3.625 ± 0.09	4.475 ± 0.14	3.375 ± 0.09	4 ± 0.09	7.45 ± 0.06	8 ±0.09
8.	3.5	4.5	3.5	4.1	7.5	8.1
	3.8	4.8	3.2	3.8	7.2	7.9
	3.4	4.4	3.4	4.3	7.4	8.3
	3.2	4.2	3.2	3.7	7.3	7.7
	3.475 ± 0.13	4.475 ± 0.13	3.325 ± 0.08	3.975 ± 0.14	7.35 ± 0.06	8 ±0.13
9.	3.3	4.3	3.3	4.3	7.4	8.3
	3.6	4.6	3.5	3.7	7.5	8.1
	3.8	4.8	3.4	3.8	7.3	7.8
	3.9	4.9	3.2	4.2	7.2	8.2
	3.65 ± 0.13	4.65 ± 0.13	3.35 ± 0.06	4 ±0.15	7.35 ± 0.06	8.1 ±0.10
10.	3.3	4.3	3.3	4.3	7.4	8.3
	3.6	4.6	3.5	3.7	7.5	8.1
	3.8	4.8	3.4	3.8	7.3	7.8
	3.9	4.9	3.2	4.2	7.2	8.2
	3.65 ± 0.13	4.65 ± 0.13	3.35 ± 0.06	4 ±0.15	7.35 ± 0.06	8.1 ±0.10

labour (32.5%) were found to be major bottlenecks regarding adoption of cattle feed formulation technology at the dairy farm. Sharma *et al* (2020) opined that for making the dairy farming a profitable market, farmers must follow the recommendations of the research institutes and take maximum care so that productivity as well as profitability can be sustained. Deka *et al*(2020) revealed that the training need index (TNI) of the livestock and poultry farmers was highest for preparation of feed with locally available feed material followed by fodder cultivation and toxicity of some toxic plants

Conclusion

The study revealed that the supplementation of Sodium bicarbonate improved rumen microbial population and milk yield and there was need to reorient the training programs and to increase the number of training programs for reducing the knowledge gap and also the adoption gap among the livestock farmers and Research or Training centres. Provision of organized training programs and method demonstrations by the Krishi Vigyan Kendra, Farmer's Training Centres, Veterinary University Training and Research Centres and other Research institutes would be a key factor in creating awareness, popularization and visualization of the expected outcome of the methods or techniques by the farmers in the field. This study had clearly indicated that identification and fine tuning of the minor mismanagement practices will eventually give major improvement in animal health and productivity which in turn results in economic growth of the farming community.

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