Efficiency Level Rises with Yeast

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It is necessary to continually search for new ways to increase the efficiency of converting grass to beef. Much is yet to be learned regarding nutritional requirements of cattle grazing native range.

According to personnel at Diamond V. Mills Inc., Cedar Rapids, Iowa, studies conducted in the feedlot have shown that steers receiving cultured yeast gained 10.7% more and required 12.0% less feed per pound of gain than their counterparts not receiving the material. Similarly, lambs fed in drylot gained 5.3% faster with 5.6% less feed required per pound of gain when fed the yeast culture.

The presence of yeast culture in the rumen increases the efficiency with which lactic acid and hence starch is utilized by the ruminant animal. When there is an abundance of nonprotein nitrogen in the feed of the ruminant, there is usually an elevated level of ammonia in the rumen. Under these conditions amylolytic microorganisms predominate over celluolytic microbes and cellulose digestion is depressed. In the presence of yeast cells, much of the ammonia present in the rumen is converted into yeast protein and the ammonia concentration is thus lowered. Under these conditions cellulolytic microorganisms predominate over amylolytic microbes and cellulose digestion is increased.

The objective of this experiment was to evaluate the use of cultured yeast in a free choice vitamin-mineral supplement for grazing cows, calves, and yearlings.

The Experiment

The experiment involved a comparison of the average daily gain of grazing cattle receiving a free choice vitamin-mineral supplement with and without cultured yeast. The experiment was conducted under practical conditions on the Shepherd Cattle Company ranch, 5 miles southeast of Hyannis, Nebr. The pastures were typical native Sandhills range in good condition. Simmental-cross cattle were used in the experiment.

There were 30 yearling heifers, 86 cows, and 71 suckling calves receiving the control supplements. There were 54 yearling heifers, 115 cows and 112 suckling calves receiving the supplement containing the yeast culture. The cows and yearlings were allotted to treatment based upon desired bull for breeding. The stocking rate of each pasture was similar and that which was desirable for good forage utilization and maintaining good range condition. The experimental period was from July 3, 1977, to October 8, 1977.

The composition of the supplements is shown in Table 1. The levels of the ingredients were periodically adjusted so that the consumption of both supplements would remain nearly the same.

The Results

The calves receiving the free choice supplement containing cultured yeast weighed 513 lb on October 8, 1977, whereas those on the control supplement weighed 450 lb. The average daily gains were 2.50 and 2.24 lb, respectively (Table 2). There was no appreciable difference in the gain of the yearling heifers on the two supplements. The yearlings did not gain as well as the calves, which is a normal relationship when they are treated similarly. Cow weights were not recorded.

Table 1. Composition of free choice vitamin-mineral supplements.

Ingredient (%)	Cultured yeast	Control
Dicalcium phosphate,	34.1	36.2
Sodium chloride,	27.6	25.8
Cultured yeast, [a]	21.6	–
Corn meal,	–	21.7
Microlite, [b]	9.6	10.0
Monosodium phosphate,	2.6	2.6
Sodium bicarbonate,	2.5	1.7
Vitamin-trace mineral premix, [c]	1.8	1.8
Flavoring agent, [d]	0.2	0.2

[a] Cultured yeast provided by Diamond V Mills, Inc., Cedar Rapids, Iowa 52407.
[b] Microlite is the trade name for Smectite-vermiculite.
[c] The vitamin trace mineral contained 5,000,000 USP units. Vitamin A, 5,000,000 IU/lb Vitamin D_3, 70 mg niacin and 7000 mg choline per lb; 1.00% iron, 1.04% manganese, 2.50% iodine, 0.24% cobalt, 0.25% copper and 0.20% zinc. The trace minerals were in the sequestered form.
[d] The flavoring agent was "Beef Nectar" and provided by Agrimerica, Inc., 1829 Stanley St., Northbrook, IL 60062.

Table 2. Average daily gain of suckling calves and yearling heifers receiving free choice vitamin-mineral supplements.

Type of stock	Cultured yeast	Control
Suckling calves (lb/day)	2.50	2.24
Yearling heifers (lb/day)	1.37	1.45

Supplement consumption was 0.77 and 0.85 lb per head per day, respectively, for those receiving the cultured yeast and those receiving the control. With this level of consumption the cattle were receiving an average of 0.17 lb of cultured yeast per head per day.

The economics of feeding cultured yeast can be estimated with the following price assumptions in conjunction with the performance obtained in this trial: (1) cost of cultured yeast of $0.18/lb, (2) average price of steer and heifer calves of $0.45/lb, and (3) a feeding period from calving to weaning of 200 days.

Added calf sale = 0.26 lb/day × 200 days × $0.45/lb	= $23.40
Added yeast cost = 0.7 lb × 200 days × $.18/lb	= 6.12
Profit/head	= $17.28

The economic advantage was in favor of the use of cultured yeast under the conditions reported here. It would, therefore, appear that commercial vitamin-mineral supplements for the cattle grazing summer ranges may be improved by the addition of cultured yeast. ●

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