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**Bahamas
Agricultural
Research
Training
And
Development
Project**

PROTEIN SUPPLEMENTATION OF GRAZING STEERS

**A.E. & R.S. BAHAMAS
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BAHAMAS AGRICULTURAL
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Protein Supplementation of Grazing Steers

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INTRODUCTION

Although the BARTAD Project livestock activity has emphasized the use of forages primarily for grazing, there is also need at times and with certain types of animals to evaluate animal performance when additional supplementation is provided. Ordinarily, concentrate supplementation is provided primarily to increase the energy intake of livestock, resulting in a "flushing" for ewes or in an increased rate of gain and finishing in cattle or lambs intended for slaughter. A relatively low rate of performance has been noted in other trials with guineagrass (*Panicum maximum*) and sheep on BARTAD, although dry matter production and persistence of guineagrass are quite desirable. Protein supplementation of cattle grazing pure grass pastures has increased animal performance, reduced dry season weight loss and improved performance of cattle in tropical systems (Van Niekerk, 1975). This trial was conducted to determine the effects of providing relatively small amounts of a commercially available "roughage feed balancer" on rate of gain of steers in a grazing regime.

PROCEDURES

Ten long yearling (14-18 months of age) steers of Santa Gertrudis and Angus X Santa Gertrudis breeding were divided into two equal groups and allotted to guineagrass pastures. Group assignments were based on steer weight, skeletal size and condition at the start of the trial. One group of steers received a commercially available, 32 percent crude protein supplement¹ on pasture. The supplement was fed as recommended by the manufacturer.

¹ Agri-Feed. Agri-stock, Inc., 3200 W. Market St., Akron, OH, 44313
Guaranteed Analysis is not less than 32% crude protein, not less than 2% crude fat and not more than 19% crude fiber.

The steers received 1.5 pounds of supplement per head daily until they reached an average group weight of 700 pounds. At that point the amount of daily supplementation was increased to 2 pounds per head. Therefore, the supplemented group received 1.5 pounds per head daily for the first 28 days of the trial and 2.0 pounds for the second and third 28-day trial periods. Control group steers received no supplement, although both groups were provided with free-choice trace mineral salt and monosodium phosphate.

The pastures were established in July, 1975. Guineagrass was seeded with a Brillion seeder at the rate of 4 pounds per acre and broadcast at one pound per acre. Seedings were topdressed with 500 pounds of 8-18-8 fertilizer per acre. Subsequent fertilizations included 50 pounds $P_{2}O_{5}$ per acre from 0-46-0 fertilizer and 35 pounds $K_{2}O$ per acre from 0-0-22 fertilizer in January, April, July and October, 1976. The pastures also received 50 pounds of nitrogen per acre from 21.5-0-0 fertilizer in April and October, 1976. Each steer group was rotated between two, 5-acre pasture blocks on a 28-day basis. All steers were individually weighed at 28-day intervals, for an 84-day test period during August, September and October of 1976.

RESULTS

The animals which received the Agri-Feed readily accepted the feed from the first day of supplementation. Therefore, it can be stated that Agri-Feed is of satisfactory acceptability when fed in limited quantities to grazing steers. Since each steer group always had ample guineagrass for grazing purposes, forage intake was not a limiting factor. All steers remained in good health throughout the study and each individual animal gained weight in each of the periods.

In the first 28 days, the supplemented steers gained twice as fast as those not receiving the Agri-Feed. However, during the second and third periods, the difference in gains was not as large, although the supplemented group gained 0.09 pounds more per head daily than the controls in the second 28-day period. At the end of the trial, the supplemented steers had gained an average of 22 pounds more than those not supplemented. This difference was an average advantage of 0.32 pounds more gain per head daily from supplementing with Agri-Feed. A summary of the average weight changes is presented in table 1.

The steers receiving the Agri-Feed appeared to be superior in condition to that of the control animals but this difference was not considered in evaluation of the advantages of the supplement. Local markets at this time do not normally consider the actual slaughter condition or grade of animals when purchased.

Table 1. Average Weights and Gains of Non-Supplemented Versus Supplemented Steers¹

Item	Non-Supplemented	Supplemented
No. Steers	5	5
Initial wt., lbs.	654	659
Avg. daily gain, lbs./day		
1st 28 days	0.71	1.56*
2nd 28 days	1.40	1.51
3rd 28 days	1.18	1.18
84-day trial	1.10	1.42
Weights, lbs.		
28-day	676.3	700.0*
56-day	715.4	742.4
84-day	748.5	775.5

¹ Steers grazing guineagrass pastures; supplementation with Agri-Feed, available from Agri-Stock, Inc., Akron, Ohio.

* Differences between these two sets of averages were significant at the 5% level.

The Agri-Feed evidently did not affect the rate of mineral consumption, since each group consumed the same total amounts of the trace mineralized salt and phosphorus supplements even though there was a slight variation in the elements preferred. In the first 15 days, each group consumed a total of 10 pounds of a complete mineral mix. Then, the type of minerals supplied were slightly altered for all of the BARTAD livestock groups. In the remaining 69 days of this trial, the Agri-Feed supplemented steers ate 19 pounds of a trace mineralized salt and 9 pounds of monosodium phosphate compared to 18

pounds and 10 pounds, respectively, by the non-supplemented group. These values indicate that the steers consumed almost twice as much of the trace mineralized salt as the phosphorus supplement, and that they consumed an overall total of approximately 0.08 pounds of minerals per head daily (salt and phosphorus combined).

The cattle used for this experiment had been consuming a high-silage ration prior to trial initiation. The difference in gains was greatest in the first one-third of the trial, and gain was higher for the supplemented group of steers. The providing of the supplement may have allowed a more satisfactory transition from the silage ration to the grazing regime than did the changing from silage to grazing alone.

Guineagrass in similar stages of maturity from research plots and harvested in the same season averaged 7.7 percent crude protein. The crude protein content recommendations (National Research Council) for this type and weight of steer is approximately 10.8%. Therefore, the additional protein provided by the supplement was probably the primary reason for increased gains. The contribution of feed energy of the supplement was probably not of consequence, since the supplement is approximately 67% total digestible nutrients and theoretically would account for a very small amount of additional gain at the levels of supplement which were fed.

Among the ingredients of the supplement were soybean meal, molasses, linseed meal, alfalfa meal, corn distillers dried grains, dicalcium phosphate, steamed bone meal, and vitamins A, B-12 and D. Several trace minerals were also contained in the supplement, and the consumption of the salt-trace minerals or vitamins from the Agri-feed may have increased the weight gains. According to the manufacturer, there is no non-protein-nitrogen source contained in the supplement. The manufacturer also recommends that silages containing non-protein-nitrogen sources or legume hay not be fed with the supplement, and that the supplement works best with all-grass hays, silages and pastures. Therefore, this supports the observation that the primary contribution of the supplement is through additional protein provided.

CONCLUSION

Grazing steers consuming an average of 154 pounds of Agri-Feed during an 84-day period gained an average of 22 pounds more than similar steers not receiving the supplement. If market steers were selling locally for \$0.55 per pound live weight (a reasonable value on Andros Island), this additional gain would be worth \$12.10 to the producer. Therefore, if overhead costs such as shipping, labor, equipment, etc. were not considered, the Agri-Feed would be worth not more than 7.86 cents per pound from the values recorded in this study. These results also indicate that limited supplementation at least during the first 28 days of a grazing period would increase weight gains. Supplementation with high-quality alfalfa hay may similarly increase gains and adaptability to pasture. However, supplementation during the first 28 days with a total of 42 pounds of Agri-Feed resulted in an increase of 24 pounds additional gain.

Literature Cited

Van Niekerk, B.D.H. 1975. Supplementation of grazing cattle. In Proc. on Potential to Increase Beef Production in Tropical America. Columbia, February 18-21, 1974. pp. 83-97