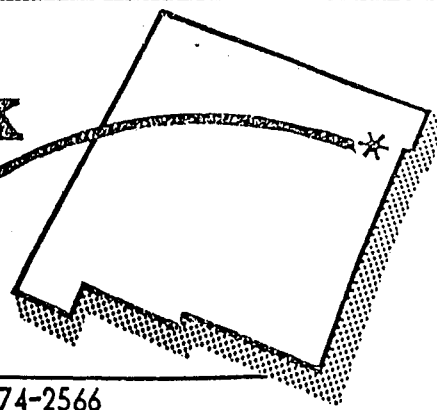




# Clayton Livestock Research Center

## PROGRESS REPORT



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### INFLUENCE OF CLINOPTILOLITE ON THE PERFORMANCE OF FINISHING STEERS

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Clinoptilolite is a naturally occurring zeolite found in fairly large quantities in New Mexico, West Texas and Arizona. Zeolites are crystalline, hydrated aluminosilicates with an infinite, three dimensional structure which have been used in a variety of agricultural applications (Mumpton and Fishman, 1977). These applications include odor control in chicken droppings, supplements to the diets of growing swine and as an anti-diarrheal agent for young calves. The ability of clinoptilolite to function as an ion-exchanger, especially with ammonia, might indicate a potential value of this mineral for ruminants. This study was conducted to determine the influence of clinoptilolite at 1.25 and 2.5% of the ration dry matter on the performance of beef steers fed a high concentrate diet.

Composition of the control diet is shown in Table 1. In the two experimental diets, clinoptilolite (minus 50 mesh) replaced either 1.25 or 2.5% of the dry matter of the control diet. The clinoptilolite used in the study was mined near Buckhorn, N.M. and was supplied by Leonard Resources, Albuquerque, N.M.

Forty-eight steers of mixed breeding were utilized in a randomized block design. Steers were divided into two groups (blocks) based on initial weight and randomly assigned within group to the control, 1.25 or 2.5%

clinoptilolite diets. This gave a total of 16 head per treatment, divided into one pen of 8 for each weight group. Steers were weighed periodically throughout the trial and all weights were adjusted by a 4% pencil shrink. Fresh feed was offered daily in quantities sufficient to allow free choice consumption. One steer on the 2.5% clinoptilolite diet foundered midway through the trial and was removed from the experiment. Otherwise, no health problems were encountered.

Performance results for the trial are shown in Table 2. Clinoptilolite tended to improve both gain and efficiency during the first two weigh periods but had no effect during the last two periods. Overall performance was slightly improved in both clinoptilolite groups; however, none of these differences was statistically significant.

In summary, clinoptilolite did not significantly improve the performance of finishing steers when fed to replace 1.25 or 2.5% of the control diet. The tendency for a slight improvement in performance during the initial portion of the feeding period suggests the most benefit, if any, from this material would occur with lighter weight, growing animals.

Table 1. Composition of Control Diet

Ingredient	% in Diet Dry Matter Basis
Sorghum grain	70.60
Rice bran	5.15
Fat	2.05
Molasses	4.90
Cottonseed hulls	4.90
Alfalfa hay, ground	10.10
Limestone	0.90
Trace mineral salt	0.55
Premix*	0.85

\* Cottonseed meal based premix. One pound supplies approximately 111,600 IU vit A, 0.54 g tylosin and 1.6 g Rumensin.

#### Reference

Mumpton, F. A. and P. H. Fishman 1977. The application of natural zeolites in animal science and aquaculture. J. Anim. Sci. 45:1188.

Table 2. Average daily gain, average daily dry feed intake and feed efficiency of steers fed clinoptilolite. (Least Squares Means)

Item	Control	1.25% Clinoptilolite	2.5% Clinoptilolite
Initial wt., lb	735	734	737
Final wt., lb	1038	1051	1058
<u>1st period (37days)</u>			
ADG, lb	3.17	3.58	3.29
Average feed intake, lb	19.29	19.75	19.76
Feed/Gain	6.09	5.53	6.04
No. of animals	16	16	16
<u>2nd period (29 days)</u>			
ADG, lb	2.13	2.24	2.56
Average feed intake, lb	18.89	18.92	19.22
Feed/Gain	8.88	8.48	7.64
No. of animals	16	16	16
<u>3rd period (27 days)</u>			
ADG, lb	1.96	2.12	1.84
Average feed intake, lb	17.32	17.80	16.83
Feed/Gain	8.83	8.87	9.16
No. of animals	16	16	16
<u>4th period (55 days)</u>			
ADG, lb	1.29	1.14	1.29
Average feed intake, lb	15.08	14.27	15.67
Feed/Gain	11.68	12.83	13.32
No. of animals	16	16	15
<u>Overall (148 days)</u>			
ADG, lb	2.05	2.14	2.17
Average feed intake, lb	17.28	17.22	17.99
Feed/Gain	8.43	8.01	8.29
No. of animals	16	16	15