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Urea vs. Soybean Meal in Wintering and  
Finishing Rations for Beef Steers (Project 370)

D. Richardson, E.F. Smith and B.E. Brent

A previous test using sorghum silage (Kans. Agri. Expt. Sta. Bull. 507:5, 1967) indicated that 3 pounds of grain per day in silage would supply enough available energy for reasonably good utilization of nonprotein nitrogen (urea). However, additional grain apparently increased the utilization of urea. This is the second test to obtain information on the minimum amount of readily available energy as grain necessary for efficient utilization of nonprotein nitrogen as a substitute for natural protein. During the wintering phase, the roughage was corn silage with an average of 38.5% dry matter. Grain made up 27% of the dry matter. Prairie hay replaced the silage in the finishing phase. Supplemental treatments are shown in the tables giving the results.

Results and Observations

Table 15 gives the results of the wintering phase. Urea supplement alone (lot 13) produced significantly lower gains than any other lot. Adding alfalfa hay, soybean meal or grain significantly increased gains. Results of the finishing phase are given in table 16. There were no significant differences in rate of gain or carcass data.

Table 15

Average Daily Gain and Feed Efficiency of Steers Fed  
Corn Silage with Different Protein Supplements, Dec. 16, 1966 - April 7, 1967, 112 days

Lot. no.	Pounds	Initial wt.	Final wt.	Av. da. gain <sup>3</sup>	Av. da. silage cons'd	Av. da.	Prot. equiv. intake	Av. feed efficiency (90% D.M.)
						feed cons'd (90% D.M.)		
						Pounds		
38 13	1.25 urea suppl. <sup>1</sup>	436.5	574.0	1.23 <sup>a</sup>	25.05	12.2	1.53	9.91
14	1.25 urea suppl. 2.00 alf. hay	437.5	631.0	1.73 <sup>b</sup>	25.44	14.3	1.87	8.26
15	1.25 SBM <sup>2</sup> 2.00 alf. hay	438.5	653.0	1.92 <sup>b</sup>	25.53	14.4	1.88	7.51
16	1.25 urea suppl. 3.00 milo	436.5	654.0	1.94 <sup>b</sup>	25.07	15.3	1.86	7.89
17	1.25 urea suppl. 3.00 milo 2.00 alf. hay	437.5	637.5	1.78 <sup>b</sup>	18.40	14.2	1.90	7.98

1 83% sorghum grain, 14% urea and 3% dicalcium phosphate

2 97% soybean meal and 3% dicalcium phosphate

3 Any two means not bearing a common superscript letter differ significantly ( $P < 0.05$ )

Table 16  
Results of Finishing Phase  
Apr. 8 - Aug. 25, 1967, 172 days

Lot	13	14	15	16	17
Av. final wt. lb.	984	1026.5	1060.0	1066.5	1071.5
Av. daily gain, lb.	2.38	2.30	2.43	2.40	2.52
Av. daily ration, lb.					
Prairie hay	1.67	1.53	1.51	1.69	1.70
alfalfa hay	-	1.80	1.80	-	1.80
sorghum grain	14.8	14.4	13.8	14.9	13.7
urea suppl. <sup>1</sup>	1.0	1.0	-	1.0	1.0
soybean meal <sup>2</sup>	-	-	1.0	-	-
Feed percent gain lb.					
Prairie hay	70	65	62	71	68
alfalfa hay	-	77	74	-	71
sorghum grain	623	606	583	623	545
urea supplement	41	41	-	41	39
soybean meal	-	-	41	-	-
Shrink to market %	3.76	1.95	4.35	4.97	4.06
Av. hot carcass wt. lb.	580	627	578	631	643
Av. dressing % feedlot wt.	58.7	61.1	60.5	59.2	60.0
Av. dressing % market wt.	61.2	62.3	63.3	62.3	62.5
Av. fat thick, 12th rib, in.	0.51	0.54	0.60	0.71	0.61
Av. size ribeye, sq. in.	11.82	12.16	12.61	11.28	13.05
Carcass grades:					
Choice	6	9	9	10	6
Good	4	1	0	0	4
ADG, Wintering & Finishing 284 days	1.93	2.11	2.23	2.22	2.23

<sup>1</sup> 80% sorghum grain, 13% urea, 4% calcium carbonate, 3% dicalcium phosphate

<sup>2</sup> 94% soybean meal, 3% dicalcium phosphate, 3% calcium carbonate.

NOTE: Each animal received daily 30,000 I.U. vit. A, 75 mg. Aureomycin and 10 mg. diethylstilbestrol