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 CLAYTON LIVESTOCK RESEARCH CENTER

PROGRESS REPORT

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Effects of supplementing sorghum sudangrass hay with whole shelled corn and soybean meal on performance of growing heifers.

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Previous research at the Clayton Livestock Research Center indicated that feeding whole shelled corn (WSC) with a protein supplement and native grass or alfalfa hay reduced cost of grain processing; however, optimal gains of newly received cattle were variable as a result of inadequate amounts of protein.¹ For beef cattle production in northeast New Mexico, basal forages are often low in digestible energy; hence, grain and (or) protein supplementation is needed to obtain economical rates of gain. Supplementing WSC to forage should be economical for producers who do not have milling facilities. The present study was conducted to determine effects of supplementing a roughage diet with WSC and soybean meal (SBM) on performance of growing heifers.

One hundred twenty crossbred heifers [avg body weight (BW) = 489 lb] were assigned randomly to one of four treatments (three pens of 10 heifers/pen for each treatment) in a 2 x 2 factorial arrangement. Factors were WSC at .5 and 1% of BW, with or without .1% of BW SBM. All heifers were allowed ad libitum intake of sorghum sudangrass hay (fed as large round bales in feeders in each pen), with free access to fresh water and a commercial trace mineral block.² Dry matter (DM) and crude protein (CP) were determined on feed samples ground in a Wiley mill (2-mm screen; Table 1). The trial consisted of two 28-d periods, and heifer weights were recorded on two consecutive days at the beginning and end of the trial, and on day 28.

Table 1. Chemical composition of growing heifer diets.

Item	Treatment		
	Whole shelled corn	Whole shelled corn + soybean meal	Sudangrass
Dry matter			
First 28 d	93.3	93.7	93.5
Second 28 d	96.1	96.3	94.8
Crude protein			
First 28 d	10.3	16.6	11.3
Second 28 d	10.2	16.1	11.8

Performance data are presented in Table 2. No interactions ($P > .15$) were detected between level of WSC or SBM for any of the variables measured. During the first 28-d period, trends for improved daily gain (ADG) were observed for heifers receiving 1 vs .5% of BW WSC ($P < .13$), and for those fed .1% of BW SBM vs no SBM ($P < .15$). The fact that WSC level and SBM level did not interact suggests that additional protein tended to be beneficial regardless of supplemental WSC level.

Daily gain decreased among all treatment groups during the second 28 d, but did not differ in response to WSC or SBM levels; however, ADG for the 56-d trial was greater ($P < .09$) among heifers receiving 1% of BW WSC compared with heifers receiving .5% of BW WSC. Heifers receiving .1% of BW SBM tended to ($P < .20$) gain faster than those fed no SBM during the 56-d trial.

Because hay was fed in large round bales, total and hay DM intake, and feed efficiency were calculated only for the overall 56-d trial. Intake of sorghum sudangrass hay was greater ($P < .07$) for heifers receiving .5% of BW WSC compared with those fed 1% of BW WSC. Total DM intake did not differ with WSC level, so essentially, the heifers substituted corn intake for hay intake. No differences were observed in 56-d total or hay DM intake between heifers receiving 0% or .1% of BW SBM. Likewise, no differences were observed for feed efficiency throughout the 56-d period as a result of or WSC or SBM level.

Results from this study indicate that sorghum sudangrass hay and WSC are effective and potentially economical feeds for growing heifers. Supplemental SBM at .1% of BW appeared to be marginally beneficial, but greater levels of SBM might be needed to elicit positive production responses. Further research with alternative protein levels and sources used in this type of growing program appears to be warranted.

¹Lofgreen et al., 1989. Clayton Livestock Research Center, Progress Report No. 57.

²Perfect-36 Mineral Block. Composition - Ca = 12%; P = 12%; salt = 12%; I = .007%; Cu = .04% and vitamin A = 200,000 IU/lb. Texline Feed Mill, Texline, TX.

Table 2. Performance of growing heifers fed sorghum sudangrass hay and two levels of whole shelled corn with or without soybean meal during two 28-d periods

Item	Main effects ^a					
	Corn level			Soybean meal level		
	.5% BW	1% BW	OSL ^b	0% BW	.1% BW	OSL ^b
Initial BW, lb	491.0	486.1		487.7	489.4	
Final BW, lb	616.8	624.8		615.5	626.1	
Total DM intake, lb/d						
Total 56 d	19.1	19.5	.65	18.9	19.7	.36
Hay DM intake, lb/d						
Total 56 d	16.6	14.7	.07	15.5	15.9	.61
ADG, lb						
First 28 d	2.94	3.20	.13	2.95	3.19	.15
Second 28 d	1.55	1.75	.18	1.62	1.69	.61
Total 56 d	2.25	2.47	.09	2.28	2.44	.20
Feed/Gain						
Total 56 d	8.56	7.92	.24	8.33	8.15	.73

^aEffects of corn level averaged over soybean meal level and effects of soybean meal level averaged over corn level. Each main effect represents the average of six pens with 10 heifers/pen.

^bOSL = observed significance level of main effect means.

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