Milo Stover and Sources of Supplemental Nitrogen for Growing Heifers

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Summary

Seventy-two heifer calves were used in a 98-day trial to evaluate four rations: (1) forage sorghum silage plus soybean meal, (2) milo stover pellets plus soybean meal, (3) milo stover silage plus soybean meal and (4) milo stover silage plus soybean meal-corn gluten meal-urea. Daily gain was highest ($P<.05$) and feed required per lb. of gain lowest ($P<.05$) for heifers fed the forage sorghum silage ration. Heifers fed milo stover pellets consumed more feed ($P<.05$) than those fed any of the other three rations and, they were less efficient than those fed rations 1 or 4. The mixture of supplemental nitrogen sources fed with milo stover silage (ration 4) gave animal performance similar to that from soybean meal with milo stover silage (ration 3).

The results indicate that milo stover's value is 53 to 57% that of forage sorghum in growing rations. On the average, heifers fed milo stover gained 57% as rapidly and 53% as efficiently as heifers fed forage sorghum.

Introduction

Milo stover is a by-product of grain production. As humans continue to compete with livestock for the world's feed grain supply, it becomes increasingly important that crop aftermaths, like milo stover, be used as energy sources for beef production.

Machine harvested or grazed milo stover can meet the energy requirement of beef cows during gestation. In a previous trial at this station (Progress Rpt. 210, Kansas Agr. Expt. Sta., 1974) growing heifers made substantial gains when fed milo stover pellet or milo stover silage rations.

Experimental Procedure

Seventy-two heifer calves of Angus, Hereford and AxH breeding averaging 460 lbs. were allotted by breed and weight to 12 pens of six heifers each. Three pens were assigned to each of these rations: (1) forage sorghum silage plus soybean meal, (2) milo stover pellets plus soybean meal, (3) milo stover silage plus soybean meal and (4) milo stover silage plus soybean meal-corn gluten meal-urea.

The trial was 98 days (December 7, 1973 to March 15, 1974). All rations contained 72.4% of the appropriate forage, 13.8% dehy. alfalfa pellets (¼ inch) and 13.8% supplement on a dry matter basis. All were formulated to be equal in crude protein (12.5%), minerals, vitamins and additives.

Compositions of the supplements are shown in table 11.1; supplement A was fed in rations 1, 2 and 3; supplement B in ration 4. Corn gluten meal and urea each provided one-third of the crude protein equivalent in supplement B. All rations were mixed twice daily and fed free-choice. Initial and final weights of the heifers were taken after heifers went 15 hours without access to feed or water.

Forage sorghum and milo stover each was obtained from a single source in October, 1973. Milo stover was harvested after a killing frost from milo that yielded 95 bushels of grain per acre. The forage harvester[1] used was equipped with a three-inch recutter screen. Approximately 50 tons of forage sorghum and 100 tons of milo stover were ensiled in upright, concrete stave silos (10 ft. x 50 ft.). Milo stover pellets (¼ inch diameter) were processed by a commercial dehydrator.[2]

Results and Discussion

Chemical analyses of the forages are shown in table 11.2.

Heifer performance is shown in table 11.3. Heifers fed forage sorghum silage gained fastest ($P<.05$) and most efficiently ($P<.05$). Differences in daily gain among the three milo stover rations were not statisitically significant. Calves fed the milo stover pellet ration tended to gain faster than calves fed either of the two milo stover silage rations. Heifers fed milo stover pellets consumed the most feed and required the most feed per lb. of gain. Supplementing milo stover silage with soybean meal or with soybean meal-corn gluten meal-urea made no difference in animal performance.

Performances by heifer calves fed forage sorghum silage, milo stover pellet or milo stover silage rations supplemented with soybean meal during the past two winters (1973 and 1974) are summarized in figure 11.1. Responses of heifers fed forage sorghum were similar from the two trials; however, heifers fed milo stover in trial 1 gained faster and more efficiently than heifers fed milo stover in trial 2. Differences in performance between the two years could be attributed to several factors: stover quality (crude protein, digestibility, etc.), weather condition, length of the wintering period.

In trial 1, calves fed stover pellets gained 80% as rapidly and 67% as efficiently, and those fed stover silage gained 70% as rapidly and 82% as efficiently as calves fed forage sorghum silage. In trial 2, those relative percentages were 68 and 50 for stover pellets .and 50 and 55 for stover silage compared with forage sorghum silage.

Averages of the two trials and two milo stovers (pellets and silage) show that milo stover has a value of 63 to 67% that of forage sorghum. These results indicate that milo stover should not be used as the major energy source in growing rations if performance similar to that from grain silages is desired. Calves fed pelleted milo stover gain too inefficiently and calves fed ensiled milo stover gain too slowly for either to be acceptable to most cattlemen. However, a feeder willing to accept gains of about one pound a day could use milo stover.

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[1]Provided by Field Queen Corporation (a division of Hesston Corporation), Maize, Kansas.

[2]C. K. Processing Co., Manhattan, Kansas.

Table 11.1. Compositions of Supplements[1]

Ingredient	Supplement A	Supplement B
	%, dry matter basis	
Soybean meal (48% CP)	74.27	14.70
Milo, rolled	10.45	42.25
Corn gluten meal (60% CP)	--	--
Urea (45% nitrogen)	--	41.55
Dehy. alfalfa	10.00	10.00
Limestone	3.00	4.50
Salt	2.00	2.00
Trace mineral premix	0.50	0.50
Vitamin A premix[2]	0.33	0.33
Aureomycin[2]	0.35	0.35

[1]Fed as a 3/16-inch pellet.

[2]Formulated to supply 30,000 IU of vitamin A and 70 mg of aureomycin per heifer per day.

Table 11.2. Dry Matter, pH, and Proximate Analyses of the Three Milo Forages.

Item	Forage sorghum silage	Milo stover	
		Silage	Pellet
Dry matter, %	26.1	29.9	93.3
pH	4.3	4.9	--
	%, dry matter basis		
Ash	8.6	15.5	13.3
Crude protein	7.6	6.0	5.0
Crude fiber	26.2	28.7	28.7
Ether extract	2.6	2.2	1.5
Nitrogen-free extract	55.0	47.6	51.5

Table 11.3. Performances of Heifers.

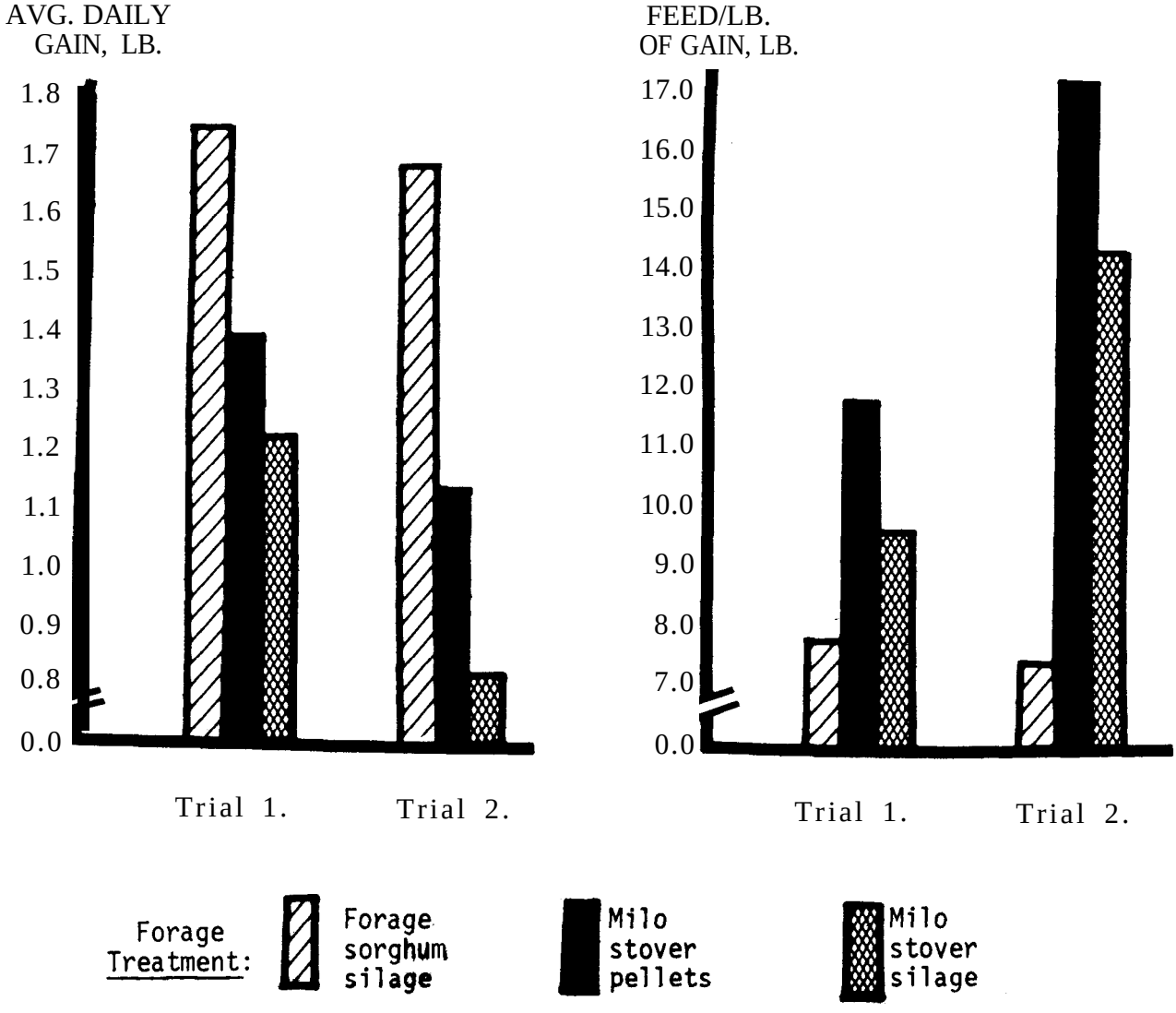
Item	Forage sorghum silage	Milo stover pellet	Milo stover silage + Soybean meal	Milo stover silage + SBM-CGM-urea
No. of heifers	18	18	18	18
Initial wt., lbs.	454	466	463	460
Final wt., lbs.	614	575	542	552
Avg. daily gain, lbs.	1.63[a]	1.11[b]	0.81[b]	0.94[b]
Avg. daily feed, lbs.[1]				
silage &/or pellets	9.17	13.31	8.02	8.40
dehy. alfalfa	1.74	2.53	1.52	1.59
supplement	1.74	2.53	1.52	1.59
Total[2]	12.65[b] (2.37)	18.37[a] (3.53)	11.06[c] (2.20)	11.58[c] (2.29)
Feed/lb. gain, lbs.[1]	7.75[c]	16.82[a]	14.01[a,b]	12.34[b]

[a,b,c] Means in the same row with different superscripts differ significantly ($P<.05$).

[1] 100% dry matter basis.

[2] Values in parenthesis are dry matter intake as percentage of body weight.

Figure 11.1. Average Daily Gains and Feed Efficiencies of Heifers in Trial 1 (1973)[1] and Trial 2 (1974).[2]



[1]Progress Rpt. 210, Kansas Agr. Expt. Sta., 1974.

[2]Table .3.