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Milo Stover for Growing Heifers

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Summary

Five rations (involving 4 forage treatments) were compared: (1) forage sorghum silage, (2) forage sorghum silage ensiled with organic acids, (3) milo stover pellets, (4) milo stover silage and (5) milo stover silage plus rolled milo. Each ration was fed to 13 heifer calves for 114 days. No differences were observed in gain, intake or feed efficiency between heifers fed untreated and organic acid-treated forage sorghum silage. Pelleting milo stover increased dry matter consumption over milo stover silage but resulted in a poorer feed conversion. Adding rolled milo to stover silage improved gain and feed conversion compared to stover silage or pellets.

Results indicate that growing heifers can make substantial winter gains on properly supplemented milo stover rations. The feeding value of forage sorghum silage was not improved by adding organic acids.

Introduction

Millions of tons of grain sorghum stover are available to Kansas farmers and ranchers each fall, but it is not yet being widely used in cattle feeding programs. Much that is used is grazed by beef cows. Milo stover can be successfully ensiled. Several weeks after killing frosts, it contains adequate moisture for ensiling. Data at this station indicate that milo stover silage is an excellent source of energy for beef cows or ewes during gestation.

Is milo stover limited to use only in maintenance rations? Little is known about the potential of milo stover in production rations for beef cattle, so one objective of this trial was to determine relative feeding values of milo stover and forage sorghum in rations for growing heifers. Pelleting improves the nutritive value of such low quality forages as prairie hay, so a second objective was to compare ensiled and pelleted milo stover.

Experimental Procedure

Milo stover and forage sorghum were each harvested from a single source with a forage harvester¹ equipped with a three-inch, recutter screen. Milo stover was harvested October 25, 26, and 27, 1972 (after a killing frost) from grain sorghum that yielded 93 bu. per acre. Grain

¹Forage harvester was provided by Field Queen Corporation (a division of Heston Corporation), Maize, Kansas

and stover moisture at harvest were approximately 18 and 70 percent, respectively. Milo stover pellets (¼ inch) were processed by a commercial dehydrator² and stored in a metal hopper bin. An organic acid mixture³ was applied to one silo of forage sorghum at 7.5 lbs. per ton of wet forage. Approximately 50 tons of each silage were ensiled in upright, concrete stave silos (10 ft. X 50 ft.).

Sixty-five Angus, Hereford and crossbred replacement heifer calves averaging 455 lb. were randomly allotted by weight and breed to each of five rations for a 114-day growing trial beginning December 20, 1972. There were 13 heifers per treatment, in two pens of six and seven head. Rations compared were: (1) forage sorghum silage (2) forage sorghum silage ensiled with organic acids, (3) milo stover pellets, (4) milo stover silage and (5) milo stover silage plus rolled milo.

Rations 1, 2, 3, and 4 contained 76.0% of the appropriate forage, 12.0% dehydrated alfalfa pellets and 12.0% supplement (dry matter basis). Ration 5 was 57.8% stover silage, 18.2% rolled milo, 12.0% dehydrated alfalfa pellets and 12.0% supplement (dry matter basis). Rolled milo was added to ration 5 to assure an average daily gain of at least 1.5 lb. All rations were formulated to be equal in crude protein (12.5%), minerals and additives. Compositions of the supplements are shown in table 13.1. Supplement A was fed with rations 1-4; supplement B with ration 5. Rations were mixed and fed twice daily. Initial and final weights of heifers were taken after 15 hours without feed or water; 28-day intermediate weights were taken before the a.m. feeding.

Results

Chemical analyses of the forages are shown in table 13.2.

Heifer performance is shown in table 13.3. Heifers fed untreated and organic acid-treated forage sorghum silage and milo stover silage plus rolled milo (rations 1, 2 and 5) had similar rates of gain, intakes and efficiencies. Performance of heifers receiving milo stover pellets or silage without additional grain (ration 3 or 4) was less than that of heifers receiving any of the other three rations. Pelleting milo stover improved consumption over milo stover silage but resulted in poorer feed conversion.

² C K Processing Co., Inc., Manhattan, Kansas.

³ Organic acid mixture (trade name - ChemStor) contained 60% acetic and 40% propionic acids and was provided by Celanese Chemical Co., Corpus Christi, Texas.

Table 13.1. Composition of the Supplements^a

Ingredient	Supplement A	Supplement B
	% (dry matter basis) %	
Soybean meal	77.27	62.00
Milo, rolled	5.55	21.57
Dehydrated alfalfa	10.00	10.00
Dried Masonex	1.00	1.00
Dicalcium phosphate	3.00	2.25
Salt	2.00	2.00
Trace mineral premix	0.50	0.50
Vitamin A premix ^b	0.33	0.33
Aureomycin ^c	0.35	0.35

^a Fed as a 3/16-inch pellet.

^b Formulated to supply 30,000 I.U. per heifer per day.

^c Formulated to supply 70 mg. per heifer per day.

Table 13.2. Proximate Analyses (100% Dry Matter Basis) and pH of the Four Forage Treatments

Item	Forage sorghum silage		Milo stover	
	Untreated	Organic acid-treated	Silage	Pellet
Dry matter, %	29.4	31.6	28.8	89.2
Ash, %	8.5	8.7	11.5	12.1
Crude protein, %	8.0	7.7	7.7	7.7
Crude fiber, %	21.6	23.5	30.8	31.5
Ether extract, %	1.8	2.1	1.7	2.0
NFE, %	60.1	58.0	48.3	46.7
pH	4.10	3.90	4.05	- - -

Table 13.3. Performance of Growing Heifers, December 20, 1972, to April 14, 1973 (114 days).

Item	Treatment				
	Forage sorghum silage			Milo stover	
	Untreated	Organic acid-treated	Pellet	Silage	Silage + rolled milo
Ration number	1	2	3	4	5
No. of heifers	13	13	13	13	13
Initial wt., lb.	448	448	444	464	456
Final wt., lb.	642	652	600	600	635
Avg. total gain, lb.	194	187	156	136	179
Avg. daily gain, lb.	1.70 ^a	1.64 ^{a,b}	1.37 ^{b,c}	1.20 ^c	1.57 ^{a,b}
<u>Avg. daily feed, lb.^d</u>					
silage &/or pellets	9.91	10.44	12.15	8.48	7.39
milo, rolled	---	---	---	---	2.41
dehy alfalfa pellets	1.74	1.74	1.93	1.50	1.70
supplement	1.70	1.70	1.88	1.48	1.65
total ^e	13.35 ^{a,b}		15.96 ^a	11.46 ^b	13.15 ^{a,b}
	(2.44)	(2.48)	(3.06)	(2.16)	(2.41)
Feed/lb. gain, lb.	7.87 ^a	8.51 ^{a,b}	11.68 ^c	9.58 ^b	8.36 ^{a,b}

^{a, b, c} Means on the same line with different superscripts differ significantly ($P < .05$).

^d 100% dry matter basis.

^e Values in parentheses are dry matter intake as a percent of body weight.