# Milo Stover, Forage Sorghum and Alfalfa Silages for Growing Heifers

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## Summary

Ninety heifer calves were used to compare six rations containing various combinations of milo stover, forage sorghum and alfalfa silages. In the 96-day trial, heifers fed 100% forage sorghum silage outperformed heifers fed 100% milo stover silage. Adding forage sorghum or alfalfa silage to the 100% milo stover silage ration improved rate and efficiency of gain. Observed gains and efficiencies for the 67% milo stover + 33% forage sorghum and for the 33% milo stover + 67% forage sorghum silage rations exceeded predicted gains and efficiencies an average of 10.7% and 11.5%, respectively.

## Introduction

We compared milo stover and forage sorghum silages in three previous heifer growing trials at this station (Prog. Rpt. 210, 230 and 262, Kansas Agr. Expt. Sta.). Results showed: (1) growing calves fed milo stover silage should gain about 1.0 lb. per day and require 10 to 14 lbs. of dry feed per lb. of gain, (2) milo stover silage has a feeding value of 63 to 67% that of forage sorghum silage and (3) milo stover silage seems to be a better feed for growing calves when it is fed in combination with forage sorghum silage than when it is fed alone.

Our objective in this trial was to verify previous results by feeding various combinations of milo stover, forage sorghum and alfalfa silages in rations for growing heifers calves.

## Experimental Procedure

Milo stover, forage sorghum (high-grain variety) and alfalfa (about ½ bloom) were each obtained from a single source near Manhattan in the summer and fall of 1975. All three forages were ensiled in concrete silos (10 ft. x 50 ft.). The forage harvester was equipped with a two-inch recutter screen. Moisture contents of the milo stover and forage sorghum were about 68 to 70%; that of the alfalfa was about 58 to 60 percent.

Ninety heifer calves of Angus, Hereford, Angus x Hereford and Simmental x Hereford breeding averaging 444 lbs. were used in the 96-day trial (November 14, 1975 to February 18, 1976). They were allotted by breed and weight into 18 pens of five heifers each. Three pens were assigned to each of these milo stover (MS), forage sorghum (FS) and alfalfa silage combinations: (1) 100% MS, (2) 67% MS + 33% FS, (3) 33% MS + 67% FS, (4) 100% FS (5) 67% MS + 33% alfalfa and (6) 33% MS + 67% alfalfa.

Compositions of the six rations and their supplements are shown in table 21.1. All rations were formulated on a fixed percentage basis to be equal in crude protein (13%), minerals, vitamins and additives. Alfalfa silage provided 33 and 67% of the total ration crude protein in rations 5 and 6, respectively. All rations were mixed twice daily and fed free-choice.

All heifers were fed the same level of silage for 5 days before initial weighing and 2 days before final weighing. All feed and water were withheld 16 hours before weighing.

## Results

Dry matter (%), crude protein (% DM basis), and crude fiber (%, DM basis), respectively, for the three silages were: 29.7, 5.4, 30.7 for milo stover; 29.0 7.8, 25.8 for forage sorghum and 42.1, 16.0, 33.6 for alfalfa.

Performances of the heifers are shown in table 21.2. Heifers fed 100% FS or 33% MS + 67% FS silage rations had similar performance and gained faster ($P<.05$) and more efficiently ($P<.05$) than heifers fed any of the other four rations. In general, as FS and alfalfa silages replaced MS silage in the ration, rate of gain and feed consumption increased ($P<.05$) and feed required per lb. of gain decreased ($P<.05$). Alfalfa silage was an effective source of both supplemental energy and protein for the milo stover silage.

Observed gains and feed efficiencies for 100% MS and 100% FS silage rations were used to calculate predicted gains and efficiencies for the two combinations of MS and FS silages (table 21.3). Observed gains exceeded predicted gains by .16 and .14 lb. per day for the 67% MS + 33% FS and for the 33% MS + 67% FS rations, respectively. Observed feed efficiencies exceeded predicted efficiencies by 1.20 and .96 lbs. for the 67% MS + 33% FS and for the 33% MS + 67% FS silage rations. On the average, combining MS and FS silages improved gain 10.7% and feed efficiency 11.5%.

Table 21.1. Compositions of rations and supplements used to compare milo stover, forage sorghum and alfalfa silages.

| Ingredient | Rations[1] | | | | | |
|---|---|---|---|---|---|---|
| | 100% MS | 67% MS 33% FS | 33% MS 67% FS | 100% FS | 67% MS 33% alfalfa | 33% MS 67% alfalfa |
| Milo stover silage | 73.0 | 48.9 | 24.1 | ---- | 48.9 | 24.1 |
| Forage sorghum silage | ---- | 24.1 | 48.9 | 73.0 | ---- | ---- |
| Alfalfa silage | ---- | ---- | ---- | ---- | 24.1 | 48.9 |
| Milo | 7.0 | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 |
| Soybean meal | 5.0 | ---- | ---- | ---- | ---- | ---- |
| Supplement A | 15.0 | ---- | ---- | ---- | ---- | ---- |
| Supplement B | ---- | 15.0 | ---- | ---- | ---- | ---- |
| Supplement C | ---- | ---- | 15.0 | ---- | ---- | ---- |
| Supplement D | ---- | ---- | ---- | 15.0 | ---- | ---- |
| Supplement E | ---- | ---- | ---- | ---- | 15.0 | ---- |
| Supplement F | ---- | ---- | ---- | ---- | ---- | 15.0 |

| | Supplements[2] | | | | | |
|---|---|---|---|---|---|---|
| | A | B | C | D | E | F |
| Soybean meal | 1338 | 1836 | 1646 | 1460 | 1028 | 68 |
| Milo | 512 | 15 | 212 | 408 | 838 | 1756 |
| Dicalcium phosphate | 42 | 42 | 50 | 40 | 50 | 92 |
| Limestone | 24 | 20 | 7 | 8 | ---- | ---- |
| Salt | 32 | 32 | 32 | 32 | 32 | 32 |
| Molasses | 40 | 40 | 40 | 40 | 40 | 40 |
| Aureomycin[3] | + | + | + | + | + | + |
| Trace mineral premix | 4 | 4 | 4 | 4 | 4 | 4 |
| Vitamin A premix[4] | + | + | + | + | + | + |

[1] % on a 100% dry matter basis.
[2] lbs. ton on an as-mixed basis.
[3] added to supply 70 mg per heifer per day.
[4] added to supply 30,000 IU per heifer per day.

Table 21.2. Heifer performance for the 96-day trial.

| Item | Ration | | | | | |
|---|---|---|---|---|---|---|
| | 100% MS | 67% MS 33% FS | 33% MS 67% FS | 100% FS | 67% MS 33% alfalfa | 33% MS 67% alfalfa |
| No. of heifers | 15 | 15 | 15 | 15 | 15 | 15 |
| Initial wt., lbs. | 446 | 448 | 437 | 449 | 441 | 443 |
| Final wt., lbs. | 549 | 588 | 599 | 619 | 558 | 578 |
| Avg. total gain, lbs. | 103 | 140 | 162 | 170 | 117 | 135 |
| Avg. daily gain, lbs. | 1.07 [c] | 1.46 [b] | 1.68 [a] | 1.77[a] | 1.22[c] | 1.41[b] |
| Avg. daily feed, lbs. | 11.68[d] | 12.62[b c] | 13.17[ab] | 13.63[a] | 11.88[c d] | 13.23[a b] |
| Feed/lb. of gain, lbs. | 11.01[d] | 8.71[b] | 7.86[a] | 7.72[a] | 9.74[c] | 9.47[b c] |

[1] 100% dry matter basis.

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

Table 21.3. Observed vs. predicted rates and efficiencies of gain for heifers fed combinations of MS and FS silages.

| Item | Ration | | | |
|---|---|---|---|---|
| | 100% MS | 67% MS 33% FS | 33% MS 67% FS | 100% FS |
| Avg. daily gain, lbs. | | | | |
| Observed | 1.07 | 1.46 | 1.68 | 1.77 |
| Predicted | ---- | 1.30 | 1.54 | ---- |
| Improvement, lbs.[1] | | +.16 | +.14 | |
| Improvement, % | | +12.3 | +9.1 | |
| Feed/lb. of gain, lbs. | | | | |
| Observed | 11.01 | 8.71 | 7.86 | 7.72 |
| Predicted | ---- | 9.91 | 8.82 | ---- |
| Improvement, lbs.[1] | | -1.20 | -.96 | |
| Improvement, % | | +12.1 | +10.9 | |

[1] Observed minus predicted.