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L.I. Smart

C.L. Drake

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A Comparison of All-in-one and Conventional Sorghum Silage With and Without MGA¹ for Feedlot Heifers

L.I. Smart and C.L. Drake

Silage is being utilized in larger quantities in beef cattle growing and fattening rations. Hammes et al. (1964) showed that higher levels of corn silage can be used because gains from high silage and high grain rations are similar. However, more total digestible nutrients may be harvested per acre and the cost of gain is usually less with silage. Several investigators have shown advantages to certain additives with silage.

The primary purposes of this study were to:

1. Evaluate effects of adding a combination of additives to sorghum silage to make an all-in-one silage.
2. To compare the all-in-one silage with conventional methods of feeding sorghum silage with soybean meal as a source of protein.
3. To feed melengestrol acetate, a hormone to prevent estrus, increase rate of gain and improve feed utilization in heifers.

¹ Melengestrol acetate (MGA) furnished by Upjohn Company, Kalamazoo, Mich.

Materials and Method

Fifty-two Hereford heifers averaging 757 pounds each were divided into 4 lots of 10 each and 12 were fed individually. For 90 days all heifers were full fed sorghum silage, which had been ensiled as shown in table 23. The experimental treatment for the group and individually fed heifers is shown in table 24 and the chemical analysis of the silage is in table 25. Carcass data were obtained following slaughter.

Results and Discussion

Group fed heifers receiving MGA had a higher daily gain and consumed more feed than heifers not receiving MGA, as shown in table 26.

Feed-lot data concerning individually fed heifers are presented in table 27. Individually fed heifers receiving MGA gained fastest, consumed more feed and were more efficient.

Carcass data are presented in table 28. Little difference was observed among treatments.

Signs of heat were observed in only 3 heifers of 26 receiving MGA during the trial.

The data indicate that all-in-one sorghum silage was comparable to sorghum silage ensiled in the conventional manner and fed with soybean meal. Less time and labor were required to feed all-in-one silage

Table 23

Treatment of Experimental Silage

	<u>Treatment</u>
All-in-one silage	Sorghum silage + 100 lbs. of supplement ¹ per ton added to the silage at the blower when the silo was filled
Conventional silage	Sorghum silage; No supplements added

¹ Supplement composition, lbs.: Urea, 10; limestone, 5; powdered molasses, 10; trace minerals, 1*; vitamin A, 1 (10,000 IU per gm); soybean meal, 40; grain sorghum, 33.

* Trace minerals in % were: manganese, 10; iron, 10; calcium, 14; copper, 1; zinc, 5; iodine, 0.3; cobalt, 0.1.

Table 24

Experimental Treatments of Group and Individually Fed Heifers

	Group fed	Individually fed	
Lots	3	1, 5, 9	All-in-one sorghum silage
Lots	4	2, 6, 10	Conventional sorghum silage plus 2# of SBM per head per day
Lots	5	3, 7, 11	All-in-one sorghum silage plus .35 mg. MGA ¹ per head per day
Lots	6	4, 8, 12	Conventional sorghum silage plus 2# of SBM per head per day plus .35 mg. MGA per head per day

¹ Assay limits call for samples to fall within 70 to 120% of theory to be "in compliance."

Table 25

Silage Analyses
As Fed Basis

	<u>Dry matter</u>	<u>Crude protein</u>	<u>Ether extract</u>	<u>Ash</u>	<u>Crude fiber</u>
All-in-one sorghum silage	37.12	4.32	0.84	2.60	8.36
Conventional sorghum silage	36.88	2.84	0.82	2.39	7.80

Table 26

Feed-lot Response from Heifers Group Fed All-in-one Silage and
Conventionally Fed on Silage With and Without MGA

<u>Ration</u>	<u>All-in-one</u>	<u>Sorghum silage</u>	<u>All-in-one</u>	<u>Sorghum silage</u>
	<u>sorghum silage</u>	<u>+ 2# SBM per</u> <u>head per day</u>	<u>sorghum silage</u>	<u>+ 2# SBM per</u> <u>head per day</u>
Hormone	None	None	MGA	MGA
Lot no.	3	4	5	6
No. heifers	10	10	10	10
Av. initial wt., lbs.	757	757	760	759
Av. final wt., lbs.	972	955	977	984
Total gain, lbs.	215	198	217	225
Av. daily gain, lbs.	2.39	2.20	2.41	2.50
Feed per lb. gain, lbs.	24.4	26.2	24.5	24.3
Feed cost per cwt. gain \$	14.51	14.35	14.58	13.48
Daily ration per heifer, lb.				
All-in-one sorghum silage	58.4		58.5	
Sorghum silage		55.6		58.4
Soybean meal		2.0		2.0
MGA (in sorghum grain carrier)			.5	.5
Av. feed consumed per day, lb.	58.4	57.6	59.0	60.9
Feed per lb. gain, lb.				
All-in-one sorghum silage	24.4		24.3	
Sorghum silage		25.3		23.3
Soybean meal		.9		.8
MGA (in sorghum grain carrier)			.2	.2
Total feed per lb. gain	24.4	26.2	24.5	24.3

Table 27

Feed-lot Response From Heifers Individually Fed All-in-one Silage
And Conventionally Fed on Silage With and Without MGA

Ration	All-in-one sorghum silage	Sorghum silage + 2# SBM per head per day	All-in-one sorghum silage	Sorghum silage + 2# SBM per head per day
Hormone	None	None	MGA	MGA
Lot no.	1,5,9	2,6,10	3,7,11	4,8,12
No. heifers	3	3	3	3
Av. initial wt., lbs.	751	747	753	751
Av. final wt., lbs.	902	926	971	968
Total gain, lbs.	151	179	218	217
Av. daily gain, lbs.	1.68	1.99	2.42	2.41
Feed per lb. gain, lbs.	26.3	22.8	20.9	20.6
Feed cost per cwt. gain \$	15.78	13.49	13.67	12.57
Daily ration per heifer, lb.				
All-in-one sorghum silage	44.2		50.2	
Sorghum silage		43.5		49.8
Soybean meal		2.0		2.0
MGA (in sorghum grain carrier)			.5	.5
Av. feed consumed per day, lb.	44.2	45.5	50.7	52.3
Feed per lb. gain, lb.				
All-in-one sorghum silage	26.3		20.7	
Sorghum silage		21.8		19.6
Soybean meal		1.0		.8
MGA (in sorghum grain carrier)			.2	.2
Total feed per lb. gain	26.3	22.8	20.9	20.6

Table 28

Carcass Evaluation of Heifers Group and Individually Fed All-in-one Silage and
Conventionally Fed on Silage With and Without MGA

<u>Ration</u>	<u>All-in-one sorghum silage</u>	<u>Sorghum silage + 2# SBM per head per day</u>	<u>All-in-one sorghum silage</u>	<u>Sorghum silage + 2# SBM per head per day</u>
Hormone	None	None	MGA	MGA
<u>Group Fed:</u>				
Lot no.	3	4	5	6
Av. hot carcass wt., lb.	517	530	542	540
Maturity	A	A	A	A
Estimated kidney knob %	3.2	3.3	3.2	3.3
Av. fat thickness 12th rib, in.	.3	.3	.3	.3
Av. degree marbling	Slight	Slight	Slight +	Slight
U.S.D.A. grade	Good -	Good	Good	Good
Av. ribeye area, sq. in.	12.5	12.1	11.7	11.9
<u>Individually Fed:</u>				
Lot no.	1,5,9	2,6,10	3,7,11	4,8,12
Av. hot carcass wt., lb.	502	502	531	498
Maturity	A	A	A	A
Estimated kidney knob %	3.1	3.3	3.4	3.4
Av. fat thickness 12th rib, in.	.3	.3	.2	.3
Av. degree marbling	Slight -	Slight -	Slight -	Slight
U.S.D.A. grade	Good -	Good	Good -	Good
Av. ribeye area, sq. in.	12.1	12.5	13.4	11.5