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## Nutritive value of forages as affected by soil and climatic differences

### Abstract

Four previous tests (Kans. Agri. Expt. Sta. Bull. 507:7, 1967) at Colby, Garden City, Manhattan, and Mound Valley, using beef steers from the same herd and feeding the same feedstuffs, grown locally, produced differences in performance. What is the cause(s) of the differences? This test was designed as previous ones, except that all locations used the same feed, which was produced at Garden City. Sorghum silage was dehydrated and pelleted for easier transportation. The calves were wintered on the silage pellets and alfalfa hay. Silage pellets were gradually removed from the ration and sorghum grain added for finishing. Analyses of the feedstuffs are shown in table 12. Feedlot performance and carcass data are shown in table 13. Results were more nearly uniform than for any previous year. The test is being repeated. An Atomic Absorption Spectrometer has been obtained and a complete mineral analysis of feedstuffs and water from each location is planned.

### Keywords

Cattlemen's Day, 1968; Report of progress (Kansas State University. Agricultural Experiment Station); 518; Beef; Nutritive value; Soil; Climate; Sorghum silage; Alfalfa hay

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Nutritive Value of Forages as Affected  
by Soil and Climatic Differences (Project 430)

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- 1 Colby Station
- 2 Garden City Station
- 3 Mound Valley Station

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Table 12

## Feedstuff Analyses, 1966-67

	% Moisture	% Dry matter	% Protein	% Ash	% Ether extract	% Crude fiber	% N.F.E.
Garden City							
Sorghum silage pellets	5.16	94.84	4.52	12.95	1.18	24.11	52.08
Alfalfa hay	6.99	93.01	20.63	9.79	1.29	29.64	31.66
Sorghum grain	11.84	88.16	9.48	1.50	1.98	1.85	73.35
Colby							
Sorghum silage pellets	6.28	93.72	7.36	9.51	1.45	23.99	51.41

Table 13  
 Feedlot results  
 Wintering Phase  
 November 9, 1966 to March 1, 1967 - 112 days

Location	COLBY		GARDEN CITY		MANHATTAN		MOUND VALLEY	
	1	2	1	2	1	2	1	2
Lot No.								
No. steers per lot	6	6	6	6	6	6	6	6
Av. initial wt., lb.	436.3	433.8	443.0	425.7	436.3	444.2	436.3	436.3
Av. final wt., lb.	576.7	586.3	580.2	563.2	533.3	555.8	530.3	523.0
Av. daily gain, lb.	1.25	1.36	1.23	1.24	.87	1.0	.84	.77
Av. daily ration, lb:								
Sorghum silage Pell.	12.30	12.62	11.73	10.95	11.57	11.68	9.30	9.31
Alfalfa hay	4.67	4.63	4.96	4.96	4.77	5.00	4.72	4.72
Feed per cwt. gain, lb:								
Sorghum silage Pell.	981	927	958	892	1336	1172	1108	1203
Alfalfa hay	373	340	405	404	551	502	562	610
Total dry matter per cwt. gain, lb.	1277	1195	1285	1221	1779	1578	1574	1708
Feed cost per cwt. <sup>1</sup> gain, \$	19.38	18.16	19.43	18.43	26.93	23.86	23.65	25.67
Finishing Phase, March 2 to September 16, 1967 - 199 days								
Av. final wt., lb.	972.3	1042.5	1030.7	1023.2	1058.8	988.5	990.2	1000.0
Av. daily gain, lb.	1.99	2.29	2.26	2.31	2.64	2.16	2.31	2.40
Av. daily ration, lb.:								
Alfalfa hay	4.97	4.98	4.97	4.97	3.75	4.23	4.90	4.89
Sorghum grain	14.66	14.94	15.76	14.99	16.60	14.84	14.64	14.72
Feed per cwt. gain:								
Alfalfa hay	250	217	220	215	142	196	212	204
Sorghum grain	737	652	696	648	629	688	634	614
Feed cost per cwt. gain, <sup>1</sup> \$	16.39	14.45	15.28	14.35	13.10	14.83	14.06	13.60
Av. daily gain, 311 days	1.72	1.96	1.89	1.92	2.00	1.75	1.78	1.81
Shrink to market, %	2.47	2.96	4.03	3.90	2.96	2.64	2.13	3.50
Av. hot carcass wt., lb.	584.3	632.7	640.6	619.7	656.8	602.0	613.5	607.5
Dressing %, feedlot wt.	60.0	60.7	62.2	60.6	59.4	60.9	62.0	60.8
Dressing %, market wt.	61.6	62.5	64.8	63.0	63.9	62.5	63.3	63.0
Av. fat thickness								
12 th rib	.55	.58	.78	.67	.63	.62	.60	.53
Estimate % kidney knob	3.50	3.50	3.54	3.53	3.50	3.53	3.47	3.50
Av. size rib eye, sq. in	9.82	11.12	10.78	10.67	11.43	10.53	10.51	10.44
Av. degree. marbling <sup>2</sup>	8.0	6.5	6.2	6.2	6.2	7.2	6.7	7.3
Av. yield grade	3.0	3.0	3.4	3.2	3.3	3.0	3.0	3.0
Carcass grades:								
Prime		1						
Low prime					1			
Top choice	1	1	3	4	1		3	
Av. choice	1	3	2	2	3	5	2	2
Low choice		1						1
Top good					1	1	1	3
Av. good	2							
high standard	2							

<sup>1</sup> Sorghum silage pellets, \$30 per ton; alfalfa hay, \$25 per ton; sorghum grain, \$1.80 per cwt.

<sup>2</sup> 4 = abundant, 5 = moderate, 6 = modest, 7 = small, 8 = slight, 9 = trace.

Table 14  
 Feedlot results  
 Wintering Phase  
 November 9, 1966 to March 1, 1967 - 112 days  
 except lot 4, 5, & 6 - 109 days

Location	COLBY				GARDEN CITY	
	3	4	3	4	5	6
Lot No.	Colby pelleted silage	Colby loose silage	Brown Swiss	Hereford	Charolais X Hereford	Charolais X Hereford
No. Animals per lot	6	6	6	6	6	6
Av. initial wt., lb.	434.7	435.5	440.5	432.0	501.0	501.5
Av. final wt., lb.	619.2	548.3	593.0	564.3	616.2	662.3
Av. daily gain, lb.	1.65	1.01	1.36	1.27	1.06	1.48
Av. daily ration, lb:						
sorghum silage	-	21.61	-	-	-	28.28
sorg. silage pell.	12.49	-	15.11	12.31	13.15	-
alfalfa hay	4.70	4.73	5.00	5.00	5.00	5.00
Feed pr. cwt. gain, lb:						
sorghum silage	-	21.55	-	-	-	19.17
sorg. silage pell.	758	-	1110	1014	1243	-
alfalfa hay	285	472	367	423	486	339
Total dry matter/cwt. gain, lb.	975.3	-	1043.5	1343.5	1616.7	-
Feed cost/cwt. gain <sup>1</sup> , \$	14.93	14.52	21.24	20.50	24.72	11.90
Finishing phase, March 2 to September 16, 1967 - 199 days						
No. Animals per lot	6	5	6	6	6	6
Av. final wt. lb.	1102.0	1024.2	1053.5	1034.3	1150.0	1154.7
Av. daily gain, lb.	2.43	2.36	2.31	2.36	2.68	2.47
Av. daily ration, lb.						
Alfalfa hay	4.98	4.75	5.00	4.98	5.00	5.00
Sorghum grain	16.08	16.70	16.10	15.03	17.47	16.89
Feed per cwt. gn., lb:						
Alfalfa hay	205	201	216	211	186	202
sorghum grain	663	706	696	636	651	683
Feed cost pr. cwt. gn. <sup>1</sup> , \$	14.50	15.24	15.23	14.08	14.04	14.82
Shrink to market, %	3.66	3.54	3.82	4.77	4.72	4.16
Av. hot carcass wt., lb.	674.5	628.6	609.2	601.6	691.6	679.6
Dressing %, feedlot wt.	61.21	61.37	57.82	58.16	60.13	58.85
Dressing %, market wt.	63.53	63.62	60.12	61.07	63.11	61.40
Av. fat thickness 12th rib, in.	0.65	0.70	0.12	0.43	0.42	0.35
Estimate % kidney knob	3.5	3.5	3.32	3.5	3.5	3.5
Av. size rib eye, sq. in.	11.74	9.73	12.23	10.14	11.72	11.33
Av. degree marbling <sup>2</sup>	6.2	6.2	7.8	6.5	7.0	6.7
Av. yield grade	3	3	1.3	3	3	3
Carcass grade:						
Prime	1					
Top choice	4	2			2	2
Av. choice		3		4	2	2
Low choice						2
High good	1			2	1	
Av. good			2		1	
Low good			2			
Av. Standard			2			

<sup>1, 2</sup> See Table