

INFLUENCE OF WINTER RATIONS UPON RETURNS FROM WINTERING,
GRAZING, AND FULL FEEDING YEARLING STEERS

A. D. Weber

Introduction

Systems of beef production which utilize roughage and grass are particularly adapted to Kansas conditions. Purchasing steer calves or yearling steers in the fall, wintering on silage, hay, fodder, dry grass; wheat pasture, or brome grass pasture, or a combination of these feeds, plus a protein concentrate where needed, and then grazing 4 or 5 months, is a system followed by many successful cattlemen. In some instances, after having been wintered and grazed in this manner, yearling or two-year-old steers are given a short feed for the fall or early winter market.

Details of this system and modifications of it need to be further delineated and tested so that the performance of cattle fed different feeds and handled in different ways can be predicted with greater accuracy. This feeding trial was planned with that objective in mind.

The primary purpose of this experiment was to test the value of prairie hay in a ration for wintering yearling steers. The quantity of prairie hay available for cattle feeding in Kansas has increased greatly in recent years due to the declining horse population. Because of this trend, it is planned to continue these studies of prairie hay for several years to determine how it can be used to the best advantage.

Experimental Procedure

Prairie hay, Atlas sorgo silage, and a combination of these roughages were compared when supplemented with one pound of cottonseed meal per steer daily (Lots 1, 2 and 4). A test was also made to determine whether one or two pounds of cottonseed meal should be used as a supplement to prairie hay (Lots 2 and 3).

No. 1 prairie hay and Atlas sorgo silage of excellent quality were fed. The cottonseed meal contained 39.6 per cent protein. Both prairie hay and silage were full fed. A limited quantity of prairie hay was wasted. Range-bred Hereford yearling steers were used. They graded good to choice as feeders.

The test rations were fed only during the wintering period. All five lots of steers were grazed together for 128 days, after which they were allotted the same as in the wintering period and full fed on the same feeds for 85 days. Thus the total gains made during the wintering, grazing and full feeding periods are an indication of the relative values of the rations fed during the wintering period.

Credit is due F. W. Bell for weighing and allotting the steers used in this experiment.

E. Smith

Observations

1. These yearling steers consumed approximately 7 pounds of silage per 100 pounds live weight. About three pounds of silage were equal to 1 pound of prairie hay in satisfying the steers' appetite for roughage, irrespective of whether the silage was fed alone or in combination with the prairie hay.

2. The steers fed prairie hay plus one pound of cottonseed meal gained only 46 per cent as much during the wintering period as those fed silage plus one pound of cottonseed meal (Lots 1 and 2). The silage-fed steers appeared thriftier and carried more flesh than those fed prairie hay. However, the steers wintered on silage gained only 47 per cent as much during the summer as those wintered on prairie hay. While the pasture gain tended to be inversely proportional to the winter gain, the advantage was not enough in the case of the steers wintered on prairie hay to overcome the larger winter gain of the silage-fed steers.

3. The steers fed silage as the only roughage made slightly more winter gain than those fed silage plus prairie hay, but the opposite was true for summer gain with the result that at the close of the pasture season the lot wintered on both silage and prairie hay had a slight advantage in total gain. During the full feeding period the steers that had been wintered on silage alone again took the lead. It is evident, therefore, that there was no advantage from feeding a dry roughage with silage. This is in accordance with the results of previous tests. It should be noted, however, that steers fed silage as the only roughage seem to crave dry feed even though their gains are not increased when it is fed (Lots 1 and 4).

4. Two pounds of cottonseed meal produced considerably better results than one pound of cottonseed meal as a supplement to prairie hay, on the basis of the results obtained in all three phases of this experiment. At the end of the wintering phase, the extra pound of cottonseed meal fed in Lot 3 had increased the gain 0.38 pound. But during the grazing phase, the Lot 2 steers made the larger gain, since they had gained less than Lot 3 during the winter. As a consequence, at the end of the grazing season, the increased gain attributable to feeding the extra pound of cottonseed meal in Lot 3 had been reduced to 0.24 pound. Gains during the full feeding period were approximately the same.

5. At the prices charged for feeds in this experiment, prairie hay was definitely inferior to silage. However, these prices are of value primarily as a historical record and are indicative of the feed situation during the winter of 1944-45. Current prices of feed and steers should always be used when comparing rations and evaluating systems of beef production.

6. The over-all results for each lot in this experiment should be of particular interest to cattlemen having roughage, grass and a limited quantity of grain to feed to beef cattle. The table summarizing the results of all three phases merits special study. Each lot was fed only 27 bushels of grain per steer, yet the average total gains were 536, 508, 551, and 526 pounds for Lots 1, 2, 3 and 4 respectively.

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Phase I - Wintering, November 8, 1944 to April 25, 1945 - 168 days

1. The relative values of prairie hay, Atlas sorgo silage and a combination of these roughages.
2. One pound versus two pounds of cottonseed meal as a supplement to prairie hay.

1 - Lot number	1	2	3	4
2 - Number of steers in lot	10	9	10	10
3 - Average daily winter ration:				
Atlas sorgo silage	49.33	....	....	30.88
Prairie hay	....	16.91	16.78	6.95
Cottonseed meal	1.00	1.00	2.00	1.00
4 - Weight per steer at beginning of wintering phase	611.0	607.0	610.0	609.0
5 - Weight per steer at end of wintering phase	833.0	709.0	777.0	827.0
6 - Gain per steer, wintering phase	222.0	102.0	167.0	218.0
7 - Daily gain per steer, wintering phase	1.32	0.61	0.99	1.30
8 - Feed cost per steer - wintering phase	\$ 25.75	\$ 26.34	\$ 31.21	\$ 26.76
9 - Cost of feed per 100 pounds gain - wintering phase	11.60	25.82	18.69	12.28
10 - Initial cost per steer at 13 $\frac{1}{2}$ cents per pound	82.49	81.95	82.35	82.22
11 - Initial cost per steer plus winter feed cost	108.24	108.29	113.56	108.98
12 - Necessary selling price per cwt. to cover initial cost plus wintering cost	12.99	15.27	14.62	13.18

FEED PRICES: Silage, \$5 per ton; Prairie hay, \$15 per ton; Cottonseed meal, \$60 per ton; Ground shelled corn, \$1.12 per bushel.

*Sept 2nd
Arthur*

Jul

Aug

Sept

*Net
Prairie
Hay*

4.5

2.5

1.5

1.0

0.5

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Phase II - Grazing, April 25, 1945 to August 31, 1945 - 128 days

1. The relative values of prairie hay, Atlas sorgo silage and a combination of these roughages.
2. One pound versus two pounds of cottonseed meal as a supplement to prairie hay.

13-Lot number	1	2	3	4
14-Number of steers in lot	10	9	10	10
15-Weight per steer at beginning of grazing phase	853.0	709.0	777.0	827.0
16-Weight per steer at end of grazing phase	925.0	905.0	949.0	926.0
17-Gain per steer, grazing phase	92.0	196.0	172.0	99.0
18-Daily gain per steer, grazing phase	0.72	1.53	1.34	0.77
19-Cost of grazing per steer	\$ 12.00	\$ 12.00	\$ 12.00	\$ 12.00
20-Cost of 100 pounds of pasture gain	13.04	6.12	6.98	12.12
21-Initial cost per head fall 1944 plus wintering cost 1944-45, plus grazing cost 1945	120.24	120.29	125.56	120.98
22-Necessary selling price per cwt. at home to cover original cost plus wintering and grazing costs	13.00	13.29	13.23	13.06

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Phase III - Full feeding, August 31, 1945 to November 24, 1945 - 85 days
(Allotment the same as in Phases I and II)

23-Lot number	1	2	3	4
24-Average daily ration:				
Ground shelled corn	17.68	17.93	17.75	17.04
Cottonseed meal	0.58	0.61	0.59	0.58
Prairie hay	1.48	1.58	1.37	1.35
Alfalfa hay	6.02	6.61	6.13	5.92
25-Weight per head at beginning of full feeding phase, August 31	925.0	905.0	949.0	926.0
26-Weight per head at end of full feeding phase, November 24	1147.0	1115.0	1161.0	1135.0
27-Gain per head - full feeding phase	222.0	210.0	212.0	209.0
28-Daily gain per head - full feeding phase	2.61	2.47	2.49	2.46
29-Full feeding cost per steer	\$ 37.60	\$ 38.67	\$ 37.77	\$ 36.34
30-Cost of feed for 100 pounds of gain - full feeding phase	16.94	18.41	17.82	17.39
31-Selling weight per steer at Kansas City, November 27	1096.0	1060.0	1098.0	1070.0
32-Shrink in Transit:				
Pounds per steer	51.0	55.0	63.0	65.0
Per cent	4.4	4.9	5.4	5.7
33-Shipping and selling expenses per steer	\$ 3.97	\$ 3.84	\$ 3.98	\$ 3.88
34-Initial cost per steer fall 1944, plus wintering cost 1944-45, plus grazing cost 1945, plus full feeding cost 1945, plus shipping and selling expenses	161.91	162.80	167.31	161.20
35-Necessary selling price per cwt. at Kansas City to cover costs listed above	14.76	15.36	15.24	15.07
36-Selling price per cwt. at Kansas City	16.75	16.75	16.75	16.75
37-Selling price per steer at Kansas City	183.58	177.55	183.92	179.25
38-Margin per steer above costs listed in Line 34	21.77	14.75	16.61	18.07
39-Dressing percentage	58.6	56.9	58.5	59.7
40-Carcass grades:				
Choice (AA)	3	6	4	9
Good (A)	7	3	6	1

FEED PRICES: Ground shelled corn, \$1.12 per bushel; Cottonseed meal, \$60 per ton; Prairie hay, \$15 per ton; Alfalfa hay, \$20 per ton.

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Summary of Phases I, II and III - November 8, 1944 to November 24, 1945
381 days

1-Lot number	1	2	3	4
2-Initial weight per steer	611.0	607.0	610.0	609.0
3-Feed consumption per steer:				
Phase I - Wintering				
Silage - tons	4.14	...	...	2.59
Prairie hay - tons	...	1.42	1.41	0.58
Cottonseed meal - pounds	168.00	168.00	336.00	168.00
Phase II - Grazing				
Bluestem pasture - acres	5	5	5	5
Phase III - Full feeding				
Ground shelled corn - bushels	26.84	27.22	26.94	25.86
Cottonseed meal - pounds	49.30	51.85	50.15	49.30
Prairie hay - tons	0.06	0.07	0.06	0.06
Alfalfa hay - tons	0.26	0.28	0.26	0.25
Total Phases - I, II and III				
Silage - tons	4.14	...	...	2.59
Prairie hay - tons	0.06	1.49	1.47	0.64
Alfalfa hay - tons	0.26	0.28	0.26	0.25
Gr. shelled corn - bushels	26.84	27.22	26.94	25.86
Cottonseed meal - pounds	217.30	219.85	386.15	217.30
Bluestem pasture - acres	5	5	5	5
4-Gains per steer:				
Phase I - Wintering	222.0	102.0	167.0	218.0
Phase II - Grazing	92.0	196.0	172.0	99.0
Phases I and II	314.0	298.0	339.0	317.0
Phase II - Full feeding	222.0	210.0	212.0	209.0
Phases I, II and III	✓ 536.0	✓ 508.0	551.0	526.0
5-Final weight per steer	1147.0	1115.0	1161.0	1135.0
6-Necessary selling price per cwt.				
At end of winter phase	\$ 12.99	\$ 15.27	\$ 14.62	\$ 13.18
At end of grazing phase	13.00	13.29	13.23	13.06
At end of full feeding phase	14.76	15.36	15.24	15.07

INFLUENCE OF WINTER RATIONS FED TO STEER CALVES UPON RETURNS
FROM WINTERING, GRAZING AND FULL FEEDING

A. D. Weber and F. W. Bell

Phase I - Wintering, January 17, 1946 to April 27, 1946 - 100 days

1. The relative values of prairie hay, Atlas sorgo silage and combinations of these roughages.
2. One pound versus two pounds of cottonseed meal as a supplement to prairie hay.

1-Lot number	1	2	3	4	5
2-No. of steers in lot	10	10	10	10	10
3-Average daily ration:					
Atlas sorgo silage	31.28	...	...	15.36	22.86
Prairie hay	...	14.04	14.08	6.84	3.60
Cottonseed meal	.99	.99	1.91	.99	.99
4-Average initial weight	516	516	514	514	514
5-Average final weight	609	624	645	619	613
6-Average gain	93	108	131	105	99
7-Average daily gain	.93	1.08	1.31	1.05	.99
8-Winter feed cost per steer	10.79	12.80	15.59	11.60	11.21
9-Cost of feed per 100 pounds gain	\$ 11.60	\$ 11.85	\$ 11.90	\$ 11.05	\$ 11.32
10-Initial cost per steer at 15 cents per pound	77.40	77.40	77.10	77.10	77.10
11-Initial cost per steer plus feed cost	88.19	90.20	92.69	88.70	88.31
12-Necessary selling price per cwt. to cover initial cost plus feed cost	14.48	14.46	14.37	14.33	14.41
13-Appraised value per cwt. May 4, 1946					

FEED PRICES: Silage, \$5 per ton; Prairie hay, \$14 per ton; Cottonseed meal, \$60 per ton.

Observations

This is the second feeding trial conducted at the Kansas Agricultural Experiment Station to test the value of prairie hay in a ration for wintering stock cattle. All five lots of steer calves will be grazed together during the summer of 1946. If conditions permit next fall they will be allotted the same as in the 1946 wintering period and fed the same rations again during the winter of 1946-47. Then they will be grazed together in 1947, after which they will be allotted the same as in previous phases and full fed for about 90 days. Rate and efficiency of gains for the various wintering, grazing and full feeding periods will be considered in measuring the influence of winter rations on final returns.