

Levels of Vitamin A and High and Low Level of Roughage in the Finishing Ration of Beef Steers Previously Wintered on Silage and Limited Grain (Project 567)

D. Richardson, E. F. Smith, L. H. Harbers and R. S. Lebdoekojo

Sixty Hereford steer calves averaging 440 pounds each from Warner's Ranch in Rice county were wintered on sorghum silage, 1 pound soybean oil meal and sorghum grain. Thirty received 4 pounds grain per head daily and 30 received 8 pounds.

After 112 days on the wintering ration, the steers were re-allotted to six lots of 10 steers each with 5 from each level of grain. The silage was reduced so three lots received 16 pounds per head daily and three lots 8 pounds. Silage was fed 111 days and then replaced by 4 or 2 pounds of prairie hay. Sorghum grain was increased to full feed. Vitamin A was added to one lot on each level of roughage at the intended rates of 0, 15000, 30000 I.U. per head daily. Actual analyses showed added levels of 0, 12750, and 22920 I.U. per head daily.

Feedstuff analyses are shown in table 22. This test was to study: 1. Two levels of grain in wintering rations and their effects on subsequent feedlot performance. 2. Effects of adding 0, 15000, or 30000 I.U. of Vitamin A in the finishing ration. 3. Performance on high and low levels of roughage in the finishing ration.

Results and Observations

A summary of the wintering phase is shown in table 23. Steers receiving the higher level of grain gained more, but not significantly more. Cost per pound of gain was increased with the higher level of grain.

A summary of the fattening phase is shown in table 24. An overall summary of the entire test is shown in table 25. The only significant differences were (1) greater gain at the highest level of vitamin A supplementation ($p = \angle 0.05$), (2) heavier carcasses for steers finished on low roughage ($p = \angle 0.05$), (3) highly significant difference in liver storage of vitamin A and carotene due to level of roughage and added vitamin A ($p = < 0.01$).

Table 22
Proximate Analyses of Sorghum Silage, Hay, Sorghum Grain and
Supplements.

Feedstuff	Moisture	Protein	Ether extract	Fiber	Ash	N.F.E.	Carotene
	%	%	%	%	%	%	mg/lb.
Silage	66.21	2.26	0.84	8.09	2.42	20.18	1.90
Prairie hay	7.01	6.29	3.13	34.29	6.31	42.97	21.80
Sorghum grain	10.70	8.52	3.93	1.93	0.77	74.15	---
Supplement #66	9.62	33.13	1.71	11.73	8.77	35.04	7.80
Supplement #67	9.83	32.63	1.98	13.05	8.83	33.68	5.50
Supplement #68	9.46	31.37	1.63	13.51	9.40	34.36	6.00

1. All supplements supplied 70 mg. Aureomycin per head daily.

Table 23
Summary of Results Obtained During the Wintering Phase,
November 13, 1964, to March 5, 1965 - 112 days.

Lot No.	7	8	9	10	11	12
No. steers per lot	10	10	10	10	10	10
Av. initial wt. lb.	441.0	440.5	440.5	441.5	441.0	441.5
Av. final wt. lb.	620.5	617.5	622.5	633.0	638.5	642.5
Av. daily gain, lb.	1.60	1.58	1.63	1.71	1.76	1.79
Av. daily ration, lb.						
Sorghum silage	23.4	23.2	23.2	17.7	17.7	17.9
Sorghum grain	4.2	4.2	4.2	7.5	7.5	7.5
Soybean oil meal	1.0	1.0	1.0	1.0	1.0	1.0
Feed per cwt. gain, lb.						
Sorghum silage	1461.0	1469.0	1428.6	1035.8	1004.3	990.5
Sorghum grain	263.9	267.8	260.2	440.2	426.8	419.4
Soybean oil meal	67.4	63.3	61.5	58.5	56.7	55.7
Feed cost per cwt. gain	\$13.61	\$13.78	\$13.40	\$15.31	\$14.84	\$14.59

Table 24
Summary of Results of Fattening Phase. March to October 4, 1965 -
213 days

Groups	7	8	9	10	11	12
No. of steers	10	10	10	10	10	9
Av. initial wt. per steer, lb.	626	630	629	628	630	630
Av. final wt. per steer, lb.	1101	1077	1083	1143	1100	1084
Av. daily gain, lb.	2.22	2.10	2.13	2.42	2.21	2.13
Vit. A added daily, I.U.	22920	12570	0	22920	12570	0
Av. daily ration, lb.						
Supplement	1.5	1.5	1.5	1.5	1.5	1.5
Sorghum grain	16.0	14.7	15.9	17.6	17.4	15.3
Silage (Mar 6-June 25)	16.3	16.4	16.6	9.5	9.5	9.3
Hay (June 25-Oct 4)	4	4	4	2	2	2.2
Feed per cwt. gain, lb.						
Supplement	67.7	71.5	70.4	62.0	68.0	70.4
Sorghum grain	736.8	701.9	748.1	722.0	787.1	718.5
Silage	381.8	406.9	406.4	205.8	223.5	228.6
Hay	85.6	90.4	89.0	39.2	43.0	49.4
Feed cost per cwt. gain	\$19.02	\$18.66	\$19.36	\$17.30	\$18.82	\$17.72
Shrinkage to market, %	5.1	5.1	5.7	5.5	4.1	3.9
Av. hot carcass wt., less 2%, lb.	640.6	633.1	639.1	627.3	648.3	646.1
Dressing %, market wt.	61.5	62.0	62.3	62.3	61.9	62.0
Av. fat thickness 12th rib, in.	0.66	0.74	0.74	0.74	0.66	0.76
Av. size rib-eye, sq. in.	10.44	10.72	10.50	11.26	10.79	10.97
Carcass grades:						
Prime	-	-	2	-	-	-
Top choice	-	1	1	1	2	1
Av. choice	4	5	-	1	2	6
Low choice	6	4	7	8	4	2
Good	-	-	-	-	2	-
Vit. A per gram liver I.U.	49.87	22.48	9.96	28.56	13.05	3.93
Carotenoids per gram liver, mcg.	2.09	2.73	2.50	1.42	1.39	1.95

Table 25
Overall Summary of Entire Test

	Winter ¹ 4 lbs. grain	Winter ¹ 8 lbs. grain	30000 added I.U.Vit.A	15000 added I.U.Vit.A	0 added Vit.A	Fattening high roughage	Fattening low roughage
No. animals	30	30	20	20	19	30	29
Av. gain, wintering phase, lb.	179.5	196.5	-----	-----	-----	-----	-----
Av. daily gain, wintering phase lb.	1.63	1.75	-----	-----	-----	-----	-----
Av. gain, fattening phase, lb.	472	464	493.5*	458.4	452.5	457	479
Av. daily gain, fattening phase, lb.	2.22	2.18	2.32	2.15	2.13	2.15	2.25
Av. total gain, lb.	652	661	681	645	644	648	665.5
Av. daily gain, lb.	2.01	2.03	2.10	1.98	1.98	1.99	2.05
Av. grain consumption, lb.	-----	-----	16.95	16.05	15.10	15.60	16.80
Av. hot carcass wt. lb.	657	662	670	654	658	651	669*
Av. dressing percent	62.0	62.0	61.9	61.7	62.3	62.0	61.9
Av. ribeye area, 12th rib, sq.in.	10.91	10.66	10.85	10.75	10.74	10.56	11.01
Av. backfat thickness, 12th rib,in.	0.72	0.71	0.70	0.70	0.75	0.71	0.72
Av. estimated kidney knob, % of carcass	3.0	2.9	3.0	2.9	2.9	3.0	2.9
Av. degree marbling ¹	6.4	6.6	6.7	6.6	6.2	6.5	6.5
Av. grade ²	4.6	4.5	4.4	4.5	4.9	4.6	4.5
Av. I.U. vit. A, storage/gram,liver	23	19	39**	18**	7**	27**	15**
Av. mg. carotenoids/gram, liver	2.0	2.1	1.7	2.1	2.2	2.4**	1.6**

1. 4=slightly abundant, 5=moderate, 6=modest, 7=small amount

2. 2=average good, 3=top good, 4=low choice, 5=average choice, 6=top choice

* significantly greater $p = < 0.05$

** highly significant difference $p = < 0.01$