

**Dicalcium Phosphate and Vitamin A for Calves on Winter Bluestem Pasture, 1962-63 (Project 253-1).**

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The 40 steer calves, 10 per lot, used in this experiment were good-to-choice Herefords from near Fort Davis, Texas, assigned on a random-weight basis to their treatments. They were pastured together in a 190-acre bluestem pasture during the winter, penned three times weekly, divided into treatment groups and fed the experimental diets shown in Table 40. The lots receiving dicalcium phosphate (0.1 pound per steer daily) and vitamin A (10,000 I.U. daily) received it mixed with soybean meal.

During the summer grazing phase only salt was fed, free choice. Each group of steers was in a 60-acre bluestem pasture. The steers were rotated among pastures the first of each month to minimize pasture differences.

The treatments appeared to have little effect during the winter. Some differences in weight gain occurred during summer grazing, but probably not from treatment.

**Table 40**  
Dicalcium phosphate and vitamin A for calves on winter bluestem pasture, winter grazing, December 8, 1962, to April 1, 1963—114 days.

Lot no. ....	12A	12B	12C	12D
Treatment .....	Control	Dicalcium phosphate	Vitamin A	Dicalcium phosphate and vitamin A
No. of steers .....	10	10	10	10
Initial wt. per steer, lbs. ....	372	378	375	382
Daily gain per steer, lbs. ....	0.30	0.23	0.23	0.23
Daily ration per steer, lbs.:				
Soybean meal .....	1.0	1.0	1.0	1.0
Ground sorghum grain .....	1.0	1.0	1.0	1.0
Dicalcium phosphate .....	.....	0.1	.....	0.1
Vitamin A, 10,000 I.U. daily .....	.....	.....	Yes	Yes
Bluestem pasture .....	.....	Free choice	.....	.....
Salt .....	.....	Free choice	.....	.....

**Summer grazing, April 1, 1963, to September 29, 1963—184 days.**

Initial wt., lbs. ....	405	404	401	408
Gain per steer, lbs. ....	242	273	272	241
Daily gain per steer, lbs. ....	1.32	1.48	1.48	1.31

**Summary, December 8, 1962, to September 29, 1963—298 days.**

Final wt., lbs. ....	648	677	673	649
Gain per steer, lbs. ....	276	299	294	267
Daily gain per steer, lbs. ....	0.93	1.00	0.99	0.90

**Dicalcium Phosphate and Vitamin A for Calves on Winter Bluestem Pasture (Project 253-2).**

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The 40 heifer calves, 10 per lot, used in this experiment were good-to-choice Herefords from near Fort Davis, Texas, assigned on a random-weight basis to their treatments. They were pastured together in a 190-acre bluestem pasture, penned three times weekly, divided into treatment groups, and fed experimental rations shown in Table 41. Dicalcium phosphate (0.1 pound per heifer daily) and vitamin A (10,000 I.U. daily), when fed, was mixed with soybean meal.

The results (Table 41) indicate no apparent advantage to feeding dicalcium phosphate, vitamin A or a combination of the two.

**Table 41**  
Dicalcium phosphate and vitamin A for calves on winter bluestem pasture, December 6, 1963, to April 3, 1964—120 days.

Lot no. ....	7	8	9	10
Item .....	Control	Dicalcium phosphate	Vitamin A	Dicalcium phosphate and Vitamin A
No. of heifers .....	11	10	11	10
Initial wt., lbs. ....	437	434	428	437
Daily gain per heifer, lbs. ....	.36	.15	.17	.15
Daily ration per heifer, lbs.:				
Soybean meal .....	1.0	1.0	1.0	1.0
Ground sorghum grain .....	1.0	1.0	1.0	1.0
Dicalcium phosphate .....	.....	0.1	.....	0.1
Vitamin A, 10,000 I.U. daily .....	.....	.....	Yes	Yes
Bluestem pasture .....	.....	Free choice	.....	.....
Salt .....	.....	Free choice	.....	.....

**The Value of Supplemental Copper and Cobalt for Steers on Fattening Rations, 1963 (Project 253-4-6).**

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Cobalt is one of the more recent minerals discovered to be essential to ruminants. It is necessary for the synthesis of vitamin B<sub>12</sub> in the rumen. Copper is necessary for hemoglobin formation, along with iron. Corn is considerably lower in copper and cobalt than sorghum grains, according to the National Research Council. Its requirement tables for beef cattle show that 2 to 4 mgs. of copper and .03 to .05 mg. of cobalt are required per pound of feed.

The 54 good-to-choice Hereford steers, 9 per lot, were assigned to treatment on a random-weight basis. Two steers were removed shortly after the test started because of urinary calculi and arthritis, one from each of Lots 18 and 21. All lots received silage for 30 days and rolled corn was gradually increased until full feed was reached. Each lot received a controlled amount of prairie hay and a soybean meal protein supplement fed at 1.5 pounds daily. It supplied 7,500 I.U. of vitamin A, 10 mgs. of stilbestrol, 70 mgs. Aureomycin, and 20 gms. of calcium. Cobalt sulfate was added to the supplement for three lots to provide .75 mg. cobalt daily per head. Cupric sulphate was fed to two lots to supply 49.5 mgs. copper daily. Excess copper was fed to two lots to supply 271.5 mgs. copper per head daily. Both copper treatments utilized the supplement as their carrier.

The results of the trial are reported in Table 42. Differences in daily gain and efficiency were not large. However, lots receiving cobalt (.75 mg. per head) or copper (49.5 mgs. per head) at the lower level or cobalt and copper combined at the lower level were somewhat superior. The two lots receiving excess copper (271.5 mgs. per head) responded the same as the control lot.

Table 42  
Effect of supplemental copper and cobalt on fattening steers, June 17 to October 7, 1963—112 days.

Treatment	Control	Oxalt	Copper and cobalt	Copper	Cobalt excess copper	Excess copper
Lot no.	18	19	20	21	22	23
No. steers per lot	8	9	9	8	9	9
Initial wt. per steer, lbs.	714	721	729	724	720	712
Total gain, lbs.	297	325	316	312	298	302
Daily gain per steer, lbs.	2.65	2.90	2.82	2.78	2.66	2.70
Daily ration per steer, lbs.:						
Corn	17.23	17.59	17.59	16.76	17.26	17.59
SBOM Supplement	1.49	1.49	1.49	1.49	1.49	1.49
Silage	3.47	3.52	3.52	3.50	3.55	3.52
Prairie hay	1.26	1.21	1.21	1.23	1.22	1.21
Feed cost per lb. gain, cents <sup>1</sup>	17.7	16.5	16.9	16.5	17.9	17.7
Lbs. feed per lb. gain	8.8	8.2	8.4	8.3	8.8	8.8
Carcass data:						
Average carcass wt., lbs.	693	633	619	619	607	598
Average dressing %	59.6	60.5	59.2	59.7	59.6	58.9
Average USDA grade <sup>2</sup>	15	14.7	14.9	14.3	14.4	13.9
Average yield grade <sup>3</sup>	3.75	3.4	3.2	3.6	3.4	3.5
Average marbling score <sup>4</sup>	7	7.4	7	7.1	7.6	8.1
Average rib eye, sq. in.	11.12	11.35	11.14	11.39	10.63	10.49

1. Feed prices can be found on inside back cover.

2. Average grade determined as follows: High choice, 18; average choice, 17; low choice, 16; high good, 15, etc.

3. Score from 1 to 6 on basis of yield, with 1 being the highest yield in closely trimmed boneless retail cuts.

4. Average marbling determined as follows: Moderately abundant, 3; slightly abundant, 4; modest amount, 5; small amount, 6; slight amount, 8.

The Value of Dicalcium Phosphate, Vitamin A and Grinding Corn for Calves Fed Prairie Hay, 1963-64 (Projects 253-4-6).

E. F. Smith, D. Richardson, R. G. Curtis, and L. Dunn

The 60 good-to-choice grade Hereford calves used in this test came from near Fort Davis, Texas. They were assigned 10 to a lot on the basis of weight. All lots received all the prairie hay they would consume, about four pounds of corn each daily, and 1.25 pounds of soybean meal; where vitamin A (15,000 I.U. daily) and dicalcium phosphate (0.1 pound per head daily) were fed they were mixed with the soybean meal. In the lots fed ground corn it was ground medium coarse or between fine and coarse ground; the modulus of fineness was 4.34.

The phosphorus and carotene content of the feeds used is reported in the table on the inside back cover. The phosphorus intake of the basic ration without dicalcium phosphate was 11.3 grams daily per head and the carotene intake on the basic ration without vitamin A added was 80 mgs. of carotene from the prairie hay alone; these values exceed requirements published by the National Research Council.

The average daily gain for the three lots fed ground corn was 1.58 pounds; those fed whole corn gained 1.54 pounds; neither dicalcium phosphate nor vitamin A and dicalcium phosphate combined improved performance.

Table 43  
The value of dicalcium phosphate, vitamin A, and grinding corn for calves fed prairie hay, November 27, 1963, to March 27, 1964—121 days.

Treatment	Ground grain	Whole grain	Ground grain + phosphorus	Whole grain + phosphorus	Ground grain + phosphorus + vitamin A	Whole grain + phosphorus + vitamin A
Lot no.	18	19	20	21	22	23
Heifers per lot	10	10	10	10	10	10
Initial wt., lbs.	369	365	368	362	361	364
Daily gain, lbs.	1.65	1.56	1.60	1.62	1.49	1.46
Daily ration per heifer, lbs.:						
Corn	3.88	3.88	3.88	3.88	3.88	3.88
Soybean meal	1.25	1.25	1.25	1.25	1.25	1.25
Prairie hay	9.10	9.03	9.36	9.14	9.32	9.20
Dicalcium phosphate			0.10	0.10	0.10	0.10
Vitamin A, 15,000 I.U. daily					Yes	Yes
Salt				Free choice		
Feed per lb. of gain, lbs.:						
Corn	2.35	2.49	2.43	2.40	2.60	2.66
Soybean meal	0.76	0.80	0.78	0.77	0.84	0.86
Prairie hay	5.52	5.79	5.85	5.64	6.26	6.30
Total feed per lb. of gain	8.63	9.08	9.16	8.91	11.05	11.17
Feed cost per lb. of gain <sup>1</sup>	\$0.1371	\$0.1420	\$0.1465	\$0.1411	\$0.1582	\$0.1581

1. Feed prices may be found on page 78.