

REPORT OF TRIALS USING INJECTIBLE VITAMINS ON STEER CALVES AND ON COWS

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The use of injectible vitamins has been suggested as a means of increasing the rate of gain of steer calves, and improving the calving performance of beef cows in western North Dakota.

Trials with steer calves at the Dickinson Experiment Station show that with this class of livestock, vitamin A needs are met fully by feeding good quality, high roughage rations.

Results of previous work at Dickinson by Klosterman (1) and others show that with the high quality roughage feeds normally available in southwestern North Dakota a shortage of vitamin A is unlikely even for breeding cows. However, in the rations fed to breeding cows in these trials, 10,000 International Units of vitamin A were included in the ration, beginning about February 1 each year. The small cost of ten cents or less per head for three months for 10,000 I.U. of vitamin A is considered cheap insurance because there are occasional cases where calves are lost because of vitamin A deficiency.

TRIALS USING INJECTIBLE VITAMINS ON STEER CALVES

Rate of gain of steer calves fed a high roughage ration was not increased by the use of injectible vitamins.

(1) Klosterman, Earle W., Bolin, D. W., and Ford, Kenneth D., **Vitamin A Studies With Beef Cattle**, Bimonthly Bulletin, Volume XI, No. 1, Sept.-Oct., 1948, North Dakota Agricultural Experiment Station, Fargo, North Dakota. (p. 115)

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In this trial 400 pound steers were allotted randomly into four groups and fed an average of 328 days. Every 28 days each steer in one lot was injected with one cc. of a vitamin solution containing 722,000 International Units of vitamin A and 62,000 I.U. of vitamin D. Calves in the second lot were injected on a 56 day interval with the same dosage used in lot one. A third lot was injected with 70,000 I.U. of vitamin D every 28 days. No injectible vitamins were used in the check lot.

For the entire feeding period the daily ration averaged 5 pounds barley, 1½ pounds alfalfa hay, 0.2 pound mineral mixture and silage free choice.

A summary of the results of this trial are shown in Table 1.

Table 1. Two Year Average Weights and Gains, Grade and Dressing Per Cent of Feed Lot Steers Receiving Injectable Vitamins Compared with Steers Receiving No Injectable Vitamins.

Treatment	Initial weight	Final weight	Total gain	Average ² daily gain	Average grade	Average dressing %
Check-no injectible vitamins	394	1025	631	1.93	Choice	56.6
Vitamin A and D every 56 days	394	1060	666	2.03	Choice	56.1
Vitamin D every 28 days ¹	370	956	586	1.75	High Good	56.5
Vitamin A and D every 28 days ¹	364	1006	642	1.92	High Good	56.6

¹On the basis of the first year's results the injections of A and D and D alone every 28 days were eliminated.

²Differences not statistically significant.

In a second trial started in 1965, four lots of yearling steers were fed a basic ration of 6 pounds rolled barley, 0.2 pound mineral mixture and all the corn silage they would eat.

The check lot was fed the base ration only. One lot was supplemented with 1 pound of alfalfa hay, one lot was supplemented with 1 pound alfalfa hay and 1 pound soybean oilmeal, and one lot received 1 pound alfalfa hay and 1 pound mixed supplement. The mixed supplement consisted of 25 per cent alfalfa meal, 12 per cent dehydrated alfalfa meal, 8 per cent trace mineral salt, 10 per cent wheat bran, 12 per cent di-calcium phosphate, 4 per cent limestone and 26 per cent soybean oil meal. Ten thousand units of vitamin A and 1000 units of vitamin D were added per pound of supplement.

Vitamin injections were given every 56 days to half the steers in each lot. The 2 cc injection contained 1,000,000 I.U. of vitamin A, 150,000 I.U. of vitamin D and 100 I.U. vitamin E.

Rates of gain for this trial are summarized in Table 2. Differences in rate of gain were not statistically significant.

Table 2. Rate of Gain for Yearling Steers Injected with Vitamins.

Treatments	Check	Alfalfa only	Alfalfa & mixed supplement	Alfalfa & soybean oil meal
No vitamin injection	1.72	1.82	1.62	1.99
Vitamin injection	1.64	1.70	1.76	1.80

Summary

Injecting vitamins A, D and E on either a 28 day or a 56 day interval did not improve the rate of gain of either calves or yearlings that were being fed a high roughage ration.

When a high roughage ration is fed, the use of additional vitamins increased costs without increasing net returns.

TRIALS USING INJECTIBLE VITAMINS ON COWS

The injection of a high level vitamin solution failed to improve cow weight gains or calving performance when the cows were fed a nutritionally adequate ration fortified with vitamin A at 10,000 International Units per head per day.

Each year for four winters, starting in 1963, approximately 100 cows were used to evaluate vitamin injections. The first two winters, all the cows were fed 22 pounds of crested wheatgrass hay per head per day during the month of Decem-

ber. From January 1 until they were turned on grass, the cows were fed 12 pounds of crested wheatgrass hay and 22.5 pounds of corn silage. Starting about February 1 each year, all cows were supplemented with 2 pounds of rolled barley and 10,000 I.U. of vitamin A per head per day.

The last two years' of this trial, half the cows were fed a ration of 20 pounds crested wheatgrass hay for the entire wintering period, from December 1 through the middle of March. During the same period, the other half of the cows were fed 7 pounds crested wheatgrass hay, 1 pound 44 per cent soybean oil meal and wheat straw free choice. In all four years, after the middle of March, all cows were fed the same ration. This was either a full feed of tame hay or a combination of hay and silage. Both the hay ration and the hay-straw ration were supplemented with 2 pounds dry rolled barley and 10,000 I.U. vitamin A per head per day starting on February 1.

Cows had access to minerals free choice in all lots.

During the four years, 198 head were injected with 2 cc. of a vitamin solution containing 500,000 I.U. of vitamin A, 75,000 I.U. vitamin D, and 50 I.U. of vitamin E per cc. on February 26, about a month before calving. There were 205 cows in the control group that were not injected with the vitamin solution.

The four year results are summarized in Table 3.

Table 3. Four Years' Results of Injecting Beef Cows with Vitamins.

	No vitamin injection ¹	Vitamin injection ¹
Number of cows	205	198
Avg. February cow weight	1054	1049
Avg. October cow weight	1104	1103
Avg. lbs. gain per cow	50	54
No. of calves born	193	197
No. of dead calves	5	14
Avg. birth weight	70	71
Avg. weaning weight	365	367
Avg. lbs. gain per calf	295	296

¹No statistically significant differences.

Summary

With the rations fed, there was no significant difference in the weight change of the cows, the number of calves lost, the birth weight of weaning weights of the calves between cows receiving the vitamin A injection and those not injected.

Four year results show no observable effects of giving beef cows a vitamin injection in addition to feeding them 10,000 I.U. of vitamin A per day starting approximately two months before calving.