Field-conditioned Alfalfa Hay As It Affects the Winter Performance of Weaned Heifer Calves, 1961-62 (Project 370).

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Through cooperative efforts of the Departments of Agronomy and Agricultural Engineering, fourth-cutting alfalfa hay was made available to winter-feed weaned heifer calves. The object of the experiment was to determine the effects of various field-conditioned alfalfa hays on the winter performance of heifer calves.

The following methods and/or conditioning machines were used on fourth-cutting alfalfa hay:

1. Control—mowed, raked, baled.
2. Crimped—mowed, crimped with corrugated steel rolls, raked, baled.
3. Crushed—mowed, crushed with one smooth steel roll and a spiral-grooved rubber roll, raked, baled.
4. Rotary Cut—a 12-foot trail behind twin-rotor rotary mower, which cut, lacerated, and windrowed the hay all in one operation, baled.
5. Swathed—a 12-foot self-propelled windrower with a crimper-crusher conditioning attachment, baled.

Fifty head of choice Hereford heifer calves from the Jeff Ranch, Ft. Davis, Texas, were used in this study. They were allotted, 10 head per lot, on the basis of quality and weight. Alfalfa hay was fed free choice to all lots of heifers. They were also fed 3.4 pounds of rolled sorghum grain per head per day. Salt was available to all lots.

Observations

The results of this experiment are reported in Table 8. Gains made by the heifers in lots 13, 14, 16, and 17 were not significantly different. However, gains made by heifers in lot 15 were significantly lower than in the other lots.

Although these data are from only one year's work and more experimental evidence is needed to draw positive conclusions, some observations can be made from the chemical analysis data presented in Table 9. These data were obtained by the Department of Agricultural Engineering from the five test-groups of alfalfa hay.

The lower protein content of crimped and crushed hay was apparently due to leaf-loss during raking, baling, and sampling. This characteristic was especially noticeable with crushed hay. Carotene loss was very rapid during the first 24 hours after mowing the hay. During this period approximately 40% of the initial carotene was lost and by the end of the winter feeding period (March 1, 1962) 70% of the carotene was lost. Although this is a considerable loss in carotene, the loss caused no apparent effect on average daily gains, under the conditions of this feeding trial. At the level of hay consumed, carotene intake still was over 10 times the recommended allowance.

Average daily gain was apparently affected more by level of protein than of carotene, with the higher protein hay producing the greatest average daily gain irrespective of carotene. Crude fiber appeared to affect gain. The greater the crude fiber, the less the gain.

Table 8

Winter performance of weaned heifer calves fed alfalfa hay field conditioned by various methods.

November 21, 1961, to March 1, 1962—98 days. (Progress Report.)

Lot no.	13	14	15	16	17
No. heifers per lot	10	10	10	10	10
Hay-conditioning method	Control	Crimped	Crushed	Rotary cut	Swathed crimped
Initial wt. per heifer, lbs.	393	401	396	397	395
Final wt. per heifer, lbs.	558	543	509	565	550
Av. gain per heifer, lbs.	165	142	113	168	155
Av. daily gain, lbs.	1.68	1.45	1.15[2]	1.71	1.58
Av. daily ration, lbs.:					
Alfalfa hay	13.18	11.02	11.36	12.62	12.27
Ground sorghum grain	3.39	3.39	3.39	3.39	3.39
Lbs. feed per cwt. gain:					
Alfalfa hay	784.52	760.00	987.83	738.01	776.58
Ground sorghum grain	201.79	233.79	294.78	198.25	214.56
Total feed required per cwt. gain, lbs.	986.31	999.79	1282.61	936.26	991.14
Feed cost per cwt. gain[1]	$10.69	$11.05	$14.20	$10.21	$10.85

1. Feed cost: Alfalfa hay, $18 per ton; ground sorghum grain, $1.80 per cwt.
2. Av. daily gain significantly lower than other gains.

Table 9

Chemical analysis of alfalfa hay.[1]

	Control	Crimped	Crushed	Rotary cut	Swathed crimped
Crude protein (NX6.25), %	15.96	13.06	12.73	18.41	19.33
Crude fiber, %	24.63	31.82	30.91	22.61	21.12
Carotene, mgs. per lb.	15.4	33.4	21.5	34.7	34.5

1. Average of 4 samples.

Diethylstilbestrol[1] Implant Plus Oral Chlortetracycline[2] vs. Oral Chlortetracycline Alone for Fattening Steers (Project 430).

M. M. McCartor,[3] B. A. Koch, E. F. Smith, D. Richardson and R. F. Cox

Experimental Procedure

Hereford steers used in this study were fed in outdoor dirt lots without shelter. Each steer in lot 23, described in a trace-mineral study reported elsewhere in this publication, received a 24-mg. implant of diethylstilbestrol on the first day of the feeding period. Steers in both lots received 70 mgs. of oral chlortetracycline each day during the feeding period.

The fattening ration included sorghum grain, soybean oil meal, and prairie hay. During the first 20 days each steer also received 10 pounds of sorghum silage per day. The sorghum grain fed was gradually increased until the steers went on self-feed. The soybean oil meal was spread over the grain each morning. Initially 10 pounds of prairie hay per head per day were fed. This was cut to 4 pounds per head per day after the cattle were on full feed. Each pound of soybean oil meal contained 70 mgs. of chlortetracycline (Aureomycin).

All animals had free-choice access to salt and to a mixture of salt and bonemeal. Water was always available from automatic waterers.

Shrink data were obtained under conditions outlined in the trace-mineral study reported elsewhere in this publication.

1. Stilbestrol implants were furnished by Chas. Pfizer & Co., Inc., Terre Haute, Ind.
2. Aureomycin (chlortetracycline) supplied by American Cyanamid Corp., Pearl River, N.Y.
3. Present address: Department of Animal Husbandry, Panhandle A & M College, Goodwell, Okla.

Observations

The steers that had been implanted gained significantly faster than those that had not been implanted.

The diethylstilbestrol implant apparently had no effect on shrink during shipping.

There were no significant differences in carcass characteristics measured.

Table 10

Diethylstilbestrol implants plus oral chlortetracycline vs. oral chlortetracycline alone for fattening steers.

March 17, 1961, to July 26, 1961—131 days.

Treatment	24-mg. implant plus oral chlortetracycline	Oral chlortetracycline
Lot no.	23	25
No. steers per lot	10	10
Av. initial wt., lbs.	846	814
Av. final wt., lbs.	1126	1043
Av. total gain, lbs.	280	229
Av. daily gain, lbs.	2.14	1.75
Standard error of mean	±0.09	±0.07
Av. daily ration, lbs.:		
Cracked sorghum grain	22.1	21.3
Soybean oil meal	1.0	1.0
Prairie hay	5.9	6.2
Sorghum silage	1.7	1.7
Av. feed per cwt. gain:		
Sorghum grain	1037	1217
Soybean oil meal	47	57
Prairie hay	277	354
Sorghum silage	78	97
Feed cost per cwt. gain[1]	$23.84	$28.29
Shrink data:		
Av. shrink June 2, 1961[2]		
Pounds	38.5	35.0
%	3.6	3.5
Av. shrink to market[3]		
Pounds	50.0	48.5
%	4.3	4.4
Av. overnight wt. change, lbs.[4]	+9.5	−10.5
Carcass data:		
Av. carcass wt., lbs.	682	634
Av. packer yield, %[5]	61.1	60.6
Av. U.S.D.A. grade[6]	10.9	11.2
Av. fat thickness, in.[7]	0.61	0.73
Av. rib eye, sq. in.[7]	11.71	11.16

1. Based on feed prices listed on page 2.

2. Cattle were individually weighed, loaded on trucks, hauled 60 miles, weighed off trucks, and returned to pens.

3. Cattle were individually weighed, loaded on trucks, hauled 125 miles to Kansas City, and individually weighed off trucks.

4. Cattle were fed and watered during overnight stand in Kansas City Stockyards.

5. Based on off-truck weight at Kansas City.

6. Average grade determined as follows: Low choice, 13; high good, 12; average good, 11; low good, 10; high standard, 9.

7. Measured at 12th rib.

Response of Fattening Steers to Oral or Injected Vitamin A, with Observations on Shrink (Project 430).

M. M. McCartor,[1] B. A. Koch, E. F. Smith, D. Richardson and R. F. Cox

Steers used in an antibiotic study and a trace mineral study reported elsewhere in this publication were also used in a study designed to further evaluate the use of supplemental vitamin A during the fattening period. The animals used showed no visual symptoms of vitamin A deficiency any time. However, the diets fed and the management practices followed were similar to those in studies at other stations where supplemental vitamin A was evaluated.

Experimental Procedure

May 5, 1961, 50 steers, five groups of 10 each, were randomly divided within lots. Three steers in each lot received an intramuscular injection of 250,000 I.U. of vitamin A palmitate in oil; three received a bolus containing 250,000 I.U. of vitamin A oil, and four served as controls. The vitamin A treatment was repeated each two weeks between May 5 and June 30, 1961. During that period each treatment animal received 1,250,000 I.U. of supplemental vitamin A. All cattle, including control animals, were driven down the chute and caught in the squeeze at each treatment time.

The cattle had been on a wintering ration of sorghum silage, alfalfa hay and soybean oil meal. During the fattening period they received a ration of ground sorghum grain, soybean oil meal and prairie hay. Forty of the steers used had been implanted with 24 mgs. of diethylstilbestrol per head March 17, 1961, and all 50 received 70 mgs. of chlortetracycline per head per day in their supplemental soybean oil meal. All the steers had been started on a fattening ration March 17, 1961.

Salt, either plain or trace-mineralized, and a mixture of salt and bonemeal were available at all times. Water was always available from automatic waterers.

This group of 50 steers was used also to collect data on shrink during movement of cattle.

June 2, 1961, the steers were individually weighed onto trucks and hauled 60 miles, then weighed off the trucks individually and returned to feeding pens. Climatic data follow: Minimum temperature, 63° F.; maximum temperature, 80° F.; average temperature, 72° F.; relative humidity, 100 at 6 a.m. and 88 at 2 p.m.; precipitation, 0.40 inch while the cattle were being moved; wind light from the east.

July 31, 1961, the steers were individually weighed onto trucks and hauled to Kansas City (125 miles) and individually weighed off the trucks at the stockyards. Climatic data follow: Minimum temperature, 73° F.; maximum temperature, 95° F.; average temperature, 84° F.; relative humidity, 100 at 6 a.m. and 68 at 2 p.m.; precipitation, 0; wind was moderate from the west.

Observations

Gain and carcass data are summarized in Table 11. Since control and treated steers were fed together, feed efficiency data could not be determined.

No real differences in average daily gain, carcass yield, carcass grade or carcass composition are indicated between control animals and those that received supplemental vitamin A. The supplemental vitamin A apparently had no effect on shrink of the animals during movement.

No visible differences in hair coat, joint stiffness, lacrimation, health of epithelial tissues or appetite were noted between treated and untreated animals in the same lot.

Under conditions of this test supplemental vitamin A apparently improved neither performance nor health of the cattle involved.

1. Present address: Department of Animal Husbandry, Panhandle A & M College, Goodwell, Oklahoma.