

The Use of Stilbestrol Implants for Steer Calves on a Wintering Ration.

PROJECT 253-6

G. L. Walker, E. F. Smith, R. F. Cox, D. Richardson, and B. A. Koch

This test was conducted to study the effect of stilbestrol implants on steer calves fed a wintering type ration. Its value as a growth stimulant in fattening-type rations has been extensively studied; however, little information is available on its use with calves fed high roughage rations.

Experimental Procedure

Twenty-seven steer calves, weighing approximately 399 pounds each, were divided into two lots of 9 and 18² animals. The lot with 18 animals served as a control and the other lot was implanted with 36 mg. of stilbestrol at the base of the right ear.

Sorghum silage was used as the roughage in both lots and the calves were fed all they would consume each day. The concentrate part of the ration consisted of 4 pounds of ground milo grain and 1 pound soybean oil meal pellets for each steer. A mineral mixture consisting of equal parts of bonemeal and salt and salt alone were fed free choice.

Observations

1. Undesirable side effects often noted as a result of stilbestrol implants such as high tailheads or increase in size of reproductive organs were not readily apparent.

2. Stilbestrol increased rate of gain .23 pound per day.

3. Feed efficiency was not increased by stilbestrol implants.

Table 16

The Use of Stilbestrol Implants for Steer Calves on Wintering-Type Rations.

November 30, 1955, to April 7, 1956—129 days.

Lot number	6	17
Number steers	9	18
Initial wt. per steer, lbs.	399	399
Final wt. per steer, lbs.	643	614
Gain per steer, lbs.	244	215
Daily gain per steer, lbs.	1.89	1.66
Daily ration per steer, lbs.:		
Ground milo grain	3.90	3.90
Soybean oil meal pellets	1	1
Sorghum silage	32.98	29.68
Mineral (bonemeal and salt)	.08	.03
Salt	.07	.04
Lbs. feed required per 100 lbs. gain:		
Ground milo grain	206	236
Soybean oil meal pellets	52.86	60.43
Sorghum silage	1744	1795
Mineral (bonemeal and salt)	4.73	2.21
Salt	4.18	2.75
Feed cost per 100 lbs. gain, \$	12.56	13.53

Winter Management for Steer Calves on a Wintering, Grazing, and Fattening Program, 1955-56.

PROJECT 253-6

E. F. Smith, B. A. Koch, R. F. Cox, and G. L. Walker

Dry bluestem pasture has been used successfully several years at this station as a source of winter roughage for steer calves that are

1. Supplied by Wick and Fry, Inc., Cumberland, Ind.

2. Eighteen animals were placed in one lot because it was to be divided into two lots at a later date for other experimental work.

to be grazed during the summer and sold off grass as feeder or stocker yearlings. This is the first attempt to supplement dry grass during the winter with several pounds of grain combined with protein, in an effort to attain sufficient winter gain so the calves could be finished on grain in the late summer and sold as fat yearlings. The test is to determine if dry grass can be supplemented in such a manner that calves will compare favorably in total performance with steer calves wintered on good-quality roughages.

The steers will be grazed until August 1 on bluestem pasture, then fattened in dry lot to choice grade.

Experimental Procedure

Seventeen head of good-quality Hereford steer calves purchased from the Williams Ranches near Lovington, N. M., were assigned to the test. The calves were allotted to their respective treatments on the basis of weight and quality. Eight calves were assigned to the pasture group and nine to the dry-lot group. Nine other calves on a similar treatment were wintered with the dry-lot group.

The treatment assigned to each lot in this experiment is as follows:

Lot 18—Wintered in dry lot on sorghum silage, 4 pounds of ground milo, and 1 pound of soybean pellets per head daily, free access to salt and mineral (bonemeal plus salt); grazed on bluestem from May 1 to August 1, fattened in dry lot from August 1 until they grade choice.

Lot 15—Wintered on dry bluestem pasture, 4 pounds of milo, and 1 pound of soybean pellets per head daily; continued on grass from May 1 to August 1 without supplemental feed; fattened in dry lot from August 1 until they grade choice.

Observations

Since the results of the test will be measured primarily by the yearly performance of the steers, this report is intended only as a progress report on the wintering phase. The steers wintered in dry lot (18) have made a much larger gain at a lower cost per cwt. than the steers in Lot 15 wintered on dry bluestem pasture.

Table 17

Winter Management for Steer Calves on a Wintering, Grazing, and Fattening Program, Progress Report for 1955-56.

November 30, 1955, to April 7, 1956—129 days.

Lot number	18	15
Number steers	9 ¹	8
Place of wintering	Dry lot	Bluestem pasture
Initial wt. per steer, lbs.	391	379
Final wt. per steer, lbs.	622	501
Gain per steer, lbs.	231	118
Daily gain per steer, lbs.	1.79	.92
Daily ration per steer, lbs.:		
Ground milo grain	3.9	3.6
Soybean oil meal pellets	1	1
Sorghum silage	29.7	
Prairie and alfalfa hay ²		.57
Dry bluestem pasture		
Salt	.04	.05
Mineral (bonemeal and salt)	.03	.04
Feed cost per steer, ³ \$	29.05	19.56
Feed cost per 100 lbs. gain, ³ \$	12.58	16.58

1. Nine other calves on a similar treatment were wintered with the dry-lot group, making a total of 18 head for the winter.

2. Prairie or alfalfa hay was fed to Lot 15 when snow covered the grass.

3. Feed prices may be found inside the back cover.

Trace Minerals¹ in a Calf Wintering Ration and a Yearling Fattening Ration, 1954-55. Three-Year Summary, 1951-52, 1952-53, 1954-55.

PROJECT 253-G

E. F. Smith, F. H. Baker, R. F. Cox, and G. L. Walker

This test was to study the value of adding trace minerals (copper, cobalt, iron, manganese, iodine, and zinc) to a wintering type ration and a fattening ration. This report includes the results for the third year of the test and a summary of the three years' work. Previous work is reported in greater detail in Circulars 297 and 308.

Experimental Procedure

Each year 10 steer calves were assigned to each treatment. In 1954-55 eight steers in each lot came from the Lonker ranch near Medicine Lodge, Kan., the other two from the Currie ranch near Westmoreland, Kan.

The system of management followed with each lot each year was as follows: wintered on sorghum silage and prairie hay (no prairie hay was fed in 1954-55) and 4 to 5 pounds of grain and 1 pound of a 41 percent protein concentrate per head daily, free access to mineral (bonemeal and salt) and salt; from about May 1 to August 1 they were grazed on bluestem pasture, then self-fed grain in dry lot from August 1 until they graded good to choice.

Both lots were handled identically except that one lot received trace minerals during the winter and in the dry-lot fattening ration.

The first year, 1951-52, the trace minerals were supplied free choice as a trace mineralized salt during the winter and during the fattening period.

The trace mineral salt contained the following minerals: Manganese carbonate, 0.400 percent; iron oxide, 0.250 percent; copper carbonate, 0.060 percent; sodium thiosulphate, 0.100 percent; sodium carbonate, 0.100 percent; cobalt carbonate, 0.022 percent; potassium iodide, 0.010 percent; sodium chloride, 99.058 percent.

The second and third years the trace minerals were fed as a trace mineral premix added to the soybean oilmeal to furnish the following amounts in milligrams per head daily in the wintering and fattening rations, respectively: manganese 25.0, 56.3; iodine 0.87, 1.97; cobalt 0.55, 1.25; iron 20.5, 46.13; copper 1.62, 3.65; zinc 1.52, 3.42.

Observations

During the 1954-55 test, as shown in Table 18, the addition of trace minerals appeared to have no significant effect on the performance of the steers on either the wintering or fattening ration. Due largely to an unexplained difference in shrink to market, the trace mineral-fed steers showed a larger return above initial cost plus feed cost. In the tests reported here the only time the addition of trace minerals appeared to affect the response of the steers to any great degree was in the fattening phase in 1953 when the gains were increased .58 pound per head daily. Since this did not occur in the other two years, additional research is needed. Perhaps the source of the steers or the particular feeds used that year were responsible for the differences observed. It may be worth noting that corn was the grain fed in the fattening ration in 1953 when the gain was increased by trace minerals. In the other two years when no response was received from the addition of trace minerals, milo grain was fed (see Table 18).

1. The trace mineral premix used in the test was supplied by the Calcium Carbonate Co., Chicago, Ill.

Table 18

Trace Minerals in Steer Calf Wintering Rations and Yearling Fattening Rations, 1954-55.

Phase 1, Wintering, November 16, 1954, to May 3, 1955—168 days.

Lot number	15	9
Management	Standard ration	Standard ration plus trace mineral
Number of steers per lot	10	10
Initial wt. per steer, lbs.	456	456
Final wt. per steer, lbs.	760	769
Gain per steer, lbs.	304	313
Daily gain per steer, lbs.	1.81	1.86
Lbs. daily ration per steer:		
Soybean meal	1.00	1.00
Milo	4.00	4.00
Sorghum silage	30.58	30.46
Salt	.10	.09
Bonemeal and salt	.09	.10
Trace minerals	No	Yes
Feed cost per cwt. gain	\$12.70	\$12.28
Feed cost per steer	\$38.61	\$38.54

Phase 2, Grazing, May 3 to August 1, 1955—90 days.

Initial wt. per steer, lbs.	760	769
Final wt. per steer, lbs.	845	854
Gain per steer, lbs.	85	85
Daily gain per steer, lbs.	.94	.94

Phase 3, Full Feeding, August 1 to November 12, 1955—104 days.

Management	Self-fed grain in dry lot	Self-fed grain in dry lot plus trace minerals
Initial wt. per steer, lbs.	845	854
Final wt. per steer, lbs.	1103	1119
Gain per steer, lbs.	258	265
Daily gain per steer, lbs.	2.48	2.55
Daily ration per steer, lbs.:		
Soybean meal	1.51	1.51
Milo	19.73	19.20
Prairie hay	6.60	6.65
Salt	.01	.01
Ground limestone	.10	.10
Trace minerals	No	Yes
Feed per cwt. gain, lbs.:		
Soybean meal	60.89	59.28
Milo	795.31	753.39
Prairie hay	266.27	261.16
Salt	.46	.45
Ground limestone	3.91	3.81
Cost of feed per cwt. gain	\$23.53	\$22.42
Total feed cost this phase	60.67	59.42

Summary of Phases 1, 2, and 3, November 16, 1954, to November 12, 1955—362 days.

Total gain per steer (all phases), lbs.	647	663
Daily gain per steer (all phases), lbs.	1.79	1.83
Feed cost per cwt. gain (all phases)	\$17.83	\$17.26
Total feed cost per steer	115.28	113.96
Initial steer cost at \$22.50 cwt.	102.60	102.60
Feed cost plus steer cost	217.88	216.56
Selling price per cwt. at market	20.00	20.00

Table 18 (Continued).

Selling price per steer ¹	211.50	219.70
Return or loss per steer, above initial cost and feed cost	-6.98	3.14
% shrink in shipping to market	4.08	1.79
Dressing percentage (chilled)	60.5	60.6
Carcass grades:		
Choice		1
Choice -	1	
Good +	3	4
Good	3	4
Good -	3	1
Marbling:		
Moderate	3	1
Modest		5
Small amount	5	3
Slight amount	2	1

1. Based on market weights.

2. See inside back cover for feed prices.

Table 19

Three-year Summary. The Value of Trace Minerals in a Calf Wintering Ration and a Yearling Fattening Ration, 1951-52, 1952-53, 1954-55.

Management	Standard ration		Standard ration plus trace minerals	
Wintering phase:				
Year	51-52	52-53	54-55	Av.
Daily gain per steer, lbs.	1.26	2.09	1.81	1.72
Daily winter ration per steer, lbs.:				
Ground milo	5.3	4.0		5.3
Ground corn		5.1		4.8
Soybean pellets		1.0	1.0	1.0
Cottonseed pellets	1.0			1.0
Sorghum silage	20.3	19.2	30.6	23.4
Prairie hay .....	.2	2.2		.2
Mineral .....	.1	.1	.1	.1
Salt .....	.11	.05	.10	.08
Trace mineral salt .....				.08
Fattening phase:				
Year	1952	1953	1955	Av.
Daily gain per steer, lbs.	2.65	2.44	2.48	2.52

Table 19 (Continued).

Daily fattening ration per steer, lbs.									
Ground milo	19.3	19.7	17.7	19.0	15.9	19.2	18.0		
Ground corn		14.1							
Cottonseed pellets	2.0		1.6	2.0					
Soybean pellets		1.4	1.5		1.5	1.5	1.7		
Prairie hay	5.9	4.9	5.8	5.9	4.6	6.7	5.7		
Ground limestone .....	.1	.1	.1	.1	.1	.1	.1		
Salt .....	.02	.09	.01		.08	.01	.04		
Trace mineral salt .....				.02					
Lbs. feed required per cwt. gain:									
Ground milo	727	795	700	732	525	753	670		
Ground corn		577							
Cottonseed pellets	75		65	77			62		
Soybean pellets		59	61		48	59			
Prairie hay	223	167	266	227	153	261	214		
Ground limestone	4	4	4	4	3	4	4		
Salt	1	4	1	1	3	1	2		
Average carcass grade ²	13.0	11.2	11.2	11.8	12.3	11.6	11.9		

1. Mineral was 2 parts bonemeal and 1 part salt; salt was fed free choice.
2. The following numbers were assigned to the USDA grades: High choice, 15; av. choice, 14; low choice, 13; high good, 12; v. good, 11; low good, 10.

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Self-Feeding Grain to Yearling Steers on Bluestem Pasture Compared to Self-Feeding Grain in Dry Lot During the Late Summer of 1955, with a Three-Year Summary, 1952, 1953, 1955.

PROJECT 253-0

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Producers following the deferred full-feeding plan sometimes prefer to leave steers on grass from August to November and fatten them there with grain instead of moving them to dry lot for grain full feeding. The steers used in this test were handled on the deferred full-feeding program. Hand feeding of grain on grass after mid-summer compared with dry-lot feeding had been studied previously at this station with heifers. Generally, the heifers fed on grass gained less and graded slightly lower than those fed in dry lot. The purpose of this study was to compare the self-feeding of grain to yearling steers on bluestem pasture with self-feeding grain in dry lot, starting about August 1 and feeding until the cattle graded good to choice.

Experimental Procedure

Twenty good-to-choice Hereford steer calves were used in each test. They were assigned to lots in the fall. Both lots were wintered identically on sorghum silage, 4 pounds of grain, and 1 pound of 41 percent protein concentrate per head daily, free access to mineral (bonemeal and salt) and salt. The two lots were grazed together until August 1. On this date, one lot was moved to dry lot and self-fed grain. The other remained on bluestem pasture and was self-fed grain there.

Observations

In the 1955 tests, the steers self-fed in dry lot were superior in daily gain, grain consumption efficiency, and selling price, and they had slightly higher grading carcasses than the steers self-fed on grass.

Because of lower grain consumption on grass, steers on grass received less protein concentrate, since the protein was fed mixed with the grain in the same ratio for each lot. Equal quantities of protein concentrate should have been fed to each lot.

The steers under each treatment performed somewhat similarly up to the 1955 test except that the steers self-fed on grass tended to sell lower on the market but were consistent in producing beef at a lower cost. Since the results in the third test were so different in many respects from those in the first two tests, a fourth trial will be conducted to reach more definite conclusions.

Each year, the steers self-fed on grass had the lowest cost per 100 pounds gain, although they sold on an average for \$1 per hundred less and tended to grade slightly lower (see Table 21). Detailed reports on previous tests may be found in Circulars 297 and 308.

Table 20

Self-Feeding Grain to Yearling Steers on Bluestem Pasture Compared with Self-Feeding Grain in Dry Lot.

August 1, 1955, to November 12, 1955—104 days.

Management	Self-fed grain in dry lot	Self-fed grain on bluestem pasture
Initial wt. per steer, lbs.	845	860
Final wt. per steer, lbs.	1103	1057
Gain per steer, lbs.	258	197
Daily gain per steer, lbs.	2.48	1.89
Daily ration per steer, lbs.:		
Soybean meal	1.51	1.21
Ground milo grain	19.73	14.39
Prairie hay	6.60	
Bluestem pasture		Free choice
Salt01	Free choice
Ground limestone10	.07

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Table 20 (Continued).

Feed per cwt. lbs. of gain, lbs.:		
Soybean meal	60.9	63.8
Ground milo grain	795.3	759.6
Prairie hay	266.3	
Bluestem pasture		Free choice
Salt .....	.5	Free choice
Ground limestone	3.9	3.8
Total feed cost, ¹ \$	60.67	42.77
Cost of feed per cwt. lbs. gain, ¹ \$	23.51	21.71
Selling price per cwt., \$	20.00	18.00
% wt. shrink in shipping to market	4.12	1.41
Dressing %, based on chilled carcass wt.	60.5	61.5
Carcass grades, number of steers grading:		
Low choice	1	
High good	3	
Av. good	3	7
Low good	3	3
Marbling:		
Moderate	3	
Modest	5	2
Small amount	2	5
Slight amount		3

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

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Table 21

Three-Year Summary of Self-Feeding Grain to Yearling Steers on Bluestem Pasture Compared with Self-Feeding Grain in Dry Lot.

August 1, 1952, to December 6, 1952—127 days.

July 31, 1953, to November 7, 1953—99 days.

August 1, 1955, to November 12, 1955—104 days.

Management	Self-fed grain in dry lot					Self-fed grain on pasture				
Year	1952	1953	1955	Average		1952	1953	1955	Average	
Daily gain, lbs.	2.65	2.44	2.48	2.52		2.65	2.45	1.89	2.33	
Lbs. daily ration:										
Ground milo	19.3		19.7	17.7		19.3		14.4	15.8	
Ground corn		14.1					13.7			
Cottonseed pellets	2.0									
Soybean pellets		1.4	1.5	1.6		1.7	1.4	1.21	1.4	
Prairie hay	5.9	4.9	6.6	5.8						
Ground limestone .....	.1	.1	.1	.1		.1	.1	.1	.1	
Salt .....	.02	.1	.01	.04		.02				
Cost of feed per 100 lbs. gain, \$	25.96	21.23	23.51	23.57						Free choice
Sale price per cwt., \$	27.50	22.00	20.00	23.17		26.50	22.00	18.00	22.17	
Carcass grade, score ¹	13.0	11.1	11.2	11.8		12.5	11.0	10.7	11.4	

1. The following numbers were assigned the carcass grades: High choice, 15; av. choice, 14; low choice, 13; high good, 12; av. good, 11; low good, 10; high commercial, 9.

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PROJECT 430

B. A. Koch, E. F. Smith, D. Richardson, R. F. Cox, and A. Ordoveza

There has long been evidence that forages produced on different types of soil in the same general area give significantly different results when fed to animals. Further information is needed on the composition and nutritive value of forages grown on soils differing in origin, fertility, and other characteristics.

This is a progress report of the wintering phase of the first trial in this study. The study has been designed to measure differences in the results obtained when cattle are grazed on forages growing on limestone or sandstone soils.

Experimental Procedure

Thirty-nine choice Hereford heifer calves purchased from the Williams Ranches in Lovington, N. M., were used in this study. The heifers were spayed before the start of the study to eliminate the possibility of their being bred during the trial. They were then divided into two lots of approximately the same average weight. Twenty of the heifers were wintered on a native sandstone pasture and 19 were wintered on a native limestone pasture. The predominant species in both pastures was bluestem grass. The pastures were located within eight miles of each other in Ellsworth county. Both lots of heifers received 1½ pounds of cottonseed cake daily as protein supplement throughout the winter period. Soil, water, and forage samples were collected during the period for detailed chemical studies. At the end of the winter period the heifers were weighed. Blood samples were also taken from a representative number of each group for chemical analysis.

The cattle will be continued on the two different treatments until they reach market weight. Further observations and blood studies will be made at regular intervals as the trial progresses.

Observations

Both lots of heifers appeared to be in excellent condition at the end of the winter period.

Those on the sandstone pasture gained an average of only 6 pounds during the period, while those on the limestone pasture made an average gain of 63 pounds.

These differences in gain cannot be fully explained at this time.

Complete results of the various chemical studies are not yet available.

Further information will be summarized in future reports.

Ratio of Roughage to Concentrate for Fattening Heifers, 1955

PROJECT 222

D. Richardson, F. H. Baker, E. F. Smith, and R. F. Cox

This is the fourth test in an experiment planned to secure information on the effects of different levels of roughage on average daily gain, feed required per unit of gain, and carcass quality. Since Kansas normally produces a large amount of roughage, it is desirable to have information concerning the maximum amount of roughage that can be used in fattening rations which will permit maximum and economical gains and, at the same time, produce a desirable carcass.

Experimental Procedure

Fifty Hereford heifers were divided into five lots as equally as possible on the basis of weight, size, conformation, and previous treatment. The heifers were wintered, 10 per lot, as calves on the following rations: (1) Alfalfa hay and 4 pounds milo grain; (2) Atlas sorghum silage, 2 pounds milo grain, and 1 pound soybean oil meal; (3) Atlas sorghum

grain, and 1 pound soybean oil meal; (5) corn cobs, 2.5 pounds milo grain, and 1.5 pounds soybean oil meal. A mineral supplement of steamed bonemeal and salt was available at all times. Two heifers from each lot on the above wintering rations were allotted to each of the five lots in this experiment. That gave a total of 10 animals per lot. All animals had gained well during the winter and were fairly fleshy at the beginning of this test.

The feeds used were good-quality chopped alfalfa hay and coarsely cracked milo grain and corn. One lot of animals received corn so that a comparison of milo grain and corn could be made. The hay and grain were mixed in a self-feeder and kept before the animals all the time. Water, salt, and ground limestone were also provided free choice at all times.

All animals were started on a ration of equal parts of hay and grain. The grain was increased until each lot was on the ration indicated as follows:

- Lot 1—1 pound of alfalfa hay to 1 pound milo grain
- Lot 2—1 pound of alfalfa hay to 3 pounds corn
- Lot 3—1 pound of alfalfa hay to 3 pounds milo grain
- Lot 4—1 pound of alfalfa hay to 5 pounds milo grain
- Lot 5—Changing ratio, started at 1 pound alfalfa hay to 1 pound milo grain. Each succeeding 28 days the grain was increased until the ratio was 1 pound hay to 5 pounds grain at the end of the test.

Results and Discussion

Table 22 gives a summary of the results obtained in the feed-lot test. The weather was very hot; however, the rates of gain in all lots were very satisfactory. Lot 1 animals on equal parts of hay and grain made better gains and graded higher than on any of the previous tests. Lot 3 contained one animal that was a chronic bloater and another that bloated occasionally. This affected the rate of gain for the lot. Taking this into consideration, there was practically no difference in rate of gain and carcass quality in lots 2, 3, and 4. The gains in lot 5 were just as good; however, the carcasses did not grade quite so high as those of lots 2, 3, and 4. The results of this test agree with those of previous tests in that 1 part hay to 3 parts concentrate or 25 percent roughage gives just as good results as rations containing a greater concentration of grain.

Table 23 gives the average daily gains of animals based upon their wintering ration.

Table 22
Ratio of Roughage to Concentrates for Fattening Heifers.
May 17 to September 19, 1955—125 days.

Lot number	1	2	3	4	5
Ratio of roughage to concentrate	1 hay 1 milo	1 hay 3 corn	1 hay 3 milo	1 hay 5 milo	changing ratio
Number heifers per lot	9	10	10	10	10
Av. initial wt., lbs.	711	702	712	704	705
Av. gain per heifer, lbs.	276	295	275	290	290
Av. daily gain per heifer, lbs.	2.21	2.36	2.20	2.32	2.32
Total feed per head, lbs.:					
Milo grain	1665.5		2097.9	2289.0	2158.5
Corn		1891.4			
Alfalfa hay	1665.5	658.8	734.3	522.8	1018.7
Av. daily feed per head, lbs.:					
Milo grain	13.32		16.78	18.31	17.27
Corn		15.13			
Alfalfa hay	13.32	5.27	5.87	4.18	8.15