losses were intermediate in the other three lots. The losses were 369, 383, and 371 lbs. for Lots 3, 4, and 5 respectively. The loss in Lot 2 was 31.5 percent of the original weight. The losses in the other lots were within the range of 35.5 to 37.5 percent. These weight changes would indicate that the most satisfactory lot of cattle was those fed 3 lbs. of pelleted cottonseed meal. However, all losses seem excessive and whether or not such losses will affect the production of the cow will be measured as the test is continued. These cows will be examined for pregnancy during the summer and the test will be continued next year.

The average birth date was earlier in all lots during the second calving season. The number of days earlier varied from 11 to 40. These extremes were in Lots 1 and 2, respectively. The average birth weight of all calves was nearly the same; however, the weight in Lot 5 was slightly lower. These weights were corrected for sex by the addition of 3 lbs. to the weight of each heifer calf.

The average weights of all lots of calves was quite low on April 1. No corrections for age and sex have been made in these averages. The calves in Lot 2 (fed 3 lbs. pelleted cottonseed meal) are the heaviest. The lightest calves are in Lot 1. Final weights of these calves will be taken at time of weaning in late July.

Preliminary results of the 1956-57 season indicate that 3 lbs. of pelleted cottonseed meal was the most satisfactory supplement fed in our tests when winter weight changes of the cow and weight of the calves were used as measures.

Effect of Certain Hormones and Feed Additives on the Performance of Steer Calves

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Due to the high costs of cattle and feed, and low returns for finished beef, attempts have been made to increase profits by the use of hormones and complex protein supplements in the fattening ration. Many commercial feeds for fattening cattle are now fortified with stilbestrol (a hormone-like drug), antibiotics, and complex vitamin and mineral additives. Combinations of certain hormone-like drugs may soon appear on the market. These additives invariably increase the cost of the supplement, and therefore the cost per cwt. gain unless additional performance is obtained from their use. Many of the feed additives now used in complex supplements have not been tested under proper experimental conditions.

Recently, stilbestrol implants for beef cattle have become available. Questions have been raised as to their effect on young calves

Table 1.—Chemical composition of feeds. (percent as fed)

Feed	Moisture	Ash	Crude Protein	Fat	Crude Fiber	N-Free Extract	Ca	P
Sorghum Silage	70.10	2.15	3.21	.82	8.18	15.54	.16	.05
Dehydrated alfalfa meal pellets	5.30	9.31	18.06	2.87	27.74	36.72	1.43	.25
Cottonseed meal[1]	6.02	5.85	43.00	5.73	13.42	25.98	.19	1.12
Cottonseed Meal + Stilbestrol[2]	6.60	6.35	41.97	3.21	14.40	27.47	.26	1.17
Special mixture[3]	5.59	16.60	22.25	2.19	6.79	46.58	5.32	.40
Milo	10.89	2.61	10.75	3.05	1.97	70.73	.07	.26

[1] Fed to Lots 1 and 2.
[2] Fed to all other lots. Stilbestrol added to supply 10 mg. per steer daily.
[3] Special mixture fed Lot 7 supplied, per steer daily: 0.40 lbs. dried molasses. 0.40 lbs. condensed fish solubles, 0.11 lbs. calcium carbonate, 2 gm. dry stabilized vitamin A (20,000 U.S.P. units), 1 gm. commercial trace mineral mix, 75 mg. aureomycin in the crude product (Aurofac). Cost = $108.40 per ton.

as well as older stocker cattle. Little research has been done on the effect of low level stilbestrol implants on the weaning weights of suckling calves.

As in many other phases of beef production, the use of stilbestrol implants in the production of feeder cattle should be viewed in its broad aspects. Increased gain from implanting as suckling calves or older stockers may not be desirable from an over-all standpoint if subsequent feedlot gain or carcass grade is lowered. Thus the role of hormone implants in the complete management program should be investigated.

This study is the first experiment in a new project designed to test the value of (a) stilbestrol implants for young suckling calves, and their possible effect on subsequent feedlot performance and (b) the effect of a thyroid depressor, complex protein supplement, and a high protein intake on fattening calves receiving stilbestrol in the ration.

Procedures

Part I. In one phase of this study, 10 Hereford steer calves were selected from the Lake Blackwell experimental herd and 14 calves from the Fort Reno herd at approximately 3½ months of age. Within each group, they were divided into 2 lots on the basis of age and weight; within the Ft. Reno group, information on sire and dam productivity were taken into consideration in allotment. To the calves of one lot, a 15 mg. stilbestrol pellet was implanted at the base of the ear, while

Table 2.—Performance of steer calves implanted with 15 mg. stilbestrol at approximately 3½ months of age.

Source of Calves and Treatment	Lake Blackwell		Fort Reno	
	Controls	Implanted with 15 mg. Stilbestrol	Controls	Implanted with 15 mg. Stilbestrol
No. of calves compared	5	5	7	7
Ave. birth date,	3-13	3-19	3-12	3-14
Ave. age when implanted (days)	94	88	113	111
Weaning date	10-11	10-11	10-11	10-11
Initial weight, lbs.	269	269	344	343
Weaning weight, lbs.	468	498	545	576
Gain from implantation to weaning	199	229	201	233
Difference due to implantation		+30		+32
Feeder grade[1]	B(4.2)	B+(3.4)	B−(4.7)	B+(2.9)
Cost of implanting ($)[2]		$0.40		$0.40
Value of implanting at 20¢/lb. less cost ($)		$5.60		$6.00

[1] Feeder grades were: A (Fancy) = 1, B (Choice) = 4, and C (Good) = 7.
[2] Actual cost of material was about 2¢ per implant. Additional charge was made for implanting instrument and labor.

the others served as controls. The calves were continued on their dams in a common pasture at each station. The calves were not creep-fed and received only their mother's milk and native grass.

The results obtained are shown in Table 2. At weaning, the calves were brought to the experimental feeding shed west of Stillwater to be fattened. They were weaned on oat hay, silage, a small amount of cottonseed meal and rolled milo. After recovering from the effects of weaning (two week period), the calves were regrouped into 4 lots of 6 calves each for the fattening period. One half of the controls (6 calves) were placed on a fattening ration of rolled milo (full-fed), 1.5 lbs. cottonseed meal, 1.0 lb. dehydrated alfalfa meal pellets and sorghum silage, with minerals (2 salt and 1 bone meal) free choice. The remainder of the controls were placed on the same ration, plus 10 mg. stilbestrol mixed with the cottonseed meal. A similar division was made among the calves which had previously been implanted while on their dams; one-half were fed the basal ration and the remainder received the basal plus 10 mg. stilbestrol.

Part II. In the second phase of the study, forty uniform Hereford steer calves were selected from the station herds at Wilburton and Ft. Reno. The calves were weaned in early October and allowed three weeks to recover from the effects of weaning and to become accustomed to the feeds to be used in the trial. They were divided into 4 uniform lots of 10 calves each on the basis of source, age, grade, shrunk weight and sire (where possible). They were all fed the same basic ration described above—rolled milo (full-fed), protein supplement, 1.0 lb. dehydrated alfalfa meal pellets, sorghum silage, and minerals free choice. All calves received 10 mg. stilbestrol mixed with the protein supplement.

The protein supplements fed, per steer daily, were:

Lot 5. 1.5 lbs. cottonseed meal.

Lot 6. 1.5 lbs. cottonseed meal plus 100 mg. of a thyroid inhibitor, to study its effect of feedlot performance and carcass quality.

Lot 7. 2.4 lbs. of a complex supplemental mixture containing cottonseed meal, dried molasses, condensed fish solubles, calcium carbonate, trace minerals, vitamin A concentrate and aureomycin (aurofac)*

Lot 8. 2.5 lbs. of cottonseed meal to study the effect of a higher protein level on the performance of steer calves receiving stilbestrol.

All cattle were hand-fed, one half the daily ration allowance at each feeding. The feeding tests lasted approximately 160 days. An appraisal of market value was made by a committee from the Oklahoma City yards at the completion of the test. Following Feeder's

* The trace minerals were supplied by Calcium Carbonate Company, Chicago, Ill., the vitamin A concentrate by Nopco Chemicals, Harrison, New Jersey, and the aurofac was obtained from American Cyanamid Corp., Lederle Division, New York City.

Day, the cattle will be sold on the Oklahoma City market and data will be obtained on shrink to market, yield and carcass grade.

Results

The average daily gains of all cattle were considered good. Rather severe death loss occurred in certain lots during the trial. Of the 64 calves started on test, 7 were lost or had to be removed during the trial. Drenching the calves with a systemic insecticide for control of grubs in the third week of the test resulted in severe depression of appetite and scouring in all lots. Two calves were lost due to this treatment. One calf died of bloat and another was removed from test for a chronic bloat condition. One calf died and two were removed with urinary calculi. These losses were severe enough in certain lots to limit the conclusions which can be drawn from the data.

Table 3.—Feedlot performance of steer calves previously implanted with stilbestrol

Lot Number & Previous Treatment	Not Fed Stilbestrol		Fed Stilbestrol	
	1 Controls	2 Implanted at 3½ mo.	3 Controls	4 Implanted at 3½ mo.
Number of calves	6[1]	6[1]	6[1]	6
Av. weights (lbs.)				
Initial 10/25/56	504	515	493	499
Final 4/5/57	879	920	923	912
Av. daily gain	2.38	2.52	2.67	2.57
Av. daily ration (lbs.)[2]				
Rolled milo	13.5	13.9	13.7	13.8
Cottonseed Meal	1.5	1.5	1.4	1.4
Dehydrated Alfalfa Meal Pellets	1.0	1.0	1.0	1.0
Sorghum Silage	11.3	11.3	10.8	10.8
2-1 Mineral Mix	.05	.05	.05	.05
Feed required per cwt. gain (lbs.)				
Milo	580	553	513	538
Cottonseed Meal	64	60	52	55
Dehydrated Alfalfa Meal Pellets	43	40	37	39
Sorghum Silage	485	449	404	421
Financial Results ($)				
Feed cost per cwt. gain	20.21	19.11	17.75	18.58
Total steer + feed cost[3]	176.58	180.39	174.91	176.52
Appraised value/cwt.	22.00	22.00	22.50	22.50
Total value/steer	193.38	202.40	207.68	205.20
Net return over cost of steer + feed[4]	16.80	22.01	32.77	28.68

[1] One calf from Lot 1 and one from Lot 2 died following treatment with systemic insecticide for grubs. One steer in Lot 3 removed as a chronic bloater, and one steer in Lot 1 died of urinary calculi. Only performance of steer removed from Lot 1 for urinary calculi was considered in computing weight gains and feed efficiency.

[2] All steers received 1 oz. $CaCO_3$ per head daily.

[3] Initial cost, $20.00 per cwt.

[4] Does not include costs of labor, equipment, insecticides, transportation or marketing.

Effect of Implanting Young Calves on Weaning Weight and Subsequent Feedlot Performance.

The effect of one 15 mg. stilbestrol implant to 3-4 months old calves on weaning weight, feeder grade and net returns can be seen from the results given in Table 2. No adverse side effects, as have been observed in older cattle, were noted. The improvement in feeder grade of implanted calves was apparently due to more bloom and slightly fatter appearance at weaning. This difference in condition might effect their price as feeders, depending on the local market demand and the preference of the feeder buyer. No heifers were implanted in this study.

In the feedlot, the allotment of the calves permittd a comparison of controls vs. implanted calves—either with or without stilbestrol in the ration. Due to the small numbers, and death loss and removal of certain steers, little emphasis can be placed on the data from this trial. The results obtained show no apparent effect of previous stilbestrol implantation when all cattle are considered. It should be noted that the difference in actual weight between control and implanted groups was much smaller at the start of the feeding trial than at weaning—indicating a greater shrinkage among implanted calves during the two-week interval between weaning and the start of the feeding trial.

The apparent carryover effect of previous implantation (compare Lots 1 & 2) is not believed to be real difference since early period gains were essentially the same. Feeding stilbestrol to either controls or implanted calves increased gains, but slightly more for calves not previously stimulated by the hormone. The committee of market representatives appraising the calves at the close of the feeding trial apparently could not discern between control calves and previously implanted calves, although they could readily pick out the groups fed stilbestrol during the fattening trial. They tended to give these a higher on-foot value.

Effect of Different Supplements to Stilbestrol-Containing Rations.

Including stilbestrol in supplements for fattening cattle poses many problems concerning the best ration to obtain maximum benefit. The majority of studies indicate a slightly lower carcass grade and yield where stilbestrol is fed. It is now the belief that hormone-fed cattle must be fattened for the same length of time as normal cattle—thus increasing weight with no improvement in grade. In an attempt to increase fat deposition, a thyroid depressing drug was added to the protein supplement fed Lot 6. The data shown in Table 4 indicates that weight gains and efficiency of feed conversion was not altered by feeding the drug in rations containing stilbestrol. Carcass grades and yield will be obtained at slaughter to determine the over-all effect of thyroid inhibitor. In a trial with yearling steers reported elsewhere in this publication, the same product was fed and no beneficial effect

Table 4.—Effect of certain hormones and feed additives on the performance of fattening steer calves

Lot Number & Treatment	5 Basal (with Stilbestrol)	6 Basal + Thyroid Inhibitor[1]	7 Basal + Complex Supplement	8 Basal + Additional Protein
Number of calves	10	10[2]	10[2]	10
Av. weights (lbs.)				
Initial 10/29/56	491	493	490	490
Final 4/5/57	904	914	913	912
Av. daily gain	2.64	2.68	2.69	2.69
Av. daily ration (lbs.)[3]				
Rolled milo	12.6	12.5	12.7	12.5
Cottonseed meal	1.5	1.5	1.4	2.5
Special mixture			.92	
Dehydrated Alf. meal pellets	1.0	1.0	1.0	1.0
Sorghum silage	12.0	12.1	12.2	12.0
2-1 Mineral mix	.07	.05	.06	.05
Feed required per cwt. gain (lbs.)				
Milo	479	466	471	465
Cottonseed meal	57	56	52	93
Special mixture			34	
Dehydrated Alf. meal pellets	38	37	37	37
Sorghum silage	456	451	453	446
Financial Results ($)				
Feed cost per cwt. gain	17.36	16.94	18.78	18.10
Total steer + feed cost[4]	169.89	169.90	177.46	174.40
Appraised value/cwt.	21.35	21.95	22.40	22.35
Total value/steer	193.00	200.62	204.51	203.83
Net return over steer + feed cost[5]	23.11	30.72	27.05	29.43

[1] Thyroid inhibitor (1-methyl-2-mercaptoimidazole) was supplied by Eli Lilly & Co., Indianapolis, Indiana. No charge for this compound was made against Lot 6 in computing feed costs.
[2] Two steers from Lot 6 removed for urinary calculi during the last month of the trial, and one steer in Lot 7 died of bloat in December. Data on these cattle were not included in computing gains or feed efficiency.
[3] All steers received 1 oz. $CaCO_3$ per head daily.
[4] Initial cost, $20.00 per cwt.
[5] Does not include costs of labor, equipment, insecticides, transportation or marketing.

was noted. The possibility exists that the material used may have been altered in the rumen, or was not effective at the levels fed.

Do stilbestrol-fed cattle have different nutrient requirements than non-treated cattle? To study this possibility, Lot 7 was fed a complex mixture containing many factors believed beneficial to either the steer or the rumen bacteria, and Lot 8 was fed additional protein above that fed the basal group.

Results show that daily gains and feed conversion were not markedly effected by either treatment. Feed costs were increased from $5 to $8 in Lots 7 & 8, as is further reflected in the increased feed cost per cwt. gain. In this trial, however, the increase in market value of Lot 7 & 8

cattle resulted in larger net returns as compared to the controls (Lot 5). Whether or not this advantage is real may become apparent when carcass grades and yields are obtained. There was a tendency for Lot 8 cattle, fed a high level of protein, to gain faster during the first 100 days of the trial.

From these results, it appears unlikely that a complex supplement will result in increased performance as compared to a simple protein in this type of ration. Further, the level of protein supplement fed the basal lot was apparently sufficient for optimum performance.

Summary

The effect of stilbestrol implants for young suckling calves (approximately 3½ months of age) and their effect on subsequent feedlot performance was studied. Implanting young calves with 15 mg. stilbestrol resulted in approximately 30 lbs. greater gain to weaning, and slight improvement in feeder grade. Although only a limited number of calves were available to study feedlot performance, the results indicate no marked effect of previous implantation on feedlot gains, feed efficiency or market value.

Four lots of steer calves were used to study the effect (a) a thyroid inhibitor, (b) a complex supplement containing antibiotic, and (c) a high level of protein in stilbestrol-containing rations. Daily gains and feed required per cwt. gain showed little or no improvement over the basal group. The thyroid inhibitor resulted in no greater feedlot performance, but the slightly higher appraised value at the completion of the trial increased the net return in this lot. The groups fed a complex supplement with antibiotic, or those receiving an additional amount of cottonseed meal, showed little improvement in gain, and feed cost per cwt. gain was increased. Using the appraised market values, they proved to be more profitable than the basal group fed 1.5 lbs. of cottonseed meal.