Apparently, the judges were not able to detect, to the same degree, the differences in tenderness noted by the Warner-Bratzler shear force technique. Differences among sire groups for flavor and juiciness were likewise small.

The loin eyes from the 9, 10, and 11 rib cuts, which were separated from the fat and bone, were finely ground and four samples were taken from each animal for chemical determination of protein, fat, water and ash. These average values for each sire group are given in Table 3. Although the relationship is not perfect, one notes that the percent fat in the rib eye is associated with the marbling scores obtained by visual means.

Summary

Seven Angus bulls were progeny tested for preweaning growth rate and feeder grade in the Federal Reformatory herd at El Reno. Sixty calves by these bulls were selected for post-weaning feed lot performance tests at Fort Reno and for detailed carcass studies.

Important sire differences were found for preweaning growth rate and for average feeder grade of their calves. Large sire differences were also noted for rate of feed lot gain on standard rations and for dressing percentage and carcass grades. Sire differences for yield of wholesale cuts, expressed as a percentage of cold carcass weights, were rather small.

Small sire differences were also shown for percentage of separable fat, lean, and bone in the 9, 10, 11 rib cut. Large sire differences were found for tenderness of the broiled rib steaks as estimated by a mechanical shear force technique. Differences in size of rib eye were due largely to variations in the size of the animals studied.

Stilbestrol and an Antibotic (Erythromycin) For Suckling Beef Calves[1]

A. B. Nelson, L. S. Pope, E. J. Turman, and R. Totusek

In recent years there has been an increased use of stilbestrol implants in range beef cattle production. A widely accepted fact is that stilbestrol administration (oral or implant) will increase gains and improve feed efficiency of fattening cattle. When grazing animals are given

[1] This study was supported in part by a Grant-in-Aid from Eli Lilly and Co., Indianapolis, Indiana.

no supplemental feed, the practical method of stilbestrol administration is the implant. The value of these implants for suckling calves has been receiving considerable attention in our experiments.

Antibiotics are feed additives which have been shown to be of value in some production systems, such as in certain feed-lot operations. In our experiments the value of antibiotics and stilbestrol implants for suckling beef calves are being studied by:

(1) Implanting fall-dropped calves with 12 milligrams of stilbestrol.

(2) Implanting spring-dropped calves with 12 milligrams of stilbestrol.

(3) Feeding 5 milligrams of stilbestrol and 5 milligrams of stilbestrol plus 45 milligrams of an antibiotic (erythromycin) per head daily in the creep-feed of spring-dropped calves.

(4) Adding 45 milligrams of erythromycin per head daily to the creep-feed of fall-dropped calves.

Trials I and II.—Implanting Spring Calves with Stilbestrol

Procedure

On June 14, 1958, twelve steer calves and twelve heifer calves at the Lake Blackwell experimental range area (Trial 1) were selected and six calves of each sex were implanted in the ear with 12 milligrams of stilbestrol. At this time the calves were approximately 120 days old and weighed an average of 288 pounds. The calves were left with their dams and all cattle were allowed to graze in the same pasture.

The experiment was continued until weaning on October 4, a period of 112 days. After a 33-day intermediate period following weaning, the calves were allotted to various wintering rations on the basis of summer stilbestrol treatments in order to study the subsequent performance of implanted calves.

At Fort Reno (Trial II), 16 heifers and 13 steers were selected. Stilbestrol was implanted in seven steers and eight heifers on June 6 when the calves were approximately 110 days old and weighed an average of 215 pounds. Final weights were taken at weaning on October 13, 129 days after implanting. During the summer, the calves grazed with their dams in native grass pastures.

Results

Weight data are shown in Table 1. At Lake Carl Blackwell (Trial I), stilbestrol implants increased gains of heifers by 23 pounds and the gains of steers by 14 pounds. In the 33-day period between weaning and the beginning of the winter feeding period, the difference in gain in

favor of implanting heifers increased 4 pounds for a net increase of 27 pounds to that time. The additional increase for steers in this weaning period was 12 pounds or a total of 26 pounds. Apparently, this was a carry-over effect of the implants.

During the subsequent 128-day wintering period, both groups of heifers gained nearly the same. The previously-implanted heifers gained 92 pounds and the non-implanted heifers gained 89 pounds. In the subsequent wintering period, both groups of steers lost 29 pounds. From time of implant on June 14, 1958, until March 14, 1959, the increased

TABLE 1. Stilbestrol implants[1] for suckling beef calves[2].

Sex of calf	Steers		Heifers	
Implant, mg.	0	12	0	12
Lake Carl Blackwell Spring Calves (Trial I)				
Number of calves	6	6	6	6
Average weight per calf, lbs.				
Initial, 6-14-58[3]	318	301	282	252
Final, 10-4-58	541	538	485	478
Gain (112 days)	223	237(14)[4]	203	226(23)
Gain during weaning[5]	—3	9(12)	—2	2(4)
Winter gain, 11-6-58 to 3-14-59[6]	—29	—29(0)	89	92(3)
Net gain (128 days)	191	217(26)	290	320(30)
Fort Reno Spring Calves (Trial II)				
Number of calves	6	7	8	8
Average weight per calf, lbs.				
Initial, 6-6-58	210	211	212	227
Final, 10-13-58	476	476	441	497
Gain (129 days)	266	265(-1)	229	270(41)
Lake Carl Blackwell Fall Calves (Trial III)				
Number of calves	16	16		
Average weight per calf, lbs.				
Initial, 3-31-58	281	282		
Final, 7-7-58	514	542		
Gain (98 days)	233	260(27)		

[1] Stilbestrol implants were "Stimplants" furnished by Chas. Pfizer and Co. Inc., Terre Haute, Indiana

[2] Spring calves were implanted when they were 110-120 days old. Fall calves were approximately 160 days old when implanted.

[3] Allotment was made on the basis of average daily gain from birth to 6-14-58.

[4] Figures in parentheses refer to increased gain due to stilbestrol implant.

[5] Gain during 33 days between weaning and beginning of winter feeding period.

[6] Steers were allotted to various wintering rations on the basis of summer stilbestrol treatment.

gain due to summer implant was 30 pounds for the heifers and 26 pounds for the steers.

During the winter of 1957-58, previously stilbestrol-implanted calves gained 14 pounds more than calves which had not been implanted during the summer. The data indicate that the subsequent performance of stilbestrol-implanted calves is not adversely affected when fed wintering rations.

The effect of summer implants on subsequent feed-lot performance has been studied in three tests in which all cattle were fed stilbestrol in the feed lot. The average feed-lot increase due to previous summer implant was 9 pounds. As was true in the wintering tests, apparently the subsequent performance of stilbestrol-implanted calves is not adversely affected when they are full-fed fattening rations in dry-lot.

At Fort Reno (Trial II), the 129-day gain of the stilbestrol-implanted heifers was 41 pounds more than the gain of the control heifers. However, there was a difference of only one pound in gains of the two groups of steers.

A total of eight trials have been conducted on the use of stilbestrol implants with suckling steer calves. In six trials, the increased gain has varied from 14 to 53 pounds. In one trial, the increased gain was one pound and in this current trial the implanted steers gained one pound less. The average increase for the eight trials was 22 pounds. In five trials with suckling heifer calves, the gains have been increased an average of 36 pounds. This increased gain varied from 23 to 42 pounds.

Trial III.—Implanting Fall Calves with Stilbestrol

Procedure

Sixteen pairs of steer calves born in October and November were selected on March 31, 1958, and one calf of each pair was implanted in the ear with a 12 milligram pellet of stilbestrol. The calves were from four groups used in a nutrition and management study. Certain pairs of calves were creep-fed. The dams of the calves were fed on either a high or low level of supplemental winter feed. Since the nutritional treatment was the same for each calf of a pair the differences between pairs have been disregarded and the average data for all calves are reported.

The calves were left with their dams in native grass pastures at the Lake Carl Blackwell experimental range area. They were weaned on July 7, 98 days after implanting.

Results

The gain data for fall calves are given in Table 1 (Trial III). The implanted calves gained 27 pounds more in the 98-day period. This was

an increase of 11.6 percent. Although observations as to general appearance of the calves were recorded, there were no consistent obvious differences in prominence of tailhead and teat length. In fact, experienced cattlemen reported considerable difficulty in attempting to detect the implanted calves although they knew that one-half of the calves were implanted.

In a previous trial, suckling calves were implanted with 12 milligrams of stilbestrol in May and an additional 12 milligrams in August. There was increased teat length and a slightly raised tailhead on some of the steers and on some of the heifers. Some of the heifers had a swelling of the vulva.

In trials where one 12 milligram implant was injected in early summer, there was noticeable swelling of the vulva of some of the heifers. However, there were no noticeable side effects with steers. In fact, both the implanted steers and the implanted heifers were given a higher feeder grade at weaning. Apparently the noticeable side effects are related to size of implant and sex of the calf.

Current tests include the value of a 6-milligram stilbestrol implant to determine whether or not this quantity of stilbestrol might increase gain, but not produce any noticeable side effects in heifers.

Trial IV.—Stilbestrol and Erythromycin In Creep-Feeds for Spring Calves.

Procedure

On June 4, 1958, 58 spring calves were divided into three lots on the basis of weight and sex of the calf, and age and winter treatment of the dam. The summer treatments of the calves were: Lot 1, creep-fed a mixture consisting of 55 percent rolled milo, 30 percent whole oats, 10 percent cottonseed meal, and 5 percent cane molasses; Lot 2, the same creep mixture as Lot 1 with stilbestrol added in amounts to furnish an average of 5 milligrams of stilbestrol per head daily; and Lot 3, creep mixture containing stilbestrol and erythromycin in amounts to furnish 5 milligrams of stilbestrol and 45 milligrams of erythromycin per head daily.

Results

Production data are recorded in Table 2. The gains of all groups of calves were essentially equal, although there were some differences in feed consumption. It is not known whether this decreased consumption, especially that in Lot 3, was due to lower palatability of the mixture or a possible failure to have the creep-feeder in the best possible location in the pasture.

The gains and feed intake of the calves in Lots 1 and 2 are in agreement with results obtained in a similar test conducted in 1957.

TABLE 2. Stilbestrol and erythromycin[1] in creep-feeds[2] for spring calves, Trial IV (Lake Blackwell).

	Creep-fed	Creep-fed Stilbestrol[3]	Creep-fed Stilbestrol and Erythromycin[4]
Number of calves	19	18	21
Average weight per calf, lbs.			
Initial, 6-4-58	251	248	246
Final, 10-11-58	522	516	519
Summer gain	271	268	273
Creep-feed consumption, lbs.	526	500	438

[1] This study was supported in part by a Grant-in-Aid from Eli Lilly and Co., Indianapolis, Indiana. Stilbestrol fed as "Stilbosol" and erythromycin as "Ilotycin".
[2] Basal creep-feed mixture was 55 percent rolled milo, 30 percent whole oats, 10 percent cottonseed meal and 5 percent cane molasses.
[3] 5 mg. stilbestrol per head daily.
[4] 5 mg. stilbestrol and 45 mg. erythromycin per head daily.

However, including stilbestrol in the creep-feed of fall calves at Fort Reno increased gains in earlier tests. Additional tests may provide information which will explain this difference.

Trial V.—Erythromycin in Creep-Feed for Fall Calves.

Procedure

Twenty-six heifer calves born in October and November were divided into two lots on December 10 at which time creep-feeding was started. Erythromycin was added to the creep-feed mixture available in Lot 2 in such amounts that the calves consumed an average 45 milligrams of erythromycin per head daily.

After March 5, stilbestrol was added to both the basal and antibiotic creep rations to supply 5 milligrams per calf daily. The calves were weaned in late June and marketed as fat slaughter calves. Dressing percentage was calculated and carcass grade scores were recorded.

Results

There were practically no differences in gains of the calves. The inclusion of 45 milligrams of erythromycin in the creep-feed increased gains only 9 pounds in 195 days (Table 3). Creep-feed consumption was 725 and 749 pounds in Lots 1 and 2, respectively. Dressing percentage and carcass grades were slightly higher in the antibiotic-fed heifers.

Summary

The value of 12 milligram stilbestrol implants has been studied in three additional trials with suckling steer calves and two additional trials with heifer calves. At Lake Blackwell, the stilbestrol implant increased summer gains of spring-dropped calves 14 pounds and heifer

TABLE 3. Erythromycin in the creep-feed[1] for fall calves (Fort Reno).

	Lot 1 Control	Lot 2 Erythromycin[2]
Number of heifers	13	13
Average weight per calf, lbs.		
Initial, 12-10-57	190	190
Final, 6-23-58	536	545
Gain, 195 days	346	355
Creep-feed per calf, lbs.	725	749
Dressing percentage	55.4	55.9
Carcass grade score[3]	4.9	5.4

[1] See mixture in footnote of Table 2.
[2] 45 mg. of erythromycin per head daily included in the creep-feed. Erythromycin was fed as "Ilotycin" furnished by Eli Lilly and Co.
[3] Based upon U. S. Choice—7, and U. S. Good—4.

calves 23 pounds in a 112-day period. In the subsequent wintering period, there were no adverse effect on gains of calves due to previous summer implant.

With spring calves at Fort Reno, stilbestrol implants decreased the gains of steer calves by one pound, but increased the gains of heifer calves by 41 pounds. The gain of fall-dropped steer calves at Lake Blackwell was increased 27 pounds by the stilbestrol implant. There were no noticeable side effects in any of the steers in these three trials. However, noticeable side effects were apparent in some of the heifers.

In eight trials conducted at the Oklahoma Agricultural Experiment Station, the average increase in gain of steer calves due to stilbestrol implants is 22 pounds. The average increased gain in five tests with heifers is 36 pounds. Noticeable side effects sometimes develop in implanted calves. These effects are apparently related to size of the implant and sex of the calf.

In trials when suckling calves were implanted with 12 milligrams of stilbestrol in May and an additional 12 milligrams in August, there was increased teat length and a slightly raised tailhead of some of the steers and heifers and a swelling of the vulva of some of the heifers. When implanted only in early summer, there have been no side effects observed with steers, although a swelling of the vulva of some of the heifers has been noted. At the end of a subsequent fattening period in dry-lot these side effects were no longer apparent. At weaning the stilbestrol-implanted calves were given a slightly higher feeder grade.

Apparently the subsequent performance of stilbestrol-implanted

calves is not adversely affected. In three trials, the subsequent feed-lot gain of previously-implanted calves has been an average of 9 pounds greater than for calves not implanted in the previous summer.

In wintering trials, the increased gain of previously-implanted calves during the subsequent period has been an average of 6 pounds in three trials. Data from these six trials would indicate that implanting suckling calves with stilbestrol does not have any adverse effect on subsequent performance either in the feed-lot or when fed wintering rations.

The inclusion of stilbestrol or stilbestrol plus erythromycin in a creep-fed mixture did not increase gains of spring calves in the current test. However, in earlier tests at Fort Reno, including stilbestrol in the creep-feed of fall calves increased gains. Erythromycin increased the gains of fall calves only 9 pounds.

The Influence of Excessive Fatness on the Performance Of Beef Females—Preliminary Report

Robert Totusek, G. L. Holland, E. W. Jones, and W. D. Campbell

Very little experimental data is available concerning the influence of extreme body fatness on the performance of the beef cow.

Many purebred cattlemen, who often fatten heifers to a high degree while fitting for show and striving for maximum development, feel that excessive body fat adversely affects the subsequent productive value of beef females. Although most commercial cattlemen do not feed heifers and cows above a moderate plane of nutrition, limited experimental results indicate the possibility that productivity may be slightly impaired by levels of energy intake within limits fed by some cattlemen.

Basic information on the effect of a high degree of body fatness is needed. Such information, obtained by studying extreme differences in energy intake, should aid in the interpretation of results from research in which more "practical" differences in plane of nutrition are studied.

The specific objective of this experiment is to determine the influence of excessive body fat on the performance of beef females by inducing a high degree of fatness at two different stages of the life cycle: (1) In the heifer during the period of growth and development after weaning (Phase I), and (2) in the mature cow that has completed growth and attained full body size (Phase II).