

**A Comparison of Wintering in Dry-Lot with Wintering on Bluestem Pasture for Yearling Steers on a Wintering, Grazing, and Fattening Program, 1956-57 (Project 253-4).**

E. F. Smith, B. A. Koch, F. W. Boren and G. L. Walker

This is the second test designed to study the effect of winter management on performance of yearling steers. The first was reported in Circular 349 from this station. Yearling steers are often used by Kansas producers in a program of this type. They consume large quantities of feed compared with calves and this increases cost of production considerably. This study is concerned with lowering the cost of wintering by introducing the use of low-cost, low-quality winter grass, and observing its effect on future performance, especially with regard to the effect on the carcass produced.

**Experimental Procedure**

Twenty head of good-quality yearling Hereford steers were used in the test. They originated in the vicinity of Clovis, New Mexico, and were purchased as calves by the College in the fall of 1955. They were wintered in dry-lot and then grazed on bluestem pastures during the summer of 1956. December 11, 1956, they were divided into two lots of 10 steers each. The only difference in treatment of the two lots was during the winter. The treatment for each lot was as follows:

Lot 1—Wintered in dry-lot on sorghum silage supplemented with protein; bluestem pasture from May 11 to July 18; fed grain and protein on grass from July 18 to October 26, 1957.

Lot 2—Wintered on bluestem pasture supplemented with protein and then handled for the remainder of the test in an identical manner to lot 1.

The 20 steers were grazed together from May 11 until July 18. During the grain-feeding period, July 18 to October 26, the two lots were fed in separate comparable pastures.

Half of the steers in each lot had been implanted in the spring of 1956 with either 24 or 36 mgs. of stilbestrol. The results of this treatment may be found elsewhere in this publication.

**Observations**

1. The difference in winter management produced a significant difference in winter gain. This difference was reduced somewhat during the summer but in the summary of all phases, the steers in lot 1, wintered in dry-lot, showed a gain advantage of 66 pounds per head over those wintered on bluestem pasture. In addition they produced superior carcasses, had a higher dressing percent and sold for \$1.00 per cwt. more.

2. The primary advantage for the steers wintered on pasture was their lower feed cost per hundred pounds of gain as reported in the summary of all phases. This enabled them to compare favorably with the steers wintered in dry-lot in regard to financial return to the producer.

**Table 29**

**A Comparison of Wintering in Dry-Lot with Wintering on Dry Bluestem Pasture for Yearling Steers on a Wintering, Grazing, and Fattening Program, 1956-57.**

Phase 1—Wintering—December 11, 1956, to May 11, 1957—151 days.

Lot number	1	2
Place wintered	Dry-lot	Bluestem pasture
Av. initial wt. per steer, lbs.	775	773
Av. final wt. per steer, lbs.	890	791
Av. gain per steer, lbs.	115	18
Av. daily gain per steer, lbs.	.76	.12
Feed per steer daily, lbs.:		
Soybean pellets	1.0	1.0
Sorghum silage	50.7	....
Bluestem pasture	....	Free choice
Salt	....	Free choice
Av. feed cost per steer, <sup>1</sup> \$	36.92	10.04

**Table 29 (Continued)**

Phase 2—Grazing—May 11, 1957, to July 18, 1957—68 days.

Av. gain per steer, lbs.	127	151
Av. daily gain per steer, lbs.	1.87	2.22
Av. feed cost per steer, \$	20.00	20.00

Phase 3—Fattening—July 18, 1956, to October 26, 1957—100 days.

Av. initial wt. per steer, lbs.	1017	942
Av. final wt. per steer, lbs.	1225	1157
Av. gain per steer, lbs.	208	215
Av. daily gain per steer, lbs.	2.08	2.15
Daily ration per steer:		
Ground sorghum grain, lbs.	13.5	13.5
Soybean oil meal, lbs.	1.42	1.42
Stilbestrol, mgs.	10	10
Ground limestone, lbs.	.1	.1
Salt	....	Free choice
Bluestem pasture	....	Free choice
Feed per cwt. gain, lbs.:		
Ground sorghum grain	647	626
Soybean meal	68.0	66.0
Av. feed cost this phase, <sup>1</sup> \$	39.41	39.41
Av. feed cost per 100 lbs. gain <sup>1</sup>	18.95	18.33

Summary of Phases 1, 2 and 3—December 11, 1956, to October 26, 1957—319 days.

Av. total gain per steer, lbs.	450	384
Av. daily gain per steer, lbs.	1.41	1.20
Av. feed cost per cwt. gain, \$	21.41	18.09
Av. total feed cost per steer	96.33	69.46
Av. initial steer cost @ \$19 per cwt.	147.25	146.87
Av. selling price per cwt.	22.00	21.00
Av. return per steer above initial cost		
plus feed cost	14.04	15.73
Av. % shrink in shipping to market	4.41	4.49
Av. dressing %, chilled	60.95	58.81
Carcass grades, USDA: <sup>2</sup>		
Low choice	1	....
High good	4	....
Av. good	4	....
Low good	1	3
High standard	....	3
Av. standard	....	1
Av. marbling score <sup>3</sup>	7.1	8.7
Av. fat thickness score <sup>4</sup>	4.0	3.9
Av. rib eye size, score <sup>5</sup>	4.5	4.7
Av. firmness score <sup>6</sup>	4.0	4.4

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

2. Three carcasses from lot 2 were shipped from the packing plant before carcass data were obtained from them.

3. Marbling score based on: small amount, 7; slight amount, 8; traces, 9.

4. Thickness of outside fat based on: moderate, 3; modest, 4; slightly thin, 5.

5. Rib eye size: modestly large, 4; slightly small, 5.

6. Firmness of rib eye based on: moderately firm, 3; modestly firm, 4; slightly firm, 5.

**Winter Management for Steer Calves on a Wintering, Grazing, and Fattening Program, 1956-57 (Project 253-6).**

E. F. Smith, B. A. Koch, F. W. Boren and G. L. Walker

A previous test has been reported in Circular 349 from this station. The objective of the study is to determine if winter bluestem pasture can be supplemented in such a manner that calves wintered on it will

compare favorably in yearly performance with steer calves wintered on good quality roughage. It was noted in the first test that production costs were cheaper on winter grass and that calves wintered in the dry-lot would have to grade higher as fat cattle and sell for more per cwt. to make as great a return as those wintered on pasture.

#### Experimental Procedure

Twenty head of good quality Hereford steer calves from near Melrose, New Mexico, were divided on the basis of weight into two lots of 10 steer calves each. The treatment assigned to each lot was as follows:

Lot 1—wintered in dry-lot on sorghum silage, 4.8 pounds of sorghum grain, and 1 pound of soybean meal per head daily; grazed on bluestem pasture from May 11 to July 27; fattened in dry-lot from July 27 to December 2, 1957.

Lot 2—wintered on bluestem pasture, with the remainder of their treatment identical to that of lot 1.

The two lots were grazed together during the summer. Five of the steers in each lot were implanted with 24 mgs. of stilbestrol at the start of the test. Results of this phase of the test are reported elsewhere in this circular.

#### Observations

1. The steers in lot 1, wintered in dry-lot, gained 77 pounds more per head than those wintered on grass; however, the cost per 100 pounds of gain was about the same due to the low charge made for winter grass.

2. The steers wintered on bluestem pasture, lot 2, gained 32 pounds per head more during the summer than lot 1, wintered in dry-lot, which narrowed the gain advantage for lot 1 considerably.

3. Lot 2 continued to gain at a faster rate when placed on full feed, 26 pounds per head for the period, and therefore had a somewhat lower feed cost per 100 pounds of gain for the fattening phase. Feed consumption was practically the same for both lots. The grain was self-fed; alfalfa hay was limited to amounts readily consumed.

4. In summary of the three phases, the calves in lot 1, wintered on sorghum silage, merit the following statements (averages): gained 19 pounds more per head, returned \$7.60 more per head, dressed 1.24 percent higher, and produced slightly superior carcasses. The calves wintered on dry grass excelled only in a lower feed cost per 100 pounds of gain.

Table 30

#### Winter Management for Steer Calves on a Wintering, Grazing, and Fattening Program, 1956-57.

Phase 1—Wintering—December 4, 1956, to May 11, 1957—158 days.

Lot number .....	1	2
Number of steers .....	10	10
Place of wintering .....	Dry-lot	Bluestem pasture
Av. initial wt. per steer, lbs. ....	445	445
Av. final wt. per steer, lbs. ....	667	590
Av. gain per steer in lbs. ....	222	145
Av. daily gain per steer, lbs. ....	1.41	.92
Av. daily ration per steer, lbs.:		
Ground sorghum grain .....	4.8	4.8
Soybean oil meal .....	1.0	1.0
Sorghum silage .....	25	
Bluestem pasture .....		
Salt .....	.05	Free choice
Feed cost per steer, <sup>1</sup> \$ .....	40.34	27.04
Feed cost per cwt. gain, <sup>1</sup> \$ .....	18.17	18.64

Phase 2—Grazing—May 11, 1957, to July 27, 1957—77 days.

Av. initial wt. per steer, lbs. ....	667	590
Av. final wt. per steer, lbs. ....	770	725
Av. gain per steer, lbs. ....	103	135
Av. daily gain per steer, lbs. ....	1.33	1.75
Feed cost per steer, \$ .....	16.00	16.00

Table 30 (Continued)

Phase 3—Full feeding—July 27, 1957, to December 2, 1957—128 days.

Number of steers per lot .....	9	10
Av. initial wt. per steer, lbs. ....	777 <sup>2</sup>	725
Av. final wt. per steer, lbs. ....	1079	1053
Av. gain per steer, lbs. ....	302	328
Av. daily gain per steer, lbs. ....	2.36	2.56
Av. daily ration per steer, lbs.:		
Ground sorghum grain .....	17.4	17.5
Soybean oil meal .....	1.5	1.5
Alfalfa hay .....	2.8	2.7
Salt .....	Free choice	Free choice
Stilbestrol .....	10 mg.	10 mg.
Av. feed per cwt. gain, lbs.:		
Ground sorghum grain .....	736	682
Soybean oil meal .....	64	59
Alfalfa hay .....	121	106
Feed cost this phase, <sup>1</sup> \$ .....	66.82	67.08
Av. feed cost per cwt. gain, <sup>1</sup> \$ .....	22.12	20.45

Summary of Phases 1, 2, and 3—December 4, 1956, to December 2, 1957—363 days.

Lot number .....	1	12
Av. total gain per steer .....	627 <sup>2</sup>	608
Av. daily gain per steer .....	1.74	1.67
Av. total feed cost per steer, <sup>1</sup> \$ .....	123.16	110.12
Av. feed cost per cwt. gain .....	19.64	18.11
Av. initial steer cost at \$23 per cwt. plus feed cost .....	225.51	212.47
Av. sale price per cwt. based on carcass value, <sup>3</sup> \$ .....	24.80	23.39
Av. sale price per steer <sup>4</sup> .....	259.44	238.80
Av. return per steer .....	33.93	26.33
Av. dressing percent .....	61.72	60.48
Carcass grade, USDA:		
High choice .....	3	
Av. choice .....	3	3
Low choice .....	1	1
High good .....	2	2
Av. good .....	..	4
Av. USDA grade <sup>5</sup> .....	13.8	12.3
Av. marbling score <sup>6</sup> .....	5.7	7.0
Av. fat thickness score <sup>7</sup> .....	4.0	4.5
Av. rib eye size score <sup>8</sup> .....	4.0	4.6
Av. firmness score <sup>9</sup> .....	3.2	4.1

1. Feed prices: Sorghum grain, \$2.50 per cwt.; soybean oil meal, \$70.00 per ton; sorghum silage, \$8.00 per ton; alfalfa hay, \$25.00 per ton; salt, \$0.75 per cwt.

2. One steer removed from lot 1 during the fattening period because of an injury.

3. Based on carcass weights and grade with U.S. Choice at 41 cents and U.S. Good carcasses at 37 cents per pound.

4. Based on carcass values as stated above.

5. Average grade determined as follows: High choice, 15; average choice, 14; low choice, 13; high good, 12; average good, 11; low good, 10; high standard, 9.

6. Visual marbling score determined as follows: Moderate, 5; modest, 6; small amount, 7; slight amount, 8.

7. Visual fat covering at 12th rib: Moderate, 3; modest, 4; slightly thin, 5.

8. Visual rib eye score: Moderately large, 3; modestly large, 4; slightly small, 5.

9. Firmness of rib eye: Firm, 2; moderately firm, 3; modestly firm, 4; slightly firm, 5.

**The Effect of Feeding Stilbestrol<sup>1</sup> to Open and Spayed Heifers, 1956-57 (Project 370).**

E. F. Smith, D. Richardson, B. A. Koch, R. A. Merkel and F. W. Boren

This is the second of two trials; the first trial was reported in Circular 349 from this station. Experimental evidence indicates that spaying heifers lowers the rate of gain, whereas stilbestrol has been successfully used to increase rate of gain. This test is to study the effect of (1) spaying; (2) spaying plus stilbestrol; (3) non-spaying, and (4) non-spaying plus stilbestrol on the performance of heifer calves on a high roughage ration, followed by a fattening ration.

**Experimental Procedure**

Forty-four good-quality Hereford heifer calves from near Melrose, New Mexico, were used in the test. They were divided into four lots of 11 heifers each on the basis of weight, and started on test December 8, 1956. Within the following week two lots were spayed. The four lots of heifers were fed the same feed: 4.7 pounds of ground sorghum grain and 2.6 pounds of alfalfa hay per head daily, all of the sorghum silage they would eat, and free access to salt. A small amount of soybean meal was fed during the last 30 days of the wintering phase. On April 3 the heifers were started on a full feed of grain. During the fattening period the heifers in all lots had free access to ground sorghum grain and alfalfa hay.

The experimental treatment for each lot was as follows:

- Lot 13—Non-spayed (control lot).
- Lot 14—Non-spayed plus 5 mgs. stilbestrol per head daily the first 56 days and 10 mgs. per head daily during the remainder of the test.
- Lot 15—Spayed.
- Lot 16—Spayed plus 5 mgs. stilbestrol per head daily the first 56 days and 10 mgs. per head daily during the remainder of the test.

The stilbestrol was fed mixed with the sorghum grain during the wintering phase and with the soybean meal during the fattening phase.

**Observations**

1. Spaying lowered the gain during the wintering phase and during the fattening period which followed. Feed consumption was slightly lower in the spayed lot (lot 15), and feed efficiency was lowered by spaying during the winter period.
2. Stilbestrol fed to spayed heifers increased their gain up to that of the control lot 13 for both the wintering and fattening periods.
3. For the two phases combined, the performance under all treatments was about the same, with small variations, except for the spayed heifers in lot 15, which were the poorest performers. However, they did compare favorably with the other lots in regard to carcass data.
4. This test demonstrates little merit for spaying, emphasizes the value of stilbestrol for spayed heifers, and shows only a small advantage of stilbestrol for regular non-spayed heifers on this type of program. About the same trends were noted in the first test.

1. The stilbestrol was furnished by Eli Lilly Co., Indianapolis, Ind.

**Table 31**

**The Effect of Feeding Stilbestrol to Open and Spayed Heifers.**

**Phase 1—Wintering—December 8, 1956, to April 3, 1957—116 days.**

Treatment	Non-spayed	Non-spayed plus stilbestrol	Spayed	Spayed plus stilbestrol
Lot number	13	14	15	16
Number of heifers per lot	10 <sup>1</sup>	11	11	11
Av. initial wt. per heifer, lbs.	373	370	371	370
Av. final wt. per heifer, lbs.	570	572	534	565
Av. gain per heifer, lbs.	197	202	163	195

1. One heifer was removed from this lot because she failed to recover sufficiently from dehorning.

**Table 31 (Continued)**

Av. daily gain per heifer, lbs.	1.69	1.74	1.41	1.68
Daily ration per heifer, lbs.:				
Ground sorghum grain	4.66	4.66	4.66	4.63
Soybean meal <sup>2</sup>	.17	.17	.17	.17
Sorghum silage	17.0	17.0	15.3	15.9
Alfalfa hay	2.65	2.70	2.50	2.66
Salt	.07	.03	.06	.03
Stilbestrol, 5 mgs. per head daily the first 56 days of test, 10 mgs. thereafter <sup>3</sup>	no	yes	no	yes
Lbs. feed per cwt. gain:				
Ground sorghum grain	273	266	332	277
Soybean meal	10	10	12	10
Sorghum silage	996	980	1086	953
Alfalfa hay	155	154	190	159
Av. feed cost per cwt. gain, <sup>4</sup> \$	13.12	13.32	15.47	13.36

**Phase 2—Full feeding—April 3, 1957, to August 8, 1957—127 days.**

Av. initial wt. per heifer, lbs.	570	572	534	565
Av. final wt. per heifer, lbs.	796	810	745	798
Av. gain per heifer, lbs.	226	238	211	233
Av. daily gain per heifer, lbs.	1.78	1.87	1.66	1.83
Daily ration per heifer, lbs.:				
Ground sorghum grain, self-fed	12.7	12.8	11.7	12.7
Soybean meal	1.0	1.0	1.0	1.0
Sorghum silage	4.4	4.0	3.8	3.8
Alfalfa hay	5.3	4.7	4.5	4.6
Salt	.02	.02	.02	.02
Lbs. feed per cwt. gain:				
Ground sorghum grain	715	684	703	691
Soybean meal	55	52	59	53
Sorghum silage	248	214	226	205
Alfalfa hay	299	251	272	248
Av. feed cost per heifer, <sup>4</sup> \$	55.44	55.32	50.46	54.49
Av. feed cost per cwt. gain	24.53	23.24	23.91	23.39

**Summary of Phases 1 and 2—December 8, 1956, to August 8, 1957—243 days.**

Av. total gain per heifer, lbs.	423	440	374	428
Av. daily gain per heifer, lbs.	1.74	1.81	1.54	1.76
Av. feed cost per cwt. gain, \$	19.24	18.55	20.24	18.64
Av. total feed cost per heifer, \$.	81.38	81.60	75.71	79.77
Av. initial heifer cost at \$19.50 per cwt.	72.74	72.15	72.35	72.15
Av. selling price per cwt. <sup>5</sup>	22.65	22.48	22.67	22.32
Av. return per heifer above initial cost plus feed cost	19.83	21.82	14.94	20.61
Av. % shrinkage in shipping to market	3.5	3.6	3.5	3.1
Dressing %, chilled	59.0	58.8	58.4	58.6
Carcass grades, USDA:				
High choice	....	....	1	1
Av. choice	2	2	1	1
Low choice	5	5	8	4
High good	3	3	....	1
Av. good	....	....	....	3

2. Soybean meal was fed at the rate of .5 pound per head daily the last 30 days of test.

3. Stilbestrol was furnished by Eli Lilly and Co., Indianapolis, Ind., as Stilbosol (a diethylstilbestrol premix).

4. Feed prices—per ton: Alfalfa hay, \$25.00; sorghum silage, \$10.00; soybean meal, \$70.00 per cwt.; ground sorghum grain, \$2.50.

5. Based on carcass grades with U.S. prime at 40c a pound, choice at 39c and good at 37c.

Table 31 (Continued)

Low good .....	....	1	1	1
Av. grade <sup>a</sup> .....	12.90	12.63	13.00	12.36
Av. marbling score <sup>7</sup> .....	7.10	7.18	6.90	7.27
Av. fat thickness score <sup>8</sup> .....	3.5	3.81	4.09	4.09
Av. rib eye size, score <sup>9</sup> .....	4.6	4.54	4.36	4.54
Av. firmness score <sup>10</sup> .....	3.7	3.45	3.72	3.45

6. Average grade was based on low prime, 16; high choice, 15; average choice, 14; low choice, 13; high good, 12; average good, 11.

7. Marbling score was based on: moderate, 5; modest, 6; small amount, 7; slight amount, 8.

8. Fat thickness score at 12th rib based on: moderate, 3; modest, 4; slightly thin, 5.

9. Rib eye score size was based on: moderately large, 3; modestly large, 4; slightly small, 5.

10. Firmness of rib eye was based on: firm, 2; moderately firm, 3; modestly firm, 4; slightly firm, 5.

#### Relationship of Summer Gains of Yearling Steers on Bluestem Pastures with Feeder Grade, Shade of Color, Weight at the Start of the Grazing Season and Previous Winter Gain, 1956-57 (Project 253-2-5).

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D. L. Good and R. F. Cox

Feeder grade, shade of color, and weight are some factors considered by cattlemen who purchase or produce yearling steers to pasture. The objective of this study is to determine the relationship of summer gains of yearling steers on bluestem pastures with feeder grade, shade of color, weight at the start of the grazing season and previous winter gain.

#### Experimental Procedure

Data were gathered on Hereford steers which were used in pasture utilization studies. In the fall of 1955, 136 steer calves were purchased and wintered 170 days in dry-lot on sorghum silage, alfalfa hay and two pounds of sorghum grain per head daily. The summer grazing period was from April 25 to October 1, 1956. The 155 steers used in the 1957 grazing season were purchased in the fall of 1956 and wintered in dry-lot on sorghum silage, a limited amount of alfalfa hay and one pound of protein concentrate per head daily. The 1957 summer grazing period was from April 27 to October 3.

In April of each year the steers were individually scored for feeder grade and shade of red by five animal husbandmen working independently. Feeder grades were the USDA grades fancy, choice, good, medium, common. Each grade was further subdivided into high, middle, and low. A numerical grade of 18 was assigned to high fancy, 17 to middle fancy, 16 to low fancy, etc. The average of the five feeder grades for each steer (as scored by the animal husbandmen) was computed for statistical analysis. The average of the five color scores for each steer was computed for statistical analysis. Shade of red scores were dark, medium, and light; each shade of red score was further subdivided into three subdivisions. Very dark was assigned a numerical value of 9, medium dark was assigned a grade of 8, etc.

#### Results

Since the steers were allotted to several pastures and some received hormone implants, correlations were computed within treatment within pasture. The correlations are listed in Table 32.

The correlation between feeder grade and summer gain was practically zero in both years. This indicates that feeder grade is not a good indicator of summer gain. Therefore, the advantage in purchasing high-grading yearlings to summer graze on bluestem pasture would not be in increased gains but would be in having higher grading steers at the end of the grazing season than if lower grading steers were purchased.

The correlation between color and summer gain was practically zero

Table 32

Correlations of Summer Gains with Feeder Grade, Color Score, Winter Gain and Weight at the Start of the Grazing Season by Years.

	1956	1957
Feeder grade .....	-.03	.07
Color score .....	-.05	.06
Winter gain .....	-.20	.....
Weight .....	-.32	.04

in both years. On the basis of these results one cannot claim an advantage in summer gains for a particular shade of red. The advantage of purchasing cattle of a particular shade of red would lie in the possible increase in sale price of these steers when sold to feed-lot operators who prefer cattle of that shade of red.

The correlation between previous winter gain and summer gains (-.20 in 1956) indicates that the steers making low winter gains tended to compensate with higher summer gains. Previous winter gain of each steer was not obtained for the steers grazed during 1957.

The correlation between beginning weight and summer gain (-.32 in 1956) shows that light-weight steers at the start of the summer grazing period tended to make larger gains than the heavier steers. In 1957, the correlation was .04, which is so nearly zero that there appeared to be no real difference in the gains made by cattle of different weights.

#### Feedlot Performance of Steers Implanted with Stilbestrol<sup>1</sup> Prior to the Grazing Season (Project 253-4).

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

Experimental evidence indicates that beef steers implanted with low levels of stilbestrol before going to grass will make increased gains during the grazing season. The test reported herein was designed to measure the performance of such implanted steers on a fattening ration in dry-lot after the grazing season.

#### Experimental Procedure

Animals used in this study were selected from a group of 150 Hereford steers used in grazing studies during the summer of 1957. One group of 10 steers had been implanted with 24 mgs. of stilbestrol in April 1957. The other group of 10 steers was among those serving as controls in the summer grazing studies. Both groups of 10 animals averaged nearly 775 pounds in weight when put on feed. The steers were brought to a full feed of grain during a four-week period of hand feeding. Thereafter, they had sorghum grain before them at all times. The alfalfa hay fed was limited to the amount consumed without waste. Each morning 10 pounds of soybean oil meal containing 10 mgs. of stilbestrol per pound was scattered over the grain bunk in each lot.

(Warm water was available to the animals at all times from automatic waterers. Salt was available to the animals at all times. A mixture of bonemeal and salt was also available.

#### Observations

1. Animals in both groups made excellent gains throughout the 100-day period. The previously implanted animals made somewhat greater gains than the control animals.

2. No feeding problems were encountered with either group. There were no cases of bloat, serious scouring or any other evidence of digestive disturbances.

<sup>1</sup> Stilbosol premix containing diethylstilbestrol supplied by Eli Lilly and Co.