

Experimental Procedure

The first experiment was conducted during the winter of 1953-54 with 60 heifer calves. The heifers were raised near Snyder, Texas, and delivered to Manhattan, December 1, 1953. The heifers were assigned December 17, 1953, as lots of 10 to a series of wintering experiments. The level of parasitism was established during the last two weeks of December. Fecal samples were collected and E.P.G. (egg per gram) counts were made on the composite fecal samples from each lot. Five heifers in each lot were treated with 60 grams (two 30-gram boluses) of phenothiazine on January 14, 1954.

A second experiment using this same procedure was conducted during the winter of 1954-55, with 70 steer calves that originated in Barber county, Kansas.

The results of the two experiments are shown in Table 47.

Table 47.—Effect of phenothiazine treatment on the gains of young beef cattle fed wintering rations.

Year	1953-54		1954-55	
	Treated	Non-treated	Treated	Non-treated
Length of experiment, days	137	137	140	140
Number of cattle	30*	30*	35**	35**
Av. initial wt., lbs.	310	312	454	456
Av. final wt., lbs.	491	487	718	721
Av. total gain, lbs.	181	175	264	265
Av. daily gain, lbs.	1.31	1.27	1.88	1.89

* Heifers.

** Steers.

Observations

Beef calves used in this experiment were typical of replacement calves used on many farms and ranches of Kansas. The average initial E.P.G. count of the heifers used in the first test was 156 as compared to 17 for the steers used in the second test. An E.P.G. count of 300 to 500 is considered to be detrimental or harmful to the animal.

The weight gains of the phenothiazine-treated heifers in the first test were 6 pounds more per head than those of the non-treated heifers, whereas in the second test the treated steers gained 1 pound less than the non-treated steers. The difference in gain was not statistically significant in either test.

Phenothiazine treatment of beef calves in Kansas is unwarranted unless the degree of parasitism is higher than it was in the cattle used in these experiments.

The Value of Stilbestrol* in Beef Cattle Rations, Wintering Phase.

PROJECT 370

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Stilbestrol has been recognized as a growth-stimulating factor in beef cattle-fattening rations. It is a synthetic compound that has a hormone-like effect when taken into the body.

This experiment was designed to determine the value of stilbestrol (1) in the wintering ration of beef calves, (2) during grazing, (3) when animals return to the feed lot after grazing, (4) effect of removing stilbestrol from the animals while grazing, (5) effect from long-time continuous feeding, (6) effect upon digestibility of feed, and (7) car-

* Stilbestrol (shortened name for diethylstilbestrol) premix was supplied by the Eli Lilly Company, Indianapolis 6, Ind.

cass grade. This report gives information on the wintering phase (1) and the digestibility (6) studies.

Experimental Procedure

Forty Hereford steer calves averaging about 450 pounds were divided as equally as possible into four lots of 10 animals each. Two lots served as controls and the other two lots received 10 mg. of stilbestrol per head daily in the soybean meal. Ten Hereford heifer calves averaging about 335 pounds were divided as equally as possible into two lots of five animals each. One served as control and the other received 10 mg. of stilbestrol per head daily in the soybean meal. Atlas sorghum silage was used as the roughage in all lots and the animals received all they would clean up each day. The concentrate part of the ration consisted of 1 pound of soybean meal and 4 pounds of ground milo grain for all lots. A mineral mixture of 2 parts steamed bone meal and 1 part salt and salt were fed free choice. Water was available at all times.

Eleven yearling Hereford steers were used in the digestion study. The ration used was chopped alfalfa hay and cracked milo grain fed at a ratio of 1 part hay to 3 parts grain. The study was made with all steers and then repeated with stilbestrol. Thus, each animal served as his own control. The stilbestrol was fed at the rate of 10 mg. per head daily. The steers were fed in stanchions, and canvas collection bags were used to collect the feces for chemical analyses.

Results and Discussion

Feed lot results for the steers are shown in Table 48, and for the heifers in Table 49. Note that there is a little variation between lots; however, there are no significant differences. Table 50 gives a summary of the digestion study. There was a consistent lowering of digestibility when stilbestrol was added to the ration. These differences are statistically significant. The economic or practical significance of these findings cannot be stated at this time. However, with increased gains on fattening rations and apparently lowered digestibility of the feed, further investigations seem to be warranted.

Many animals, both steers and heifers, developed high tailheads and weak backs in the region of the loin. Here again, the practical significance of these results is not known at this time.

Table 48.—Results with and without stilbestrol in the wintering ration of beef steer calves.

(Nov. 16, 1954-April 5, 1955—140 days)

Lot number	10	15	11*	12*
Number steers per lot	10	10	10	10
Av. initial wt., lbs.	454	457	456	455
Av. final wt., lbs.	723	714	723	729
Av. total gain, lbs.	269	257	267	274
Av. daily gain, lbs.	1.92	1.84	1.91	1.96
Av. daily ration, lbs.:				
Soybean meal	1.00	1.00	1.00	1.00
Ground milo	4.00	4.00	4.00	4.00
Atlas sorgo silage	29.05	29.04	28.94	29.05
Salt .....	.10	.11	.13	.13
Mineral (bone meal + salt) .....	.09	.10	.09	.09
Lbs. feed per 100 lbs. gain:				
Soybean meal	52.12	54.45	52.43	51.13
Ground milo	208.49	217.81	209.74	204.53
Atlas sorgo silage	1514.89	1581.09	1517.60	1485.57
Salt	5.14	5.72	6.62	6.87
Mineral	4.80	5.60	4.83	5.08
Feed cost per 100 lbs. gain ...	\$13.38	\$13.99	\$13.86	\$13.56

* Received 10 mg. of stilbestrol in soybean oil meal per head daily. Cost figured at .08c per mg. or .3c per head daily.

Table 49.—Results with stilbestrol in the wintering ration of beef heifer calves. (Nov. 16, 1954-April 5, 1955—140 days)

Lot number	16	17*
Number heifers per lot	5	5
Av. initial wt., lbs.	336	338
Av. final wt., lbs.	577	592
Av. total gain, lbs.	241	254
Av. daily gain, lbs.	1.72	1.82
Av. daily ration, lbs.:		
Soybean meal	1.00	1.00
Ground milo	4.00	4.00
Atlas sorghum silage	22.57	22.54
Salt .....	.13	.11
Mineral (bone meal + salt) .....	.18	.18
Lbs. feed per 100 lbs. gain:		
Soybean meal	58.09	55.03
Ground milo	232.37	220.13
Atlas sorghum silage	1311.20	1240.17
Salt	7.72	5.90
Mineral (bone meal + salt)	10.79	10.22
Feed cost per 100 lbs. gain	\$13.63	\$13.33

* Received 10 mg. of stilbestrol per head daily. Cost figured at .08c per mg. or .8c per head daily.

The Use of Live Yeast Suspensions in Beef Cattle Rations.

PROJECT 370

F. H. Baker, D. Richardson, J. O. Harris, R. F. Cox, and O. M. Bowman

It has long been recognized that the rumen of cattle and sheep normally contains innumerable microorganisms which function in the fermentation of complex carbohydrates and the synthesis of nutrients beneficial to the host animal. However, the modern era of feed additives has resulted in a renewed interest in the feeding of live yeast to ruminants.

An experiment was initiated to study the value of two strains of yeast in wintering and fattening rations for beef cattle. This progress report is on a digestion study of a fattening ration and the wintering phase of an experiment that includes wintering, grazing, and fattening steer calves.

Procedure

Forty head of choice-quality steer calves were used in the wintering phase of this test. These calves were part of a shipment from the Lonker Ranch, Medicine Lodge, Kan. The steers were assigned to lots on the basis of weight and feeder grade.

The live yeast suspensions used in this experiment are *Torula utilis* and *Saccharomyces cerevisiae*. The yeast suspensions were prepared weekly and stored at the optimum temperature until fed. They were prepared to supply 3 billion live yeast cells per animal daily. The suspensions were mixed with ½ pint of water and sprinkled over the rations in the feed bunks each morning.

Results of this phase of the study are presented in Table 51.

A digestion study was conducted to determine the influence of the two strains of yeast on the digestibility of a cattle-fattening ration composed of 3 parts milo grain and 1 part alfalfa hay. Eleven yearling Hereford steers weighing 700 pounds each were used in this study. The results of this study are given in Table 52.

Table 50.—Results of digestion study with stilbestrol using 11 yearling Hereford steers and a ration of 1 part alfalfa hay to 3 parts milo grain.

Steer number	Crude protein		% Apparent Digestibility of		Crude fiber		N-free extract		% T.D.N.	
	Control	Treated*	Ether extract Control	Ether extract Treated*	Control	Treated*	Control	Treated*	Control	Treated*
1	65.6	60.3	70.0	54.1	57.3	52.4	77.9	79.9	68.3	67.4
2	70.2	58.1	65.4	55.0	60.9	49.6	86.7	79.2	74.5	66.5
3	70.1	66.3	70.7	64.9	65.8	51.7	82.2	83.7	72.4	71.1
4	68.2	57.4	72.5	64.0	60.7	58.6	77.5	72.7	68.9	63.4
5	61.3	53.2	63.7	46.4	55.1	50.4	75.6	63.7	65.6	55.2
6	61.4	50.5	55.4	54.2	55.4	50.1	77.1	66.2	66.0	57.0
7	66.1	52.7	62.6	51.7	58.2	50.9	83.2	67.4	71.3	58.0
8	67.2	56.6	60.5	50.1	56.9	50.4	80.3	62.8	69.4	55.2
9	67.2	60.0	69.0	59.1	54.7	52.2	81.3	80.3	70.4	67.9
10	66.2	57.3	65.1	62.3	51.2	50.8	77.0	70.2	66.9	61.0
11	62.3	57.5	50.7	46.6	56.2	53.9	75.5	76.8	64.9	64.7
Weighted Av.	66.1	57.3	64.0	55.0	57.5	51.3	79.6	73.2	69.0	62.6

* Received 10 mg. of stilbestrol per head daily.