

AGRICULTURAL EXPERIMENT STATION

KANSAS STATE AGRICULTURAL COLLEGE
MANHATTAN, KANSAS

DEPARTMENT OF ANIMAL HUSBANDRY



FIRST-PRIZE STEER HERD—KANSAS NATIONAL LIVE-STOCK SHOW, 1925

CATTLE FEEDING INVESTIGATIONS, 1925-'26¹

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Previous tests conducted by the Kansas Agricultural Experiment Station indicate that a ration consisting of all the shelled corn calves will eat, one pound of cottonseed meal per head per day, two pounds of alfalfa hay per head per day, and all the silage they will eat is about the most satisfactory ration that can be fed from the standpoint of gains, finish, and efficient use of feed. During the winter of 1925-'26 a test was conducted for the purpose of determining: (1) The possibility of making silage and prairie hay as efficient as silage and alfalfa hay, as the roughage portion of a ration for calves being fed to be marketed as fat yearlings. (2) The relative value of cot-

1. Contribution No. 82 from the Department of Animal Husbandry.

tonseed meal and linseed oilmeal as a protein supplement for corn, silage and hay in a ration fed to calves being fed to be marketed as fat yearlings. (3) The relative value of hand-feeding and self-feeding as methods of feeding grain to calves being fed to be marketed as fat yearlings.

This test involved the use of six lots of calves which were fed as follows:

Lot 1, all the shelled corn and cane silage they would eat, two pounds of alfalfa hay per head per day, and an average of 0.99 of a pound of cottonseed meal per head per day.

Lot 2, all the shelled corn and cane silage they would eat, one pound of alfalfa hay and one pound of prairie hay per head per day, and an average of 1.14 pounds of cottonseed meal per head per day.

Lot 3, all the shelled corn and cane silage they would eat, two pounds of prairie hay per head per day, and an average of 1.28 pounds of cottonseed meal per head per day.

Lot 4 was fed the same as lot 3 with the addition of an average of 0.11 pound of calcium carbonate per head per day.

Lot 5, all the shelled corn and cane silage they would eat, two pounds of prairie hay per head per day, and an average of 1.28 pounds of old process linseed oilmeal.

Lot 6, self-fed shelled corn and cane silage after they were gotten up on full-feed. In addition they were fed two pounds of alfalfa hay and an average of 0.99 pound of cottonseed meal per head per day.

All the calves were started on an average of two pounds of shelled corn per head per day, two pounds of dry roughage consisting either of alfalfa or prairie hay alone or a combination of both per day, a quarter of a pound of protein supplement per head per day, and in addition what cane silage they would clean up. The shelled corn was increased at the rate of approximately one pound per head per week. The protein supplements were increased at the rate of one-quarter of a pound per head per week. The protein supplements were all up to the maximum amount allowed for each lot at the end of the first 30-day period. The amount of protein supplement fed in the lots varied. The aim was to feed just enough of the protein supplement that the protein content of the rations fed in the various lots would be the same.

The dry roughages fed were the same from start to finish, an average of two pounds per head per day. This was fed once a day—at noon. The cane silage was fed according to appetite. All lots were

hand-fed the same amount of shelled corn the first 45 days. A self-feeder was put in lot 6 at the end of 45 days, after which it was used in feeding the shelled corn to this lot. All lots were consuming an average of eight pounds of shelled corn per head per day at the time the self-feeder was put in lot 6. From this time on until the end of the test lot 6 had shelled corn before them at all times. The cane silage and cottonseed meal was hand-fed twice daily and the alfalfa hay at noon each day.

The other five lots were all fed the same amount of shelled corn per head per day up until the end of 120 days of the feeding period when lot 3, which was receiving prairie hay as its dry roughage portion of the ration, slowed up and the other lots forged ahead. It was aimed to give them all the shelled corn that they would eat. The cane silage was used as the "buffer" and was fed in varying amounts as the average daily ration given previously indicates.

The minimum amount of shelled corn fed per head per day was two pounds and the maximum amount was 16 pounds. The average daily amount consumed per steer for the 175 days is given in the average daily ration per steer for each lot,

The calcium carbonate was mixed with the cottonseed meal and hand-fed twice daily in lot 4. Free access to salt was available at all times.

The results of this test are given in detail in Table I.

TABLE I.—Results of a 175-day feeding experiment attempting to make silage and prairie hay as efficient as silage and alfalfa hay, also studying the relative value of cottonseed and linseed oilmeal and self-feeding and hand-feeding.

Lot No.	1	2	3	4	5	6
Number of days on test	175	175	175	175	175	175
Weight per calf at beginning of test, December 1, 1925	Pounds. 418.00	Pounds. 420.89	Pounds. 421.33	Pounds. 420.89	Pounds. 419.78	Pounds. 418.45
Weight per calf at end of test, May 25, 1926	820.37	811.00	792.49	825.6	814.92	841.71
Gain per calf during test	402.37	390.11	371.16	404.71	395.14	423.26
Daily gain per calf during test	2.30	2.23	2.12	2.31	2.26	2.42
Average daily ration per calf:						
Shelled corn	11.23	10.95	10.79	10.95	10.96	11.86
Cane silage	10.89	9.73	8.58	8.97	8.93	9.19
Alfalfa hay	1.99	1.00				1.99
Prairie hay		1.00	1.99	1.99	1.99	
Cottonseed meal	.89	1.14	1.28	1.28		.90
Linseed oilmeal					1.28	
Calcium carbonate				.11		
Feed required to produce 100 pounds gain:						
Shelled corn	485.3	491.26	508.79	473.56	485.37	490.45
Cane silage	473.72	436.49	404.59	387.93	395.70	379.86
Alfalfa hay	86.74	44.73				82.46
Prairie hay		44.73	94.03	86.23	88.32	
Cottonseed meal	43.24	51.13	60.50	55.49		41.11
Linseed oilmeal					56.83	
Calcium carbonate				4.8		
Cost of 100 pounds gain	\$8.79	\$8.81	\$9.05	\$8.48	\$9.06	\$8.52
Cost of calves per head at \$9 per cwt.	37.62	37.88	37.92	37.88	37.78	37.66
Cost of feed per head	35.43	34.39	33.60	34.32	35.81	36.07
Calf cost plus feed cost	73.05	72.27	71.52	72.20	73.59	73.73
Value per head at home at end of test	73.83	70.15	67.36	72.24	72.12	77.02
Margin per head	-.78	-2.12	-4.16	-.04	-1.47	+3.29
Necessary value per cwt. at feedlots to break even	8.90	8.81	9.02	8.75	9.03	8.78
Value per cwt. at feedlot—Kansas City price minus 50 cents per cwt.	9.00	8.65	8.50	8.75	8.95	9.15

Feed Prices.—Corn, 70 cents a bushel; cottonseed meal, \$40 a ton; linseed oilmeal, \$55 a ton; alfalfa hay, \$15 a ton; prairie hay, \$10 a ton; cane silage, \$5 a ton; calcium carbonate, \$20 a ton.

OBSERVATIONS

1. The addition of approximately one-ninth of a pound of calcium carbonate to a ration consisting of prairie hay, cane silage, shelled corn, and cottonseed meal fed in lot 4, produced slightly greater gains at less cost per hundred pounds of gain than alfalfa hay, cane silage, shelled corn, and cottonseed meal, fed in lot 1. However, the yearlings receiving alfalfa hay in lot 1 were valued at 25 cents a hundred pounds more than those receiving prairie hay in lot 4, which resulted in slightly greater profits in lot 1, fed alfalfa hay. Apparently the addition of calcium carbonate to prairie hay and silage makes it compare favorably with alfalfa and silage as the roughage portion of a ration to be used for fattening calves to be sold as yearlings.

2. The advantage of adding calcium carbonate to a ration consisting of prairie hay, cane silage, corn, and cottonseed meal, is

further emphasized by comparing lot 4 with lot 3. The addition of 20 cents worth of calcium carbonate to the ration fed in lot 4 resulted in a net return of \$4.20 per steer greater than in lot 3, fed the same feeds except calcium carbonate.

3. The relative value of cottonseed meal and linseed oilmeal as protein supplements in rations that do not include a legume hay is shown in lots 3 and 5. The calves receiving linseed oilmeal made greater gains, required less feed to make 100 pounds of gain, and showed more finish as indicated by a higher appraised value per pound. These factors resulted in a greater profit from the use of linseed oilmeal than from cottonseed meal.

4. The results secured in lots 1 and 6 indicate that self-feeding is more profitable than hand-feeding provided calves are up to practically a full-feed of concentrates before being permitted access to a self-feeder. In this experiment they were hand-fed 45 days before they were started on a self-feeder.

5. The initial cost of cattle is an important factor in determining profit, from cattle-feeding operations. However, rate of gain and economy of gains and finish, which largely determine selling price, are also important factors.

Quality is of prime importance in feeding calves which are to be fattened and sold as yearlings. Nondescript animals will not make good desirable fat yearlings and the person who attempts to feed the plain kind is doomed to disappointment. It requires a long feeding period, from six to eight months, to make a calf fat enough to sell well as a yearling, but it should be remembered that even though it takes longer it requires very much less feed to produce a given amount of gain on a calf than on a big steer. Too many feeders have planned to market after a short feed, 70 to 90 days. They are doomed to disappointment.

