

EXPERIMENT STATION
OF THE
KANSAS STATE AGRICULTURAL COLLEGE.
M A N H A T T A N .

BULLETIN NO. 34—SEPTEMBER, 1892.

FARM DEPARTMENT.

C. C. GEORGESON, M. Sc.,

Professor of Agriculture, and Superintendent of Farm.

F. C. BURTIS, B. Sc., *Assistant.*

WM. SHELTON, *Foreman of Farm.*

EXPERIMENTS IN FEEDING STEERS.

Kansas farmers own upwards of a million and a half of beef cattle. The value of the beeves which they yearly fatten and market amounts to more than thirty-three million dollars (\$33,000,000). These are stupendous figures, yet they fall below rather than go above the actual estimates. Is this enormous sum handled in a manner to bring the best returns? That is, are the beeves which annually bring this sum fattened in the most economical way, or could they bring larger returns from the food consumed? When so large amounts are involved, even a slight waste will in the aggregate foot up large figures. A saving of only 10 per cent. would amount to \$3,300,000 annually for Kansas alone. That is, if the feed which now produces \$10 worth of beef could be made to produce \$11 worth, Kansas feeders would clear the above sum yearly; and if the calculations were extended to all the corn-growing and corn-feeding States, the aggregate gain would at least equal the total market value of Kansas beeves.

Corn is the most important crop in the Western States, and it very properly forms the basis of all fattening operations. But is the exclusive corn

diet, which is well-nigh universal in these States, the cheapest way of finishing beeves for market? Is there anything gained by sheltering fattening beeves? Do we get better returns from corn meal than from whole corn? These are some of the questions which suggested themselves to the writer while the experiment was under contemplation. And while there are many other questions of equal interest in connection with beef production, these involve at least some of the fundamental principles in the handling of steers here in the West. The problems suggested were presented to the steers themselves for solution, in the following

PLAN OF THE EXPERIMENTS.

It was decided to procure 20 average steers, and divide them into four lots of five steers each, the lots to be as nearly equal in weight and quality as possible. One lot was to be fed in the open yard, as nearly as possible according to the method followed by a majority of Kansas feeders. They were to be confined in a suitable lot in which a shed was erected, open to the south, but boarded up on the north, east, and west, under which they could seek shelter from storms at their pleasure. They were to be fed in a trough in the open, and the feed to consist of all the ear corn, corn fodder and prairie hay that they would eat, with free access to good water—this lot to be the standard with which the others were to be compared.

The other three lots were all to be tied up in the barn; one of them to be fed exactly like the lot in the yard, the only difference being that their shelter was compulsory, whereas the out-door lot had the freedom of the yard, the open air, and the sunshine. The object was to see if there was any merit in the shelter of the barn under these conditions.

A third lot was to be similarly tied up in the barn; but instead of being fed on ear corn exclusively, as in the previous case, this lot was to be fed on corn meal, all they would eat, with what they would consume of corn stalks and prairie hay, as in the other cases. They were to be compared with the other lots, but especially with the lot tied alongside of them and fed on ear corn, in order to ascertain the beef-producing value of corn meal.

Finally, a fourth lot of five steers was also to be tied up and fed in the barn; but instead of an exclusive corn diet, this lot was to have a judicious mixture of corn meal, oil meal, bran, and shorts, the proportion of albuminoids and carbohydrates in the feed to approximate the requirements of the "feeding standards;" and in addition to this mixture to have what corn fodder and hay they would eat.

All the feed, both grain and fodder, was to be weighed out to each steer separately at each meal, and in like manner all the water drunk was to be weighed to each, for the lots in the barn. A record of the temperature in the yard and in the barn was also to be kept.

This program was adhered to strictly in all its details through the entire feeding period of six months, and, as is self-evident, it involved a vast amount of most careful work.

HISTORY OF THE STEERS.

The 20 steers used in these experiments were grade short-horns. They were bought of Judge W. B. Sutton, of Russell, Kas., who had raised some of them on his own ranch, and a few of them had been raised on neighboring ranches. They were procured from this locality largely because, being in the heart of the vast stock-raising region of western Kansas, it was thought they would be fair representatives of the large class of native ranch cattle handled by our farmers and feeders throughout the State. They were three-year-olds past, and all had been dehorned, some of them a year or more, and others only a few weeks previous to the purchase. They were drafted from a herd of nearly 200 head, with the points in view that they should represent the average of the herd in size and quality, and be as nearly uniform in shape and apparent feeding qualities as they could be picked by the eye, in order that all might start in the test with equal advantages. It is believed that these points were secured. They were purchased in the middle of November, and, in common with the rest of the herd, they had at that time been in the feed lot about two weeks, where they had been fed on whole ear corn and cane fodder. These are, briefly stated, the leading facts in their history previous to their arrival here at the Station.

FIRST COST.

They were bought at an average price of \$39.50 a head, or \$790 for the 20 head. Their weight was estimated to average 1,200 pounds, and this estimate was subsequently proved to be correct. Their cost on the ranch was therefore equal to \$3.29 per hundred, live weight. But to this should be added a freight bill of \$35, for transportation to Manhattan, which brings the total up to \$825 for the lot laid down at the Experiment Station, or a trifle over \$3.41 per hundred weight. This was as reasonable a price as similar steers could at that time be procured for from any quarter. The heavy corn crop of 1891 increased the demand for feeders, and stock men everywhere had rosy visions of large profits to be realized on feeding. None know better than they how poorly these expectations were fulfilled.

INITIAL WORK.

The steers arrived at the barn November 16, and were at once numbered from 1 to 20, by means of ear-marks, and weighed, with the following result:

No. 1.....	1,160 lbs.	No. 11.....	1,320 lbs.
No. 2.....	1,050 "	No. 12.....	1,380 "
No. 3.....	1,180 "	No. 13.....	1,205 "
No. 4.....	1,180 "	No. 14.....	1,155 "
No. 5.....	1,150 "	No. 15.....	1,120 "
No. 6.....	1,190 "	No. 16.....	1,185 "
No. 7.....	1,140 "	No. 17.....	1,070 "
No. 8.....	1,060 "	No. 18.....	1,205 "
No. 9.....	1,310 "	No. 19.....	1,240 "
No. 10.....	1,280 "	No. 20.....	1,310 "

Total weight, 23,890 pounds; average per head, 1,194.5 pounds. It is to be noticed that these are the weights as they came off the car and before they had opportunity to fill up on feed. The weights on which their division into lots was subsequently based were taken a few days later. All ran together in the barn-yard to accustom them to the place until November 19, during which time they ate 1,850 pounds ear corn, with corn stalks *ad libitum*. On that date a preliminary division was made and 15 of them were tied up in the barn and five put in the yard provided for the out-door feeding. It was found to be no easy task. Although they were dehorned, as already noted, and they were not in any sense vicious, they had never been handled before, and offered serious resistance. Each one had to be lassoed and hauled to his stall by main force and tied in place. As a natural consequence they were exceedingly restless, and refused to eat or drink until starved to it. Of necessity the experiment could not begin until they quieted down. November 23 they were again weighed individually, and it was found that the total weights of the lots now differed considerably. This necessitated a readjustment by changes from one lot to another, which was accordingly made. This division remained permanent and resulted as follows:

LOT I.		LOT II.	
Steer No. 1.....	1,192 lbs.	Steer No. 2.....	1,038 lbs.
Steer No. 5.....	1,176 "	Steer No. 11.....	1,299 "
Steer No. 6.....	1,165 "	Steer No. 14.....	1,167 "
Steer No. 9.....	1,291 "	Steer No. 16.....	1,163 "
Steer No. 13.....	1,167 "	Steer No. 20.....	1,292 "
Total.....	5,991 lbs.	Total.....	5,965 lbs.

LOT III.		LOT IV.	
Steer No. 3.....	1,183 lbs.	Steer No. 4.....	1,262 lbs.
Steer No. 8.....	1,052 "	Steer No. 10.....	1,331 "
Steer No. 7.....	1,152 "	Steer No. 15.....	1,096 "
Steer No. 12.....	1,385 "	Steer No. 17.....	1,149 "
Steer No. 19.....	1,296 "	Steer No. 18.....	1,216 "
Total.....	6,068 lbs.	Total.....	6,054 lbs.

Lots I, II, and III, which were tied up in the barn, continued restless, and did not feed well. They were therefore all fed alike for another week, namely, on ear corn and corn fodder. An account was kept of what they consumed, but it does not enter into the experiment proper.

THE EXPERIMENTS BEGIN.

On Monday, November 30, the three lots in the barn had so far become accustomed to their confinement that it was practicable to begin the work. On that day the feed of lots I and II was changed in accordance with the plan to a ration of corn meal, oil meal, shorts and bran for lot I, and to corn meal for lot II, while the feed of lots III and IV remained the same, namely, whole ear corn, husked. The supply of coarse feed con-

sisted of corn stalks, cut up when the corn was ripe, for all four lots, each animal being fed what he would eat; but in the case of lots I and II the corn fodder was run through the fodder cutter and chopped into inch lengths, and on and after December 7 lot I received tame hay, consisting of a mixture of clover and orchard grass, about equal parts, in the evening, and the cut corn fodder in the morning. The weights November 30, the starting-point of the experiment, were as follows:

LOT I.		LOT II.	
Steer No. 1.....	1,232 lbs.	Steer No. 2.....	1,067 lbs.
Steer No. 5.....	1,190 "	Steer No. 11.....	1,325 "
Steer No. 6.....	1,207 "	Steer No. 14.....	1,155 "
Steer No. 9.....	1,287 "	Steer No. 16.....	1,200 "
Steer No. 13.....	1,188 "	Steer No. 20.....	1,208 "
Total.....	6,104 lbs.	Total.....	6,055 lbs.

LOT III.		LOT IV.	
Steer No. 3.....	1,200 lbs.	Steer No. 4.....	1,276 lbs.
Steer No. 8.....	1,050 "	Steer No. 10.....	1,315 "
Steer No. 7.....	1,166 "	Steer No. 15.....	1,136 "
Steer No. 12.....	1,406 "	Steer No. 17.....	1,148 "
Steer No. 19.....	1,255 "	Steer No. 18.....	1,208 "
Total.....	6,077 lbs.	Total.....	6,123 lbs.

Having by this time learned something of the individuality of each steer, the feed given to each was adjusted to his appetite, the aim being to give only as much as would be eaten moderately clean. The amount fed was therefore not fixed in any case to a particular weight; but the appetite shown in the consumption of the last meal was a guide for the amount to be fed at the next. In the case of lot I the amounts of oil meal and shorts were added gradually until the desired ratio was reached, when the mixture remained unchanged for weeks at a time. From December 7 until February 29 the proportion consisted of 10 pounds corn meal, five pounds shorts, two pounds bran, and two pounds oil meal. Enough of these materials to last a week or more was placed in a heap on the floor in the proportion named, and thoroughly mixed by repeated shoveling. When entirely uniform, this prepared feed was stored in bins, from which it was weighed out to each steer in the lot at feeding time. They were fed twice daily: in the morning, between 6 and 7 o'clock, and in the evening, between 5 and 6. The grain was given first, in a loose box, which was placed in the manger in front of the steer, and half an hour later the corn fodder or hay was put in. Whatever was left of either was weighed back and deducted from the amount fed. They were also watered twice daily, from buckets in the stalls; the water was weighed and the amount drunk recorded.

A table was hung in front of each lot, on which each steer was charged with the amount of grain, fodder and water given him at each meal, and at the next meal he was credited with whatever grain and fodder he had left. The leavings were never offered him a second time.

After the first couple of weeks the three lots tied up in the barn were let out in the yard for exercise, for about two hours at noon every pleasant day. Of course, they had access to neither food nor water on these outings.

This was the treatment accorded to all steers in the barn. The five steers constituting lot IV could not be fed separately, as they all ran together in the yard. Their corn was weighed to the lot as a whole, and placed in a suitable box, where they fed at pleasure, and the same was the case with the corn stalks and hay. What corn there might be left on the cob was weighed, and deducted from the amount fed.

All the steers were weighed every Monday morning, after they had eaten their feed, but before they were watered, as far as those in the barn were concerned. Lot IV, having access to water at all times, could not be restricted in the same manner. A bullock scale, placed at a convenient point at the end of a narrow passage, received each steer in turn, and the man at the beam recorded his weight.

COST OF FEED.

The average price of the corn fed was 33 cents per bushel of 70 pounds ear corn. Reducing it to the price per hundred pounds, for the sake of greater ease in calculating the cost of the feed consumed, the figures stand as follows:

- Ear corn, 47 cents per hundred.
- Corn meal, 55 cents per hundred.
- Shorts, 54 cents per hundred.
- Bran, 40 cents per hundred.
- Oil meal, \$1.35 per hundred.
- Tame hay, 25 cents per hundred.
- Corn stalks, 12½ cents per hundred.
- Prairie hay, 17½ cents per hundred.

THE TABLES

which follow have been condensed from the daily records. Although it is desirable to give the fullest details in bulletins of experimental work, to enable the reader to trace the work in all minor points from beginning to end, still, in this case, the daily records are so voluminous that it is impracticable to reproduce them in full. Nothing has been omitted from the tables which follow, but the facts and figures have been condensed into weeks, and periods of four weeks each, in order to facilitate comparison of results as the experiment progressed, and to render them more intelligible.

The first five tables refer to lot I, and show the amount of feed and water consumed by each steer during each week, together with his weight and gain, or loss, cost of feed and cost of gain per pound.

It is to be noticed in this connection that the supply of corn stalks did not hold out, so that by the 22d of February it became necessary to substitute

prairie hay for the corn fodder. The fact is noted in the tables by a star and foot-note. On the 7th of March the oil-meal ration was doubled, two pounds being added to the mixture, so that the oil meal constituted four parts out of 21 parts, instead of two parts in 19, as previous to that date. On May 6 the five parts of shorts were left out and five parts of corn meal added instead. And on the 14th of May two parts oil meal were withdrawn from the ration.

As regards the individual steers in the lot, it will be noticed that they made their gains very irregularly, some weeks losing several pounds, indicated by the minus (—) sign in front of the figure, and again suddenly making heavy gains. This fluctuation is due to the varying amount of food in the stomach, and, for periods of only a few days, it is no proof of the actual gain, or loss, in flesh made.

On January 18 steer No. 1 ruptured an artery in the nose, from which he bled profusely for some hours, so much as to weaken him perceptibly and cause him to lose 20 pounds in weight. He recovered, however, and in two days' time had regained both his appetite and his weight.

LOT I—STEER No. 1.

WEEKLY SUMMARY OF FEED, WEIGHT, AND GAIN, EXPRESSED IN POUNDS.

DATE.	GRAIN.					Corn fodder.	Hay.	Water drunk.	Weight of steer.	Gain.
	Totals.	Corn meal.	Shorts.	Bran.	Oil meal.					
Nov. 30.....									1,232	
Dec. 7.....	147.5	125.00	15.50		7.00	38.0		452.0	1,269	37
“ 14.....	155.0	82.10	41.05	16.42	16.42	5.0	32.0	496.0	1,280	11
“ 21.....	171.0	90.00	45.00	18.00	18.00	6.0	8.0	413.0	1,278	—2
“ 28.....	182.0	95.79	47.89	19.16	19.16	7.0	14.0	493.5	1,325	47
Jan. 4.....	186.0	97.90	48.95	19.58	19.58	8.0	20.5	504.5	1,320	—5
“ 11.....	152.0	80.00	40.00	16.00	16.00	18.0	15.0	483.5	1,388	68
“ 18.....	157.0	82.73	41.36	16.54	16.54	22.5	24.5	455.5	1,368	—20
“ 25.....	126.0	66.31	33.15	13.26	13.26	25.5	45.0	522.0	1,403	35
Feb. 1.....	162.5	85.52	42.76	17.04	17.04	16.5	18.5	525.5	1,380	—23
“ 8.....	164.0	86.31	43.15	17.26	17.26	20.0	35.0	575.0	1,428	48
“ 15.....	176.0	92.63	46.31	18.52	18.52	25.0	49.5	674.0	1,471	43
“ 22.....	170.0	89.42	44.71	17.88	17.88	*36.0	23.0	576.5	1,466	—5
“ 29.....	122.5	64.47	32.23	12.89	12.89	27.0	22.0	432.0	1,448	—18
Mar. 7.....	166.0	79.04	39.52	15.31	31.62	31.5	21.0	564.0	1,478	30
“ 14.....	163.0	80.00	40.00	16.00	32.00	37.5	22.0	546.5	1,489	11
“ 21.....	136.5	65.00	32.50	13.00	26.00	28.5	24.0	467.5	1,480	—9
“ 28.....	123.5	58.31	29.40	11.76	23.52	28.5	13.0	380.5	1,434	—46
Apr. 4.....	153.0	72.85	36.42	14.57	29.14	26.0	10.0	510.5	1,475	41
“ 11.....	135.0	64.29	32.14	12.85	25.70	22.5	10.0	524.0	1,491	16
“ 18.....	153.0	75.24	37.62	15.05	30.10	19.5	6.0	508.5	1,520	29
“ 25.....	163.0	77.66	38.33	15.53	31.06	26.0	12.5	482.0	1,541	21
May 2.....	159.0	75.71	37.85	15.14	30.28	19.0	12.0	573.0	1,545	4
“ 9.....	160.0	92.73	21.54	15.24	30.47	22.0	10.0	449.5	1,565	20
“ 16.....	162.0	119.14		15.88	26.97	27.0	15.0	524.5	1,597	32
“ 23.....	162.5	128.29		17.10	17.10	25.0	6.0	535.5	1,598	1
“ 30.....	162.5	128.29		17.10	17.10	19.0	6.5	538.0	1,610	12

*Prairie hay substituted for corn fodder.

LOT I—STEER No. 5.

WEEKLY SUMMARY OF FEED, WEIGHT, AND GAIN, EXPRESSED IN POUNDS.

DATE.	GRAIN.					Corn fodder.	Tame hay.	Water drunk.	Weight of steer.	Gain.
	Total.	Corn meal.	Shorts.	Bran.	Oil meal.					
Nov. 30.....									1,190	
Dec. 7.....	139.5	117.00	15.50		7.00	51.0		423.0	1,205	15
“ 14.....	153.0	80.52	40.26	16.10	16.10	2.0	47.0	440.0	1,213	8
“ 21.....	163.0	85.79	42.89	17.16	17.16	1.5	33.0	407.0	1,226	13
“ 28.....	166.0	87.33	43.66	17.47	17.47	1.5	45.5	428.5	1,250	24
Jan. 4.....	172.0	90.52	45.26	18.10	18.10	3.0	52.5	521.0	1,270	20
“ 11.....	178.0	93.68	46.84	18.73	18.73	8.5	47.0	515.5	1,315	45
“ 18.....	182.0	95.79	47.84	19.16	19.16	9.5	48.5	499.0	1,342	27
“ 25.....	170.0	89.42	44.71	17.88	17.88	10.5	46.5	512.5	1,366	24
Feb. 1.....	166.0	87.36	43.68	17.47	17.47	13.0	45.5	517.0	1,366	0
“ 8.....	158.0	83.15	41.58	16.63	16.63	8.0	46.0	530.0	1,405	39
“ 15.....	167.0	87.89	43.94	17.57	17.57	16.0	51.5	534.5	1,422	17
“ 22.....	165.7	88.42	44.21	16.57	16.57	*29.5	39.0	526.5	1,431	9
“ 29.....	157.5	82.89	41.44	16.57	16.57	29.5	33.5	512.0	1,434	3
Mar. 7.....	136.5	65.00	32.50	13.00	26.00	28.0	24.5	445.0	1,463	29
“ 14.....	135.5	64.52	32.26	12.90	25.80	39.5	36.5	448.5	1,463	0
“ 21.....	151.0	71.90	35.95	14.38	28.76	43.0	36.0	476.0	1,488	25
“ 28.....	168.0	80.00	40.00	16.00	32.00	43.0	34.5	558.0	1,488	0
April 4.....	172.0	81.95	40.97	16.39	32.78	41.0	24.5	579.0	1,503	15
“ 11.....	175.9	84.05	42.02	16.81	33.62	41.0	22.5	580.0	1,532	29
“ 18.....	177.0	84.28	42.14	16.85	33.70	31.5	22.0	540.0	1,547	15
“ 25.....	181.0	86.19	43.09	17.23	34.46	28.0	21.5	496.0	1,561	14
May 2.....	179.0	85.24	42.62	17.05	34.10	22.0	27.5	598.0	1,583	22
“ 9.....	176.0	101.90	23.81	16.76	33.51	27.0	26.0	525.5	1,603	20
“ 16.....	177.5	130.55		17.40	29.54	31.0	32.5	502.5	1,620	17
“ 23.....	175.0	138.15		18.42	18.42	37.0	23.5	581.5	1,643	23
“ 30.....	148.0	116.94		15.57	15.57	26.5	24.0	568.0	1,606	-37

* Prairie hay substituted for corn fodder.

LOT I—STEER No. 6.

WEEKLY SUMMARY OF FEED, WEIGHT, AND GAIN, EXPRESSED IN POUNDS.

DATE.	GRAIN.					Corn fodder.	Tame hay.	Water drunk.	Weight of steer.	Gain.
	Total.	Corn meal.	Shorts.	Bran.	Oil meal.					
Nov. 30.....									1,207	
Dec. 7.....	121.50	100.50	14.00		7.00	60.0		366.0	1,240	38
“ 14.....	117.00	61.57	30.78	12.31	12.31	21.5	61.5	404.5	1,236	—4
“ 21.....	121.00	68.68	31.84	12.73	12.73	9.5	59.5	328.0	1,244	8
“ 28.....	137.50	73.37	36.18	14.47	14.47	6.0	59.5	477.5	1,270	26
Jan. 4.....	149.00	78.42	39.21	15.68	15.68	6.0	60.5	476.5	1,267	—3
“ 11.....	154.00	81.05	40.53	16.21	16.21	12.5	55.5	482.0	1,336	69
“ 18.....	154.00	81.05	40.53	16.21	16.21	13.5	62.0	435.0	1,330	—6
“ 25.....	152.00	80.00	40.00	16.00	16.00	12.5	62.0	502.0	1,366	36
Feb. 1.....	150.00	78.94	39.47	15.79	15.79	13.0	58.0	432.5	1,379	13
“ 8.....	148.00	77.89	38.95	15.37	15.37	12.5	58.5	487.5	1,410	31
“ 15.....	154.00	81.05	40.53	16.21	16.21	21.0	57.5	419.0	1,446	36
“ 22.....	154.00	81.05	40.53	16.21	16.21	*22.5	45.5	411.5	1,425	—21
“ 29.....	152.50	80.53	40.26	16.11	16.11	26.5	35.0	405.0	1,431	6
Mar. 7.....	154.00	73.33	36.66	14.67	29.33	39.0	29.0	483.5	1,477	46
“ 14.....	154.00	73.33	36.66	14.67	29.33	42.5	23.5	430.0	1,487	10
“ 21.....	157.00	74.76	37.38	14.95	29.90	41.5	37.0	457.5	1,509	22
“ 28.....	168.00	80.00	40.00	16.00	32.00	44.5	27.0	438.0	1,488	—21
Apr. 4.....	158.50	75.48	37.74	15.09	30.18	38.5	13.0	400.5	1,495	7
“ 11.....	149.00	79.54	39.77	15.91	13.82	40.0	17.5	486.5	1,539	44
“ 18.....	173.50	82.62	41.31	16.52	33.04	30.5	23.5	451.5	1,557	18
“ 25.....	168.50	80.24	40.12	16.05	32.10	26.5	24.5	389.5	1,550	—7
May 2.....	167.00	79.54	39.77	15.91	31.82	25.0	23.5	523.5	1,567	17
“ 9.....	154.48	89.88	20.47	14.71	29.42	26.0	30.5	537.5	1,593	26
“ 16.....	161.00	118.05		16.26	27.06	27.5	34.0	437.5	1,619	26
“ 23.....	157.00	123.95		16.52	16.52	35.5	27.0	495.5	1,626	7
“ 30.....	125.50	99.08		13.21	13.21	35.5	27.0	416.0	1,593	—33

* Prairie hay substituted for corn fodder.

LOT I—STEER NO. 9.

WEEKLY SUMMARY OF FEED, WEIGHT, AND GAIN, EXPRESSED IN POUNDS.

DATE.	GRAIN.					Corn fodder.	Tame hay.	Water drunk.	Weight of steer.	Gain.
	Total.	Corn meal.	Shorts.	Bran.	Oil meal.					
Nov. 30.....									1,287	
Dec. 7.....	147.5	125.00	15.50		7.00	57.0		488.0	1,315	28
“ 14.....	171.0	90.00	45.00	18.00	18.00	14.5	38.0	536.5	1,339	24
“ 21.....	143.0	75.26	37.63	15.05	15.00	8.0	27.5	440.5	1,319	—20
“ 28.....	182.0	95.79	47.89	19.16	19.16	7.5	37.5	606.0	1,382	63
Jan. 4.....	152.5	80.36	40.18	16.07	16.07	16.0	43.0	532.5	1,376	—6
“ 11.....	177.0	93.15	46.57	18.63	18.63	30.5	46.5	631.5	1,456	80
“ 18.....	182.0	95.79	47.89	19.16	19.16	22.5	61.5	596.5	1,490	34
“ 25.....	182.0	95.79	47.89	19.16	19.16	25.0	57.0	620.5	1,489	—1
Feb. 1.....	182.0	95.79	47.89	19.16	19.16	30.5	58.0	667.0	1,495	6
“ 8.....	182.0	95.79	47.89	19.16	19.16	23.0	58.0	665.0	1,540	45
“ 15.....	182.0	95.79	47.89	19.16	19.16	25.0	65.5	680.0	1,562	22
“ 22.....	182.0	95.79	47.89	19.16	19.16	*24.5	31.0	588.5	1,545	—17
“ 29.....	182.0	95.79	47.89	19.16	19.16	26.5	23.5	549.0	1,552	7
Mar. 7.....	182.0	86.66	43.33	17.33	34.66	32.0	23.5	563.5	1,587	35
“ 14.....	186.0	88.57	44.28	17.71	35.42	36.0	25.0	566.5	1,609	22
“ 21.....	194.0	92.38	46.19	18.47	36.94	43.0	31.5	600.0	1,624	15
“ 28.....	191.0	90.95	45.47	18.19	36.38	26.0	21.5	574.0	1,612	—12
Apr. 4.....	196.0	93.33	46.66	18.67	37.33	32.0	12.0	620.0	1,630	18
“ 11.....	196.0	93.33	46.66	18.67	37.33	35.0	17.0	698.5	1,673	43
“ 18.....	203.0	96.66	48.33	19.33	38.66	29.5	17.0	675.0	1,693	20
“ 25.....	205.0	97.62	48.81	19.52	39.04	21.5	12.0	621.0	1,700	7
May 2.....	188.0	89.52	44.76	17.90	35.80	23.5	18.5	716.0	1,720	20
“ 9.....	188.0	108.55	25.59	17.88	35.75	24.5	21.0	663.5	1,739	19
“ 16.....	186.5	137.16		18.29	31.05	27.0	23.5	600.5	1,752	13
“ 23.....	181.0	142.89		19.05	19.05	26.5	21.5	662.0	1,772	20
“ 30.....	179.0	141.32		18.84	18.84	20.0	13.0	651.0	1,773	1

* Prairie hay substituted for corn fodder.

LOT I—STEER No. 13.

WEEKLY SUMMARY OF FEED, WEIGHT, AND GAIN, EXPRESSED IN POUNDS.

DATE.	GRAIN.					Corn fodder.	Tame hay.	Water drunk.	Weight of steer.	Gain.
	Total.	Corn meal.	Shorts.	Bran.	Oil meal.					
Nov. 30.....									1,188	.....
Dec. 7.....	147.5	125.00	15.50		7.00	55.0		414.0	1,214	26
“ 14.....	173.0	91.05	45.53	18.21	18.21	23.0	29.0	444.0	1,242	28
“ 21.....	169.0	88.95	44.47	17.79	17.79	10.0	9.5	384.0	1,231	—11
“ 28.....	182.0	95.79	47.89	19.16	19.16	14.0	28.0	535.0	1,265	34
Jan. 4.....	149.5	78.68	39.34	15.73	15.73	18.5	28.5	470.0	1,275	10
“ 11.....	177.0	93.15	46.57	18.73	18.73	25.5	17.0	527.5	1,328	53
“ 18.....	182.0	95.79	47.89	19.16	19.16	19.0	19.0	491.5	1,348	20
“ 25.....	182.0	95.79	47.89	19.16	19.16	21.5	20.5	507.0	1,358	10
Feb. 1.....	180.0	94.73	47.36	18.95	18.95	28.5	23.5	621.5	1,380	22
“ 8.....	174.0	91.58	45.79	18.31	18.31	29.0	20.5	545.0	1,425	45
“ 15.....	182.0	95.79	47.89	19.16	19.16	30.5	28.5	533.5	1,428	3
“ 22.....	182.0	95.79	47.89	19.16	19.16	*35.0	34.0	613.0	1,450	22
“ 29.....	182.0	95.79	47.89	19.16	19.16	37.0	27.5	565.5	1,460	10
Mar. 7.....	182.0	86.66	43.33	17.33	34.66	40.5	24.0	544.0	1,478	18
“ 14.....	186.0	88.57	44.28	17.71	35.42	49.0	25.5	586.5	1,482	4
“ 21.....	191.0	90.95	45.47	18.19	36.38	47.5	28.0	568.0	1,521	39
“ 28.....	196.0	93.33	46.66	18.67	37.33	44.5	21.0	599.5	1,530	9
Apr. 4.....	193.0	91.90	45.95	18.38	36.76	42.5	10.0	643.5	1,522	2
“ 11.....	196.0	93.33	46.66	18.67	37.33	46.5	18.5	650.0	1,552	20
“ 18.....	201.0	95.71	47.85	19.14	38.28	34.0	14.5	635.0	1,590	38
“ 25.....	204.0	97.14	48.57	19.43	38.86	34.0	14.0	609.0	1,595	5
May 2.....	193.0	91.90	45.95	18.38	36.76	32.5	20.5	635.0	1,616	21
“ 9.....	192.0	110.96	26.19	18.28	36.56	42.0	29.5	596.5	1,631	15
“ 16.....	190.5	140.16		18.67	31.61	33.0	26.0	536.5	1,651	20
“ 23.....	192.0	151.52		20.20	20.20	26.0	18.0	611.0	1,682	31
“ 30.....	189.5	149.51		19.95	19.95	21.5	17.5	654.5	1,700	18

*Prairie hay substituted for corn fodder.

The foregoing tables have been condensed into periods of four weeks each, and in that form are given in the five tables which follow, together with the rate of gain, cost of feed and cost per pound of gain in each period. They afford material for careful study. One of the facts they show is, that the best gain is made during the early periods of feeding. All five steers show a heavier gain during the first 12 weeks than they do in the last 14 weeks, some of them falling much behind in the last half, and the cost of the gain is correspondingly greater in the later periods. If these steers had been sold some time in March at the same prices they finally realized, they would have brought a profit.

The feeding was purposely extended to a full six months in order to illustrate this fact. And the gains made during April and part of March would not have been as large as they are except for the addition of more oil meal to the ration.

Another fact to be noticed in these tables is, that the amount of feed consumed remains practically the same from one period to another. The falling-off in gain is not due to a falling-off in the amount eaten. In fact, Nos. 9 and 13 made their best gains, during the first three months, on less feed than they ate during the last three months.

Still another point to which attention is called is the marked individuality in the steers, as shown in the amount of feed consumed and gain made. While all did well, some gained much faster than others, and it is this ability to lay on flesh rapidly and economically which, when the market is low and the margin of profit narrow, often determines whether the feeding is to result in a gain or in a loss.

LOT I—STEER No. 1.

FEED EATEN (pounds), COST OF FEED, AND COST PER POUND OF GAIN.

Number of period.	GRAIN.					Corn fodder.	Tame hay.	Water drunk.	Weight of steer.	Gain.	Average daily gain.
	Total.	Corn meal.	Shorts.	Bran.	Oil meal.						
1st. Nov. 30, Dec. 28.	656.4	392.89	149.44	53.58	60.58	56.0	54.0	1,854.5	1,232 1,325	93	3.32
		\$2.16	\$0.806	\$0.214	\$0.817	\$0.068	\$0.135				
<p>Cost of feed, \$4.20. Cost per pound of gain, 4.52 cents.</p>											
2d. Dec. 28, Jan. 25.	621.0	326.94	163.46	65.38	65.38	74.0	105.0	1,965.5	1,403	78	2.78
		\$1.798	\$0.882	\$0.261	\$0.882	\$0.092	\$0.262				
<p>Cost of feed, \$4.177. Cost per pound of gain, 5.35 cents.</p>											
3d. Jan. 25, Feb. 22.	672.5	353.88	176.93	70.70	70.70	97.5	131.0	2,351.0	1,466	63	2.25
		\$1.946	\$0.955	\$0.282	\$0.955	\$0.121	\$0.327				
<p>Cost of feed, \$4.586. Cost per pound of gain, 7.28 cents.</p>											
4th. Feb. 22, Mar. 21.	593.0	288.51	144.25	57.70	102.51	*124.5	89.0	2,010.0	1,480	14	0.50
		\$1.586	\$0.778	\$0.230	\$1.333	\$0.217	\$0.222				
<p>Cost of feed, \$4.416. Cost per pound of gain, 31.54 cents.</p>											
5th. Mar. 21, Apr. 18.	569.5	271.19	135.58	54.23	108.46	96.5	39.0	1,923.5	1,520	40	1.43
		\$1.491	\$0.732	\$0.216	\$1.464	\$0.168	\$0.097				
<p>Cost of feed, \$4.168. Cost per pound of gain, 10.42 cents.</p>											
6th. Apr. 18, May 16.	644.0	365.24	98.22	61.79	118.78	94.0	49.5	2,034.0	1,597	77	2.75
		\$2.000	\$0.520	\$0.247	\$1.600	\$0.164	\$0.121				
<p>Cost of feed, \$4.662. Cost per pound of gain, 6.05 cents.</p>											
7th. May 16, May 30.	325.0	256.58	.....	31.20	34.20	44.0	12.5	1,073.5	1,610	13	0.93
		\$1.411	.....	\$0.136	\$0.461	\$0.077	\$0.031				
<p>Cost of feed, \$2.136. Cost per pound of gain, 16.43 cents.</p>											

* Prairie hay substituted for corn fodder.

Total cost of feed, \$28.345.
Gain in 182 days, 378 pounds.
Daily gain during 182 days, 2.07 pounds.
Cost per pound of gain, 7.49 cents.

LOT I—STEER No. 5.

FEED EATEN (pounds), COST OF FEED, AND COST PER POUND OF GAIN.

Number of period.	GRAIN.					Corn fodder.	Tame hay.	Water drunk.	Weight of steer.	Gain.	Average daily gain.
	Total	Corn meal.	Shorts.	Bran.	Oil meal.						
1st.	621.5	370.64	142.31	50.73	57.73	56.00	125.5	1,698.5	1,190 1,250	60	2.14
Nov. 30, Dec. 28.		\$2.038	\$0.768	\$0.202	\$0.779	\$0.068	\$0.313				
	Cost of feed, \$4.17. Cost per pound of gain, 6.95 cents.										
2d.	702	369.41	184.65	73.87	73.87	31.5	194.5	2,048.0	1,366	116	4.10
Dec. 23, Jan. 25.		\$2.031	\$0.995	\$0.295	\$0.997	\$0.039	\$0.486				
	Cost of feed, \$4.843. Cost per pound of gain, 4.17 cents.										
3d.	656.7	346.82	173.41	68.24	68.24	66.5	182.0	2,108.0	1,431	65	2.32
Jan. 25, Feb. 22.		\$1.907	\$0.936	\$0.272	\$0.921	\$0.083	\$0.455				
	Cost of feed, \$4.574. Cost per pound of gain, 7.04 cents.										
4th.	580.5	284.31	142.15	56.85	97.13	*140.5	130.5	1,831.5	1,488	57	2.03
Feb. 22, Mar. 21.		\$1.563	\$0.767	\$0.227	\$1.311	\$0.245	\$0.326				
	Cost of feed, \$4.439. Cost per pound of gain, 7.78 cents.										
5th.	693.5	330.28	165.13	66.05	132.10	156.5	103.5	2,257.0	1,547	59	2.10
Mar. 21, Apr. 18.		\$1.816	\$0.891	\$0.264	\$1.783	\$0.273	\$0.258				
	Cost of feed, \$5.285. Cost per pound of gain, 8.95 cents.										
6th.	722.4	403.85	109.52	68.44	131.61	108.0	107.5	2,122.0	1,620	73	2.60
Apr. 18, May 16.		\$2.221	\$0.591	\$0.273	\$1.776	\$0.189	\$0.268				
	Cost of feed, \$5.318. Cost per pound of gain, 7.28 cents.										
7th.	323.0	225.09	.....	33.99	33.99	63.5	47.5	1,149.5	1,606	-14	-1
ay 16, ay 30.		\$1.402	.....	\$0.135	\$0.458	\$0.110	\$0.118				
	Cost of feed, \$2.223—all loss.										

*Prairie hay substituted for corn fodder.

Total cost of feed, \$30.85.
 Gain during 182 days, 416 pounds.
 Average daily gain, 2.28 pounds.
 Cost per pound of gain, 7.43 cents.

LOT I—STEER No. 6.

FEED EATEN (pounds), COST OF FEED, AND COST PER POUND OF GAIN.

Number of period.	GRAIN.					Corn fodder.	Tame hay.	Water drunk.	Weight of steer.	Gain.	Average daily gain.
	Total.	Corn meal.	Shorts.	Bran.	Oil meal.						
1st.	497.9	299.12	112.89	59.51	46.51	43.0	180.5	1,576.0	1,207 1,270	63	2.25
Nov. 30. Dec. 28.		\$1.645	\$0.609	\$0.158	\$0.627	\$0.053	\$0.451				
		Cost of feed, \$3.543. Cost per pound of gain, 5.62 cents.									
2d.	609.0	320.52	160.27	64.10	64.10	44.5	240.0	1,895.5	1,366	96	3.42
Dec. 28, Jan. 25.		\$1.782	\$0.865	\$0.256	\$0.865	\$0.055	\$0.60				
		Cost of feed, \$4.403. Cost per pound of gain, 4.59 cents.									
3d.	606.0	318.93	159.48	63.78	63.78	69.0	219.5	1,750.5	1,425	59	2.10
Jan. 25, Feb. 22.		\$1.754	\$0.831	\$0.255	\$0.861	\$0.086	\$0.548				
		Cost of feed, \$4.365. Cost per pound of gain, 7.40 cents.									
4th.	617.5	301.95	150.96	60.40	104.67	*149.5	129.5	1,776.0	1,509	84	3.00
Feb. 22, Mar. 21.		\$1.655	\$0.815	\$0.241	\$1.412	\$0.261	\$0.323				
		Cost of feed, \$4.707. Cost per pound of gain, 5.60 cents.									
5th.	649.0	318.64	158.82	63.52	109.04	153.5	86.0	1,776.5	1,557	48	1.71
Mar. 21, Apr. 18.		\$1.741	\$0.837	\$0.254	\$1.472	\$0.268	\$0.215				
		Cost of feed, \$4.807. Cost per pound of gain, 10.00 cents.									
6th.	651.0	367.71	100.36	62.93	120.40	104.0	112.5	1,888.0	1,619	62	2.21
Apr. 18, May 16.		\$2.022	\$0.541	\$0.251	\$1.625	\$0.180	\$0.281				
		Cost of feed, \$4.90. Cost per pound of gain, 7.90 cents.									
7th.	282.5	223.03	.....	29.73	29.73	71.0	54.0	911.5	1,593	-26	-3.70
May 16, May 30.		\$1.226	.....	\$0.118	\$0.401	\$0.124	\$0.135				
		Cost of feed, \$2.004—all loss.									

*Prairie hay substituted for corn fodder.

Total cost of feed, \$28.729.
Gain in 182 days, 386 pounds.
Daily gain during 182 days, 2.12 pounds.
Cost per pound of gain, 7.44 cents.

LOT I—STEER NO. 9.

FEED EATEN (pounds), COST OF FEED, AND COST PER POUND OF GAIN.

Number of period.	GRAIN.					Corn fodder.	Tame hay.	Water drunk.	Weight of steer.	Gain.	Average daily gain.
	Total.	Corn meal.	Shorts.	Bran.	Oil meal.						
1st.	642.4	386.05	145.02	52.21	59.16	87.0	103.0	2,071.0	1,287 1,982	95	3.89
Nov. 30. Dec. 28.		\$2.117	\$0.783	\$0.208	\$0.798	\$0.104	\$0.257				
Cost of feed, \$4.26. Cost per pound of gain, 4.47 cents.											
2d.	693.5	365.09	182.53	73.02	73.02	84.0	208.0	2,381.0	1,489	107	3.82
Dec. 28. Jan. 25.		\$2.007	\$0.985	\$0.292	\$0.985	\$0.10	\$0.52				
Cost of feed, \$4.88. Cost per pound of gain, 4.55 cents.											
3d.	728.0	383.16	191.56	76.64	76.64	103.0	212.5	2,600.5	1,545	56	2.00
Jan. 25. Feb. 22.		\$2.107	\$1.034	\$0.306	\$1.034	\$0.128	\$0.531				
Cost of feed, \$5.14. Cost per pound of gain, 9.17 cents.											
4th.	744.0	363.40	181.69	72.67	126.18	*137.5	103.5	2,279.0	1,624	79	2.82
Feb. 22. Mar. 21.		\$1.993	\$0.981	\$0.290	\$1.703	\$0.240	\$0.258				
Cost of feed, \$5.471. Cost per pound of gain, 6.92 cents.											
5th.	786.0	374.27	187.12	74.86	149.70	122.5	67.5	2,567.5	1,693	69	2.46
Mar. 21. Apr. 18.		\$2.058	\$1.01	\$0.299	\$2.02	\$0.214	\$0.168				
Cost of feed, \$5.769. Cost per pound of gain, 8.46 cents.											
6th.	767.2	432.85	119.16	73.59	141.64	96.5	75.0	2,601.0	1,752	59	2.11
Apr. 18. May 16.		\$2.380	\$0.643	\$0.294	\$1.912	\$0.168	\$0.187				
Cost of feed, \$5.58. Cost per pound of gain, 9.46 cents.											
7th.	360.0	234.21	.....	37.89	37.89	46.5	34.5	1,313.0	1,773	21	1.56
May 16. May 30.		\$1.563	.....	\$0.151	\$0.511	\$0.081	\$0.086				
Cost of feed, \$2.392. Cost per pound of gain, 11.39 cents.											

* Prairie hay substituted for corn fodder.

Total cost of feed, \$33.49.
 Total gain, 486 pounds.
 Daily gain during 182 days, 2.67 pounds.
 Cost per pound of gain, 6.89 cents.

LOT I—STEER No. 13.

FEED EATEN (pounds), COST OF FEED, AND COST PER POUND OF GAIN.

Number of period.	GRAIN.					Corn fodder.	Tame hay.	Water drunk.	Weight of steer.	Gain.	Average daily gain.
	Total.	Corn meal.	Shorts.	Bran.	Oil meal.						
1st.	671.5	400.79	153.39	55.16	62.16	102.0	66.5	1,778.0	1,188 1,265	77	2.75
Nov. 30, Dec. 28.		\$2.204	\$0.828	\$0.22	\$0.839	\$0.127	\$0.165				
Cost of feed, \$4.883. Cost per pound of gain, 5.7 cents.											
2d.	690.5	363.41	181.69	72.78	72.78	84.5	85.0	1,996.0	1,358	93	3.32
Dec. 28, Jan. 25.		\$1.998	\$0.981	\$0.291	\$0.982	\$0.105	\$0.212				
Cost of feed, \$4.569. Cost per pound of gain, 4.9 cents.											
3d.	718.0	377.89	188.93	75.58	75.58	123.0	106.5	2,313.0	1,450	92	3.28
Jan. 25, Feb. 22.		\$2.078	\$1.02	\$0.302	\$1.02	\$0.153	\$0.266				
Cost of feed, \$4.839. Cost per pound of gain, 5.26 cents.											
4th.	741.0	361.97	180.97	72.39	125.62	*174.0	105.0	2,264.0	1,521	71	2.53
Feb. 22, Mar. 21.		\$1.99	\$0.977	\$0.289	\$1.695	\$0.304	\$0.262				
Cost of feed, \$5.52. Cost per pound of gain, 7.75 cents.											
5th.	786.0	374.27	187.02	74.86	149.70	167.5	64.0	2,528.0	1,590	69	2.46
Mar. 21, Apr. 18.		\$2.058	\$1.009	\$0.299	\$2.02	\$0.293	\$0.168				
Cost of feed, \$5.847. Cost per pound of gain, 8.46 cents.											
6th.	779.5	440.16	120.71	74.76	143.79	141.5	90.0	2,427.0	1,651	61	2.18
Apr. 18, May 16.		\$2.420	\$0.651	\$0.299	\$1.941	\$0.246	\$0.225				
Cost of feed, \$5.782. Cost per pound of gain, 9.83 cents.											
7th.	381.5	\$01.03	.....	40.15	40.15	47.5	35.5	1,265.5	1,700	49	3.50
May 16, May 30.		\$1.655	.....	\$0.160	\$0.542	\$0.082	\$0.088				
Cost of feed, \$2.527. Cost per pound of gain, 5.17 cents.											

*Prairie hay substituted for corn fodder.

Total cost of feed, \$33.467.
 Total gain, 512 pounds.
 Daily gain during 182 days, 2.81 pounds.
 Cost per pound of gain, 6.53 cents.

The tables for lots II and III, which follow, are also compiled on the plan followed with lot I. The weekly summary shows how much each steer has consumed of feed and water each week, his weight, and his gain or loss. The first weight given in each case, under date of November 30, is the weight of the steer when the experiment began, and the last weight in the column is his weight the day he was sent to the shambles. The difference between the two is his gain. It is noticeable that the gain as indicated by the difference in weight from week to week is in nearly all cases very spasmodic. One week will show a heavy gain, while often one or two succeeding weeks will show a loss. This is a common characteristic.

LOT

WEEKLY SUMMARY OF

DATE.	STEER No. 2.					STEER No. 11.				
	Corn meal.	Corn fodder.	Water drunk.	Weight of steer.	Gain.	Corn meal.	Corn fodder.	Water drunk.	Weight of steer.	Gain.
Nov. 30.....				1,067					1,325	
Dec. 7.....	126.5	33.5	223.5	1,062	5	131.5	46.2	273.5	1,279	-46
“ 14.....	102.5	31.0	257.0	1,045	-17	102.0	51.5	262.0	1,299	20
“ 21.....	90.5	36.0	190.5	1,029	-16	131.0	41.0	285.5	1,303	4
“ 28.....	115.5	42.5	281.5	1,053	24	137.5	56.5	335.0	1,330	27
Jan. 4.....	129.5	38.0	227.5	1,061	8	163.0	32.5	338.0	1,361	31
“ 11.....	137.5	27.0	305.5	1,098	37	165.0	23.5	298.5	1,401	46
“ 18.....	59.5	20.5	217.0	1,073	-25	159.0	26.0	292.0	1,412	11
“ 25.....	56.5	47.5	270.0	1,101	28	165.0	27.0	286.0	1,425	13
Feb. 1.....	114.0	29.5	286.5	1,092	-9	154.0	32.5	355.5	1,417	-8
“ 8.....	112.0	34.0	329.5	1,125	33	154.0	28.0	330.5	1,431	14
“ 15.....	117.0	41.5	284.5	1,130	5	159.0	36.0	303.5	1,470	39
“ 22.....	106.0	*36.0	260.5	1,130	0	167.0	*44.0	328.0	1,480	10
“ 29.....	99.5	23.0	271.5	1,132	2	154.0	37.5	337.0	1,479	-1
Mar. 7.....	112.0	33.0	247.5	1,151	19	142.5	42.0	307.0	1,519	46
“ 14.....	109.5	36.5	259.0	1,140	-11	154.0	47.5	334.5	1,517	-2
“ 21.....	105.5	39.5	267.5	1,172	32	162.5	49.0	307.5	1,539	22
“ 28.....	102.5	43.0	284.5	1,167	-5	148.5	49.0	330.5	1,536	-3
Apr. 4.....	90.0	59.5	345.0	1,158	-9	152.5	61.0	389.0	1,522	-14
“ 11.....	98.5	60.0	377.5	1,184	26	150.0	66.0	384.0	1,553	31
“ 18.....	104.0	38.0	274.0	1,192	8	168.0	33.5	414.5	1,568	15
“ 25.....	100.0	38.5	249.0	1,190	-2	167.0	37.0	343.0	1,559	-8
May 2.....	106.0	36.5	298.0	1,183	-7	151.5	29.0	413.0	1,570	11
“ 9.....	100.5	31.0	317.0	1,227	44	126.5	28.0	363.5	1,570	0
“ 16.....	100.0	28.5	292.5	1,221	-6	148.5	25.5	421.0	1,595	25
“ 23.....	102.0	48.5	399.5	1,240	19	139.0	46.0	426.0	1,614	19
“ 30.....	103.5	49.0	362.5	1,215	-25	142.0	50.00	338.0	1,596	-18

*Prairie hay substituted for corn fodder.

II.

FEED, WEIGHT, AND GAIN.

STEER No. 14.					STEER No. 16.					STEER No. 20.				
Corn meal.	Corn fodder.	Water drunk.	Weight of steer.	Gain.	Corn meal.	Corn fodder.	Water drunk.	Weight of steer.	Gain.	Corn meal.	Corn fodder.	Water drunk.	Weight of steer.	Gain.
			1,155					1,200					1,308	
143.5	16.7	245.0	1,140	-15	96.0	26.0	243.0	1,160	-40	147.5	40.0	384.0	1,354	46
137.0	18.5	256.5	1,147	7	120.5	25.0	220.5	1,174	14	194.0	43.0	448.5	1,374	20
136.0	20.0	234.0	1,138	-9	141.0	27.0	255.5	1,170	-4	211.0	37.5	320.0	1,379	5
151.0	28.5	264.5	1,170	32	126.0	40.5	279.0	1,200	30	147.0	45.5	413.0	1,370	-9
139.5	22.0	266.0	1,178	8	161.0	26.0	340.5	1,225	25	172.5	25.5	406.0	1,388	18
142.5	18.5	283.5	1,227	49	143.0	30.5	275.5	1,250	25	148.0	32.0	368.0	1,401	13
137.0	20.5	237.0	1,244	17	146.0	25.5	300.5	1,276	26	124.0	48.0	351.5	1,434	33
142.0	17.0	289.5	1,267	23	146.0	35.5	278.0	1,271	-5	167.0	33.0	392.5	1,462	28
154.0	17.5	316.5	1,270	3	160.0	39.0	355.5	1,290	19	178.0	30.5	421.5	1,471	9
154.0	9.5	316.0	1,295	25	168.0	28.5	342.5	1,318	28	178.0	26.5	498.5	1,507	36
159.0	19.0	274.5	1,310	15	173.0	39.0	310.0	1,355	37	173.0	32.0	416.0	1,525	18
167.0	* 23.0	274.0	1,315	5	142.0	* 20.5	275.0	1,342	-13	170.0	* 32.5	393.5	1,502	-23
141.0	23.0	308.5	1,356	41	90.0	29.0	220.5	1,335	-7	167.0	35.0	377.5	1,536	34
126.0	28.5	307.0	1,348	-8	117.0	42.5	262.5	1,346	11	168.0	39.0	352.5	1,544	8
76.5	21.0	271.0	1,329	-19	103.0	42.5	260.5	1,350	4	155.5	45.5	355.0	1,577	33
132.0	31.0	270.5	1,347	18	139.5	45.0	222.5	1,350	0	144.0	50.0	313.5	1,571	-6
135.0	35.0	339.0	1,364	17	157.0	49.0	287.0	1,395	45	130.0	48.0	355.5	1,593	22
137.0	60.0	444.0	1,370	6	168.0	58.5	455.0	1,415	20	101.5	69.0	384.0	1,599	6
114.5	54.0	406.0	1,369	-1	174.0	61.0	442.0	1,437	22	90.0	48.0	412.0	1,597	-2
154.0	27.0	342.0	1,398	29	157.0	38.5	317.0	1,438	1	45.0	52.0	227.0	1,520	-77
161.0	17.0	323.0	1,406	8	135.5	29.5	282.5	1,446	8	129.0	36.5	344.0	1,519	-1
166.5	21.0	408.5	1,419	13	153.5	32.0	349.5	1,461	15	145.5	35.0	464.0	1,581	62
157.5	17.0	325.5	1,432	13	129.5	27.5	250.0	1,468	7	149.0	35.5	326.0	1,560	-21
160.0	28.5	408.5	1,453	21	154.0	33.0	301.0	1,467	-1	142.0	36.5	381.0	1,605	45
146.0	38.5	432.5	1,465	12	154.0	40.0	412.0	1,512	45	140.0	49.5	492.0	1,634	29
152.0	40.0	441.0	1,448	-17	154.0	40.5	395.5	1,501	-11	130.0	53.0	478.0	1,635	1

LOT II—STEER No. 2.

FEED AND WEIGHT (in pounds), COST OF FEED, AND COST PER POUND OF GAIN.

Number of period.	Corn meal.	Corn fodder.	Water drunk.	Weight of steer.	Gain.	Average daily gain.
1st. November 30, December 28.	435	143	952.5	1,067 1,053	-14	-.5
	\$2.392	\$0.178				
Cost of feed, \$2.57—all loss.						
2d. December 28, January 25.	383	133	1,020.0	1,101	48	1.71
	\$2.10	\$0.166				
Cost of feed, \$2.266. Cost per pound of gain, 4.72 cents.						
3d. January 25, February 22.	449	141	1,161.0	1,130	29	1.03
	\$2.46	\$0.176				
Cost of feed, \$2.636. Cost per pound of gain, 9.08 cents.						
4th. February 22, March 21.	426.5	*132	1,045.5	1,172	42	1.5
	\$2.345	\$0.231				
Cost of feed, \$2.576. Cost per pound of gain, 6.13 cents.						
5th. March 21, April 18.	395	200.5	1,281.0	1,192	20	.71
	\$2.17	\$0.35				
Cost of feed, \$2.52. Cost per pound of gain, 12.6 cents.						
6th. April 18, May 16.	406.5	134.5	1,156.5	1,221	29	1.03
	\$2.23	\$0.235				
Cost of feed, \$2.465. Cost per pound of gain, 8.5 cents.						
7th. May 16, May 30.	205.5	97.5	762.0	1,215	-6	-.21
	\$1.13	\$0.17				
Cost of feed, \$1.30—all loss.						

* Prairie hay substituted for corn fodder.

Total cost of feed, \$16.333.

Gain in 182 days, 148 pounds.

Average daily gain during 182 days, .81 pound.

Cost per pound of gain, 11.03 cents.

LOT II--STEER No. 11.

FEED AND WEIGHT (in pounds), COST OF FEED, AND COST PER POUND OF GAIN.

Number of period.	Corn meal.	Corn fodder.	Water drunk.	Weight of steer.	Gain.	Average daily gain.
1st. November 30, December 28.	502.0	195.0	1,156.0	1,325 1,330	5	.17
	\$2.761	\$0.248				
Cost of feed, \$3.004. Cost per pound of gain, 60.08 cents.						
2d. December 28, January 25.	652.0	109.0	1,214.5	1,425	95	3.88
	\$3.586	\$0.136				
Cost of feed, \$3.722. Cost per pound of gain, 3.9 cents.						
3d. January 25, February 22.	684.0	140.5	1,817.5	1,480	55	1.96
	\$3.487	\$0.175				
Cost of feed, \$3.662. Cost per pound of gain, 6.65 cents.						
4th. February 22, March 21.	613.0	*176.0	1,286.0	1,539	59	2.10
	\$3.371	\$0.308				
Cost of feed, \$3.679. Cost per pound of gain, 6.23 cents.						
5th. March 21, April 18.	619.0	214.5	1,518.0	1,568	29	1.03
	\$3.404	\$0.375				
Cost of feed, \$3.779. Cost per pound of gain, 13.03 cents.						
6th. April 18, May 16.	593.5	119.5	1,480.5	1,595	27	.96
	\$3.264	\$0.209				
Cost of feed, \$3.473. Cost per pound of gain, 12.86 cents.						
7th. May 16, May 30.	281.0	96.0	764.0	1,596	1	.03
	\$1.545	\$0.168				
Cost of feed, \$1.713. Cost per pound of gain, \$1.713.						

* Prairie hay substituted for corn fodder.

Total cost of feed, \$23.03.

Gain in 182 days, 271 pounds.

Average daily gain during 182 days, 1.49 pounds.

Cost per pound of gain, 8.50 cents.

LOT II—STEER No. 14.

FEED AND WEIGHT (in pounds), COST OF FEED, AND COST PER POUND OF GAIN.

Number of period.	Corn meal.	Corn fodder.	Water drunk.	Weight of steer.	Gain.	Average daily gain.
1st. November 30, December 28.	567.5	78.7	1,000.0	1,155 1,170	15	.53
	\$3.121	\$0.098	Cost of feed, \$3.219. Cost per pound of gain, 21.46 cents.			
2d. December 28, January 25.	561.0	88.0	1,076.0	1,267	97	3.46
	\$3.085	\$0.11	Cost of feed, \$3.195. Cost per pound of gain, 3.28 cents.			
3d. January 25, February 22.	634.0	69.0	1,181.0	1,315	48	1.71
	\$3.487	\$0.086	Cost of feed, \$3.573. Cost per pound of gain, 7.44 cents.			
4th. February 22, March 21.	475.5	*103.5	1,157.0	1,347	32	1.14
	\$2.615	\$0.181	Cost of feed, \$2.796. Cost per pound of gain, 8.73 cents.			
5th. March 21, April 18.	540.5	176.0	1,531.0	1,398	51	1.82
	\$2.972	\$0.308	Cost of feed, \$3.280. Cost per pound of gain, 6.43 cents.			
6th. April 18, May 16.	645.0	88.5	1,465.5	1,453	55	1.96
	\$3.547	\$0.146	Cost of feed, \$3.693. Cost per pound of gain, 6.71 cents.			
7th. May 16, May 30.	298.0	78.5	873.5	1,443	—5	— .35
	\$1.639	\$0.123	Cost of feed, \$1.762—all loss.			

* Prairie hay substituted for corn fodder.

Total cost of feed, \$21.518.

Gain in 182 days, 293 pounds.

Average daily gain during 182 days, 1.61 pounds.

Cost per pound of gain, 7.34 cents.

LOT II—STEER No. 16.

FEED AND WEIGHT (in pounds), COST OF FEED, AND COST PER POUND OF GAIN.

Number of period.	Corn meal.	Corn fodder.	Water drunk.	Weight of steer.	Gain.	Average daily gain.
1st. November 30, December 28.	483.5	118.5	998.0	1,200 1,200	0	.00
	\$2.659	\$0.148	Cost of feed, \$2.807—all loss.			
2d. December 28, January 25.	596.0	117.5	1,194.5	1,271	71	2.53
	\$3.278	\$0.146	Cost of feed, \$3.424. Cost per pound of gain, 4.82 cents.			
3d. January 25, February 22.	643.0	127.0	1,283.0	1,342	71	2.53
	\$3.536	\$0.159	Cost of feed, \$3.695. Cost per pound of gain, 5.20 cents.			
4th. February 22, March 21.	449.5	*159.0	966.0	1,350	8	.28
	\$2.472	\$0.278	Cost of feed, \$2.75. Cost per pound of gain, 34.37 cents.			
5th. March 21, April 18.	656.0	207.0	1,501.0	1,438	88	3.14
	\$3.608	\$0.362	Cost of feed, \$3.97. Cost per pound of gain, 4.48 cents.			
6th. April 18, May 16.	573.5	122.0	1,183.0	1,467	29	1.05
	\$3.154	\$0.213	Cost of feed, \$3.367. Cost per pound of gain, 11.61 cents.			
7th. May 16, May 30.	308.0	80.5	807.5	1,501	34	1.21
	\$1.694	\$0.14	Cost of feed, \$1.834. Cost per pound of gain, 5.40 cents.			

* Prairie hay substituted for corn fodder.

Total cost of feed, \$21.847.

Gain in 182 days, 301 pounds.

Average daily gain during 182 days, 1.65 pounds.

Cost per pound of gain, 7.24 cents.

LOT II—STEER No. 20.

FEEED AND WEIGHT (in pounds), COST OF FEEED, AND COST PER POUND OF GAIN.

Number of period.	Corn meal.	Corn fodder.	Water drunk.	Weight of steer.	Gain.	Average daily gain.
1st. November 30, December 28.	699.5	166.0	1,765.5	1,308 1,370	62	2.21
	\$3.847	\$0.207				
Cost of feed, \$4.054. Cost per pound of gain, 6.54 cents.						
2d. December 28, January 25.	611.5	138.5	1,518.0	1,462	92	3.28
	\$3.362	\$0.173				
Cost of feed, \$3.535. Cost per pound of gain, 3.84 cents.						
3d. January 25, February 22.	699.0	121.5	1,669.5	1,502	40	1.42
	\$3.844	\$0.151				
Cost of feed, \$3.995. Cost per pound of gain, 9.99 cents.						
4th. February 22, March 21.	634.5	*169.5	1,398.5	1,571	69	2.46
	\$3.489	\$0.296				
Cost of feed, \$3.785. Cost per pound of gain, 5.48 cents.						
5th. March 21, April 18.	366.5	217.0	1,378.5	1,520	-51	-1.82
	\$2.015	\$0.379				
Cost of feed, \$2.394—all loss.						
6th. April 18, May 16.	565.5	143.5	1,515.0	1,605	85	3.03
	\$3.11	\$0.251				
Cost of feed, \$3.361. Cost per pound of gain, 3.95 cents.						
7th. May 16, May 30.	270.0	102.5	970.0	1,635	30	1.07
	\$1.485	\$0.179				
Cost of feed, \$1.664. Cost per pound of gain, 5.54 cents.						

* Prairie hay substituted for corn fodder.

Total cost of feed, \$22.788.

Gain in 182 days, 327 pounds.

Average daily gain during 182 days, 1.79 pounds.

Cost per pound of gain, 6.96 cents.

LOT III—STEER No. 3.

FEED AND WEIGHT (in pounds), COST OF FEED, AND COST PER POUND OF GAIN.

Number of period.	Ear corn.	Corn fodder.	Water drunk.	Weight of steer.	Gain.	Average daily gain.
1st. November 30, December 28.	658.0	273.0	1,441.0	1,200 1,217	17	.60
	\$3.092	\$0.341				
Cost of feed, \$3.433. Cost per pound of gain, 20.19 cents.						
2d. December 28, January 25.	569.0	403.5	1,524.0	1,290	73	2.67
	\$2.674	\$0.504				
Cost of feed, \$3.178. Cost per pound of gain, 4.35 cents.						
3d. January 25, February 22.	627.5	315.5	1,539.5	1,337	47	1.67
	\$2.949	\$0.394				
Cost of feed, \$3.343. Cost per pound of gain, 7.11 cents.						
4th. February 22, March 21.	652.5	*134.5	1,372.0	1,339	2	.00
	\$3.066	\$0.235				
Cost of feed, \$3.301. Cost per pound of gain, \$1.65.						
5th. March 21. April 18.	531.5	222.5	1,591.0	1,388	49	1.75
	\$2.498	\$0.389				
Cost of feed, \$2.887. Cost per pound of gain, 5.89 cents.						
6th. April 18, May 16.	616.0	114.5	1,365.0	1,410	22	.75
	\$2.895	\$0.19				
Cost of feed, \$3.085. Cost per pound of gain, 14.02 cents.						
7th. May 16, May 30.	286.0	98.5	880.0	1,410	0	.00
	\$1.344	\$0.172				
Cost of feed, \$1.516—all loss.						

* Prairie hay substituted for corn fodder.

Total cost of feed, \$20.743.

Gain in 182 days, 210 pounds.

Average daily gain during 182 days, 1.15 pounds.

Cost per pound of gain, 9.88 cents.

LOT III—STEER No. 7.

FEED AND WEIGHT (in pounds), COST OF FEED, AND COST PER POUND OF GAIN.

Number of period.	Ear corn.	Corn fodder.	Water drunk.	Weight of steer.	Gain.	Average daily gain.
1st. November 30, December 23.	639.5	233.5	1,456.0	1,166 1,234	68	2.42
	\$3.005	\$0.291				
Cost of feed, \$3.296. Cost per pound of gain, 4.84 cents.						
2d. December 28, January 25.	548.0	341.5	1,249.5	1,293	59	2.10
	\$2.575	\$0.426				
Cost of feed, \$3.001. Cost per pound of gain, 5.08 cents.						
3d. January 25, February 22.	613.0	253.0	1,353.0	1,313	20	.71
	\$2.881	\$0.322				
Cost of feed, \$3.203. Cost per pound of gain, 16.01.						
4th. February 22, March 21.	561.0	*121.5	1,150.0	1,363	50	1.71
	\$2.636	\$0.213				
Cost of feed, \$2.849. Cost per pound of gain, 5.70.						
5th. March 21, April 18.	578.5	191.5	1,279.0	1,401	38	1.35
	\$2.718	\$0.335				
Cost of feed, \$3.053. Cost per pound of gain, 8.03 cents.						
6th. April 18, May 16.	651.5	111.5	1,331.5	1,480	79	2.82
	\$3.062	\$0.195				
Cost of feed, \$3.257. Cost per pound of gain, 4.12 cents.						
7th. May 16, May 30.	291.0	99.5	849.0	1,490	10	.71
	\$1.367	\$0.174				
Cost of feed, \$1.541. Cost per pound of gain, 15.41 cents.						

*Prairie hay substituted for corn fodder.

Total cost of feed, \$20.20.

Gain in 182 days, 324 pounds.

Average daily gain during 182 days, 1.78 pounds.

Cost per pound of gain, 6.23 cents.

LOT III—STEER No. 8.

FEED AND WEIGHT (in pounds), COST OF FEED, AND COST PER POUND OF GAIN.

Number of period.	Ear corn.	Corn fodder.	Water drunk.	Weight of steer.	Gain.	Average daily gain.
1st. November 30, December 28.	531.0	215.0	971.0	1,050 1,070	20	.71
	\$2.495	\$0.263				
Cost of feed, \$2.763. Cost per pound of gain, 13.81 cents.						
2d. December 28, January 25.	433.0	297.0	1,138.5	1,124	54	1.92
	\$2.035	\$0.371				
Cost of feed, \$2.406. Cost per pound of gain, 4.45 cents.						
3d. January 25, February 22.	494.5	224.5	1,192.0	1,163	39	1.39
	\$2.294	\$0.28				
Cost of feed, \$2.574. Cost per pound of gain, 6.60 cents.						
4th. February 22, March 21.	506.0	*87.5	1,080.5	1,216	53	1.89
	\$2.378	\$0.153				
Cost of feed, \$2.531. Cost per pound of gain, 4.77 cents.						
5th. March 21, April 18.	513.0	51.5	1,257.5	1,260	44	1.57
	\$2.411	\$0.091				
Cost of feed, \$2.502. Cost per pound of gain, 5.68 cents.						
6th. April 18, May 16.	520.5	87.0	1,131.5	1,313	53	1.89
	\$2.446	\$0.152				
Cost of feed, \$2.598. Cost per pound of gain, 4.9 cents.						
7th. May 16, May 30.	292.5	77.0	842.5	1,324	11	.78
	\$1.374	\$0.134				
Cost of feed, \$1.508. Cost per pound of gain, 13.71 cents.						

*Prairie hay substituted for corn fodder.

Total cost of feed, \$16.882.
Gain in 182 days, 274 pounds.
Average daily gain, 1.50 pounds.
Cost per pound of gain, 6.16 cents.

LOT III—STEER No. 12.

FEED AND WEIGHT (in pounds), COST OF FEED, AND COST PER POUND OF GAIN.

Number of period.	Ear corn.	Corn fodder.	Water drunk.	Weight of steer.	Gain.	Average daily gain.
1st. November 30, December 28.	776.0	287.5	1,578.0	1,406 1,503	97	3.46
	\$3.647	\$0.359				
Cost of feed, \$4.006. Cost per pound of gain, 4.13 cents.						
2d. December 28, January 25.	708.5	341.0	1,552.0	1,586	83	2.95
	\$3.329	\$0.426				
Cost of feed, \$3.755. Cost per pound of gain, 4.52 cents.						
3d. January 25, February 22.	853.5	299.5	1,411.0	1,619	33	1.18
	\$4.011	\$0.374				
Cost of feed, \$4.385. Cost per pound of gain, 13.28 cents.						
4th. February 22, March 21.	653.0	* 128.5	1,173.0	1,667	48	1.71
	\$3.069	\$0.214				
Cost of feed, \$3.283. Cost per pound of gain, 6.84 cents.						
5th. March 21, April 18.	607.5	226.5	1,462.0	1,675	8	.28
	\$2,855	\$0.396				
Cost of feed, \$3.251. Cost per pound of gain, 40.64 cents.						
6th. April 18, May 16.	662.0	189.0	1,434.5	1,721	46	1.64
	\$3.111	\$0.243				
Cost of feed, \$3.354. Cost per pound of gain, 7.29 cents.						
7th. May 16, May 30.	260.5	108.5	801.5	1,715	-6	-.42
	\$1,224	\$0.189				
Cost of feed, \$1.413—all loss.						

* Prairie hay substituted for corn fodder.

Total cost of feed, \$23.447.

Gain in 182 days, 309 pounds.

Average daily gain, 1.7 pounds.

Cost per pound of gain, 7.58 cents.

LOT III—STEER No. 19.

FEED AND WEIGHT (in pounds), COST OF FEED, AND COST PER POUND OF GAIN.

Number of period.	Ear corn.	Corn fodder.	Water drunk.	Weight of steer.	Gain.	Average daily gain.
1st. November 30, December 28.	781	225.5	1,444.5	1,255 1,340	85	3.03
	\$3.670	\$0.281				
Cost of feed, \$3 951. Cost per pound of gain, 4.65 cents.						
2d. December 28, January 25.	702	241.5	1,202.0	1,391	51	1.82
	\$3.299	\$0.301				
Cost of feed, \$3.60. Cost per pound of gain, 7.06 cents.						
3d. January 25, February 22.	760.5	204	1,394.0	1,415	24	.85
	\$3.574	\$0.255				
Cost of feed, \$3.829. Cost per pound of gain, 15.95 cents.						
4th. February 22, March 21.	610.5	*109	1,181.0	1,451	36	1.23
	\$2.869	\$0.19				
Cost of feed, \$3.059. Cost per pound of gain, 8.5 cents.						
5th. March 21, April 18.	659	245	1,561.0	1,489	38	1.35
	\$3.097	\$0.428				
Cost of feed, \$3.525. Cost per pound of gain, 9.27 cents.						
6th. April 18, May 15.	683	104.5	1,352.5	1,556	67	2.39
	\$3.210	\$0.182				
Cost of feed, \$3.392. Cost per pound of gain, 5.06 cents.						
7th. May 16, May 30.	297	86	783.0	1,559	3	.21
	\$1.395	\$0.15				
Cost of feed, \$1.545. Cost per pound of gain, 51.3 cents.						

* Prairie hay substituted for corn fodder.

Total cost of feed, \$22.901.

Gain in 182 days, 304 pounds.

Average daily gain, 1.67 pounds.

Cost per pound of gain, 7.53 cents.

LOT

WEEKLY SUMMARY OF

DATE.	STEER No. 3.					STEER No. 7.				
	Ear corn.	Corn fodder.	Water drunk.	Weight of steer.	Gain.	Ear corn.	Corn fodder.	Water drunk.	Weight of steer.	Gain.
Nov. 30.....				1,200					1,166	
Dec. 7.....	168.0	63.0	360.5	1,226	26	168.0	53.5	574.0	1,190	24
“ 14.....	186.0	57.0	368.0	1,199	-27	181.5	50.5	313.5	1,187	-3
“ 21.....	161.5	69.0	353.0	1,191	-6	166.5	56.5	260.5	1,204	17
“ 28.....	142.5	84.0	360.5	1,217	24	123.5	73.0	308.0	1,234	30
Jan. 4.....	138.5	108.5	383.5	1,231	14	127.0	92.0	310.0	1,230	-4
“ 11.....	149.5	100.5	383.5	1,261	30	130.5	84.5	309.5	1,248	18
“ 18.....	144.0	100.0	381.5	1,306	45	139.0	88.0	299.5	1,280	32
“ 25.....	137.0	94.5	375.5	1,290	-16	151.5	77.0	330.5	1,293	13
Feb. 1.....	144.5	94.5	392.0	1,283	-7	154.0	73.5	374.5	1,280	-13
“ 8.....	149.5	*95.5	418.5	1,320	37	156.5	*81.0	377.0	1,307	27
“ 15.....	163.0	96.5	377.0	1,344	24	159.5	76.0	329.5	1,325	18
“ 22.....	170.5	29.0	352.0	1,337	-7	143.0	27.5	272.0	1,313	-12
“ 29.....	164.5	30.5	336.5	1,320	-17	137.0	23.5	286.0	1,313	0
Mar. 7.....	165.5	34.0	375.0	1,335	16	126.0	28.5	282.5	1,330	17
“ 14.....	167.0	58.0	372.0	1,348	12	143.5	34.5	289.5	1,319	19
“ 21.....	155.5	32.0	288.5	1,339	-9	154.5	35.0	257.0	1,363	14
“ 28.....	121.5	47.0	347.0	1,353	14	131.0	39.0	327.0	1,365	2
Apr. 4.....	110.5	73.5	417.0	1,350	-3	132.5	62.5	243.5	1,378	13
“ 11.....	140.5	63.0	465.0	1,365	15	157.5	58.5	392.5	1,405	27
“ 18.....	159.0	39.0	362.0	1,388	23	157.5	31.5	316.0	1,401	-4
“ 25.....	158.0	30.0	263.0	1,379	-9	169.0	29.0	317.0	1,415	14
May 2.....	148.5	30.5	419.5	1,397	18	162.5	30.0	391.0	1,436	21
“ 9.....	150.0	26.5	345.5	1,405	8	150.5	22.0	295.5	1,441	5
“ 16.....	159.5	27.5	337.0	1,410	5	169.5	30.5	378.0	1,450	39
“ 23.....	143.0	52.5	426.5	1,419	9	147.5	50.5	406.0	1,483	8
“ 30.....	133.0	46.0	453.5	1,410	-9	143.5	49.0	443.0	1,490	2

* Prairie hay substituted for corn fodder.

III.

FEED, WEIGHT, AND GAIN.

STEER No. 8.					STEER No. 12.					STEER No. 19.				
Ear corn.	Corn fodder.	Water drunk.	Weight of steer.	Gain.	Ear corn.	Corn fodder.	Water drunk.	Weight of steer.	Gain.	Ear corn.	Corn fodder.	Water drunk.	Weight of steer.	Gain.
			1,050					1,406					1,255	
146.0	52.0	237.0	1,069	19	168.0	69.5	382.5	1,470	64	168.0	91.5	364.5	1,290	25
129.0	52.0	231.5	1,060	-9	220.5	78.0	410.0	1,465	-5	216.0	56.5	373.5	1,302	12
105.5	52.5	242.5	1,059	-1	201.5	61.5	355.5	1,475	10	206.5	35.0	356.5	1,308	6
100.5	58.5	260.0	1,070	11	186.0	78.5	430.0	1,503	28	190.5	42.5	351.0	1,340	32
93.5	85.0	263.0	1,081	11	169.0	88.0	403.0	1,498	-5	183.0	48.5	368.5	1,344	4
108.0	80.0	326.0	1,120	39	161.5	89.5	381.5	1,518	20	177.5	66.0	344.5	1,389	45
112.0	79.5	263.0	1,143	23	173.0	90.0	390.5	1,570	52	151.0	68.5	285.5	1,375	-14
119.5	51.5	236.5	1,124	-19	205.0	73.5	377.0	1,586	16	190.5	58.5	203.5	1,391	16
120.5	70.5	334.5	1,134	10	208.0	81.0	380.0	1,591	5	172.5	51.0	356.5	1,380	-11
136.5	*76.0	305.5	1,159	25	208.0	*89.0	359.5	1,601	10	191.0	*67.0	340.5	1,405	25
112.5	62.5	312.0	1,165	6	215.0	91.0	342.0	1,615	14	197.0	54.5	244.5	1,413	8
125.0	15.5	240.0	1,163	-2	222.5	38.5	329.5	1,619	4	200.0	31.5	352.5	1,415	2
102.0	26.5	303.0	1,181	18	175.5	22.0	347.0	1,630	11	109.0	21.5	311.5	1,415	0
127.5	22.5	232.5	1,200	10	132.0	31.0	260.0	1,618	-12	187.0	27.0	316.0	1,432	17
143.0	21.0	252.5	1,207	7	174.5	38.0	257.0	1,623	10	122.5	22.0	249.5	1,441	9
133.5	17.5	242.5	1,216	9	171.0	37.5	309.0	1,667	39	192.0	38.5	304.0	1,451	10
112.5	35.5	232.0	1,221	5	140.5	42.5	349.0	1,653	-9	162.5	27.5	298.0	1,451	0
124.0	56.0	266.0	1,204	-17	104.5	70.5	375.0	1,622	-36	143.5	152.0	376.0	1,432	-19
128.5	51.0	407.5	1,248	44	168.0	70.5	422.0	1,660	38	160.5	40.5	445.5	1,462	30
148.0	19.0	302.0	1,260	12	194.5	43.0	316.0	1,675	15	192.5	25.0	441.5	1,489	27
140.5	18.5	278.0	1,262	2	199.5	40.0	348.0	1,691	16	166.5	23.5	325.0	1,505	16
87.5	29.0	319.5	1,287	25	141.5	31.5	389.5	1,673	-18	169.5	30.5	309.5	1,515	10
146.5	20.5	240.5	1,305	18	166.0	33.0	355.5	1,702	29	171.0	23.5	323.5	1,529	14
146.0	19.0	293.5	1,313	8	155.0	34.5	341.5	1,721	19	176.0	27.0	334.5	1,556	27
137.0	40.0	374.0	1,340	24	131.0	56.5	361.0	1,707	-14	145.0	43.5	361.5	1,571	15
135.5	37.0	468.5	1,324	-16	129.5	52.0	440.5	1,715	8	152.0	42.5	421.5	1,559	-12

The tables for lot IV are the same as the foregoing in plan, but differ from them in that the feed was weighed out to the lot as a whole, and a separate account with each steer could be kept only in the case of the weight.

LOT IV.
WEEKLY SUMMARY OF FEED, WEIGHT, AND GAIN.

DATE.	Ear corn.	Corn fodder.	STEER 4.		STEER 10.		STEER 15.		STEER 17.		STEER 18.	
			Weight.	Gain.	Weight.	Gain.	Weight.	Gain.	Weight.	Gain.	Weight.	Gain.
Nov. 30.....			1,276		1,315		1,136		1,148		1,248	
Dec. 7.....	1,011.0	403.0	1,269	-7	1,366	51	1,150	14	1,167	19	1,295	47
“ 14.....	1,080.5	441.0	1,283	14	1,406	40	1,173	23	1,229	62	1,336	41
“ 21.....	941.5	365.5	1,317	34	1,424	18	1,159	-14	1,215	-14	1,268	-68
“ 28.....	724.0	468.5	1,345	28	1,437	13	1,160	1	1,207	-8	1,320	52
Jan. 4.....	997.5	480.0	1,380	35	1,460	23	1,135	-25	1,231	24	1,323	8
“ 11.....	877.5	395.5	1,300	-80	1,468	8	1,167	32	1,226	-5	1,366	38
“ 18.....	896.5	374.0	1,280	-20	1,448	-20	1,166	-1	1,212	-14	1,371	5
“ 25.....	986.0	292.0	1,347	67	1,511	63	1,201	35	1,262	50	1,405	34
Feb. 1.....	1,050.0	352.0	1,373	26	1,518	7	1,235	34	1,285	23	1,399	-6
“ 8.....	1,043.5	451.5	1,373	0	1,491	-27	1,252	17	1,305	20	1,400	1
“ 15.....	1,059.5	350.5	1,367	-6	1,514	23	1,267	15	1,289	-16	1,430	30
“ 22.....	1,018.5	163.5	*1,440	73	1,511	-8	1,265	-2	1,312	23	1,444	14
“ 29.....	957.5	184.5	1,412	-28	1,523	12	1,280	15	1,299	-13	1,438	-6
Mar. 7.....	923.0	198.5	1,421	9	1,560	37	1,280	0	1,315	16	1,469	31
“ 14.....	815.0	214.0	1,458	37	1,571	11	1,293	13	1,324	9	1,462	-7
“ 21.....	914.0	216.5	1,437	29	1,609	38	1,321	28	1,370	46	1,485	23
“ 28.....	848.0	227.5	1,475	-12	1,592	-17	1,287	-34	1,343	-27	1,480	-5
Apr. 4.....	782.0	313.5	1,453	8	1,634	42	1,315	28	1,332	-11	1,522	42
“ 11.....	842.0	356.0	1,482	-1	1,622	-12	1,307	-8	1,360	28	1,500	-22
“ 18.....	964.5	201.5	1,493	11	1,625	3	1,300	-7	1,366	6	1,495	-5
“ 25.....	1,001.0	220.5	1,511	13	1,645	20	1,363	63	1,363	2	1,522	27
May 2.....	928.5	199.0	1,484	-27	1,630	-15	1,319	-44	1,393	25	1,521	-1
“ 9.....	946.5	206.0	1,505	21	1,672	42	1,367	48	1,417	24	1,536	15
“ 16.....	898.0	193.5	1,306	1	1,645	-27	1,340	-27	1,410	-7	1,545	9
“ 23.....	910.5	301.5	1,552	46	1,674	29	1,390	50	1,453	43	1,551	6
“ 30.....	938.0	301.5	1,569	17	1,692	18	1,392	2	1,438	-15	1,596	45

* Prairie hay substituted for corn fodder.

LOT IV.

FEED AND WEIGHT (in pounds), COST OF FEED, AND COST PER POUND OF GAIN.

Number of period.	Ear corn.	Corn fodder.	STEER No. 4.		STEER No. 10.		STEER No. 15.		STEER No. 17.		STEER No. 18.	
			Weight.	Gain.	Weight.	Gain.	Weight.	Gain.	Weight.	Gain.	Weight.	Gain.
1st. Nov. 30, Dec. 28.	3,787	1,678	1,276 1,345	69	1,315 1,437	122	1,136 1,160	24	1,148 1,207	59	1,248 1,320	72
	\$17.657	\$2.097	Cost of feed, \$19.754. Cost per pound of gain, 5.71 cents.									
2d. Dec. 28, Jan. 25.	3,757.5	1,541.5	1,347	2	1,511	74	1,201	41	1,262	55	1,405	85
	\$17.65	\$1.926	Cost of feed, \$19.576. Cost per pound of gain, 7.61 cents.									
3d. Jan. 25, Feb. 22.	4,171.5	1,317.5	1,440	98	1,511	0	1,265	64	1,312	50	1,444	89
	\$19.606	\$1.646	Cost of feed, \$21.252. Cost per pound of gain, 8.64 cents.									
4th. Feb. 22, Mar. 21.	3,609.5	* 813.5	1,487	47	1,609	98	1,321	56	1,370.	58	1,485	41
	\$16.964	\$1.423	Cost of feed, \$18.387. Cost per pound of gain, 6.13 cents.									
5th. Mar. 21, Apr. 18.	3,436	1,128.5	1,493	6	1,625	16	1,300	-21	1,366	-4	1,495	10
	\$16.149	\$1.974	Cost of feed, \$18.123. Cost per pound of gain, \$2.59.									
6th. Apr. 18, May 16.	3,774	819	1,506	13	1,645	20	1,340	40	1,410	44	1,545	50
	\$17.737	\$1.433	Cost of feed, \$19.17. Cost per pound of gain, 11.48 cents.									
7th. May 16, May 30.	1,848.5	603	1,569	63	1,692	47	1,392	52	1,438	28	1,596	51
	\$8.687	\$1.055	Cost of feed, \$9.742. Cost per pound of gain, 4.57 cents.									

* Prairie hay substituted for corn fodder.

Total cost of feed, \$126.01.
 Total gain of lot in 182 days, 1,564 pounds.
 Average gain per head, 312.8 pounds.
 Average daily gain, 1.71 pounds.
 Cost per pound of gain, 8.05 cents.

WEEKLY MEAN TEMPERATURE DURING FEEDING PERIOD.

DATE.	TEMPERATURE.		Differ- ence.	DATE.	TEMPERATURE.		Differ- ence.
	In yard.	In barn.			In yard.	In barn.	
Dec. 7.....				Mar. 7.....	44.1	57.0	12.9
“ 14.....	34.4	46.5	12.1	“ 14.....	37.0	50.5	13.5
“ 21.....	30.5	51.7	15.2	“ 21.....	23.1	41.8	18.7
“ 28.....	30.0	47.3	17.3	“ 28.....	42.7	54.0	11.3
Jan. 4.....	36.2	51.2	15.0	Apr. 4.....	54.4	61.4	17.0
“ 11.....	19.6	41.6	22.0	“ 11.....	47.7	55.7	8.0
“ 18.....	9.0	31.7	22.7	“ 18.....	51.9	58.7	6.8
“ 25.....	6.1	41.6	35.5	“ 25.....	50.9	59.7	8.8
Feb. 1.....	38.9	67.0	28.1	May 2.....	62.1	68.0	5.9
“ 8.....	30.7	50.7	20.0	“ 9.....	53.7	60.7	7.0
“ 15.....	30.3	42.3	12.0	“ 16.....	57.2	61.6	4.4
“ 22.....	35.7	51.4	15.7	“ 23.....	57.0	60.9	3.9
“ 29.....	38.7	52.7	14.0	“ 30.....	67.2	69.9	2.7

The temperature was noted in order to ascertain what influence cold weather had on the feeding of cattle in the open. One thermometer was hung in the barn and another under the shed in the yard where lot IV was fed.

The readings were taken twice daily, at 7 A. M. and at 6 P. M. But this was not begun until December 7; consequently we have no record for the week ending that date. The figures show the mean temperature in the yard and barn, respectively, for the week ending on the date given in each case. It will be noticed that there is no small difference in favor of the barn, during the coldest weather. This difference was presumably of no little advantage to the steers in the barn.

THE ILLUSTRATIONS.

The illustrations (facing p. 98) are intended to convey some idea of the type of the steers, and their condition at the time they were marketed. They have been engraved from photographs taken a few days before they were sold, and hence the plates show them at their best. Each lot is represented by two steers, the lightest and the heaviest having been drawn in each case. They therefore represent the extremes of condition, the poorest and the best in each lot, from which the reader can readily form an idea of the lot as a whole. From the mere appearance of the steers in these illustrations, without reference to weights given elsewhere, it is easy to see that those in lot I, the lot which was fed on the balanced ration, are in prime condition and far exceed the others in the amount of flesh and fat

they have taken on. On the other hand, there is but little to choose between the other three lots.

THE RELATION OF FEED AND WATER TO GAIN

is shown in a condensed form in the following tables. The total amounts of grain, fodder and water consumed by each steer during the six months and the gain made are given, and from these the number of pounds of grain, fodder and water that have been required to produce a pound of gain are calculated, and finally the average requirements are shown.

LOT I—FEED: BALANCED RATION.

RELATION OF FEED AND WATER TO GAIN.

Number of steer.	Total grain eaten.	Total fodder eaten.	Total water drunk.	Total gain.	Pounds grain per pound of gain.	Pounds fodder per pound of gain.	Pounds water per pound of gain.	Pounds water to one pound of food.
1.....	4,081.4	1,066.5	13,212.0	378.0	10.8	2.8	34.9	2.5
5.....	4,299.6	1,513.5	13,264.5	416.0	10.3	3.6	31.9	2.3
6.....	3,912.9	1,656.5	11,574.0	386.0	10.1	3.5	29.7	2.1
9.....	4,721.1	1,481.0	15,813.0	486.0	9.7	3.0	32.5	2.5
13.....	4,768.5	1,392.5	14,571.5	512.0	9.3	2.5	28.4	2.2
Av'rag's,	4,356.7	1,422.0	13,687.0	435.6	10.0	3.2	31.2	2.4

LOT II—FEED: CORN MEAL.

RELATION OF FEED AND WATER TO GAIN.

Number of steer.	Total corn meal eaten.	Total fodder eaten.	Total water drunk.	Total gain.	Pounds corn meal per pound of gain.	Pounds fodder per pound of gain.	Pounds water per pound of gain.	Pounds water to one pound of food.
2.....	2,700.5	981.5	7,377.5	148	18.20	6.60	49.80	2.0
11.....	3,894.5	1,050.5	8,736.5	271	14.37	3.37	32.23	1.7
14.....	3,721.5	677.2	8,284.0	293	14.70	2.60	32.70	1.8
16.....	3,709.5	931.5	7,933.0	301	12.30	3.10	26.30	1.7
20.....	3,846.5	1,058.5	10,215.0	327	11.80	3.30	31.50	2.1
Av'rag's,	3,574.5	939.8	8,509.2	268	13.34	3.50	32.70	1.8

LOT III—FEED: EAR CORN.
RELATION OF FEED AND WATER TO GAIN.

Number of steer.	Total ear corn eaten.	Total fodder eaten.	Total water drunk.	Total gain.	Pounds of ear corn per pound of gain.	Pounds of fodder per pound of gain.	Pounds of water per pound of gain.	Pounds water to one pound of food.
3.....	3,940.5	1,562.0	9,712.5	210.0	18.7	7.4	46.2	1.7
7.....	3,882.5	1,337.0	8,718.0	324.0	12.0	4.2	27.0	1.6
8.....	3,298.5	1,039.5	7,563.5	274.0	12.0	4.0	37.5	1.7
12.....	4,521.0	1,530.5	9,412.0	309.0	14.6	5.0	30.4	1.5
19.....	4,493.0	1,215.0	8,918.0	304.0	14.7	4.0	29.3	1.5
Average's,	4,027.1	1,340.8	8,864.8	284.2	14.1	4.7	31.2	1.6

LOT IV—FEED: EAR CORN IN YARD.
RELATION OF FEED TO GAIN.

Total ear corn eaten.	Total fodder eaten.	Total gain.	Pounds of corn to one pound gain.	Pounds of fodder to one pound gain.
24,354	4,536	1,564	15.3	2.8

ON THE BLOCK.

The steers were sold to the Armour Packing Company, of Kansas City, and by their courtesy we were enabled to obtain the statistics as to dressed weight and intestinal fat given in the accompanying table. The showing on the block was decidedly in favor of lot I. Several good judges of meat, who examined and compared the carcasses after slaughtering, had no great difficulty in picking out the best fed lot. Aside from being the heaviest, the meat was thicker, the fat more abundant, and better distributed. The carcasses of the other three lots did not differ in appearance to any marked degree, but the figures show some difference in favor of those fed in-doors. The table tells its own tale.

COMPARISON OF LIVE WEIGHT, SHRINKAGE, AND DRESSED WEIGHT.

Lot and number of steer.	Weight at barn May 30.	Weight at Kansas City May 31.	Shrinkage.	Dressed weight of carcass.	Per cent. dressed of live weight.	Intestinal fat.
Lot I.						
Steer No. 5.....	1,606	1,576	30	997	63.26	117
Steer No. 9.....	1,773	1,740	33	1,120	64.36	133
Steer No. 13.....	1,700	1,669	31	1,062	63.63	123
Steer No. 1.....	1,610	1,581	29	1,009	63.12	117
Steer No. 6.....	1,593	1,564	29	1,016	64.96	121
Averages.....	1,656.4	1,626.0	30.4	1,040.8	63.866	122.2
Lot II.						
Steer No. 20.....	1,635	1,615	20	988	61.17	105
Steer No. 16.....	1,501	1,482	19	903	61.26	120
Steer No. 2.....	1,215	1,196	19	760	63.54	63
Steer No. 14.....	1,448	1,430	18	904	63.21	92
Steer No. 11.....	1,596	1,576	20	991	62.81	109
Averages.....	1,479.0	1,459.8	19.5	910.2	62.272	97.8
Lot III.						
Steer No. 12.....	1,715	1,676	39	1,050	62.50	106
Steer No. 8.....	1,324	1,294	30	787	60.72	91
Steer No. 7.....	1,490	1,456	34	861	58.97	78
Steer No. 3.....	1,410	1,380	30	859	62.20	64
Steer No. 19.....	1,539	1,524	35	922	60.37	88
Averages.....	1,499.6	1,466.0	33.6	895.8	60.952	85.0
Lot IV.						
Steer No. 15.....	1,392	1,327	65	833	62.01	84
Steer No. 18.....	1,596	1,522	74	930	61.10	91
Steer No. 17.....	1,438	1,372	66	839	61.15	68
Steer No. 4.....	1,569	1,497	72	853	56.98	86
Steer No. 10.....	1,692	1,613	79	995	61.74	84
Averages.....	1,517.4	1,466.2	71.2	888.2	60.598	82.6

FINANCIAL DATA.

As was to be expected, all four lots were fed at a loss, as is shown in the detailed accounts below. This does not, however, detract anything from the value of the experiment. If the market had been better, some, or all of them, would have shown a profit; or in the case of lot I, fed on more nutritious feed than the others, and ready for market earlier, if they had been sold as soon as marketable, that lot would have brought a profit, as I shall show. The experiment was purposely prolonged more than necessary to render them marketable in order to show that the gain decreased as the feeding progressed, and that it is the last pounds of gain which cost the most money. This is especially true of lot I, and is shown in the preceding tables. The three corn-fed lots were not so ripe, and the decrease in gain is not so marked.

LOT I—*Dr.*

To five steers @ \$39.50	.. . . .	\$197 50	
To freight on same..	.. . . .	7 50	
To feed, as follows:			
11,974 pounds corn meal @ 55 cents per cwt.	.. . . .	\$65 85	
4,648 pounds shorts @ 54 cents per cwt.	.. . . .	25 09	
2,129 pounds bran @ 40 cents per cwt	.. . . .	8 52	
3,027 pounds oil meal @ \$1.35 per cwt..	.. . . .	40 86	
1,121 pounds corn fodder @ 12½ cents per cwt.	.. . . .	1 40	
2,238 pounds prairie hay @ 17½ cents per cwt..	.. . . .	3 91	
3,649 pounds tame hay @ 25 cents per cwt.	.. . . .	9 37	155 00
To expenses of sale, as follows:			
Freight...	.. . . .	\$3 10	
Commission..	.. . . .	2 50	
Yardage	.. . . .	1 00	
Hay	.. . . .	20	6 80
Total..	.. . . .		\$366 80

Cr.

By five steers, 8,130 pounds, @ \$4.20 per cwt.	.. . . .	341 46
Balance..	.. . . .	\$25 34

LOT II—*Dr.*

To five steers @ \$39.50..	.. . . .	\$197 50	
To freight on same.	.. . . .	7 50	
To feed, as follows:			
17,872 pounds corn meal @ 55 cents per cwt.	.. . . .	\$98 29	
1,886 pounds corn fodder @ 12½ cents per cwt.	.. . . .	2 35	
2,813 pounds prairie hay @ 17½ cents per cwt..	.. . . .	4 92	105 56
To expenses of sale..	.. . . .	6 71	
Total..	.. . . .		\$317 27

Cr.

By five steers, 7,300 pounds, @ \$4.10..	.. . . .	299 80
Balance..	.. . . .	\$17 97

LOT III—*Dr.*

To five steers @ \$39.50..	\$197 50
To freight on same	7 50
To feed, as follows:	
24,132 pounds ear corn @ 47 cents per cwt.	\$94 62
4,160 pounds corn fodder @ 12½ cents per cwt.	5 20
2,544 pounds prairie hay @ 17½ cents per cwt.. . . .	4 45
	104 27
To expenses of sale..	6 74
Total..	\$318 01

Cr.

By five steers, 7,330 pounds, @ \$4.10 per cwt.	300 53
Balance..	\$15 48

LOT IV—*Dr.*

To five steers @ \$39.50	\$197 50
To freight on same... ..	7 50
To feed, as follows:	
24,354 pounds ear corn @ 47 cents per cwt.	\$114 46
4,536 pounds corn fodder @ 12½ cents per cwt.	5 67
3,364 pounds prairie hay @ 17½ cents per cwt.. . . .	5 88
	126 01
To expenses of sale..	6 73
Total.	\$337 74

Cr.

By five steers, 7,330 pounds, @ \$4.10 per cwt.. . . .	300 53
Balance..	\$37 21

In this account the expense of feeding is not taken into consideration. We could not do so with so small a number and reach conclusions that would approximate the actual expense of tending to a large herd. Nor have we, on the other hand, given any credit for the manure, either as a fertilizer or its value for hogs to work over. It was not practicable to keep the manure from the stabled steers separate from the manure of the rest of the herd or of the lots from each other; and even if this could have been done, and hogs given access to each lot, the amount of manure was too small to afford anything like a fair test of its value for hogs to work over. A few hogs followed the steers in the yard, but they were not entirely supported by their pickings, and no accurate estimate could be made of their gain from that source; so it had better be omitted. Besides, stock men have already pretty correct notions of the amount of pork that can be made by letting hogs follow corn-fed steers. The point that it would be desirable to investigate is, how corn meal and the "balanced ration," and ground feed generally compare with whole-corn feed for that purpose. But for the above reasons this could not be made part of the experiment.

Unfortunately Western feeders do not yet consider the fertilizing value of the manure. If they would save the manure and apply it to their farm lands, many of the losses now sustained in feeding would be canceled by the

increased profits on the crops. In the present case, if the value of the manure were credited to the steers it would go far toward throwing the balance on the credit side of the account.

THE NUTRIENTS IN THE FEEDS USED.

According to the available analyses, and estimated digestibility of the feeds used, they contain the amounts of digestible nutrients given in the table below. All the feed stuffs were of good average quality, and may fairly be taken to represent similar feeds everywhere in the West. No digestion experiments with prairie hay have as yet been undertaken and the results published; the value of this feed is therefore estimated to be equal to that of mixed meadow grasses, and the digestible nutrients assigned to them have been used in the calculation.

TABLE SHOWING PER CENT. OF DIGESTIBLE NUTRIENTS CONTAINED IN THE FEEDS USED.

	Protein.	Carbo- hydrates.	Fats.	Nutritive ratio.
Ear corn.....	5.47	57.52	2.70	11.74
Corn meal.....	6.25	60.06	3.14	10.80
Oil meal.....	27.10	34.30	7.00	1.91
Shorts.....	10.80	46.80	2.80	4.97
Bran.....	12.60	44.10	2.90	41.00
Prairie hay.....	3.55	43.09	.98	1.28
Corn stalks.....	2.41	84.48	.47	14.70
Orchard grass and clover hay.....	5.78	40.07	1.55	8.10

According to this estimated digestibility of the feeds, the actual amount of nutrients contained in the feed for each lot is given, as follows.

TABLE SHOWING THE AMOUNT OF DIGESTIBLE NUTRIENTS IN THE FEED CONSUMED BY EACH LOT.

LOT I.			
FEED EATEN —	DIGESTIBLE NUTRIENTS. (In pounds.)		
	Protein.	Carbo- hydrates.	Fat.
<i>From November 30 to February 23.</i>			
5,375.54 pounds corn meal contained.....	335.97	3,228.54	167.79
965.28 pounds bran contained.....	147.62	425.68	27.99
2,465.87 pounds shorts contained.....	266.31	1,154.02	69.04
990.23 pounds oil meal contained.....	298.35	339.64	69.51
1,121 pounds corn fodder contained.....	27.01	383.32	5.26
2,213.5 pounds tame hay (orchard grass and clover) contained.....	127.94	888.94	34.30
Totals.....	1,173.20	6,421.54	373.69
Nutritive ratio, 1:6.27.			
<i>From February 22 to May 30</i>			
6,598.57 pounds corn meal contained.....	416.41	3,963.10	207.10
1,174 pounds bran contained.....	147.90	517.70	34.04
2,181.66 pounds shorts contained.....	235.61	1,021.01	61.08
2,037.29 pounds oil meal contained.....	552.10	698.70	142.60
2,239 pounds prairie hay contained.....	79.40	964.70	21.90
1,535 pounds tame hay (orchard grass and clover) contained.....	88.72	615.07	23.70
Totals.....	1,520.14	7,780.28	490.42
Nutritive ratio, 1:5.92.			

LOT II.

FEED EATEN —	DIGESTIBLE NUTRIENTS. (in pounds.)		
	Protein.	Carbo- hydrates.	Fat.
17,872 pounds corn meal contained.....	1,117.00	10,733.92	561.18
1,886 pounds corn fodder contained.....	45.45	650.29	8.86
2,513 pounds prairie hay contained.....	99.86	1,212.12	27.56
Totals.....	1,262.31	12,596.33	597.60
Nutritive ratio, 1 11.16.			

LOT III.

20,132 pounds ear corn contained.....	1,101.22	11,579.00	543.56
4,160 pounds corn fodder contained.....	100.25	1,434.36	19.55
2,544 pounds prairie hay contained.....	90.31	1,096.20	24.93
Totals.....	1,291.78	14,109.56	588.04
Nutritive ratio, 1 12.06.			

LOT IV

24,354 pounds ear corn contained.....	1,232.16	14,008.42	657.55
4,536 pounds corn fodder contained.....	109.31	1,564.01	21.31
3,364 pounds prairie hay contained.....	119.42	1,449.54	32.96
Totals.....	1,460.89	17,021.97	711.82
Nutritive ratio, 1 12.87.			

This table is of interest, in that it shows the amount of nutrients consumed by the steers under each of the several conditions of feeding, and it also shows the difference between a wide and a narrow "nutritive ratio" in the production in beef. The nutritive ratio is the ratio existing between the digestible protein and the digestible carbohydrates. In an arithmetical expression of this relation the protein is always represented by the figure 1, and the ratio shows how many pounds of carbohydrates there are in the feed to one pound of protein. The ratio is calculated by multiplying the fat by 2.5, and adding the product to the carbohydrates, and then dividing the sum of the two by the protein. Thus, in the feed of lot I, from November 30 to February 22, there was one pound of protein to 6.27 pounds of carbohydrates, or, as technically expressed, the ratio was 1:6.27. During February it was noticed that the gains fell off rapidly, as may be seen by reference to the preceding tables, and to keep up the rate of gain the amount of protein in the ration was increased by the addition of more oil meal to the feed. This change took place February 22. It had the effect of maintaining the general average of the gains. During the last two weeks the ratio was widened by the withdrawal of the shorts and a portion of the oil meal, and, with one exception, there was also a falling-off in the gains.

AN INTERESTING POINT.

This table of total nutrients shows another point of absorbing interest and one which may prove to be of much practical utility. It is the fact that *the gain depends upon the available protein in the feed, and, within certain limits, regardless of the amount of carbohydrates in the feed.*

Up to February 22, lot I gained 1,213 pounds, and consumed 1,173.20 pounds protein, 6,421.34 pounds carbohydrates, and 373.69 pounds fat. This requires, for each pound of gain, .968 pound protein, 5.29 pounds carbohydrates, and .31 pound fat; or, combining the fat and carbohydrates as in the calculation of the nutritive ratio, .968 pound protein to 6.0 pounds carbohydrates.

From February 22 to May 30 the gain was 965 pounds, and the relation of protein and carbohydrates to each pound of gain was 1.57 of the former and 9.33 of the latter. There is here an increase in both the protein and the carbohydrates, which is accounted for by the fact that, as the animals ripened, it required more and more nourishment for each pound of gain. This fact is well known to feeders. The increase of feed to the gain, in this case, during the successive stages in the fattening, will be shown presently. First, let us notice the relation of protein to gain in the other three lots. The feed of these three lots remained unchanged during the 182 days they were fed. The calculation of the nutritive ratios is therefore not divided into periods. Lot II gained 1,340 pounds. They consumed a total of 1,262.31 pounds protein, 12,596.33 pounds carbohydrates, and 597.60 pounds fat, the ratio being 1:11.16. This gives .941 pound protein and 10.51 pounds carbohydrates to each pound of gain. Lot III gained 1,421 pounds, and consumed 1,291.78 pounds protein, 14,109.56 pounds carbohydrates, and 588.04 pounds fat. This gives .909 pound protein and 10.51 pounds carbohydrates to each pound of gain. Lot IV gained 1,564 pounds, and consumed 1,460.89 pounds protein, 17,021.97 pounds carbohydrates, and 711.82 pounds fat, which gives .934 pound protein and 12.02 pounds carbohydrates to each pound of gain. Putting it in tabular form, it appears as follows:

	Gain, pounds.	CONSUMED PER POUND OF GAIN.	
		Protein, pounds.	Carbohy- drates, pounds.
Lot I, November 30 to February 22.....	1,213	.968	6.00
Lot I, February 22 to May 30.....	965	1.570	9.33
Lot II, November 30 to May 30.....	1,340	.941	10.51
Lot III, " ".....	1,421	.909	10.97
Lot IV, " ".....	1,564	.934	12.02

With the exception of the second period in lot I, which is accounted for there is here a remarkable uniformity in the amount of protein required to make a pound of gain, regardless alike of the difference in gain and the

difference in carbohydrates. I have nowhere in works on feeding seen this relation of protein to gain pointed out, and I venture to call attention to it here because it may be of much practical importance. It suggests that the feeder should base his valuation of any feed almost exclusively on the amount of digestible protein it contains, and, instead of buying it by the bushel or by the hundred weight, he should buy it at so much per pound of digestible protein, precisely as artificial fertilizers are bought for the amount of nitrogen, potash and phosphoric acid they contain. It is a confirmation of the practical value of the "feeding standards" as a guide in feeding, and is in fact simply a presentation of the same principle in a different form. That the amount of protein required for a pound of gain increases as the animal ripens, is proven by the diminished gain for the feed consumed. In this connection, the following figures which are deduced from the tables of lot I will be of interest:

After 56 days' feeding	they had eaten	7.30	pounds of grain	to each pound gain.				
After 84	"	"	"	8.07	"	"	"	"
After 112	"	"	"	8.40	"	"	"	"
After 140	"	"	"	9.01	"	"	"	"
After 168	"	"	"	9.27	"	"	"	"
After 182	"	"	"	10.00	"	"	"	"

This simply confirms what is known to every feeder, that it costs more to finish a steer off than it does to give him the main portion of his weight. It shows that the greatest profit is likely to be made if the cattle are marketed as soon as in fairly good condition, other conditions being equal. This being the case, there is but little encouragement for feeders to bring highly finished cattle on the market. The packers do not pay enough more for that class of cattle to pay for the extra feed it requires to put them in condition, and leave the same margin of profit to the feeder that he can realize on an animal in only moderate flesh.

Lot I, fed on the balanced ration, were extra-fine cattle, as the reader can learn from the preceding table of gains and per cent. of dressed weight. Yet they brought but ten (10) cents more *per hundred pounds* than the corn-fed cattle, which dressed from 2 to 4 per cent. less. When the feeders fully realize what it costs to raise a steer from a medium to a high condition of flesh, there will be but few extra-fine cattle offered on the market, until the packers are willing to pay a just premium on their condition.

COMPARISON OF RESULTS.

The reader should study the foregoing tables from two points of view: First, as regards the gain made for the feed consumed by each lot under the conditions named, regardless of the cost of feed and the price of beef; second, they should be studied in the light of profit and loss. As regards the lessons which can be drawn from them, the first point is of vastly greater importance than the second. The cost of feed and the price of beef on

the market are fluctuating factors, and cannot form the basis of any conclusion as regards the merit of a particular method of treatment. A man may feed this year at a loss, and next year, with exactly the same treatment of the stock, he may make a profit, owing to a better market when he sells, or to a cheapening of the feed. The fact, then, that all of these experimental cattle were fed at a loss does not militate against the success of the experiment. This is pointed out to guard the casual reader against drawing unwarrantable conclusions.

Let us first compare the two lots fed on whole ear corn, corn stalks, and prairie hay. At the last weighing at the barn, May 30, the lot fed in the yard showed a total gain of 1,564 pounds, whereas the lot in the barn gained but 1,421 pounds. Here, apparently, the out-door lot has the advantage; but on being weighed at Kansas City, the two lots, by a remarkable coincidence, weighed exactly alike to a pound; each lot tipped the beam at 7,330 pounds, and this was the weight they were sold at. This equalization was caused by the lot in the yard shrinking more during transportation than the lot in the barn did. The out-door lot was not accustomed to be handled, and the enforced confinement on the train probably excited them more than it did the others. The difference in gain is then more apparent than real. There is a marked difference in the amount of feed eaten by the two lots.

Lot IV, fed in the yard, ate 24,354 pounds ear corn, 4,536 pounds corn fodder, and 3,364 pounds prairie hay. This gives 15.5 pounds ear corn, 2.9 pounds corn fodder and 2.1 pounds hay to each pound of gain. Or, putting it in another way, the average consumption of each steer was 4,871 pounds of corn, 907 pounds corn stalks, and 673 pounds prairie hay, from which he produced a gain of 313 pounds.

Lot III, fed the same way in the barn, ate 20,132 pounds ear corn, 4,160 pounds corn stalks, and 2,544 pounds prairie hay, and gained 1,421 pounds. This gives 14.1 pounds ear corn, 2.9 pounds corn fodder and 1.7 pounds hay to each pound of gain. Or, putting it as above, the average consumption by each steer in the lot was 4,027 pounds ear corn, 832 pounds corn fodder, and 509 pounds hay. On balancing results, we find that each steer in the yard ate 844 pounds corn more than the steers similarly fed in the barn, and also somewhat more of the rough feed. The gain, as we have seen, was practically the same. This is 12 bushels of corn, at 33 cents a bushel, or \$4.00 that it cost more per head in feed to feed out-doors than it did in the barn. Whether it is more profitable to pay this tribute to cold weather under out-door management than to invest it in shelter, each feeder must decide for himself. It should be noted in this connection that, on the whole, the season was very favorable to out-door feeding. The fall and early winter were dry and clear, and the low temperature in January was not of long duration. Under less favorable conditions the out-door lot might therefore not have done so well. It will also be seen, on comparing the table giving the weekly feed and gain of lot IV with temperature in the shed, that the gain was very light during the oldest weather.

Turning now to a comparison of lot II, fed on corn meal and chopped corn fodder, and lot III, fed as just described, on whole ear corn, both tied alongside each other in the barn, we find that lot II gained only 1,340 pounds, or 81 pounds less than the lot fed on whole corn. Thus it appears from the last weighing at the barn, May 30. But on arrival at Kansas City this lot weighed 7,300 pounds, and the other 7,330 pounds, showing that lot II shrank less during transportation, and that in reality it was only 30 pounds behind lot III. However, on the basis of a gain of only 1,340 pounds, lot II ate 13.3 pounds corn meal, 1.4 pounds corn fodder (chopped), and 2.2 pounds prairie hay for each pound of gain. Allowing the rough fodders to balance each other, which, however, they do not quite do, this shows that it required only .8 pound ear corn more than corn meal to each pound of gain, or only 80 pounds—but little over a bushel on 100 pounds of gain. This is not a very favorable showing for the corn meal; and I confess that the result is contrary to my expectations. A considerable percentage of the whole corn passes through the animal undigested, and it would seem that the digestive juices could act to better advantage on the fine corn meal than on the partially-masticated grains of corn, and extract more nourishment from it. But apparently this is not the case. The test can, however, not be considered conclusive. The steers were not accustomed to corn meal, and for some time after the experiment began they did not eat enough to maintain their weight, as may be seen by reference to the tables. Had they eaten better from the start, the result might have been different.

Lot I, fed on the "balanced ration" in the barn, as described elsewhere, stands out conspicuously in comparison with the others. They laid on flesh much more rapidly and on a much less weight of feed for the gain made. I have already, on page 94, indicated the amount of the mixed-grain feed it required at successive stages in the feeding to make a pound of gain. They ate well; they seemed to relish the feed. They did not suffer from indigestion or scours, as was the case with a few of the others for brief periods. Their corn fodder was chopped as in the case of lot II, but the hay was fed whole. The feed was not moistened nor seasoned with any relishes except occasionally a pinch of salt, which was given to the others in like manner. On February 22, 12 weeks from the beginning of the experiment, this lot had gained 1,213 pounds, 243 pounds per head, or an average daily gain of more than 2.8 pounds per head. Lot II averaged at that date 1.7 pounds; lot III, 1.8 pounds, and lot IV, 2 pounds per day per head. The tables show details as to character of feed and amount eaten.

This result simply confirms the fact established long ago, that the rate of gain depends upon the character of the feed. The elements which go to make meat and fat must come from the feed, and if the feed does not contain them in sufficient quantity or of the quality needed, the gain is necessarily slow.

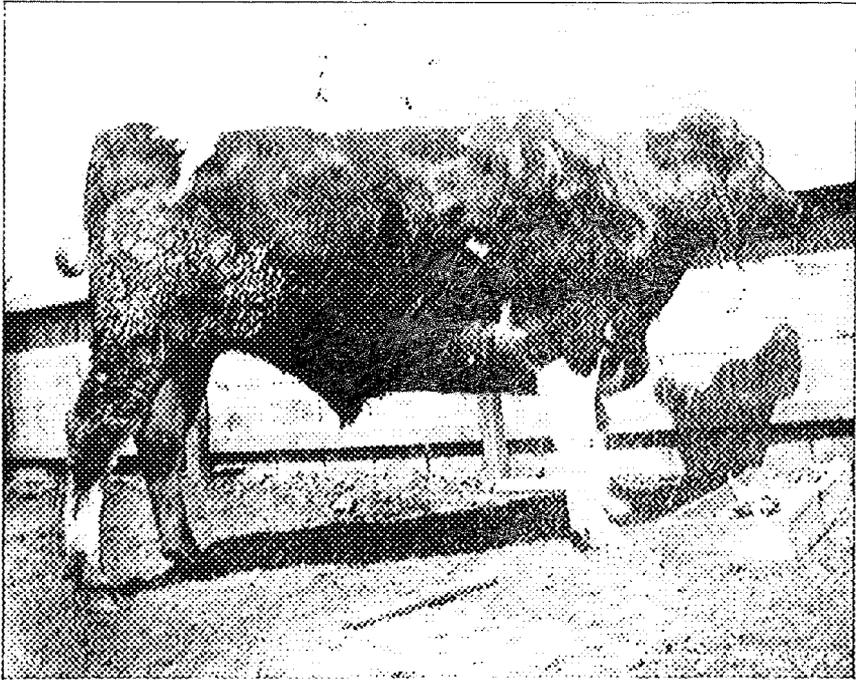
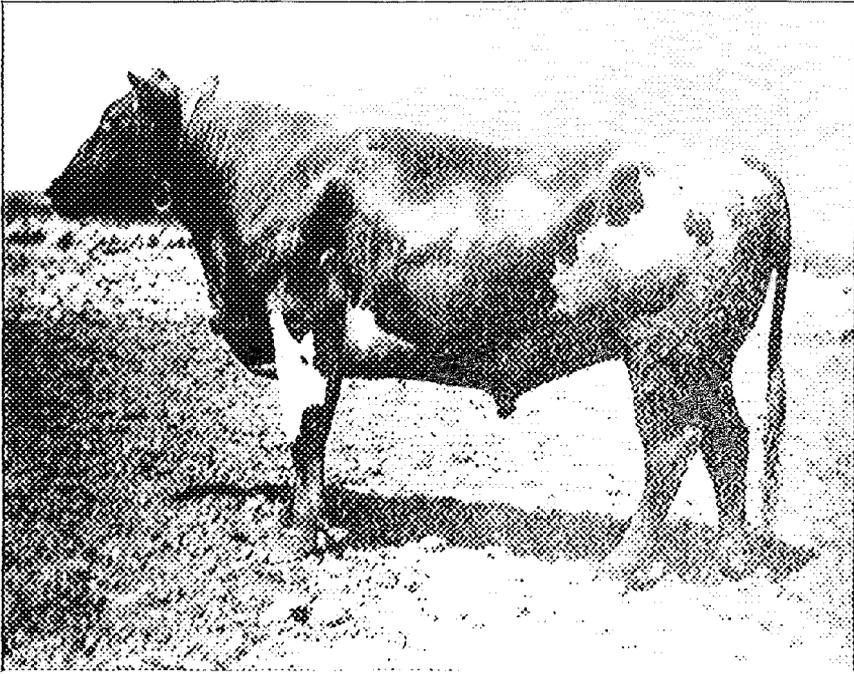
The feeding of this lot proves another point, namely, that the balanced ration will fit cattle for market much more rapidly than corn, and that it is unprofitable to continue the feeding much beyond the period of rapid gain. While they gained 1,213 pounds during the first 12 weeks, they gained only 965 pounds during the last 14 weeks, and that, too, on a considerably richer feed.

The financial comparison has already been given in the account rendered. All were fed at a loss, which accords with the experience of the majority of feeders the past season. It is to be noticed, however, that the loss would have been less had they been sold earlier, even at the same price. The three corn-fed lots were ready for market by the end of April, and as the gain during the last month was not great, the loss could have been diminished by the value of the feed eaten during that time. On the other hand, they would at no time have yielded much profit on the same market.

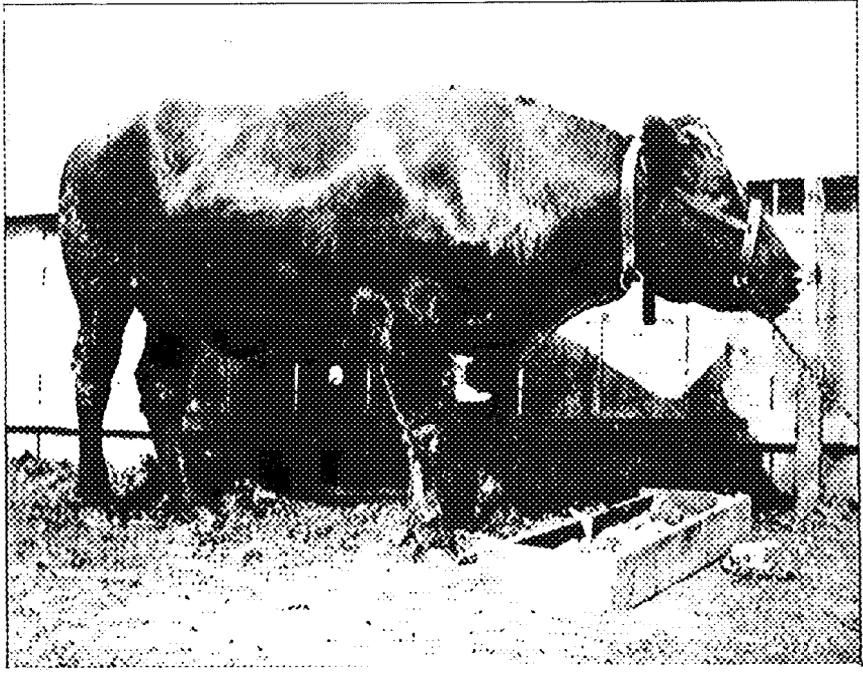
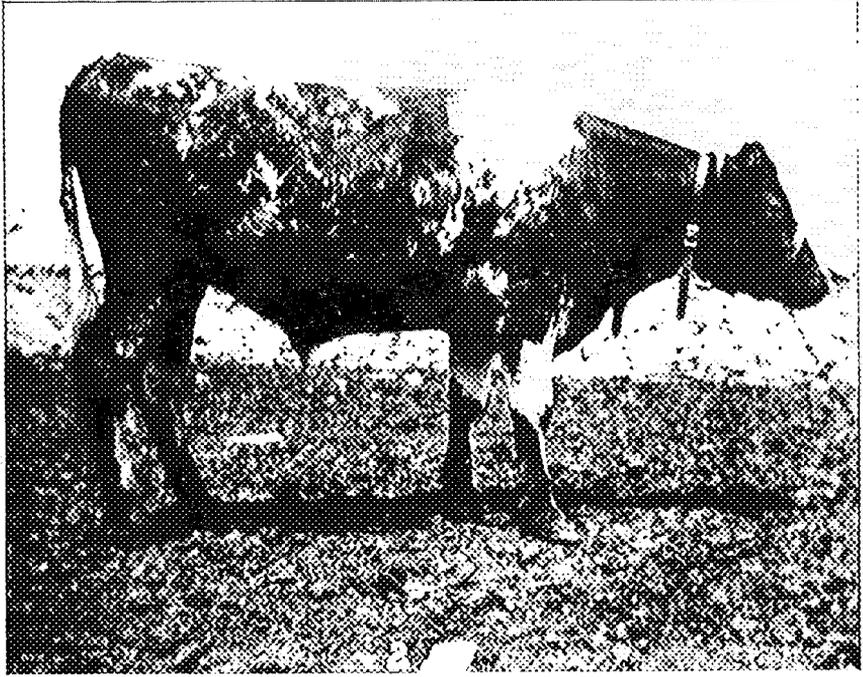
From the stand-point of profit, lot I should have been sold not later than the end of February. The following figures show the decrease in profit from that date; assuming that they then would have brought \$4.10, the price obtained for the corn-fed lots, the account would stand as follows:

LOT I.	
February 22.—First cost...	\$205 00
Cost of feed to February 22..	67 13
Expenses of sale.	<u>6 00</u>
Total.	\$278 13
Weight, February 22...	7,317 pounds.
Shrinkage..	150 "
Net	<u>7,167 pounds, @ \$4.10.... 293 74</u>
Profit..	<u>\$15 61</u>
March 21.—First cost.	\$205 00
Cost of feed.	91 42
Expenses of sale.	<u>6 00</u>
Total.	\$302 42
Net weight, 7,472 pounds, @ \$4.10	<u>306 35</u>
Profit..	<u>\$3 93</u>

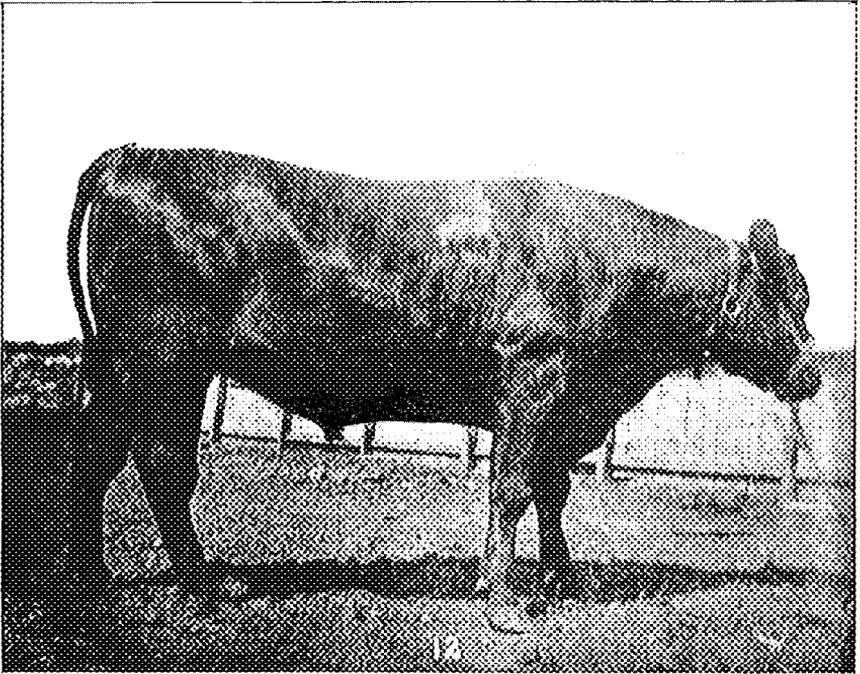
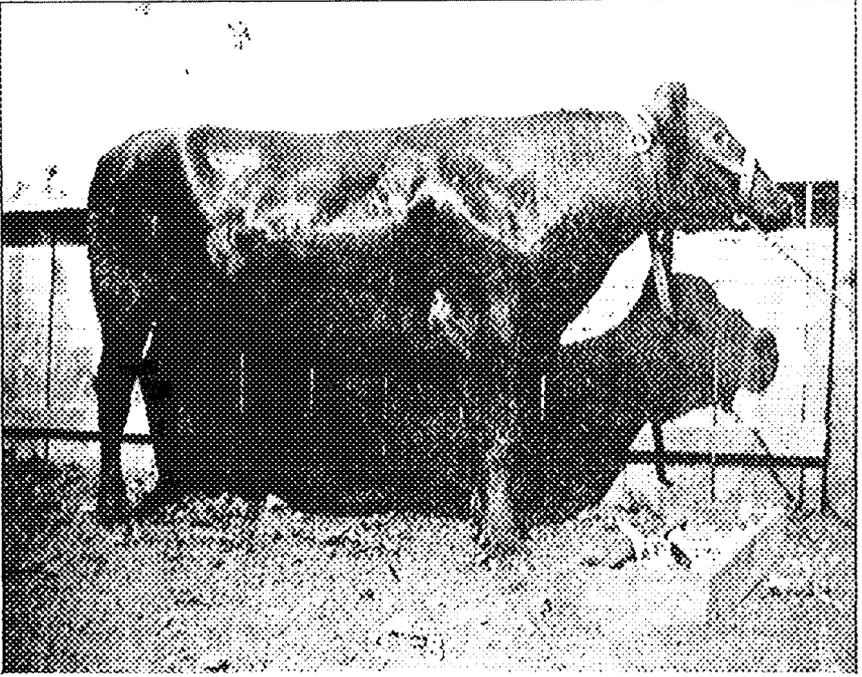
From this date on, the balance appears on the wrong side. It points two lessons: First, that as a rule, it is not profitable to feed cattle after they are in fair marketable condition; and, second, that the feeder should be able to tell, on any day, just how much his cattle have eaten and the cost of the feed. Knowing this, he can, in connection with a stock scale, tell when he reaches the turning-point in the profit. When this point is reached, it is time to sell.



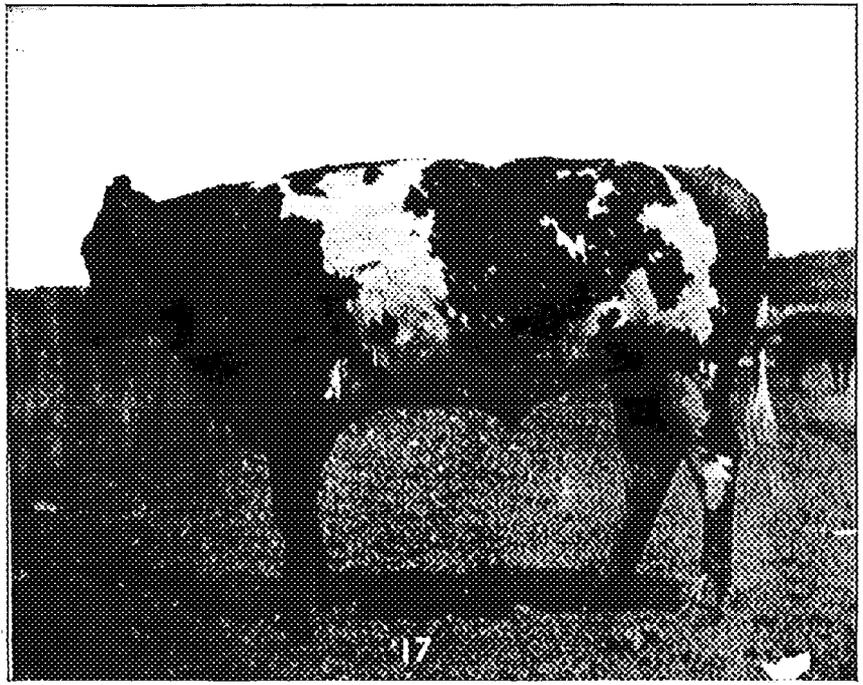
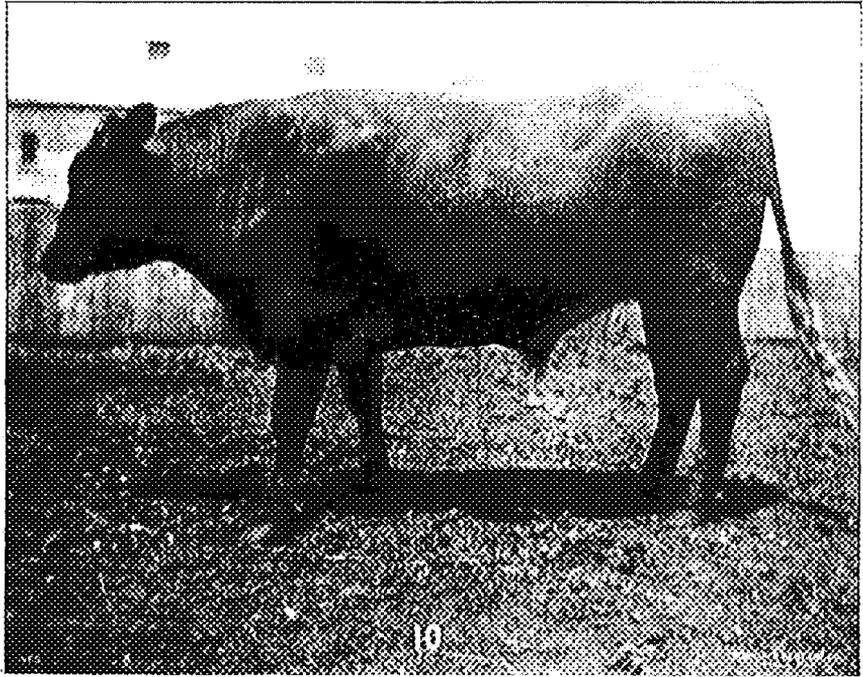
LOT I. Nos. 5 and 9. FEED: BALANCED RATION IN BARN.



LOT II. Nos. 2 and 20. FEED: CORN MEAL IN BARN.



LOT III. Nos. 8 and 12. FEED: EAR CORN IN BARN.



LOT IV. Nos. 10 and 17. FEED: EAR CORN IN THE YARD.