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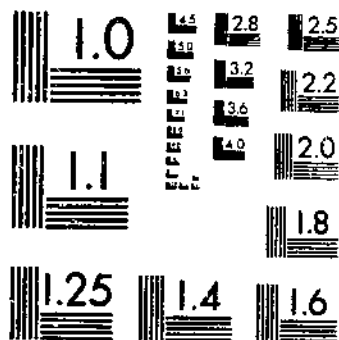
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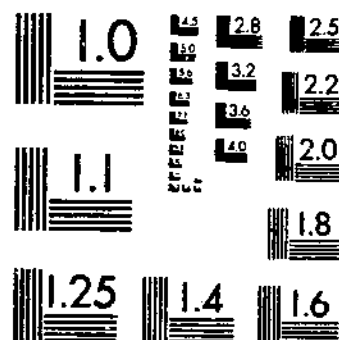
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COMPARISON OF CORN AND CORN-MOLASSES MIXTURE FOR FATTENING BEEF CALVES  
HAZEN, H. W. COMFORT, J. E. 1205-1206

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**UNITED STATES  
DEPARTMENT OF AGRICULTURE  
WASHINGTON, D. C.**

# Comparison of Corn and Corn-Molasses Mixture for Fattening Beef Calves Before and After Weaning<sup>1</sup>

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## INTRODUCTION

In recent years there has been an increasing demand for lighter cuts of beef in the United States. In the attempt to satisfy this changing demand, producers have striven to have cattle fat enough for slaughter when they are comparatively young. The more economical use of grain by younger cattle has been a contributing factor to the growth of this practice, though the ability of older cattle to make extensive use of roughage not otherwise marketable has offset this advantage to some extent. However, when calves to be fattened are raised instead of purchased, breeding herds of beef cows utilize to advantage coarse roughages that are less suitable for calves. Consequently, the maintenance of breeding herds and the fattening of calves produced may replace to some extent the grazing and fattening of older cattle on many farms. The improvement of permanent pastures, the diversion of unprofitable tilled land into permanent and semi-permanent pastures, and the development, on many Corn Belt farms, of pasture systems that provide grazing for the greater part of the year, have made the maintenance of breeding herds more practical and probably more profitable as well.

<sup>1</sup> Submitted for publication October 14, 1943.

To meet the demand for smaller cuts of beef and to produce beef more economically, it has been found that under certain conditions full-feeding of well-bred beef calves grain-concentrate mixtures previous to weaning and having them fat enough for slaughter at weaning time or a few months thereafter is a satisfactory practice. Three years of cooperative work<sup>2</sup> by the United States Department of Agriculture and the Missouri Agricultural Experiment Station showed that grain-fed calves, produced and fed at Sni-A-Bar Farms, Grain Valley, Mo., weighed about 100 pounds more at weaning time (8 months of age) than similar calves fed no grain and were usually fat enough for slaughter when weaned. When such calves were not marketed at weaning time, the practice of feeding grain before weaning shortened the subsequent feeding period. The most suitable grain ration for such feeding became a problem of importance.

In 3 years of cooperative feeding tests at Sni-A-Bar Farms<sup>3</sup> comparing (1) shelled corn alone, (2) 8 parts by weight of shelled corn and 1 part of cottonseed cake, and (3) 2 parts of shelled corn and 1 part of oats, it was found that suckling calves fed 140 days consumed less grain per 100 pounds of gain when fed shelled corn alone than when fed either of the other two rations. However, the calves fed shelled corn and cottonseed cake made greater gains, were fatter, and were valued 50 cents per 100 pounds higher at weaning time than those fed corn alone or the corn-oats mixture. The increased value of the calves fed shelled corn and cottonseed cake and their greater gains more than offset the cost of the increased feed consumed.

In 2 years of cooperative feeding tests with spring calves at Sni-A-Bar Farms,<sup>4</sup> the following feed combinations were also compared: (1) 8 parts by weight of shelled corn and 1 part of cottonseed cake, (2) 8 parts of ground corn and 1 part of cottonseed cake, (3) 8 parts of shelled corn, 1 part of cottonseed cake, and 1 part of molasses-alfalfa supplement, and (4) 8 parts of ground corn, 1 part of cottonseed cake, and 1 part of molasses-alfalfa supplement. During the suckling-creep feeding period of 140 days on pasture, all four combinations produced calves fat enough for slaughter and with no significant differences in the final appraisal value at weaning time. The calves fed shelled corn and cottonseed cake made significantly greater and cheaper gains than the calves fed any of the other mixtures. In the subsequent dry-lot feeding period of 196 days after weaning, there was no significant difference in the total gains produced by the four feed combinations. Slightly more feed was necessary to produce 100 pounds of gain when the molasses-alfalfa supplement was fed with either shelled or ground corn than when it was omitted. Grinding the corn increased slightly the final sale value of the cattle, but this was more than offset by the increased cost of production.

The object of the experiments reported in this bulletin was to compare the fattening value of (1) 8 parts by weight of shelled corn and 1 part of cottonseed cake, and (2) 4 parts of shelled corn, 4 parts of cane molasses, and 1 part of cottonseed cake, when fed to fall calves from the time they were old enough to eat such feeds before weaning and for 168 days after weaning. One part of chopped alfalfa hay

<sup>2</sup> BLACK, W. H., and TROWBRIDGE, E. A. REEF FROM CALVES FED GRAIN BEFORE AND AFTER WEANING. U. S. Dept. Agr. Tech. Bul. 208, 24 pp., illus. 1930.

<sup>3</sup> BLACK, W. H., and TROWBRIDGE, E. A. COMPARISON OF GRAIN RATIONS FOR REEF CALVES BEFORE AND AFTER WEANING. U. S. Dept. Agr. Tech. Bul. 397, 16 pp. 1933.

<sup>4</sup> BLACK, W. H., and TROWBRIDGE, E. A. COMPARISON OF FEEDS FOR FATTENING REEF CALVES BEFORE AND AFTER WEANING. U. S. Dept. Agr. Tech. Bul. 504, 12 pp. 1937.

## CORRECTION

Technical Bulletin No. 858, Life History of the Wireworm *Melanotus longulus* (Lec.) in Southern California.

On page 27, in the paragraph under the heading "Summary," the first line of the paragraph should read as follows:

The wireworm *Melanotus longulus* ranks next to *Limonius cali-*

was added to both grain mixtures primarily as a "carrier" for the molasses. These investigations were carried on at Sni-A-Bar Farms during 1935-36 and 1936-37.

## EXPERIMENTAL PROCEDURE

### CATTLE USED AND METHODS OF HANDLING

In these experiments 19 steer calves were used in 1935-36 and 20 steer calves in 1936-37. The calves averaged  $2\frac{1}{2}$  months of age at the time they were started on grain. All of them were high-grade Shorthorns sired by registered Shorthorn bulls. The dams of the calves showed a predominance of Shorthorn breeding and produced milk in such quantities that it was necessary occasionally to milk some of them when the calves were young. The dams were wintered each year on bluegrass pasture and such quantities of silage, cottonseed cake or soybean meal, hay, and straw as were necessary to keep them thrifty but not fat. Open sheds or timber furnished shelter. Each summer the cows were kept on pasture and received no grain. Ample shade, good water, and salt were available at all times.

At the beginning of each experiment the calves were divided according to weight, age, grade, and breeding into two lots. Lot 1 received the mixture of shelled corn, cottonseed cake, and chopped alfalfa hay, and lot 2 received the mixture in which half of the corn was replaced with cane molasses.

The calves were kept in dry lot during the nursing period and allowed to nurse twice daily, about 6:00 a. m. and 5:45 p. m. In the morning they nursed before being fed the concentrates and hay and in the evening nursing followed the grain feeding. The molasses-grain mixture was stirred immediately prior to feeding time and was not allowed to stand before being fed. Hay was fed shortly after the grain was cleaned up. During the first 28-day period in the feed lot the calves were self-fed grain and hay.

At the end of the suckling period the calves were weighed on 3 consecutive days. These weights, as well as the initial weights, were taken in the morning after the animals had finished eating. The calves were also weighed individually at 28-day intervals and at the end of the postweaning period.

The calves were kept in dry lot following weaning and were full fed the same kind of feeds they had received previous to weaning. Concentrates were fed in such quantities as to be cleaned up in 30 to 45 minutes, after which the hay was fed. The calves getting molasses in their ration usually required a little more time to consume their feed. Each group of calves had 20 by 36 feet of space in a shed partly open to the south and 36 by 40 feet of lot space. All the feed was given in troughs under the shed. The lots were surfaced with crushed rock. Enough bedding was used to provide a suitable place for the cattle to lie down comfortably.

At weaning time and at the close of the postweaning period, commission merchants from the Kansas City stockyards appraised the two groups of calves on the basis of prices they would bring on that market. The appraisal value may be considered as an expression of the packers' opinion as to finish, dressing percentage, and quality of cattle.

## FEEDS USED

The corn used was No. 2 yellow grade and of uniform quality. Screening-size cottonseed cake containing 43 percent of protein was used. The molasses was cane, or blackstrap, a product of the sugar industry. It was usually thick, heavy, and dark in color, and in extremely cold weather it was necessary to add a slight amount of water and to heat it before it could be mixed with the grain. The alfalfa hay was purchased on the Kansas City market and was graded U. S. No. 1. The chopped hay added to the grain mixtures was prepared by putting it through a hammer mill in which the largest screen was used. Feed prices for the two experiments are given in table 1.

TABLE 1.—Feed prices per ton during the 2 years

Feed	1935-36		1936-37	
	Suckling period	Postweaning period	Suckling period	Postweaning period
Shelled corn	\$25.00	\$40.00	\$42.56	\$40.00
Molasses	20.00	22.00	24.00	22.00
Cottonseed cake	30.00	37.00	36.00	35.00
Alfalfa hay	12.00	13.50	18.50	20.00

## EXPERIMENTAL RESULTS

## FIRST EXPERIMENT (1935-36)

## SUCKLING PERIOD

The results of the suckling period of the first experiment are summarized in table 2.

TABLE 2.—Summary of results of the suckling period, in the first experiment, extending from Nov. 26, 1935, to May 12, 1936 (168 days)

Item	Lot 1, fed corn, cottonseed meal, and hay	Lot 2, fed corn, molasses, cottonseed meal, and hay
Steers.....	number..... 19 <sup>1</sup>	10
Average initial weight.....	pounds..... 141.6	145.0
Average final weight.....	do..... 500.1	425.1
Average total gain.....	do..... 358.5	279.2
Average daily gain.....	do..... 2.1	1.7
Average daily feed:		
Shelled corn.....	do..... 3.7	1.6
Molasses.....	do.....	1.6
Cottonseed cake.....	do..... 0.5	0.4
Alfalfa hay.....	do..... 2.0	1.0
Total feed consumed per steer:		
Shelled corn.....	do..... 614.8	261.5
Molasses.....	do.....	261.5
Cottonseed cake.....	do..... 75.8	65.4
Alfalfa hay.....	do..... 333.0	323.2
Feed per 100 pounds of gain:		
Shelled corn.....	do..... 168.4	93.7
Molasses.....	do.....	93.7
Cottonseed cake.....	do..... 21	24.4
Alfalfa hay.....	do..... 92.1	115.8
Cost of feed per steer <sup>2</sup> .....	dollars..... 11.19	9.10
Appraised value of steers per 100 pounds of weight at end of suckling period.....	dollars..... 8.10	7.25
Value per head at end of suckling period.....	do..... 40.51	30.82
Value of weaned steer less cost of supplemental feed.....	do..... 29.32	21.72

<sup>1</sup> 1 steer in lot 1 died at the end of the third period. The record of this steer was eliminated except for the feed per 100 pounds of gain and cost of feed per 100 pounds of gain.

<sup>2</sup> Approximately 22 percent of the alfalfa fed to lot 1 and 19.2 percent of that fed to lot 2 was given as chopped hay in the grain mixture.

<sup>3</sup> Applies only to concentrates and hay and does not include a charge for milk.



The calves in lot 1, fed shelled corn, cottonseed meal, and hay, gained 79.3 pounds, or approximately one-half pound per day, more than the calves in lot 2, fed shelled corn, molasses, cottonseed meal, and hay. Approximately 21.4 pounds more concentrates and 23.7 pounds more hay were required to produce 100 pounds of gain by the calves in lot 2 than by those in lot 1. The cost of the feed for lot 1 was \$2.09 per head more than for lot 2 in spite of the fact that the molasses cost \$5 per ton less than shelled corn. The greater gains of the calves in lot 1 resulted in more efficient use of their feeds, and accordingly the cost of the feed per 100 pounds of gain was approximately 19 cents less in lot 1 than in lot 2.

Owing to their slightly higher condition, the calves in lot 1 at weaning time were valued at 85 cents per 100 pounds higher than the calves in lot 2. The former were worth \$9.69 more per head than the latter, not only because of their greater weight, but also because of their higher sale value. The average value of the calves fed shelled corn and cottonseed meal, less the cost of supplemental feed, was \$7.60 more than for those fed shelled corn, molasses, and cottonseed meal.

#### POSTWEANING PERIOD

The results of the postweaning period of the first experiment are summarized in table 3.

TABLE 3.—Summary of results of the postweaning period, in the first experiment, extending from May 12 to Oct. 27, 1936 (163 days)

Item	Lot 1, fed corn, cottonseed meal, and hay	Lot 2, fed corn, molasses, cottonseed meal, and hay
Steers.....	number.....	10
Average initial weight.....	pounds.....	425.1
Average final weight.....	do.....	726.1
Average total gain.....	do.....	301.0
Average daily gain.....	do.....	1.8
Average daily feed:		
Shelled corn.....	do.....	5.2
Molasses.....	do.....	5.2
Cottonseed cake.....	do.....	1.3
Alfalfa hay.....	do.....	3.2
Feed consumed per steer:		
Shelled corn.....	do.....	1,714.3
Molasses.....	do.....	866.0
Cottonseed cake.....	do.....	216.5
Alfalfa hay <sup>1</sup> .....	do.....	540.6
Feed per 100 pounds of gain:		
Shelled corn.....	do.....	545.2
Molasses.....	do.....	287.7
Cottonseed cake.....	do.....	71.9
Alfalfa hay.....	do.....	179.6
Efficiency of gains <sup>2</sup> .....	do.....	18.5
Cost of feed per 100 pounds of gain.....	dollars.....	11.46
Cost of feed per steer.....	dollars.....	34.50
Value of steers per 100 pounds of weight at beginning of postweaning period.....	dollars.....	7.25
Value per head at beginning of postweaning period.....	do.....	30.82
Value per 100 pounds of weight at end of experiment.....	do.....	9.25
Gross value per head at end of experiment <sup>3</sup> .....	do.....	68.53
Steer and feed costs.....	do.....	65.32
Loss per steer.....	do.....	1.79

<sup>1</sup> Approximately 38.7 percent of the alfalfa fed to lot 1 and 40 percent of that fed to lot 2 was given as chopped hay in the grain mixture.

<sup>2</sup> Based on pounds of gain in weight from 100 pounds of digestible nutrients consumed. Digestibility factors used were as follows: Shelled corn, 80.8; molasses, 56.6; cottonseed meal, 73.1; and alfalfa hay, 51.1.

<sup>3</sup> Less 50 cents per 100 pounds of live weight for marketing cattle in Kansas City from Sni-Nar Farms, a distance of about 25 miles. This charge includes transportation, shrinkage in transit, commission charges, and other terminal costs.

The differences in the average gain per head were 13.4 pounds in favor of the steers in lot 1. The amounts of feed consumed per steer were approximately the same in both lots, but the steers in lot 1 required approximately 34 pounds less concentrates per 100 pounds of gain. However, with shelled corn at \$40 and molasses at \$22 per ton, the average feed cost for lot 2 was \$1.90 less per 100 pounds of gain and \$7.49 less per steer than for lot 1.

The appraised market value at the end of the experiment was 50 cents per 100 pounds higher for the lot 1 steers. The margin, or difference between the initial and final value per 100 pounds, was \$1.65 for lot 1 and \$2 for lot 2. The average value per head, after deducting marketing expenses, was \$11.09 greater for the steers in lot 1. This was due chiefly to their greater weight and higher value per 100 pounds of weight at the end of the experiment. An unfavorable final market in relation to feed costs during the season, together with a narrow margin between feeder and slaughter values, was chiefly responsible for the failure of the animals to show a profit during the postweaning period.

## SECOND EXPERIMENT (1936-37)

### SUCKLING PERIOD

The results of the suckling period of the second experiment are summarized in table 4.

TABLE 4.—Summary of results of the suckling period, in the second experiment, extending from Nov. 24, 1936, to May 11, 1937 (163 days)

Item	Lot 1, fed corn, cottonseed meal, and hay	Lot 2, fed corn, molasses, cottonseed meal, and hay
Steers.....number.....	10	10
Average initial weight.....pounds.....	175.2	174.5
Average final weight.....do.....	552.0	545.0
Average total gain.....do.....	383.8	370.5
Average daily gain.....do.....	2.3	2.2
Average daily feed:		
Shelled corn.....do.....	6.0	2.6
Molasses.....do.....		2.6
Cottonseed cake.....do.....	0.7	0.7
Alfalfa hay.....do.....	1.3	1.4
Feed consumed per steer:		
Shelled corn.....do.....	1,092.6	445.7
Molasses.....do.....		445.7
Cottonseed cake.....do.....	125.3	111.4
Alfalfa hay.....do.....	217.6	242.4
Feed per 100 pounds of gain:		
Shelled corn.....do.....	261.2	120.3
Molasses.....do.....		120.3
Cottonseed cake.....do.....	32.6	30.1
Alfalfa hay.....do.....	56.7	65.4
Cost of feed per 100 pounds of gain.....dollars.....	6.76	5.21
Cost of feed per steer.....do.....	25.94	19.32
Appraised value of steers per 100 pounds of weight at end of suckling period.....dollars.....	10.50	9.75
Value per head at end of suckling period.....do.....	55.70	53.14
Value of weaned steer less cost of supplemental feed.....do.....	32.76	33.82

<sup>1</sup> Approximately 57.6 percent of the alfalfa fed to lot 1 and 46 percent of that fed to lot 2 was given as chopped hay in the grain mixture.

<sup>2</sup> See footnote 3, table 2.

Both groups of calves available for the second experiment were approximately 30 pounds heavier in initial weights than were the

calves used in the first experiment. The calves in lot 1, which received corn as the sole carbohydrate in the ration, gained but 13 pounds more than the calves in lot 2, which received the corn-molasses mixture. Lot 1 consumed 125 pounds more concentrate per head than did lot 2. With shelled corn at \$42.86 and molasses at \$24 a ton, the saving on the cost of feed per head was \$6.62 for lot 2.

The average final value per hundredweight was \$0.75 higher for lot 1, which resulted in \$5.56 higher value per head at weaning time. The value per steer less cost of supplemental feed was slightly in favor of lot 2.

#### POSTWEANING PERIOD

Results of the postweaning period of the second experiment are summarized in table 5.

TABLE 5.—Summary of results of the postweaning period, in the second experiment, extending from May 11 to Oct. 26, 1937 (168 days)

Item	Lot 1 fed corn, cottonseed meal, and hay	Lot 2, fed corn, molasses, cottonseed meal, and hay
Steers.....number.....	10	10
Average initial weight.....pounds.....	559.0	545.0
Average final weight.....do.....	843.5	781.7
Average total gain.....do.....	284.5	236.7
Average daily gain.....do.....	1.7	1.4
Average daily feed:		
Shelled corn.....do.....	10.6	5.3
Molasses.....do.....		5.3
Cottonseed cake.....do.....	1.3	1.3
Alfalfa hay.....do.....	2.8	2.8
Feed consumed per steer:		
Shelled corn.....do.....	1,776.2	868.4
Molasses.....do.....		898.4
Cottonseed cake.....do.....	220.0	224.6
Alfalfa hay.....do.....	472.9	476.9
Feed per 100 pounds of gain:		
Shelled corn.....do.....	624.3	379.5
Molasses.....do.....		379.5
Cottonseed cake.....do.....	78.0	94.0
Alfalfa hay.....do.....	160.2	201.1
Efficiency of gains.....do.....	15.5	14.4
Cost of feed per 100 pounds of gain.....dollars.....	15.51	15.44
Cost of feed per steer.....do.....	44.14	36.64
Value of steers per 100 pounds of weight at beginning of postweaning period.....dollars.....	10.50	9.75
Value per head at beginning of post weaning period.....do.....	58.70	53.14
Value per 100 pounds of weight at end of experiment.....do.....	15.50	13.50
Gross value per head <sup>1</sup> at end of experiment.....do.....	126.53	101.62
Steer and feed costs.....do.....	102.84	89.68
Profit per steer.....do.....	23.69	11.95

<sup>1</sup> Approximately 47 percent of the alfalfa fed to lot 1 and 47 percent of that fed to lot 2 was given as chopped hay.

<sup>2</sup> See footnote 2, table 3.

<sup>3</sup> See footnote 3, table 3.

The results in general are similar to those obtained during the postweaning period of the preceding experiment. The steers in lot 1 gained, on the average, about 48 pounds more than those in lot 2, although the latter consumed slightly more feed per head.

The shelled corn cost approximately \$19 more per ton than the molasses, which resulted in a saving per head of \$7.60 in favor of lot 2. The cost of feed per 100 pounds of gain was slightly in favor of lot 2, but the lot 1 steers were slightly more efficient.

The final slaughter value at the end of the experiment was \$2 per hundredweight higher for lot 1 than for lot 2. The margin for post-

weaning feeding was \$1.75 in favor of lot 1. This reflects a relatively improved condition of lot 1 over lot 2 during the postweaning period. The steers in lot 1 were worth, on the average, \$24.91 more per head than those in lot 2 and yielded \$11.75 more profit.

### AVERAGE RESULTS

#### SUCKLING PERIOD

The average results of the suckling periods of both experiments are summarized in table 6. The average weights of the steers at

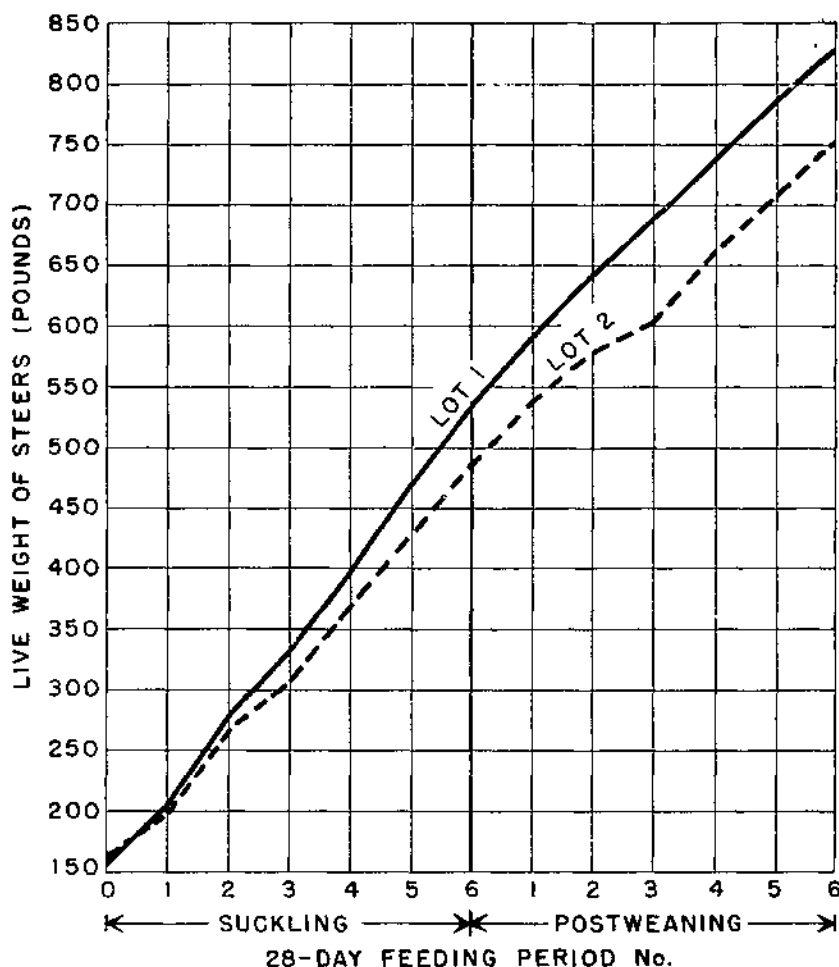


FIGURE 1.—Average live weights of the steers, at 28-day intervals, for the suckling and postweaning periods.

28-day intervals for the suckling period, as well as the postweaning period, are shown in figure 1.

The calves in lot 1, which received no molasses, gained a total of 47 pounds per head, or 0.3 pound per day, more than those in lot 2,

which were fed the corn-molasses mixture. The former lot consumed 0.8 pound more concentrates per day than the latter. The amount of concentrates required to produce 100 pounds of gain was the same for both lots. The cost of feed per 100 pounds of gain was \$0.67 higher for the steers in lot 1, and the cost per head was \$4.35 higher. The average appraised value at weaning time was \$0.80 per hundred-weight and \$7.62 per head higher for the calves in lot 1 than for those in lot 2. The former had \$3.27 more value less cost of supplemental feed than the latter.

TABLE 6.—Summary of results of the suckling periods of the 2 experiments

Item	Lot 1, fed corn, cottonseed meal, and hay	Lot 2, fed corn, molasses, cottonseed meal, and hay
Steers.....number.....	19	20
Average initial weight.....pounds.....	150.3	160.2
Average final weight.....do.....	531.1	485.0
Average total gain.....do.....	371.8	324.7
Average daily gain.....do.....	2.2	1.9
Average daily feed:		
Shelled corn.....do.....	4.9	2.1
Molasses.....do.....		2.1
Cottonseed cake.....do.....	.6	.5
Alfalfa hay.....do.....	1.6	1.7
Feed consumed per steer:		
Shelled corn.....do.....	318.9	353.6
Molasses.....do.....		353.6
Cottonseed cake.....do.....	102.4	88.4
Alfalfa hay.....do.....	272.6	282.5
Feed per 100 pounds of gain:		
Shelled corn.....do.....	217.7	108.9
Molasses.....do.....		108.9
Cottonseed cake.....do.....	27.2	27.2
Alfalfa hay.....do.....	73.3	87.1
Cost of feed per 100 pounds of gain.....dollars.....	4.91	4.24
Cost of feed per steer <sup>1</sup> .....do.....	18.55	14.21
Appraised value of steers per 100 pounds of weight at end of suckling period.....do.....	9.30	8.50
Value per head at end of suckling period.....do.....	49.60	41.98
Value of weaned steer less cost of supplemental feed.....do.....	31.04	27.77

<sup>1</sup> Approximately 37.1 percent of the alfalfa fed to lot 1 and 30.7 percent of that fed to lot 2 was given as chopped hay in the grain mixture.

<sup>2</sup> See footnote 3, table 2.

#### POSTWEANING PERIOD

The average results of the postweaning periods of both experiments are summarized in table 7.

In 168 days of dry-lot feeding following weaning, the steers in lot 1 outgained those in lot 2 by 28.9 pounds. The amount of feed consumed per steer was approximately the same for both lots. The amount of concentrates required per 100 pounds of gain was 77.6 pounds less in lot 1 than in lot 2, whereas the cost of feed per 100 pounds of gain was \$0.98 less in lot 2. The feed cost per head was \$7.54 less in lot 2. The average market value per 100 pounds of weight and per steer were \$1.25 and \$18 higher, respectively, for lot 1 than for lot 2.

TABLE 7.—Summary of results of the postweaning periods of the 2 experiments

Item	Lot 1, fed corn, cottonseed meal, and hay	Lot 2, fed corn, molasses, cottonseed meal, and hay
Steers.....	number	20
Average initial weight.....	pounds	520.3
Average final weight.....	do.	827.1
Average total gain.....	do.	287.8
Average daily gain.....	do.	1.6
Average daily feed:		
Shelled corn.....	do.	10.4
Molasses.....	do.	5.2
Cottonseed cake.....	do.	1.3
Alfalfa hay.....	do.	3.0
Feed consumed per steer:		
Shelled corn.....	do.	1,748.7
Molasses.....	do.	882.2
Cottonseed cake.....	do.	218.6
Alfalfa hay.....	do.	508.9
Feed per 100 pounds of gain:		
Shelled corn.....	do.	587.2
Molasses.....	do.	328.1
Cottonseed cake.....	do.	73.4
Alfalfa hay.....	do.	170.9
Efficiency of gains.....	do.	16.3
Cost of feed per 100 pounds of gain.....	dollars.	14.43
Cost of feed per head.....	do.	43.06
Value of steers per 100 pounds of weight at beginning of postweaning period.....	dollars.	9.30
Value per head at beginning of postweaning period.....	do.	40.28
Value per 100 pounds of weight at end of experiment.....	do.	12.62
Gross value per head at end of experiment.....	do.	160.57
Steer and feed costs.....	do.	92.35
Profit per steer.....	do.	5.22

<sup>1</sup> Approximately 42.95 percent of the alfalfa fed to lot 1 and 43.59 percent of that fed to lot 2 was given as chopped hay.

<sup>2</sup> See footnote 2, table 3.

<sup>3</sup> See footnote 3, table 3.

## SUMMARY AND CONCLUSIONS

Experiments were carried on in 1935-36 and 1936-37 at Sni-A-Bar Farms, Grain Valley, Mo., to compare, for fattening purposes, shelled corn and a mixture of shelled corn and blackstrap molasses, for calves before and after weaning. In addition to the feeds compared, cottonseed meal and alfalfa hay were fed. High-grade Shorthorn steers 2 to 3 months of age were used. The calves were put in dry lot and were nursed and fed twice daily for a period of 168 days. The cows were kept on bluegrass pasture and were given other feeds during the winter nursing period. After weaning in the spring, the calves were continued in dry lot on the same feeds for an additional 168 days of full feeding and marketed in the fall.

In the suckling experiments, fall calves averaging 160.2 pounds in weight demonstrated their ability to handle satisfactorily a mixture of equal parts of shelled corn and cane molasses. The calves fed shelled corn and no molasses, however, consumed more feed per head, gained an average of 47.1 pounds more per head, were in higher condition, were valued \$0.80 per 100 pounds higher, and had a greater value less cost of supplemental feed than the calves receiving the corn-molasses mixture.

In the two postweaning experiments of 168 days immediately following weaning, the steers fed no molasses gained 28.9 pounds more per head, were 73.2 pounds heavier at the end of the experiment, required 77.6 pounds less concentrates per 100 pounds of gain, were in higher condition, and were appraised at \$1.25 more per 100 pounds

of weight than the steers receiving the corn-molasses mixture. The latter made their gains at a feed cost of \$7.54 less per head and \$0.98 less per 100 pounds of gain. However, the lower feed cost resulting when one-half of the corn was replaced with molasses did not offset the lower sale value of these steers as the cattle fed no molasses made \$3.14 greater profit per head.

After the combined feed costs of the suckling and the postweaning periods were deducted from the final market value of the cattle, the returns per steer in the first experiment were \$21.44 for lot 1 and \$19.93 for lot 2, and in the second experiment \$56.45 for lot 1 and \$45.76 for lot 2. For the 2-year average the returns were \$38.95 for lot 1 and \$32.85 for lot 2.

**END**