pounds of protein fed in a decreasing manner resulted in a feed efficiency between that of 0.5 and 1.0 constantly fed.

Table 51 shows data collected from Trial 2 with the same objectives. Feeding methods were the same.

Average daily gain was increased when the daily soybean meal intake increased from 0.5 to 1.5 pounds per head. Increasing the soybean meal intake every 28 days did not affect the average daily gain; however, decreasing the average daily protein intake every 28 days decreased average daily gain compared with that of the constant 1.5-pound level.

Table 51

Trial 2: Effects of adding protein to dry-rolled sorghum grain fattening rations, May 20, 1963, to October 10, 1963—143 days.

Lot no.	8	9	10	11	12
Protein feeding:					
Lbs. per head daily ..	0.5	1.0	1.5	0.5 first 28 days plus 0.5 each 28 days	2.5 per day decreasing 0.5 each 28 days
No. heifers per lot	10	10	10	9[3]	10
Av. initial wt., lbs.	588	588	584	586	597
Total gain, lbs.	227	246	278	278	244
Av. final wt., lbs.	815	834	862	864	841
Av. daily gain, lbs.	1.59	1.72	1.94	1.94	1.71
Av. daily ration, lbs.:[1]					
Sorghum grain	13.65	13.60	13.32	13.21	13.04
Soybean oil meal	0.5	1.00	1.50	1.44	1.61
Silage	9.97	9.94	9.60	9.88	9.16
Prairie hay[4]	1.99	1.99	1.99	1.99	1.99
Feed required per cwt. gain, lbs.:					
Sorghum grain	860	793	685	680	764
Soybean oil meal	31	58	77	68	94
Silage	628	578	494	508	537
Prairie hay	126	116	103	103	117
Total	1645	1545	1359	1359	1512
Feed cost per cwt. gain:[2]					
Sorghum grain	$16.34	$15.07	$13.02	$12.92	$14.52
Soybean oil meal	1.40	2.61	3.47	3.06	4.23
Silage	2.04	1.88	1.61	1.65	1.75
Prairie hay	1.20	1.10	0.98	0.98	1.11
Total	$20.98	$20.66	$19.08	$18.61	$21.61
Carcass data					
Av. area rib eye, sq. in.	9.73	9.53	9.61	9.81	8.78
Av. fat thickness, 12th rib, in.	.56	.67	.69	.67	.59
Av. carcass grade:					
Prime = 1				1	
Choice + = 2				1	1
Choice = 5		1	1	2	1
Choice − = 7	4	2	1		2
Good + = 11	2	3	4	3	3
Good = 13	3	4	4	2	2
Good − = 1	1				1

1. Each animal supplemented with 0.1 lb. dicalcium phosphate and 10,000 I.U. vitamin A daily. Salt fed free choice; none of these included in feed costs.
2. Feed costs on page 78.
3. One animal died of pneumonia September 8, 1963.
4. Prairie hay fed from August 15 to end of period; silage supply exhausted.

Feed efficiency increased as average daily protein intake increased from 0.5 to 1.5 pounds. Increasing the average soybean oil meal intake each 28 days did not affect feed efficiency; decreasing the average daily protein intake each 28 days decreased feed efficiency.

Cane Molasses in Rations of Growing Beef Calves. The Value of Winter Shelter for Feedlot Calves, 1963-64 (Project 370).

E. F. Smith, D. Richardson, C. W. Deyoe, F. W. Boren, and R. G. Curtis

Choice grade Hereford steer calves in this test came from near Alden, Kansas, and were assigned to treatments on a random-weight basis.

All lots received the same experimental diet except 10 percent molasses was substituted for grain in the self-fed mixture for two lots. Small adjustments were made to equalize protein and energy intake between molasses and no-molasses lots. The composition of the roughage-concentrate mixture is listed in Table 52; it consisted primarily of ground rice

Table 52

1. The use of cane molasses in rations for growing beef calves. 2. The value of winter shelter for calves, December 17, 1963, to March 21, 1964 —95 days.

Treatment	Molasses 10%		No molasses	
	Shed	No shed	Shed	No shed
Lot no.	17	15	16	14
Steers per lot	10	10	10	10
Initial wt., lbs.	479	482	480	481
Daily gain, lbs.	2.77	2.69	2.51	2.13
Daily ration per steer, lbs.:				
Roughage-concentrate mixture	16.68	17.54	15.85	14.94
Alfalfa wafers	3.83	3.83	3.83	3.87
Prairie hay	1.76	1.64	1.61	1.80
Salt	Free choice			
Feed per lb. of gain:				
Roughage-concentrate mixture	6.02	6.52	6.31	7.01
Prairie hay	.64	.61	.64	.85
Alfalfa wafers	1.39	1.42	1.53	1.82
Feed cost per lb. of gain[1]	$0.1496	$0.1598	$0.1477	$0.1676
Composition of roughage-concentrate mixture, %:				
Ground sorghum grain	40.4		49.0	
Ground rice hulls	42.0		45.0	
Cane molasses	10.0		.....	
Soybean meal	4.6		3.0	
Urea	1.0		1.0	
Dicalcium phosphate	1.0		1.0	
Premix (supplying about 70 mgs. Aureomycin and 10 mgs. stilbestrol per steer daily)	1.0		1.0	

1. Feed prices used on page 78.

hulls, ground sorghum grain, additives and other nutrients, including additional protein. Ground rice hulls were used because it was thought they might be unpalatable and molasses might show more effect. The basal diet was finely ground and dusty. Molasses reduced the amount of fine material where it was included. The average chemical composition of the no-molasses mixture was 10.2 percent protein, 1.9 percent fat, and 17.8 percent fiber; the molasses mixture was 10.7 percent protein, 1.9 percent fat, and 17.4 percent fiber. In addition to the roughage-concentrate mixture, which was before the animals at all times, nearly 4 pounds of alfalfa wafers were fed per head daily and a small amount of prairie hay.

One of the lots receiving molasses and one on the no-molasses treatment were in pens with the shed shelter fenced off.

The concrete pens were 30 × 48 feet, with a 15- × 30-foot dirt-floor shed open to the south. The shed was about 7 feet high at the rear, 12 feet high in front.

Some calves in all lots bloated. One calf in Lot 17 died of bloat the first 10 days and was replaced. A calf in Lot 16 was stuck with a trocar to relieve bloat.

Calves fed the roughage - concentrate mixture with 10 percent cane molasses consumed an average of 1.71 pounds more of the mixture and gained 0.41 pound more per head daily. Their feed efficiency was slightly improved.

Shelter furnished by the sheds seemed to be of some benefit. In the comparison of shed and no shed with molasses in the ration some favorable effect was noted. The lot with shelter gained considerably more and required less feed to produce a pound of gain in the other comparison.

These trials will be completed in about 40 days.

The Value of Wheat Shorts in Coarse and Fine Ground Concentrate Mixtures for Fattening Heifers.

E. F. Smith, D. Richardson, and J. E. Kramer

Twenty-four yearling Hereford heifers with a USDA Feeder Grade of about High Good were divided on the basis of prior treatment and on a random-weight basis into four groups of six heifers each.

The experimental diet is listed in Table 53. Two lots of six each received wheat shorts to increase the protein content of the corn base ration to 10.5 percent protein, two lots received soybean oil meal in their mixture to raise the protein content to the same level. One lot fed wheat shorts and one lot fed soybean meal received their concentrate mixture fine ground; in the other wheat shorts and soybean meal lots, the mixture was fed in a medium-coarse ground form. The cattle were fed twice daily for about 60 days and then self-fed the latter part of the trial. No roughage was fed about the last 30 days of the trial.

The two sources of protein produced about the same result as did the two methods of grain preparation.

Table 53

The value of wheat shorts in coarse and fine ground concentrate mixtures for fattening heifers, June 10, 1963, to October 11, 1963—123 days.

Treatment	Wheat shorts		Soybean meal	
	Fine ground	Coarse ground	Fine ground	Coarse ground
Composition of concentrate mixture, %:				
Wheat shorts	25.0	25.0		
Soybean meal			5.0	5.0
Ground corn, 3/32" screen	73.0		93.0	
Ground corn, ¼" screen		73.0		93.0
Ground limestone and trace minerals[1]	1.0	1.0	1.0	1.0
Vitamin A premix (supplied 600 I.U. per lb. feed)	1.0	1.0	1.0	1.0
Cost of concentrate mixture per ton delivered	$48.70	$48.70	$50.30	$50.30
Lot no.	1	2	3	4
Heifers per lot	6	6	6	6
Av. initial wt., lbs.	696	697	702	702
Av. daily gain, lbs.	2.33	2.37	2.19	2.53
Feed consumption per head daily, lbs.:				
Concentrate mixture	17.6	18.4	17.6	17.6
Sorghum silage	5.7	5.7	5.7	5.7
Prairie hay	1.5	1.5	1.5	1.5
Feed required to produce a lb. of gain (air-dry basis), lbs.	8.8	9.0	8.8	8.1
Carcass weight, lbs.	613	606	598	613
Dressing %	62.1	61.3	61.6	60.5
Carcass grades:				
High choice		1		2
Choice	1	4		2
Low choice	2	1	6	2
High good	3			
Marbling estimate[2]	7.3	6.2	6.8	6.3
Carcass yield estimate[3]	3.0	3.2	2.8	2.8

1. Trace minerals supplied by adding 1 pound of trace mineral premix (Calcium Carbonate Company) per ton of feed.

2. Marbling—the lower the score, the greater the degree of marbling; 6 is modest amount, 7 is small amount, scored from 1 to 10 (10 being practically devoid).

3. Carcass yield—the lower the score, the higher the yield; carcasses scored from 1 to 6.