

### Experimental Procedure

Ten good quality Hereford heifer calves were divided into two lots of five calves each for use in this test. They were the lightest heifers of 80 head purchased from the Brite Ranch at Marfa, Texas. They were fed prairie hay and 1 pound of soybean pellets per head daily until started on test December 22, 1952.

The alfalfa straw used in the test was obtained in the vicinity of the College. The sprayed straw came from Dr. N. D. Harwood and was produced on a farm a few miles west of Manhattan, Kansas. It was stemmy but had a good green color. The non-sprayed straw was obtained from Mr. Floyd Cederberg's farm a few miles south of Manhattan, Kansas. It was not as stemmy or as green in color as the Harwood straw. It appeared to have more leaves. The two straws were not comparable in some respects but it was not possible to find more suitable straw, sprayed and non-sprayed. Other data, such as effect of the chemical on the alimentary tract, various organs, tissue, and the extent of its presence in the animal body, will be collected when the animals are slaughtered.

### Observations

The curing agent apparently has no detrimental effect on the gaining ability or efficiency of feed utilization. This is not conclusive and should be given further study with more animals.

Table 29.—The Effect of Feeding Alfalfa Straw Sprayed with a General Curing Chemical to Heifer Calves.

December 22, 1952, to April 9, 1953—108 days.

1. Lot number .....	20	21
2. Number of heifers per lot .....	5	5
3. Treatment .....	Alfalfa straw	Alfalfa straw sprayed with curing agent
4. Initial weight per heifer .....	338	336
5. Final weight per heifer .....	457	472
6. Gain per heifer .....	119	136
7. Daily gain per heifer .....	1.10	1.26
8. Daily ration per heifer:		
Soybean oilmeal pellets .....	1.22	1.22
Ground shelled corn .....	2.27	2.27
Alfalfa straw .....	8.14	7.61
Mineral (bonemeal and salt) .....	.19	.19
Salt .....	.06	.08
9. Feed per cwt. gain:		
Soybean oilmeal pellets .....	111.09	97.21
Ground shelled corn .....	205.80	180.07
Alfalfa straw .....	739.13	604.70
Mineral (bonemeal and salt) .....	17.48	15.29
Salt .....	5.38	6.61

## Project 222: Fundamental Nutrition Studies of Sorghum Roughages and Grain

### A Comparison of Rolled, Coarsely Ground and Finely Ground Milo Grain for Fattening Yearling Steers, 1952.

E. F. Smith and D. B. Parrish

Good to choice quality Hereford steers were used in this test. They were purchased in the fall of 1951 and used in winter feeding tests. For the test reported here, they were lotted as equally as possible in regard to previous treatment.

All lots were treated the same in this test except for the method of grain preparation. The grain was self-fed. The cottonseed oilmeal was fed in a separate bunk. Prairie hay was fed in quantities that would be readily cleaned up by each lot.

The rolled milo was dry rolled and appeared satisfactory upon emergence from the roller; however, after sacking and when it was finally fed to the cattle, it was broken into small particles and somewhat powdered. The coarsely ground or cracked milo was the product of a burr mill. A hammer mill was used to prepare the finely ground milo, which was ground to a coarse, mealy mixture.

### Observations

1. The steers in Lot 3 fed rolled milo grain gained an average of .20 pound less per head daily than the lots fed the cracked and finely ground milo. They also consumed slightly less grain; this has been true in two other tests.

2. Steers fed finely ground milo were slightly more efficient in feed utilization with the lowest feed cost per 100 pounds of gain of the three lots.

3. The most reasonable explanation for the increased selling price of Lot 1 over Lots 2 and 3 was the unsettled condition of the market. However, Lot 1 did dress .6 percent higher than Lots 2 and 3. The carcass grades were about the same.

Table 30.—Comparison of Rolled, Coarsely Ground, and Finely Ground Milo Grain for Fattening Steers.

July 22 to December 6, 1952—137 days.

1. Lot number .....	1	2	3
2. Management .....	Finely ground milo	Coarsely ground milo	Rolled milo
3. Number steers/lot .....	10	8 <sup>1</sup>	9
4. Initial weight/steer .....	607	620	613
5. Final weight/steer .....	934	941	909
6. Gain/steer .....	327	321	296
7. Daily gain/steer .....	2.38	2.34	2.16
8. Daily ration/steer:			
Milo grain .....	16.32	16.84	15.46
Cottonseed oilmeal .....	2.00	2.00	2.00
Prairie hay .....	4.18	5.20	5.98
Ground limestone .....	.10	.11	.11
Salt .....	.02	.01	.03
9. Feed required for 100 lbs. gain:			
Milo grain .....	683.79	718.93	715.72
Cottonseed oilmeal .....	83.79	85.36	92.56
Prairie hay .....	175.50	222.05	277.13

Ground limestone .....	4.18	4.74	5.14
Salt .....	.99	.47	1.56
10. Cost of feed/100 lbs. gain <sup>2</sup> .....	\$24.68	\$26.09	\$26.79
11. Selling price/cwt. ....	\$28.50	\$25.00	\$25.00
12. Dressing percent .....	60.5	59.9	59.9
13. Carcass grades, U.S.:			
Prime .....	1		1
Choice .....	9	8	8

1. One sick calf was omitted from Lot 2 in computing the results of this test.

2. Feed prices: Milo grain, \$2.80/cwt.; cottonseed oilmeal, \$100/ton; prairie hay, \$15/ton; salt and ground limestone, \$12/ton.

### Project 222: Ratio of Roughage to Grain for Fattening Steer Calves, 1951-52

D. Richardson, E. F. Smith, and R. F. Cox

The physical balance or ratio of roughage to concentrates is an important factor to consider in the ration of fattening cattle. Beef cattle serve as one of the principal means of marketing roughage. Since a large amount of roughage is produced in Kansas and throughout the Midwest, it is desirable to have information concerning the maximum amount of roughage that can be used in fattening rations, consistent with maximum and economical production. This experiment was planned to secure information on the effects of different levels of roughage on average daily gain, feed requirement per unit of gain, quality of finish, carcass quality, and selling price.

#### Experimental Procedure

Thirty Hereford steer calves were divided into three lots of 10 each as equally as possible on the basis of weight, size, and conformation. They were self-fed a mixture of chopped alfalfa hay and coarsely ground milo grain. The feed for each group was gradually changed until on the ratio of roughage to concentrates as follows:

Lot 1—1 pound chopped alfalfa hay: 1 pound milo grain

Lot 2—1 pound chopped alfalfa hay: 3 pounds milo grain

Lot 3—1 pound chopped alfalfa hay: 5 pounds milo grain

The feeding period was from December 22, 1951, to July 12, 1952, or a total of 203 days. Salt and water were available to the animals at all times.

Table 31 gives a summary of the results.

Table 31.—Ratio of Roughage to Grain for Fattening Steer Calves. (December 22, 1951, to July 12, 1952—203 days)

1. Lot number .....	1	2	3
2. Number steers per lot .....	10	10	9 <sup>1</sup>
3. Average initial weight, lbs. ....	502	503	505
4. Average final weight, lbs. ....	934	949	933
5. Average gain per steer, lbs. ....	432	446	428
6. Average daily gain per steer, lbs. ..	2.13	2.20	2.10
7. Days from start until on ratio .....	34	45	65
8. Days on respective ratio .....	169	158	138
9. Total days on feed .....	203	203	203
10. Feed, lbs.:			
Total milo grain until start of ratio .....	1735	3335	5459

Total milo grain while on ratio....	20662	25443	20655
Total milo grain consumed .....	22397	28778	26114
Total alfalfa hay until start of ratio .....	4133	5035	5153
Total alfalfa hay while on ratio ..	20662	8472	4131
Total alfalfa hay consumed <sup>2</sup> .....	24795	13507	9284
11. Average grain per head per day on ratio .....	11.54	16.10	16.60
12. Average hay per head per day on ratio .....	11.54	5.36	3.30
13. Feed per 100 lbs. gain:			
Milo grain .....	519	644	678
Alfalfa hay .....	514	302	241
Salt .....	1.35	.98	1.46
14. Feed cost per 100 lbs. gain .....	\$21.72	\$21.81	\$22.00
15. Percent shrink to market .....	2.4	1.9	3.0
16. Dressing percent (includes cooler shrink) .....	58.6	60.0	60.3
17. Carcass grades:			
Prime .....		1	
Top choice .....		6	2
Average choice .....	2		5
Low choice .....	6	1	2
Top good .....	1	2	
Average good .....	1		
18. Selling price per 100 lbs. ....	\$32.50	\$33.50	\$34.00

1. One steer died.

2. 300 lbs. dehydrated alfalfa pellets fed.

#### Observations

1. All lots made satisfactory gains; however, Lot 2 receiving a ratio of 1 pound roughage to 3 of grain made the best average gain for the entire period.

2. The rate of gain for Lot 1 remained fairly constant throughout the entire feeding period. The gains were largely from the standpoint of growth as evidenced by greater size at the end of the feeding period; however, they were lacking in finish.

3. The rate of gain began to decline toward the end of the feeding period in Lots 2 and 3. This was probably the result of using poor quality alfalfa hay. Also, the amount consumed was small. One steer in Lot 3 went blind and others began to show evidence of poor eyesight. The feeding of dehydrated alfalfa pellets proved beneficial when fed to these animals.

4. As the level of grain in the ration was increased, the amount of grain per 100 pounds of gain increased. At the same time, the amount of hay was decreased.

5. Animals in Lot 3 receiving only 1 pound of hay to 5 pounds of grain consumed approximately the same amount of grain per day as those in Lot 2 receiving 1 pound of hay to 3 pounds of grain. The rate of grain consumption and rate of gain failed to increase with the increased concentration of the ration in Lot 3.

6. There was very little difference in feed cost per 100 pounds gain when existing feed costs at the time were used. This would vary with changes in hay and grain prices.

7. The average carcass grade was about the same for Lots 2 and 3. The carcass grades of Lot 1 were lower because of lack of finish.