

Atlas sorgo silage		23.46
Dry bluestem	Free choice	
Mineral (salt, bonemeal)	Free choice	Free choice
Salt	Free choice	Free choice
Feed cost per heifer ¹	\$8.55	\$20.31
Feed cost per 100 lbs. gain ¹	9.50	10.69

1. Feed prices may be found on page 27 of this publication.

Observations

1. The winter was mild, open, dry, and favorable for wintering on dry grass.
2. The heifers in Lot 7 wintered on dry grass made a favorable gain at a rather low feed cost. They had sufficient dry grass to winter on, in pastures that were lightly stocked the previous season.
3. Exceptionally good gains were made by the heifers in Lot 8 and they show more "fleshing" than those in Lot 7.

Ratio of Roughage to Concentrate for Fattening Heifers, 1953.

PROJECT 222

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

Beef cattle are naturally large consumers of roughage. The relative cost of producing or purchasing roughages throughout Kansas is normally less than for grain and other concentrates. It is desirable to have information concerning the maximum amount of roughage that can be used in fattening rations, consistent with maximum and economical gains. This is the second trial in an experiment which was planned to secure information on the effects of different levels of roughage on average daily gain, feed required per unit of gain, carcass quality, and selling price. This trial was planned also to determine the effect of previous wintering rations on fattening ability, the relative value of milo grain and corn for fattening, and effect on carcass quality.

Experimental Procedure

Fifty Hereford heifers were divided into five lots as equally as possible on the basis of weight, size, conformation, and previous treatment. These heifers were wintered as calves on the following rations: (1) alfalfa hay, (2) Atlas sorghum silage, 2 pounds of corn and 1 pound of soybean oilmeal pellets, (3) Atlas sorghum silage and 3 pounds of special supplement, (4) prairie hay, 4.9 pounds of corn and 1.25 pounds of soybean oilmeal pellets, (5) corn cobs, 4.9 pounds of corn and 1.9 pounds of soybean oilmeal pellets.

There were 10 animals on each of these rations. Each of the five lots in this experiment had two heifers from each of the five previous treatments.

A mixture of one-half alfalfa and one-half bromegrass hay which had been chopped to facilitate mixing was used as the roughage. Coarsely ground corn and milo grain were used as the concentrates except in Lots 2, 4, and 5, where soybean oilmeal was added to maintain the same level of protein in all lots. Chemical analyses of feeds used in this experiment are shown in Table No. 36 in the back of this circular. Water, salt, and ground limestone were provided free choice at all times.

After starting the animals on feed, the grain was increased until each lot was on the following rations:

Lot 1—3 pounds of milo grain to 1 pound of hay.

Lot 2—moving ratio started with 1 pound of corn to 1 pound of hay for first 28 days and each succeeding 28 days the corn was increased by 1 pound so that at the end of the feeding period the ratio was 4 pounds of corn to 1 pound of hay.

Lot 3—1 pound of corn to 1 pound of hay.

Lot 4—3 pounds of corn to 1 pound of hay.

Lot 5—5 pounds of corn to 1 pound of hay.

The feeding period was from May 14 to August 13, 1953. Table 10 gives a summary of the results. Table 10a gives the average daily gain of the 10 animals per lot when summarized on the basis of their wintering ration.

Table 10.—Ratio of Roughage to Concentrates for Fattening Heifers. (May 14-August 13, 1953—91 days.)

Lot number	1	2	3	4	5
Ratio of roughage to concentrate	1 hay 3 milo	changing ratio	1 hay 1 corn	1 hay 3 corn	1 hay 5 corn
No. heifers per lot	10	10	10	10	10
Av. initial wt., lbs.	638	638	639	638	637
Av. daily gain per heifer, lbs.	2.27	1.77	1.83	1.97	2.34
Total days on feed	91	91	91	91	91
Total feed, lbs., per head:					
Milo grain	1561				
Corn		1092	1035	1263	1435
Hay	657	698	1045	663	507
Soybean oilmeal		16.9		23.5	36.8
Average daily feed per head, lbs.:					
Milo grain	17.1				
Corn		12	11.4	13.9	15.8
Hay	7.2	7.7	11.5	6.2	5.6
Soybean oilmeal19		.26	.40
Feed per 100 lbs. gain:					
Milo grain	754				
Corn		674	623	706	674
Hay	318	431	630	370	238
Soybean oilmeal		10.4		13.1	17.3
Feed cost per 100 lbs. gain*	\$26.28	\$26.79	\$28.06	\$26.82	\$23.97
Selling price per 100 lbs.	21.00	19.50	20.50	21.00	22.00
Av. dressing percent (including cooler shrink)	59.4	58.0	58.3	58.8	60.0
Carcass grades:					
Low prime	1		1		
High choice					1
Av. choice		1		2	1

* Corn per bu., \$1.60; milo grain per cwt., \$2.80; soybean oilmeal per ton, \$95; bromegrass hay per ton, \$25; and alfalfa hay per ton, \$40.

Low choice	4	2		3	4
High good	4	1	2	3	3
Av. good	1	3	4	2	1
Low good		3	2		
High commercial			1		
Marbling:					
Slightly abundant	1		1		
Moderate					1
Modest		1		3	
Small	5	3	2	2	5
Slight	4	2	3	1	2
Traces		4	4	4	1
Av. external finish (thickness in cm. between 12th and 13th rib)					
	1.48	.83	1.51	1.28	1.34

Table 10a.—Average Daily Gain Per Head Based Upon Wintering Rations with 10 Animals Per Lot.

Previous treatment	Wintering Ration				
	Alfalfa hay	Atlas sorghum silage, 2 lbs. corn, 1 lb. SBOM	Atlas sorghum silage, special supplt.	Prairie hay 4.9 lbs. corn, 1.25 lbs. SBOM	Corn cobs, 4.9 lbs. corn, 1.9 lbs. SBOM
Av. daily gain during 91-day fattening period ...	1.93	1.95	2.00	2.05	1.68

Observations

1. Considering the extremely hot weather, all lots made satisfactory gains; however, the gains in Lot 2 were not as good as expected.

2. Rate of gain, economy of gain, and carcass quality were highest in the lots receiving the greatest amount of concentrates in relation to roughage. This indicates that for short feeding periods, the amount of grain should be high in relation to roughage.

3. Animals receiving milo grain ate more, gained faster, and showed less digestive disturbances than animals receiving the same ratio of corn; however, there was essentially no difference in feed or total cost per 100 pounds of gain.

4. The overall carcass values were the same for milo grain and corn fed animals. The external finish between the 12th and 13th rib of the milo-grain fed heifers was greater; however, they showed a slight tendency for less finish over the forequarter and rounds.

5. Animals receiving corn cobs as the roughage in a wintering ration did not gain as well in the feedlot as those receiving alfalfa hay, Atlas sorghum silage, or prairie hay.

Adapting Roughages Varying in Quality and Curing Processes to the Nutrition of Beef Cattle: A Comparison of Prairie Hay and Corn Cobs; a Special Supplement vs. Milo Grain and Cottonseed Meal, 1953-54.

PROJECT 370

E. F. Smith, D. Richardson, F. H. Baker, R. B. Cathcart, R. F. Cox

This is the second test in an experiment designed to compare the

value of certain roughages and supplements in the wintering ration of beef calves.

Experimental Procedure

Forty good quality Hereford heifer calves were divided as equally as possible into four lots of 10 animals each. The heifers originated in the vicinity of Snyder, Texas. They were dehorned, vaccinated, and branded before starting the experiment.

The rations used in this experiment are shown in Table 11. An attempt was made to keep the protein and total digestible nutrients on an equal basis between the prairie hay and corn cob lots. The animals receiving corn cobs as their roughage were given 50,000 International Units of vitamin A per head daily. The 3 pounds of special supplement fed daily to Lot 12 was composed of 2.25 pounds cottonseed meal, .50 pound molasses, .18 pound steamed bonemeal, .06 pound salt, and .01 pound vitamin supplement (2250 international units of vitamin A and 400 international units of vitamin D per gram). All lots were fed once daily during the morning.

Observations

1. There was no difference in rate of gain, daily feed consumption, or cost per hundred pounds of gain between Lots 1 and 2.

2. Animals in Lot 12 receiving 3 pounds daily of the special supplement made .08 pound more daily gain than animals in Lot 13 receiving 2 pounds of milo grain and 1 pound of cottonseed meal daily. However, the cost per 100 pounds gain was higher for Lot 12 because of the cost of the special supplement.

Table 11.—A Comparison of Roughages and Supplements for Wintering Beef Heifer Calves.

December 17, 1953-April 8, 1954—113 days.

Lot number	1	2	12	13
No. heifers per lot	10	10	10	10
Treatment	Prairie hay, cottonseed meal, milo grain	Corn cobs, cottonseed meal, milo grain, vitamin A ¹	Atlas sorgo silage, special supplt.	Atlas sorgo silage, cottonseed meal, milo grain
Av. initial wt. per heifer	294	296	296	296
Av. final wt. per heifer	438	437	491	483
Av. gain per heifer	144	141	195	187
Av. daily gain per heifer	1.27	1.25	1.73	1.65
Av. daily feed consumed:				
Prairie hay	6.48			
Corn cobs		6.23		
Atlas sorgo silage			23.38	23.47
Milo grain	2.59	2.26		2.0
Cottonseed meal	.98	1.50		1.0
Special supplement			3.0	
Mineral (bonemeal, salt)	.06	.05	.06	.06
Salt	.04	.04	.03	.03
Feed per cwt. gain:				
Prairie hay	508.26			
Corn cobs		499.50		
Atlas sorgo silage			1355.13	1418.45

1. 50,000 IU vitamin A per head daily. Total cost \$14.75 for Lot 2.