

**Table 7 (Continued)**

Feed per cwt. gain, lbs.:		
Sorghum grain .....	696	601
Soybean meal .....	32	27
Alfalfa hay .....	172	145
Feed cost per steer <sup>3</sup> .....	\$50.31	52.72
Feed cost per cwt. gain .....	\$16.39	14.37
Summary—December 27, 1957, to November 14, 1958—322 days.		
Final wt. per steer, lbs. ....	1132	1199
Gain per steer, lbs. ....	603	669
Daily gain per steer, lbs. ....	1.87	2.08
Feed cost per steer <sup>3</sup> .....	\$81.64	85.39
Feed cost per cwt. gain .....	\$13.54	12.76
Sale price per cwt., live weight, based on carcass value <sup>4</sup> .....	\$26.69	26.45
Dressing % .....	59.4	58.2
Av. carcass grade <sup>5</sup> .....	16.4	17.0
Av. marbling score <sup>6</sup> .....	8.3	7.8

3. Feed prices may be found inside back cover.

4. Carcasses were evaluated per cwt. as follows: Choice, \$46.50; good, \$45.50; standard, \$43.58.

5. The USDA low good grade was assigned a value of 16; average good, 17.

6. The description of the marbling score was as follows: Small amount, 7; slight amount, 8; traces, 9.

**Wintering Heifers on Bluestem Pasture; Molasses vs. Sorghum Grain, Soybean Meal vs. Soybean Meal Plus Beef Tallow, 1957-1958. Project 253-2.**

E. F. Smith, F. W. Boren, and B. A. Koch

In this experiment two feeds were evaluated as possibilities for economically increasing gains on winter pasture. Molasses was self-fed to heifer calves in one pasture and compared with sorghum grain hand fed to heifer calves in another pasture. The dry matter intake was maintained at about the same level by varying the sorghum grain intake to equal molasses consumption. Soybean meal was fed as a source of protein to both lots.

A third lot was fed soybean meal with beef tallow added to study beef tallow as a source of energy and to observe its effect on palatability. The beef tallow varied in percentage fed, but the soybean meal fed this lot contained an average of about 10% tallow. Inedible stabilized bleachable fancy tallow was fed.

Good to choice Hereford heifers used in the test came from near Clovis, N.M., and were assigned to their experimental treatment on the basis of weight. The lots were fed as follows:

Lot 1. One pound of soybean meal per head daily and sorghum grain to equal the dry matter intake of molasses by lot 2.

Lot 2. One pound of soybean meal per head daily and cane molasses self-fed.

Lot 3. One pound of soybean meal per head daily with added beef tallow (about 10%) and molasses self-fed.

Plenty of old grass was available in all pastures, about 6 acres per head. A mineral mixture of 2 parts bonemeal and 1 part salt by weight and salt alone were offered free choice.

The winter feeding period was discontinued April 19 but the heifers were grazed with no supplemental feed until July 19.

**Observations**

Molasses was equal to sorghum grain as a source of nutrients, primarily energy, on winter pasture. An attempt was made to keep the dry matter intake of the lots about the same by regulating the sorghum grain consumption in keeping with molasses intake; the molasses was self-fed.

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Due to the larger consumption of molasses on an "as fed basis" the cost of production was somewhat higher for the molasses lots.

The tallow fed to lot 3 was unpalatable. The first soybean meal fed carried 10% inedible bleachable fancy tallow; it was refused by the animals. They were then gradually introduced to the tallow by mixing only minute quantities with the soybean meal. The last 60 days the soybean meal carried 17% tallow. There appeared to be a great deal of individual variation in regard to acceptance of the tallow; one heifer was never observed eating the supplement, whereas a few ate it readily after a few days.

The tallow did not improve the performance of the heifers.

**Table 8**

**Wintering heifers on bluestem pasture; molasses vs. sorghum grain, soybean meal vs. soybean meal, plus tallow.**

Wintering—December 13, 1957, to April 19, 1958—127 days.

Treatment .....	Sorghum grain and soybean meal	Molasses and soybean meal	Molasses and soybean meal plus tallow
Pasture number .....	1	2	3
Number of heifers per pasture .....	10	10	9
Initial wt. per heifer, lbs. ....	523	524	530
Final wt. per heifer .....	589	591	584
Gain per heifer .....	66	67	54
Daily gain per heifer .....	0.52	0.53	0.43
Daily ration per heifer:			
Soybean meal .....	1.0	1.0	
Soybean meal, 10% tallow .....			1.0
Sorghum grain .....	3.4		
Molasses, self-fed .....		5.1	4.2
Bonemeal and salt mixture .....		Free choice	
Salt .....		Free choice	
Bluestem pasture .....		Free choice	
Feed cost per heifer <sup>1</sup> .....	15.31	19.83	17.47

Grazing—April 19, 1958, to July 19, 1958—91 days.

Initial wt. per heifer, lbs. ....	589	591	584
Final wt. per heifer .....	761	753	767
Gain per heifer .....	172	162	183
Daily gain per heifer .....	1.89	1.78	2.01
Grazing cost per heifer .....	\$16.00	16.00	16.00

Summary—December 13, 1957, to July 19, 1958—218 days.

Initial wt. per heifer, lbs. ....	523	524	530
Final wt. per heifer .....	761	753	767
Gain per heifer .....	238	229	237
Daily gain per heifer .....	1.09	1.05	1.09
Feed cost per heifer <sup>1</sup> .....	\$31.31	35.83	33.47
Feed cost per 100 lbs. gain <sup>1</sup> .....	\$13.16	15.65	14.12

1. Feed prices may be found inside the back cover.

**The Value of Supplementary Trace Minerals<sup>1</sup> and Trace Minerals Plus Bonemeal in a Fattening Ration, 1958. Project 253-2.**

E. F. Smith, B. A. Koch, and F. W. Boren

This is the fifth experiment in this series conducted to determine the value of added trace minerals in a typical cattle-fattening ration. The four previous experiments are reported in Kansas Agricultural Experiment Station Circulars 279, 308, 335, and 358. No response has been obtained when trace minerals were added to high roughage rations of sorghum silage, sorghum grain and a protein concentrate, or to a fatten-

1. Supplied by Calcium Carbonate Company, Chicago, Ill.

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ing ration of sorghum grain, prairie hay, and a protein concentrate. Improved performance has been obtained when trace minerals were added to fattening rations of corn, prairie hay, and a protein concentrate. Ground limestone has been fed in all the fattening trials to furnish adequate calcium.

#### Experimental Procedure

Forty-nine head of good to choice Hereford heifers were divided on the basis of previous treatment and weight into 5 lots, 9 in 1 lot and 10 in each of the other 4 lots. The heifers were purchased as calves in the fall of 1957 near Clovis, N.M., and had been wintered and summer grazed on bluestem pastures near Manhattan prior to the experiment. They were fed corn on pasture for about 10 days before being moved to dry lot and starting on experiment.

Lots 1 and 2 were fed the control ration of corn, protein supplement, prairie hay, and ground limestone, lots 3, 4, and 5 received added trace minerals and lot 5 received bonemeal instead of ground limestone to observe the value of added phosphorus.

The corn was self-fed and prairie hay was fed daily in quantities readily eaten. Soybean meal was fed once daily with the daily allowance of ground limestone, or bonemeal in the case of lot 5, mixed with it.

The trace minerals were fed as a trace mineral premix and were added to the soybean meal to furnish these quantities in milligrams per head daily: cobalt 1.25, copper 3.65, iodine 1.97, iron 46.13, manganese 56.3, and zinc 3.42.

#### Observations

The addition of trace minerals to the rations of the heifers in lots 3 and 4 increased the gain an average of 0.33 pound per head daily, with only a slight improvement in efficiency of gain over lots 1 and 2. The carcasses in general were about the same; however, carcasses from lot 3 (a trace mineral lot) graded slightly lower.

Additional phosphorus, about 9 grams per head daily (lot 5), failed to improve performance.

The improvement in gain, noted in this test where trace minerals were fed, was slightly lower than the average of 0.47 pound per head daily achieved in two previous trials.

Table 9

The value of supplementary trace minerals and trace minerals plus bonemeal in a fattening ration.

August 7, 1958, to November 10, 1958—95 days.

Lot number .....	1	2	3	4	5
Number of heifers per lot .....	10	10	9 <sup>1</sup>	10	9
	No supplementary trace minerals	No supplementary trace minerals	Trace minerals added <sup>2</sup>	Trace minerals added <sup>2</sup>	Trace minerals <sup>2</sup> and bonemeal added
Management .....					
Initial wt. per heifer, lbs. ....	778	780	775	792	789
Final wt. per heifer, lbs. ....	1021	1034	1058	1069	1075
Gain per heifer, lbs. ...	243	254	283	277	286
Daily gain per heifer, lbs. ....	2.56	2.67	2.98	2.92	3.01
Daily ration per heifer, lbs.:					
Ground corn, self-fed .....	17.3	18.0	18.3	19.2	19.3
Soybean meal .....	1.5	1.5	1.5	1.5	1.5
Prairie hay .....	3.7	3.8	3.9	3.7	3.9
Salt .....	.05	.03	.04	.05	.04
Ground limestone ..	0.10	0.10	0.10	0.10	
Bonemeal .....					0.17
Trace minerals <sup>2</sup> .....	No	No	Yes	Yes	Yes

Table 9 (Continued)

Feed per cwt. gain, lbs.:	677	672	616	657	642
Corn .....	677	672	616	657	642
Soybean meal .....	59	56	50	51	50
Prairie hay .....	144	141	130	128	130
Cost of feed per cwt. gain <sup>3</sup> .....	\$18.60	18.38	16.81	17.78	17.71
Total feed cost .....	\$45.20	46.68	47.58	49.26	50.65
Selling price per cwt. <sup>4</sup> ..	\$24.26	24.29	23.96	24.76	24.55
Dressing percent .....	58.6	58.3	58.2	59.6	60.0
Carcass grades, USDA:					
Low choice .....	1	3		2	2
High good .....	2	5	4	5	5
Av. good .....	3				1
Low good .....	3	2	3	3	
High standard .....	1		2		1
Av. thickness of finish, score <sup>5</sup> .....	3.9	3.8	3.8	4.1	3.7
Av. degree of marbling, score <sup>6</sup> ..	7.7	6.9	7.4	7.2	7.0
Av. size of rib-eye, score <sup>7</sup> .....	4.3	4.2	4.2	4.5	4.1

1. One heifer died, cause unknown.

2. These quantities were fed in mg. per head daily: cobalt, 1.25; copper, 3.65; iodine, 1.97; iron, 46.13; manganese, 56.3; and zinc, 3.42.

3. See table on inside back cover page of bulletin for feed prices.

4. Selling price was computed on the basis of carcass grade, weight, and carcass price: choice, \$42.50 cwt.; high and av. good, \$41.50; low good, \$41; and standard, \$40.50.

5. Scores for thickness of finish: moderate, 3; modest, 4.

6. Scores for degree of marbling: small amount, 7; slight amount, 8.

7. Scores for size of rib-eye: modestly large, 4; slightly small, 5.

Feeding Two Levels of Alfalfa Hay to Heifer Calves on Winter Bluestem Pasture, 1957-1958, and a Three-Year Summary, 1955-1958. Project 253-2.

E. F. Smith, B. A. Koch, F. W. Boren, and D. I. Good

This experiment was designed to collect data in regard to the optimum level of alfalfa hay feeding for calves wintered on bluestem pasture. One group of heifers was fed twice as much alfalfa hay as another, but the supplemental total digestible nutrient intake was maintained at about the same level by feeding grain to heifers on the lower level of alfalfa hay. Two previous tests are reported in Circulars 349 and 358.

#### Experimental Procedure

In the third experiment reported here, 20 heifers, originating near Clovis, N.M., were assigned to the following experimental treatments on the basis of weight:

Pasture 8. Fed 4 pounds of alfalfa hay and 2.6 pounds of ground corn per head daily.

Pasture 13. Fed 8 pounds of alfalfa hay per head daily.

The 4 pounds of alfalfa and 2.6 pounds of corn fed to heifers in pasture 8 furnished approximately the same amount of total digestible nutrients as the 8 pounds of alfalfa hay fed to the heifers in pasture 13.

Sufficient old grass was available in both pastures, and the heifers had free access to salt and a bonemeal and salt mixture of equal parts by weight.

After the wintering period, the heifers were grazed without supplemental feed until July 19.