	Prairie hay ..	246.55		1191.47	784.38	698.14
	Sorghum silage		2933.11			
	Salt	7.93	17.70	6.21	5.04	3.78
	Mineral mixture	6.64	19.32	13.05	9.23	6.15
	Dry bluestem pasture	ad lib				
10.	Cost of feed per 100 lbs. gain[4]	$21.56	$17.70	$15.16	$14.49	$16.51
11.	Total feed cost per steer[1]	$13.34	$13.10	$14.40	$19.86	$25.76
12.	Initial cost per steer @ $41 per cwt.	$159.08	$159.49	$159.49	$159.90	$160.31
13.	Initial cost plus feed cost	$172.42	$172.59	$173.89	$179.76	$186.07
14.	Necessary selling price per cwt. to cover initial cost plus feed cost	$38.66	$37.27	$35.93	$34.11	$34.02
15.	Appraised value per cwt. May 3, 1952	$	$	$	$	$

1 The wintering period for Lot 1 was 101 days.
2 Prairie hay was fed to Lot 1 on dry bluestem pasture only when necessary.
3 Mineral mixture was composed of 2 parts steamed bonemeal to 1 part salt.
4 Feed prices may be found on page 58 of this publication.

Wintering Steer Calves on Alfalfa Silage, 1951-52

R. F. Cox and E. F. Smith

Introduction

This test was intended to compare alfalfa silage with alfalfa hay as a roughage for wintering steer calves by feeding nonwilted alfalfa silage to one lot, wilted alfalfa silage to another, and alfalfa hay to a third lot. However, the alfalfa hay lot was omitted this year because of a lack of hay comparable to the silage.

Experimental Procedure

Eighteen good quality Hereford steer calves were used in the test. They were part of a group of 150 steer calves obtained from Marfa, Texas, for experimental purposes. They were divided into two lots of 9 head each and started on test December 22, 1951. Both lots were given free access to a mineral mixture and salt. Lot 1 was fed nonwilted alfalfa silage, and Lot 2 was fed wilted alfalfa silage. No preservative was added to either silage. Each type of silage was stored separately in small tile silos. The silage was made from second-cutting alfalfa approaching full bloom. The nonwilted silage

was somewhat more mature than the wilted silage. The calves were fed all of the silage they would eat twice daily.

Observations

1. Nonwilted or wilted alfalfa silage put up without a preservative did not prove satisfactory in this test as the only roughage for wintering steer calves.
2. Wilted alfalfa silage was superior to nonwilted alfalfa silage in producing steer gains.
3. The calves on the nonwilted alfalfa silage did not consume enough silage to meet their dry matter requirement. They simply did not get enough to eat, although they were fed all they would clean up. The test was discontinued after 86 days, due to a shortage of wilted alfalfa silage and to the condition of the calves.
4. Following is the analysis of the two types of alfalfa silage:

Type	Moisture %	Protein %	Fat %	Fiber %	N-free ext. %	Ash %	Carotene dry basis mg/100gm
Nonwilted	75.28	4.00	.93	9.84	7.44	2.51	.63
Wilted	57.00	7.58	.89	16.50	13.61	4.40	.36

Wintering Steer Calves on Alfalfa Silage
(December 22, 1951, to March 17, 1952—86 days)

1.	Lot number	1	2
2.	Number steers per lot	9	9
3.	Ration fed	Nonwilted silage	Wilted silage
4.	Average initial weight, lbs.	387	387
5.	Average final weight, lbs.	372	412
6.	Average gain, lbs.	−15	25
7.	Average daily gain, lbs.	−.17	.29
8.	Average daily ration, lbs.:		
	Nonwilted alfalfa silage, no preservative	24.87	
	Wilted alfalfa silage, no preservative		21.83
	Salt	.04	.04
	Mineral[1]	.05	.04

1 Composed of 2 parts steamed bonemeal to 1 part salt.

Project 253-2: Wintering, Grazing, and Fattening Heifers, 1950-51

E. F. Smith, R. F. Cox, D. L. Good, and D. L. Mackintosh

Introduction

This test was to obtain further information about fattening heifers in regard to the following points:

1. Cottonseed oil meal as compared to soybean oil meal as a protein supplement in winter rations.
2. Influence of the level of wintering on future gain and finishing of heifers.
3. Extending the grazing season on bluestem pasture for heifers that are to be finished for a fall market.
4. Compare full-feeding grain on brome grass to full-feeding grain in dry lot.

5. Compare various methods of wintering, grazing, and fattening heifers.

Experimental Procedure

Seventy good quality Hereford heifer calves were purchased for $31.50 a hundredweight in east central Kansas and received October 1, 1951. The pay weight was 425 pounds per head. It was necessary to dehorn most of the heifers after they were received. They were started on test November 30, 1951, at an average weight of about 440 pounds. Five heifers were removed from different lots during the wintering period, two because of lead paint poisoning and three because of no gain. The seven lots of heifers received the following treatment:

Lot 1—wintered on 2 pounds grain, soybean oil meal pellets, sorghum silage, and prairie hay; grazed May 2 to July 20 on bluestem pasture; full-fed 100 days in dry lot.

Lot 2—wintered on 2 pounds grain, soybean oil meal pellets, sorghum silage, prairie hay; grazed April 16 to July 1 on brome pasture; started on grain on brome pasture June 1; moved to dry lot July 1 for completion of 100-day full-feeding period.

Lot 3—wintered on 2 pounds grain, cottonseed oil meal pellets, sorghum silage, prairie hay; full-fed grain on brome pasture for 100 days from April 16 to July 25.

Lot 4—wintered on 2 pounds grain, cottonseed oil meal pellets, sorghum silage, prairie hay; full-fed grain 100 days in dry lot after wintering period.

Lot 5—wintered on 4 pounds of grain, soybean oil meal pellets, sorghum silage, prairie hay; full-fed 100 days in dry lot following the wintering period.

Lot 6—wintered on sorghum silage, prairie hay, soybean oil meal pellets; bluestem pasture May 2 to July 20; full-fed 100 days in dry lot after July 20.

Lot 7—wintered on sorghum silage, prairie hay, soybean oil meal pellets; bluestem pasture May 2 to August 16; fed soybean oil meal pellets July 18 to August 16 on bluestem pasture; full-fed grain 72 days in dry lot after August 16.

The sorghum silage (Tennessee Orange) was very acid and contained very little grain, and the heifers did not consume it readily. The prairie hay was cut late, about September 1, but was still fair quality hay. An analysis of the feeds used in this test may be found on page 59 of this bulletin.

Observations

1. During the wintering period, the soybean oil meal pellets (expeller type) fed to Lots 1 and 2 increased the daily gain per head by .10 and .17 pound respectively over Lots 3 and 4 fed cottonseed oil meal pellets (hydraulic extracted).

2. In this test it was profitable to feed 2 pounds of grain per head daily as compared to no grain in the wintering rations of heifers; compare Lots 1 and 6.

Lot 1, fed 2 pounds grain per head daily (1) made a greater total gain, 41 pounds more, (2) sold for $1.00 a hundredweight more, (3) made a larger return per head, and (4) dressed slightly higher.

3. The level of winter grain feeding was compared in Lots 4 and 5 for heifers that are to be fattened after the wintering period. Lot 4 was fed 2 pounds grain per head daily in addition to the wintering ration, and Lot 5 was fed 4 pounds of grain.

Lot 5 held the following advantages over Lot 4: (1) made a greater total gain of 24 pounds more, (2) sold for 40c a hundred-

Wintering Heifers

(November 30, 1951, to May 2, 1951[2]—153 days)

	1	2	3	4	5	6	7
1. Lot number	1	2	3	4	5	6	7
2. Number heifers in a lot	91	91	92	92	10	91	10
3. Number days in phase	153	.137[3]	137[3]	137[3]	137[3]	153	153
4. Average daily ration, lbs.:							
Milo grain	2.00	2.00	2.00	2.00	4.05		
Soybean oil meal pellets (exp.)	1.00	1.00			1.00	1.00	1.00
Cottonseed oil meal pellets (hyd.)			1.00	1.00			
Prairie hay	2.45	2.02	1.52	1.40	1.13	3.70	3.33
Silage	19.73	19.91	19.58	19.43	19.55	18.95	19.54
Salt	.06	.09	.08	.10	.09	.08	.10
5. Average initial weight, lbs.	449	448	447	434	434	428	434
6. Average final weight, lbs.	619	609	586	572	621	566	556
7. Average gain, lbs.	170	161	139	138	187	138	122
8. Average daily gain, lbs.	1.11	1.18	1.01	1.01	1.36	.90	.80
9. Cost of feed per cwt. gain	$14.66	$13.69	$15.42	$15.43	$14.74	$13.58	$15.30
10. Feed cost per heifer	$24.93	$22.05	$21.43	$21.29	$27.56	$18.74	$18.66
Grazing							
	Grazed on bluestem pasture 5/2-7/20 1951	Grazed on brome 4/16-6/1, 1951. Fed grain on brome 6/1-7/1 1951				Grazed on bluestem pasture 5/2-7/20 1951	Grazed on bluestem pasture 5/2-7/18 1951. Fed 1¼ lbs. soybean pellets on grass 7/18-8/16 1951
11. Management followed							
12. Number days in phase	79	46				79	106
13. Average initial weight, lbs.	619	609				566	556
14. Average final weight, lbs.	703	657				642	684
15. Average gain, lbs.	84	48				76	128
16. Average daily gain, lbs.	1.06	1.04				.96	1.21

Wintering Heifers (Cont.)
Full Feeding

	Lot number	1	2	3	4	5	6	7
17.	Period when full-fed and where	7/20-10/27 1951; dry lot	6/1-9/12 1951; 6/1-7/1 on brome, 7/1-9/12 in dry lot	4/16-7/25 1951; brome grass	4/16-7/25 1951; dry lot	4/16-7/25 1951; dry lot	7/20-10/27 1951; dry lot	8/16-10/27 1951; dry lot
18.	Number days in phase	99	103	102	102	102	99	72
19.	Average initial weight, lbs.	703	657	586	572	621	642	684
20.	Average final weight, lbs.	935	890	763	801	825	873	846
21.	Average gain, lbs.	232	233	177	229	204	231	162
22.	Average daily gain, lbs.	2.34	2.26	1.74	2.25	2.00	2.33	2.25
23.	Average daily ration, lbs.:							
	Milo grain	17.67	16.29	13.87	15.58	14.23	16.94	15.68
	Soybean pellets	1.54	1.08		1.44	1.47	1.54	1.50
	Prairie hay	5.45	1.82		4.55	3.99	4.11	5.69
	Silage				.61	.59		
	Salt	.01		.17	.03	.04	.03	.03
	Alfalfa	2.06	1.43		1.65	1.65	2.06	2.00
24.	Feed per cwt. gain, lbs.:							
	Milo grain	753.83	720.00	799.44	694.03	711.25	725.83	696.73
	Soybean pellets	65.52	47.73		64.10	73.58	65.80	66.67
	Prairie hay	232.38	80.45		202.67	199.61	199.40	253.21
	Silage				27.17	29.41		
	Salt	.48	.03	9.68	1.21	1.75	1.27	1.39
	Alfalfa	87.93	63.09		73.41	82.35	88.31	88.89
25.	Cost of feed per 100 lbs. gain	$22.20	$19.51	$18.45	$20.51	$21.34	$21.21	$21.07
26.	Total feed cost this phase	$51.47	$45.46	$47.65	$46.97	$43.54	$49.00	$34.13

Wintering Heifers (Cont.)
Summary

	Lot number	1	2	3	4	5	6	7
27.	Average total gain (all phases)	486	442	316	367	391	445	402
28.	Average daily gain (all phases)	1.47	1.55	1.32	1.54	1.64	1.34	1.21
29.	Feed cost per 100 lbs. gain (all phases)	$15.71	$15.26	$21.86	$18.60	$18.17	$15.29	$13.13
30.	Total cost of feed per heifer	$76.40	$67.50	$69.08	$68.27	$71.10	$68.05	$52.79
31.	Initial cost per heifer @ $31.50 cwt.	$141.44	$141.12	$140.81	$136.71	$136.71	$134.82	$136.71
32.	Feed cost plus heifer cost	$217.84	$208.62	$209.89	$204.98	$207.81	$202.87	$189.50
33.	Selling price per cwt. at market	$35.00	$36.00	$33.88	$34.50	$34.90	$34.00	$32.70[4]
34.	Selling price per heifer	$315.35	$314.64	$254.44	$268.41	$277.46	$286.62	$266.51
35.	Margin per heifer above feed cost	$97.51	$106.02	$44.55	$63.43	$69.65	$83.75	$77.01
36.	Percent shrink in shipping to market	3.6	1.8	1.6	2.9	3.6	3.4	3.7
37.	Dressing percent	59.1	58.9	57.9	57.7	59.4	58.3	57.5
38.	Carcass grades, U.S.:							
	Low prime	2					1	1
	High choice	1	1			3	4	5
	Average choice	5	6	1	6	4	1	1
	Low choice	1	2	2	2		3	2
	High good			2	1	3		1
	Average good			3				

1 One heifer removed because of no gain.

2 One heifer died because of lead paint poisoning.

3 For Lots 2, 3, 4, and 5, the wintering period extended only to April 16, 1951.

4 Lot sold for $33.00 cwt. with 1 selling for $30.00 cwt.

Feed prices: Milo grain, $2.30 cwt.; soybean pellets, $75.00 a ton; cottonseed pellets, $75.00 a ton; prairie hay, $13.00 a ton; sorghum silage, $6.50 a ton; salt, $12.00 a ton; alfalfa, $1.00 cwt.

weight more, (3) returned a greater profit, (4) had a higher dressing percent, and (5) made higher carcass grades.

4. Lot 7 was continued on grass after July 20 and was fed protein on grass until August 16 and then full-fed for 72 days in dry lot until October 27. Lot 6 was the check lot and was full-fed in dry lot 99 days from July 20 to October 27.

Lot 7 returned less per head than Lot 6. It failed to produce as much total gain, sold for $1.30 less per hundredweight, and had a lower dressing percent.

5. Self-feeding grain in dry lot resulted in the following advantages as compared to self-feeding grain on brome grass: (see Lots 3 and 4) (1) one-half pound more gain per head daily, (2) larger grain consumption, (3) 62c per hundredweight increase in selling price, (4) greater return per head, and (5) higher grading carcasses.

6. As measured by total gain, selling price per hundredweight, margin per heifer, and carcass grade, the systems of management represented by Lot 1 and Lot 2 appear to be above average in this test.

Project 253-2: Wintering, Grazing, and Fattening Heifers

Wintering Heifer Calves That Are To Be Fattened for the Summer or Early Fall Market, 1951-52.

E. F. Smith, D. L. Good, R. F. Cox

Introduction

This is a report of the wintering phase of this test. Following this phase, the different lots either will be full-fed or go to grass and be full-fed after the grazing period. The objective of the test is to compare different methods of wintering heifer calves that are going to be full-fed after the wintering period or after a summer grazing period.

Experimental Procedure

Forty-five good quality Hereford heifer calves were purchased in south-central Kansas for use in this test. They were fed silage, prairie hay, 1 pound of protein, and 2 pounds of milo grain per head daily until the test started December 11, 1951. The 5 lightest heifers were cut off and the 40 remaining were divided into four lots of 10 heifers each. The system of management planned for each lot follows:

Lot 1—wintered on dry bluestem pasture, 2 pounds cottonseed oil meal pellets per head daily, mineral (bonemeal and salt), and free access to salt; grazed on bluestem pasture until July 15; full-fed in dry lot to the choice grade.

Lot 2—wintered on brome pasture supplemented when necessary with protein, free access to mineral (bonemeal and salt), and salt; grazed on brome pasture until July 15; full-fed in dry lot to the choice grade.

Lot 3—wintered on sorghum silage, prairie hay, 1 pound of cottonseed cake, and 2 pounds of milo grain per head daily, free access to mineral (bonemeal and salt) and salt; grazed on bluestem pasture May 1 to July 15; full-fed in dry lot to grade choice.

Lot 4—wintered on sorghum silage, prairie hay, 1 pound of cottonseed cake, and 4 pounds of milo grain per head daily, free access to mineral (bonemeal and salt) and salt; full-fed in dry lot to grade choice.

Observations

1. The heifers carried some condition at the start of the test, which those being wintered on dry grass soon lost. The weather was favorable

for wintering out on dry grass except during the month of December and a storm the first week in March.

2. The heifers in Lot 1 wintered on dry bluestem pasture were strong and healthy at the close of winter. They were wintered in a 190-acre bluestem pasture with 10 steer calves. The pasture was stocked during the previous summer at a normal rate, but plenty of dry dead grass remained.

3. The heifers in Lot 2, wintered on brome pasture, were in strong condition and thin. They received no supplemental feed from the start of the test until February 1. From February on they were fed 2 pounds of cottonseed oil meal pellets daily; alfalfa hay was fed for a short period to break them into coming up for the cake. The brome was fertilized the previous winter with about 100 pounds of ammonium nitrate per acre. It was not grazed after July 1, and had a fair amount of dead top growth when the heifers were started on test December 11. The brome was stocked at the rate of 1½ to 2 acres per head.

4. The silage fed to Lot 3 and Lot 4 was of poor quality. The first part of the winter it was Tennessee Orange which was immature, excessively acid with very little grain. The second part of the winter, mixed Atlas sorgo and volunteer Black Amber were fed. This was dry with hardly any grain. The addition of 4 pounds of milo grain to the ration increased the gain considerably and placed Lot 4 in position that it could be sold for less per cwt. than any of the other lots and still pay for feed and initial cost of heifers.

Wintering Heifer Calves That Are To Be Fattened for the Summer or Early Fall Market, 1951-52.

Phase I—Wintering

(December 11, 1951, to April 1, 1952—122 days)

1.	Lot number	1	2	3	4
2.	Place of wintering	Bluestem pasture	Brome pasture	Dry lot	Dry lot
3.	Number heifers in lot	10	10	10	10
4.	Av. initial wt., lbs.	480	479	482	485
5.	Av. final wt., lbs.	498	460	585	645
6.	Av. gain, lbs.	18	−19	103	160
7.	Av. daily gain, lbs.	.16	−.17	.92	1.43
8.	Av. daily ration, lbs.:				
	Ground milo grain			2.00	4.00
	Cottonseed pellets or cake	1.97	.75[1]	1.00	1.00
	Sorghum silage			19.15	19.82
	Prairie hay	.83[2]	.98[2]	1.70	1.68
	Alfalfa hay[3]		.96		
	Salt	.04	ad lib	.11	.08
	Minerals[4]	.03	ad lib	.12	.09
	Bluestem pasture	ad lib			
	Brome pasture		ad lib		
9.	Feed cost per heifer[5]	$11.35	$13.97	$20.98	$27.37
10.	Initial cost of heifers, @ $40 cwt.	$192.00	$191.60	$192.80	$194.00
11.	Heifer cost plus feed cost	$203.35	$205.57	$213.78	$221.37