

31. Selling price per steer .....	\$270.56	\$268.40	\$285.36
32. Loss per steer .....	\$58.20	\$66.85	\$49.04
33. Percent shrink in shipping to market	3.50	6.63	5.83
34. Dressing percent .....	60.2	60.1	60.6
35. Carcass grades: U.S. <sup>4</sup>			
Average choice .....	1	4	1
Low choice .....	4	3	3
High good .....	4	2	1
Average good .....	1	1	3
Low good .....			2

1. Mineral was 2 parts steamed bonemeal to 1 part salt.
2. The trace mineral salt contained the following minerals: Manganese carbonate, .400 percent; iron oxide, .250 percent; copper carbonate, .060 percent; sodium thiosulphate, .100 percent; sodium carbonate, .100 percent; cobalt carbonate, .022 percent; potassium iodide, .010 percent; sodium chloride, 99.058 percent.
3. Feed prices: Milo grain, \$2.80 cwt.; cottonseed oilmeal pellets, \$100.00 ton; prairie hay, \$15.00 ton; sorghum silage, \$6.50 ton; mineral, \$5.00 cwt.; trace mineral salt, \$2.00 cwt.; salt and ground limestone, \$12.00 ton; bluestem pasture, \$25.00 per head for season.
4. The carcasses were graded the following day as follows: Lot 1, 1 prime, 7 choice, 3 good; Lot 2, 7 choice and 3 good; Lot 3, 5 choice and 5 good.

### Project 370: Adapting Roughages Varying in Quality and Curing Processes to the Nutrition of Beef Cattle

A Comparison of Alfalfa Silage and Alfalfa Hay; Prairie Hay and Corn Cobs; a Special Supplement vs. Corn and Soybean Oilmeal, 1952-53.

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

The increased use of such feeds as alfalfa silage, corn cobs, and special cattle supplements has prompted this test. The objective of the test is to compare the following feeds:

1. Wilted and non-wilted alfalfa silage with alfalfa hay.
2. Ground corn cobs with prairie hay.
3. Three pounds per head daily of a special cattle supplement with 2 pounds of corn and 1 pound of soybean oilmeal per head daily.

#### Experimental Procedure

The Hereford heifers used in this test were of good to choice quality from the Brite Ranch at Marfa, Texas. They were delivered to Manhattan, Kansas, November 3, 1952, at a cost of 23 cents per pound. From that date until started on test December 22, 1952, they were fed prairie hay and 1 pound of soybean pellets per head daily.

The first cutting alfalfa fed to Lots 1, 2, and 3 came from the same field. No preservative was used in making the silage. The wilted alfalfa was left in the field from 30 minutes to 3 hours. The non-wilted was cut, raked, picked up with a silage cutter, and hauled to the silo as rapidly as possible.

The special supplement fed to Lot 5 at the rate of 3 pounds per head daily was of the following composition: soybean oilmeal, 2.25 pounds; molasses, 0.50 pound; steamed bonemeal, 0.18 pound; salt, 0.06 pound; vitamin supplement, 0.01 pound (2,250 A and 400 D per gram).

An attempt was made in Lots 17 and 18, where prairie hay and corn cobs were compared, to eliminate as many variables as possible,

leaving a comparison of the two roughages. An average of 4.90 pounds of corn and soybean meal per head daily was fed to each lot. The protein intake of each lot was maintained at about the same level. In the case of the corn cob lot, more of the protein had to come from the soybean meal to compensate for the low protein content of corn cobs as compared to prairie hay. Since the prairie hay lot received less concentrate feed on this basis, their corn allowance was increased so that each lot received the same number of pounds of corn and soybean meal combined. The prairie hay and corn cobs were fed in amounts the animal would clean up. The corn and soybean meal was fed to both lots twice daily and was mixed with the corn cobs in Lot 18. Synthetic vitamin A concentrate furnishing 10,000 I.U. per gram was mixed with the soybean meal fed to Lot 18 so as to furnish 50,000 I.U. of vitamin A per head daily to this lot.

Molasses was fed at the rate of 1 pound per head daily to Lots 17 and 18 for five days at the start of the test. It was discontinued with the objective of including it in future tests in a study of its value when fed with low quality roughage rations.

#### Observations

1. Wilted and non-wilted alfalfa silage appear equal in value in this test and definitely inferior to alfalfa hay for calves.
2. Two pounds of corn and 1 pound of soybean pellets fed to Lot 4 produced about the same gain as the special supplement fed to Lot 5 at a lower feed cost per 100 pounds of gain.
3. Prairie hay fed to Lot 17 produced 0.17 pound more gain per head daily than corn cobs fed to Lot 18 at only slightly less feed cost per 100 pounds of gain.
4. Some of the heifers in Lot 18, fed corn cobs, coughed the cobs up for about three weeks at the start of the test. With this exception the cobs appeared satisfactory as the only roughage for wintering calves in this test.

### Supplementing Wheat Straw in the Wintering Ration of Beef Calves.

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

Wheat straw is a very poor roughage and under normal conditions should never be used as the entire roughage for cattle; however, there are times when wheat straw has to make up most or all of the roughage. It is desirable to know how to supplement this poor quality roughage when one is forced to use it. The purpose of this preliminary experiment was to observe the value of vitamin A and dehydrated alfalfa pellets when added to a wintering ration for beef calves in which wheat straw was the only roughage.

#### Experimental Procedure

Twelve Hereford steer calves purchased in Texas were divided into three lots of four calves each. All calves received all the wheat straw they would consume. The daily ration for each animal in the various lots is shown in Table 28. A preliminary period of 25 days was used to get the calves used to eating the straw. After the experiment started, the calves were fed individually.

#### Observations

1. No vitamin A deficiency symptoms were observed. There was no source of vitamin A in Lot 1.
2. The calves did not like the straw but at no time did they completely refuse to eat it. The total amount consumed was lower than the amount of roughage which would be normally consumed if it were of better quality.

Table 27.—A Comparison of Roughages and Supplements for Wintering Heifer Calves.  
December 22, 1952, to April 9, 1953—108 days.

	1	2	3	4	5	17	18
1. Lot number .....	8	8	8	10	10	10	10
2. Number heifers per lot .....	8	8	8	10	10	10	10
3. Treatment .....	Non-wilted alfalfa silage	Wilted alfalfa silage	Alfalfa hay	Atlas sorgo silage, 2 lbs. corn, 1 lb. soybean pellets	Atlas sorgo silage, 3 lbs. special supplement	Prairie hay plus 4.9 lbs. corn and soybean pellets	Corn cobs plus 4.9 lbs. corn and soybean pellets
4. Initial weight per heifer .....	420	420	420	424	419	419	419
5. Final weight per heifer .....	434	433	550	610	602	592	573
6. Gain per heifer .....	14	13	134	186	183	173	154
7. Daily gain per heifer .....	.10	.12	1.24	1.72	1.69	1.60	1.43
8. Daily ration per heifer:							
Soybean oilmeal or pellets .....				1.00		1.25	1.90
Ground shelled corn .....				2.00		3.65	3.00
Special supplement .....	35.04				3.00		
Non-wilted alfalfa silage .....		26.53					
Wilted alfalfa silage .....			14.71				
Alfalfa hay .....				30.37	30.65		
Atlas sorgo silage .....							
Prairie hay .....						9.80	
Corn cobs .....							8.41
Mineral (bonemeal and salt) .....	.11	.08	.06	.11	.10	.13	.07
Salt .....	.16	.11	.05	.04	.06	.02	.04
9. Feed per cwt. gain:							
Soybean oilmeal or pellets .....				58.06		77.51	133.12
Ground shelled corn .....				116.13		228.32	210.39
Special supplement .....					177.04		
Atlas sorgo silage .....				1763.44	1808.74		
Prairie hay .....						611.84	
Corn cobs .....							590.13
Mineral (bonemeal and salt) .....				6.08	6.17	8.09	5.19
Salt .....				2.37	3.77	1.33	2.80
10. Feed cost per 100 lbs. gain <sup>1</sup> .....				\$15.20	\$16.63	\$18.25	\$19.68

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

3. The addition of 50,000 units of vitamin A per head daily apparently increased the rate of gain and feed efficiency.  
4. The addition of 1 pound of dehydrated alfalfa pellets apparently greatly increased the rate of gain and feed efficiency.

Table 28.—Supplementing Wheat Straw in the Wintering Ration of Beef Calves, January 6, 1953-April 13, 1953.

Lot number .....	1	2	3
Number animals .....	4	4	4
Number days on feed .....	97	97	97
Daily ration—pounds:*			
Wheat straw .....	3.8	3.9	4.3
Ground milo grain .....	2	2	2
Soybean oilmeal pellets .....	2	2	1.5
Dehydrated alfalfa pellets .....			1.0
Vitamin A .....		50,000 units	
Average initial weight .....	441	447	443
Average final weight .....	499	514	526
Average gain .....	58	67	83
Average daily gain .....	.59	.69	.86
Feed per 100 pounds gain:			
Wheat straw .....	639	568	501
Ground milo grain .....	336	292	234
Soybean oilmeal pellets .....	336	292	175
Dehydrated alfalfa pellets .....			117
Vitamin A supplement .....		1.6	
Cost per 100 lbs. gain .....	\$29.20	\$27.34	\$22.31

\* Mineral mixture of equal parts steamed bonemeal and salt kept in a box before calves.

### Project 147: The Effect of Feeding Alfalfa Straw Sprayed with a Curing Agent to Heifer Calves,<sup>1</sup> 1952-53

E. F. Smith, D. Richardson, L. M. Roderick, and R. F. Cox

According to Circular 290<sup>2</sup> from the Kansas Agricultural Experiment Station, "chemically curing the alfalfa seed crop is a practical and economical method of harvesting. Four years of research at this station and actual farm experiences have shown that there is a heavy loss of seed from the old method of harvesting by mowing, windrowing, and combining."

The objective of this test was to determine if the straw remaining after the seed was removed is poisonous to livestock because of the presence of the curing agent (Di-Nitro-Ortho-Secondary Butyl Phenol), one of the di-nitro phenols.

1. This project is being partially supported by a grant from the Dow Chemical Company, Midland, Michigan. The material used was Dow General Weed Killer.
2. Grandfield, C. O., and W. W. Franklin, 1952. Alfalfa Seed Production in Kansas. Kansas Agr. Expt. Sta. Cir. 290.