purpose of this study is to continue investigation of the use of wheat straw in the winter ration of beef cattle, with particular emphasis upon the effect of various combinations of wheat straw and alfalfa hay upon the performance of beef heifers being wintered in dry-lot.

Experimental Procedure

Fifty Hereford heifers of good to choice quality were allotted into 5 lots of 10 calves each on the basis of live weight and grade. The average daily ration for each heifer in the various lots is shown in Table 62. Each lot received an equal amount of ground sorghum grain and protein from soybean oil meal and/or alfalfa hay. Wheat straw was fed free-choice to lots 1, 3, 4, and 5. The same amount of alfalfa hay was fed to lot 2 as straw fed to lot 1. The soybean oil meal fed was fortified with vitamin A so that each pound of soybean oil meal contained 10,000 IU of the vitamin.

Observations

Table 62 presents the 98-day summary of this test and the following observations can be made:

1. No vitamin A deficiency symptoms were apparent.
2. Alfalfa hay fed at the rate of 5.79 pounds per head daily as the only source of roughage and protein (lot 2) produced the same daily gain per head (.91 pound) as did 1.25 pounds of soybean oil meal and 5.79 pounds of wheat straw (lot 1).
3. The feeding of 1 pound of alfalfa hay plus wheat straw fed free-choice as a source of roughage (lot 3) increased average daily gain only slightly. The calves consumed as much wheat straw as was consumed in lot 1.
4. Although the total wheat straw consumption decreased as the alfalfa allowance increased from 2 pounds to 4 pounds per head daily, total roughage consumption increased.
5. Lot 3, receiving 1 pound alfalfa hay in addition to wheat straw free-choice, made essentially the same average daily gain as was made by lot 4, which received 2 pounds alfalfa hay.
6. Increasing the alfalfa hay from 2 to 4 pounds greatly increased average daily gains.
7. Based on the conditions of this trial, 4 pounds of alfalfa hay were required, in addition to wheat straw fed free-choice, to materially increase the average daily gains.
8. As the alfalfa hay allowance increased, the cost per cwt. gain decreased.

Table 62

The Effect of Various Combinations of Wheat Straw and Alfalfa Hay on the Performance of Beef Heifers Wintered in Dry-Lot.

December 12, 1957, to March 20, 1958—98-day progress report.

Lot number	1	2	3	4	5
Number heifers per lot	10	10	10	10	10
Av. initial wt. per heifer, lbs.	457	455	454	456	455
Av. final wt. per heifer, lbs.	546	544	552	557	577
Av. gain per heifer, lbs.	89	89	98	101	122
Av. daily gain per heifer, lbs.	.91	.91	1.00	1.04	1.24
Av. daily ration per heifer, lbs.:[1]					
Ground sorghum grain	4.00	4.00	4.00	4.00	4.00
Soybean oil meal + Vitamin A[2]	1.25	0	1.00	.75	.25
Alfalfa hay	0	5.79	1.00	2.00	4.00
Wheat straw	5.79	0	5.75	5.05	4.17
Av. lbs. feed per cwt. gain:					
Ground sorghum grain	440	440	400	384	321
Soybean oil meal	137	0	100	72	20
Alfalfa hay	0	637	100	192	321
Wheat straw	637	0	575	485	335
Av. feed cost per cwt. gain,[3] $	17.21	13.90	15.60	14.54	11.67

1. Salt supplied free-choice and a mixture of equal parts salt and steamed bone meal, free-choice.

2. Vitamin A used was Nopcay 30 type V supplied by Nopco Chemical Co., Harrison, N.J. Each pound of soybean oil meal contained 10,000 I.U. of vitamin A.
3. Feed prices for 1957-58 are inside back cover.

Short-Term Feeding of Aureomycin (R) to Suppress the Occurrence of Respiratory Diseases in Cattle (Project 370-2—1957).

F. W. Boren, B. A. Koch, E. F. Smith, D. Richardson, R. F. Cox, W. H. Hay

One of the major problems confronting cattlemen is control of occurrence of respiratory diseases such as the shipping fever complex, colds, nasal congestion, and pneumonia. These respiratory conditions are especially troublesome to the cattle feeder who ships and receives cattle during the fall and winter months when adverse weather conditions create added stress on cattle.

It is the purpose of this study to investigate the value of orally administering antibiotics to weaning calves to control the occurrence of respiratory diseases during the first 28 days they are in the dry-lot.

Experimental Procedure

The 161 heifer and steer calves used in experiment number 1 of this test were purchased from two different ranches in New Mexico. They were loaded into railroad stock cars at Clovis, N.M., October 18, 1957. On October 20, they were unloaded at Emporia, Kan., given hay, water and allowed to rest.. Then the calves were loaded into the stock cars and arrived in Manhattan October 21. They were unloaded, weighed and immediately trucked from the railroad stock pens to the experimental beef cattle unit at Kansas State College. The calves were then randomly placed in two lots, 81 head in the control lot, and 80 head in the lot to receive aureomycin. There was approximately the same number of steer and heifer calves in each lot. Each lot was then weighed and an average beginning weight per head determined.

The 223 heifer and steer calves used in experiment number 2 of this test were purchased from one ranch in New Mexico. They were loaded into railroad stock cars at Logan, N.M., October 16, 1957, and shipped to Manhattan. The calves arrived in Manhattan October 18. They received no feed, water and rest stop en route. Upon arrival in Manhattan they were treated exactly as the calves in experiment number 1, except that they were randomly placed in two lots with about the same number of heifers and steers in each lot. One of the lots was fed aureomycin and the other was the control lot.

The daily concentrate ration fed to the control and treatment calves was as follows (pounds):

	1st week	2nd week	3rd week	4th week
Wheat bran	1.50	1.20	....	....
Dehydrated alfalfa meal	.40	.45	.40	....
Molasses	.10	.15	.20	....
Soybean meal	....	....	.40	1.00
Ground sorghum grain	....	1.20	3.00	4.00
Total daily ration	2.00	3.00	4.00	5.00

Aureomycin was added to the concentrate fed the treatment calves at a level to supply 350 mgs. per head daily. The roughage portion of the ration consisted of prairie hay fed free choice plus 2 pounds of atlas sorgo silage daily.

Each day during the study the calves in each pen were observed for respiratory disease symptoms such as an appearance of tiredness, chilling, light cough, heavy breathing, or mucus discharge from the nostrils. Any animal possessing a degree of these symptoms sufficient to warrant treatment was removed from the lot, placed in a treatment pen and treated by Dr. W. H. Hay, Assistant Professor of Surgery and Medicine, Kansas State College. The treatment used varied, depending upon the manifestation of the symptoms. Sulfonamides and antibiotics were used in treating the calves. The calves were returned to their original pens when released by Dr. Hay.

Observations

Both groups of calves used in these two experiments had a transit shrink in live weight of 9 percent. The calves used in experiment 1 appeared to have made the trip in better condition than the calves that were used in experiment 2. This could have been due to the stop-over for feed, water and rest.

Table 63 gives the results of this study. Some of the statements that can be made concerning the data presented are:

1. There was very little difference in the average daily gain of the control and aureomycin fed calves within experiments. The great difference in average daily gains between experiments is difficult to explain and no valid reason has been determined for this difference. Since this test was for only 28 days, average daily gains are of little value in evaluating the results of this study.
2. In experiment 1, only 5 percent of the animals fed aureomycin were treated during the test, whereas 11 percent of the control calves required treatment. In experiment 2, 14 percent of the animals fed aureomycin required treatment and 19 percent of the control calves were treated. Under the conditions of these experiments the feeding of 350 mgs. of aureomycin per head daily suppressed the occurrence of respiratory disease symptoms by approximately 5 percent.
3. There was no difference between experiments 1 and 2 or between controls and aureomycin-fed calves within each experiment in the average number of days each animal was in the sick pen.
4. At the beginning of this experiment the calves being fed aureomycin were slow to consume their concentrate ration. The level of aureomycin fed, 350 mgs. per head daily, decreased palatability of the ration. However, after the third day, the calves became adjusted to the concentrate and readily consumed their daily allowance.

Table 63

Short-Term Feeding of Aureomycin (R) to Suppress the Occurrence of Respiratory Diseases in Weaning Beef Calves.

Experiment number	1		2	
Date	6/21/57-7/18/57		6/18/57-7/15/57	
	28 days			
Lot number	1	2	1	2
Treatment	Control	Aureomycin	Control	Aureomycin
Number calves	81	80	101	122
Av. initial wt.	459	455	400	405
Av. final wt.	504	495	415	419
Av. total gain per head	45	40	15	14
Av. daily gain per head	1.61	1.43	.54	.50
Total animals in sick pen (28-day period)	9	4	19	17
% of total	11	5	19	14
Av. number days each animal was in sick pen	6	5.5	5	5

Aureomycin was furnished by American Cyanamid Co.

Chemical Analysis of Feeds Used in Beef Cattle Feeding Trials, 1957-58 (As Fed).

Description	Protein (Nx6.25) %	Ether extract %	Crude fiber %	Moisture %	Ash %	N-free extract %	Carbohydrates %
Coarse ground corn	10.13	3.48	1.78	14.05	1.25	69.31	71.09
Fine ground corn	10.06	3.90	1.91	12.97	1.41	69.75	71.66
Coarse sorghum grain	10.94	2.91	2.05	13.53	1.77	68.80	70.85
Fine ground sorghum grain	10.13	2.63	1.81	13.70	1.46	70.27	72.08
Sorghum grain in pellets	11.25	2.41	2.39	13.62	1.90	68.43	70.82
Soybean oil meal	42.56	2.04	5.94	13.14	5.54	30.78	36.72
Dehydrated pellets, 60% alfalfa, 40% corn	14.31	2.88	19.71	10.32	6.07	46.71	66.42
Sun-cured pellets, 60% alfalfa, 40% corn	12.25	2.58	19.41	11.20	4.77	49.79	69.20
Alfalfa hay	13.63	1.13	33.66	9.87	7.47	34.28	67.94
Sorghum silage	4.13	1.02	13.63	47.50	4.75	28.97	42.60
Milo mill feed	10.50	8.01	4.60	10.62	4.10	62.17	66.77
Wheat straw	3.81	.67				39.12	

Feed Prices Used in Beef Cattle Tests.[1]

	1956-57	1957-58
Sorghum grain, per cwt.	$ 2.50	$ 2.00
Corn, per cwt.	2.86	2.30
Soybean oil meal pellets, per ton	70.00	67.00
Soybean oil meal with stilbestrol, per ton	80.00	70.00
Sorghum silage, per ton	8.00	7.00
Alfalfa hay, per ton	25.00	16.00
Prairie hay, per ton	25.00	14.00
Wheat straw, per ton	....	12.00
Molasses, per ton	65.00	....
Urea molasses, per ton	85.00	80.00
Ammoniated blackstrap molasses, per ton	....	45.00
Bluestem pasture, summer:		
Yearling, per head	16.00	16.00
Two-year-old, per head	20.00	20.00
Bluestem pasture, winter:		
Calf, per head per month	.50	.50
Yearling, per head per month	.75	.75
Steamed bonemeal, per cwt.	....	6.00
Ground limestone, per cwt.	.75	1.00
Salt, per cwt.	.75	1.20
Aurofac 2A, per lb.	.50	....

1. The prices reported here were used in calculating beef cattle feed costs unless otherwise stated in individual reports.