tional source of protein other than that found in dry bluestem pasture and urea is desirable for calves.

Table 22

Self-Feeding Urea-Molasses and the Feeding of Aureomycin to Steer Calves Wintered on Bluestem Pasture. Compare Lot 12 with 12A and Lot 7 with 15.

Phase 1—Wintering—December 11, 1956, to March 30, 1957—109 days.

Treatment	No aureomycin	Aureomycin	Molasses and soybean meal	Urea-molasses
Lot number	12	12A	7	15
Number steers per lot	10	10	10	10
Av. initial wt. per steer, lbs.	433	432	435	435
Av. final wt. per steer	514	526	534	447
Av. gain per steer, lbs.	81	94	99	12
Av. daily gain per steer, lbs.	.74	.86	.91	.11
Av. daily ration per steer, lbs.:				
Soybean meal	1.0	1.0	1.3	
Ground sorghum grain	4.6	4.6		
Aureomycin, mgs.		45 mgs.		
Molasses, self-fed			4.0	
10% urea-molasses, self-fed				2.6
Dry bluestem pasture	Free choice		Free choice	
Salt	Free choice		Free choice	
Av. feed cost per steer,* $	23.21	24.03	25.89	18.37
Phase 2—Grazing—March 30 to July 27, 1957—119 days.				
Av. gain per steer, lbs.	211	230	205	247
Av. daily gain per steer, lbs.	1.77	1.93	1.72	2.08
Av. final wt. per steer, lbs.	725	756	739	694
Av. feed cost per steer,* $	16.00	16.00	16.00	16.00
Summary of Phases 1 and 2—December 11, 1956, to July 27, 1957—228 days.				
Av. gain per steer, lbs.	292	324	304	259
Av. daily gain per steer, lbs.	1.28	1.42	1.33	1.14
Av. feed cost per 100 lbs. gain, $	13.42	12.35	13.78	13.27
Av. feed cost per steer,* $	39.21	40.03	41.89	34.37

* Winter rations were continued until April 20, 1957, and cost is included through this date. Feed prices for 1956-57 are inside back cover; $1.00 per steer was charged for salt.

A Comparison of the Amount and Kind of Protein Concentrate for Yearling Steers on Bluestem Pasture, 1957 (Project 253-1).

E. F. Smith, B. A. Koch, F. W. Boren and G. L. Walker

In Circular 349 from this station, it has been reported in a three-year study that 2 pounds of soybean pellets fed per steer daily increased the gain .39 pound per head daily on yearling steers on bluestem pasture in late summer (August, September, and October). Most of this gain increase occurred in September and October. This report is concerned primarily with finding out if the level of supplemental feeding can be profitably lowered and if the kind of protein concentrate has any effect on performance.

Experimental Procedure

Twenty-four head of good to choice quality Hereford yearling steers were used in this test. They had been grazed together on bluestem pasture previous to the test. They were divided into four lots of six steers each in a manner to equalize any differences due to previous winter treatment. The steers had been wintered on grass the previous winter and used in other experimental tests. For this test, they were grazed on bluestem

pasture from August 5, 1957, to October 30, 1957, and received the following protein concentrates in pounds per head daily.

Pasture 1—1.0 pound soybean meal, 44 percent crude protein.
Pasture 2—2.0 pounds soybean meal, 44 percent crude protein.
Pasture 3—1.3 pounds linseed meal, 34 percent crude protein.
Pasture 4—2.6 pounds linseed meal, 34 percent crude protein.

Each pasture covered 60 acres with a good growth of grass.

Observations

By increasing the level of concentrate feeding, the gain was increased in both soybean meal and linseed meal groups. The gain increase occurred in October, with little benefit during August and September. Based on this and previous studies, it appears that in most years no supplemental feed may be necessary in August; approximately 1 pound of protein concentrate would suffice in September, and 2 pounds per head daily in October.

The differences in gain between the animals fed linseed meal and soybean meal were minor.

Table 23

A Comparison of the Amount and Kind of Protein Concentrate for Yearling Steers on Bluestem Pasture in Late Summer.

August 5 to October 30, 1957—86 days.

Pasture number	1	2	3	4
Number steers per pasture	6	6	6	6
Av. initial wt. per steer, lbs.	731	725	731	740
Av. final wt. per steer, lbs.	863	894	867	896
Av. gain per steer, lbs.	132	169	136	156
Av. daily gain per steer, lbs.	1.53	1.97	1.58	1.81
Av. daily ration per steer, lbs.:				
Soybean meal	1.0	2.0		
Linseed oil meal			1.3	2.6
Av. gain per steer by periods:				
August 5 to September 3	50.0	51.0	62.0	69.0
September 3 to October 5	78.0	72.0	53.0	53.0
October 5 to October 30	4.0	46.0	21.0	34.0
Av. total gain	132	169	136	156

A Comparison of Alfalfa and Alfalfa Plus Grain for Wintering Heifer Calves on Bluestem Pasture, 1956-57 (Project 253-2).

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

This is the second trial of this comparison. The first one was reported in Circular 349 from this station. The objective is to obtain information on the optimum level of alfalfa hay for heifers being wintered on bluestem pasture.

Experimental Procedure

Twenty-two head of good quality Hereford heifer calves purchased from the Harris Ranch at Melrose, New Mexico, were used in the test. They were divided on the basis of weight into two lots of 11 heifers each and wintered on bluestem pasture with the following treatments:

Pasture 8—Fed 4 pounds of alfalfa hay and 2.5 pounds of corn per head daily.

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

The 2.5 pounds of corn fed to pasture 8 furnished approximately the same amount of total digestible nutrients as the additional 4 pounds of alfalfa hay fed to pasture 13.

Plenty of grass was available in both pastures. The heifers had free access to salt.

Observations

The 2.5 pounds of corn and 4 pounds of alfalfa hay fed per heifer daily in pasture 8 produced .41 pound more gain per heifer daily than the 8