

## THE EFFECT OF PROTEIN SUPPLEMENT ON LATE SUMMER GAINS OF STOCKER CATTLE GRAZED ON NATIVE BLUESTEM RANGE

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### Story in Brief

Yearling steers averaging 653 lb were divided into three test groups and grazed on native bluestem range at the Pawhuska Research Station (North Central Oklahoma). One group served as a control and received no supplemental feed; the other two groups were fed about 1 lb per day of either a 38 percent protein supplement based on cottonseed and soybean meal, or a 38 percent protein supplement based on sunflower meal. Steers receiving no supplement gained .44 lb per day for the 60-day test period (July 15-September 15). Steers receiving the sunflower meal pellet gained 1.04 lb per day, and those receiving the soy-cottonseed pellet gained 1.39 lb per day.

The large improvements in gain resulting from the feeding of small amounts of high protein concentrate are consistent with other tests conducted at Oklahoma State University (Lusby & Horn 1983). The large improvements in gain would have resulted in about 1 additional lb of gain from 10-20 cents worth of protein concentrate. These results suggest that Oklahoma cattlemen grazing steers on native ranges in late summer should supplement cattle with small amounts of high protein concentrates (0.5-1.0 lb per day fed three times a week).

### Introduction

Feeding small amounts of high protein meals to cattle consuming low quality forages has been shown to increase forage digestibility and intake. Cottonseed meal or soybean meal have been shown to be effective supplements to low quality forage. Sunflower meal has not been studied in this role, but it has recently become more available and is often priced lower than the other protein meals. In recent years, some sunflower meal has been used in commercial range cattle and feedlot supplements in Oklahoma. Previous studies with late summer supplementation with protein had not been conducted on Osage county range grasses.

### Experimental Procedures

One-hundred crossbred yearling steers averaging 653 lb had been on previous grazing studies at the Pawhuska research station since January 1983. These cattle did not receive any supplement other than native range after April 13. On July 15, the cattle were divided on the basis of weight and previous treatment into three treatments with two replications each. The control treatment was maintained on grass and received no supplement. Pastures were rotated about every ten days to help remove any effect of pasture or location. The treatment receiving the 38 percent soy-cottonseed supplement received A&M 38 percent Hi Protein

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Cubes<sup>™</sup> fed at a rate of 6 lb per week (2 lb, Monday, Wednesday, and Friday) from July 15 until August 15 when the rate was increased to 9 lb per week. The experimental sunflower meal cube was fed at the same rate and schedule as the soy-cottonseed cube. Both the soy-cottonseed cube and the sunflower meal cube were formulated to contain 38 percent protein on an as fed basis. Composition of the two test cubes is shown in Table 1.

Cattle were gathered about 5pm the day before weighing and penned over night in a dry lot without feed or water. Weights were taken between 7am and 9am. Cattle had been implanted at 90-day intervals with Ralgro<sup>™</sup>, and one replication of each treatment was tagged with 2 Ectrin<sup>™</sup> ear tags and the other replication with two Atroban<sup>™</sup> tags for fly control. Statistical analysis was conducted using the Statistical Analysis Package developed by Stephen W. Hebbler.

**Table 1. Composition of test supplements (as mixed)<sup>a</sup>.**

Ingredient, %	Soy-Cottonseed Cube	Sunflower Cube
Soybean meal	43.00	0
Cottonseed meal	47.00	0
Sunflower meal	0	95.34
Dicalcium phosphate	1.00	1.00
Cane molasses	5.00	2.00
Fat	0	1.50
Vitamin A, 30000 IU/gram	.16	.16
Binders and premix	3.84	0

<sup>a</sup> Manufactured by Stillwater Milling Company, Stillwater, Oklahoma, and pelleted into 3/4 inch range cubes.

**Table 2. Weight gains of steers grazing on native Osage Bluestem with or without supplement.**

Amount Per Week:	Control None	Treatments	
		Soy-Cottonseed 6-9 <sup>a</sup>	Sunflower 6-9 <sup>a</sup>
Number of steers/treatment	33	34	33
Initial wt. (07/15/83)	674	637	664
Final wt. (09/15/83)	701	729	740
Total gain (lb)	27 <sup>b</sup>	92 <sup>c</sup>	75 <sup>d</sup>
Average daily gain	.44 <sup>b</sup>	1.48 <sup>c</sup>	1.22 <sup>d</sup>
Supplement fed/head	0	66	66
Pounds supp./lb added gain	--	1.02	1.38

<sup>a</sup> Fed 6 lb per week until August 15 when the rate was increased to 9

<sup>b,c,d</sup> Means with different superscript letters differ ( $p < .05$ ).

### Results and Discussion

The feeding of either protein supplement resulted in a significant increase in gain over the non-supplemented controls (Table 1). The

magnitude of the increase is larger than previously reported by Lusby and Horn (1983), but was in general agreement with reported field trial experience in Oklahoma.

Improvements in rates of gain as the result of feeding protein supplement to steers on summer grass were reported by Darlow (1946), Ross (1947), and Stephens (1948). In these early reports, protein increased gain .43, .31, and .64 lb per day for the respective years. However, these early tests were conducted with two- and three-year-old steers. With these older cattle, gains of the non-supplemented cattle in the summer months were far higher than can be expected with today's calves and yearlings. The recent studies would suggest that the providing of supplemental protein on late summer grass is far more important with younger animals.

The gains of cattle fed the experimental sunflower meal cube were 2.77 times greater than the non-supplemented control cattle, while the cattle on the soy-cottonseed meal based cubes were 3.36 times greater than the control cattle. There was a significant advantage in this test for the soy-cottonseed cube over the sunflower meal cube. However, when compared to the non-supplemented control lot, the gains on the sunflower cube were more than satisfactory. Additional studies with more sensitive tests will be needed to determine the relative value of sunflower meal compared to soybean or cottonseed meal for grazing cattle.

This test again demonstrates the very valuable potential for improving rates of gain and profits of cattle grazing summer ranges in Oklahoma. Even though the grass throughout this test period was green and not excessively mature, the cattle responded to supplemental protein.

#### Literature Cited

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