

# Kansas Agricultural Experiment Station Research Reports

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Volume 0  
Issue 1 *Cattleman's Day (1993-2014)*

Article 749

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1992

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### Recommended Citation

Cochran, R.C.; Vanzant, E.S.; Brandt, Robert T. Jr.; Owensby, Clenton E.; and Auen, Lisa M. (1992) "Use of low-level grain supplementation in an intensive-early stocking program: influence on daily gain and forage production," *Kansas Agricultural Experiment Station Research Reports*: Vol. 0: Iss. 1. <https://doi.org/10.4148/2378-5977.2152>

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## Use of low-level grain supplementation in an intensive-early stocking program: influence on daily gain and forage production

### Abstract

A 4-year experiment was conducted to evaluate the effect of increasing amounts of grain supplementation on steer gains and forage production in pastures managed under an intensive-early stocking system. Average daily gain tended to increase in direct proportion to increasing level of sorghum grain supplementation (2.19, 2.43 and 2.59 lb/day for the control, 2 and 4 lb/day supplement levels, respectively). The amount of grass remaining in the pastures at the end of the grazing season (approximately July 15) also increased in direct proportion to increasing sorghum grain supplementation. Forage remaining in the pastures at the end of the growing season (approximately October 1) tended to respond in a similar manner.

### Keywords

Cattlemen's Day, 1992; Kansas Agricultural Experiment Station contribution; no. 92-407-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 651; Beef; Intensive-early stocking; Supplementation; Sorghum grain; Milo

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# USE OF LOW-LEVEL GRAIN SUPPLEMENTATION IN AN INTENSIVE-EARLY STOCKING PROGRAM: INFLUENCE ON DAILY GAIN AND FORAGE PRODUCTION

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R. T. Brandt, Jr., and L. M. Auen<sup>1</sup>*

## Summary

A 4-year experiment was conducted to evaluate the effect of increasing amounts of grain supplementation on steer gains and forage production in pastures managed under an intensive-early stocking system. Average daily gain tended to increase in direct proportion to increasing level of sorghum grain supplementation (2.19, 2.43 and 2.59 lb/day for the control, 2 and 4 lb/day supplement levels, respectively). The amount of grass remaining in the pastures at the end of the grazing season (approximately July 15) also increased in direct proportion to increasing sorghum grain supplementation. Forage remaining in the pastures at the end of the growing season (approximately October 1) tended to respond in a similar manner.

(Key Words: Intensive-early Stocking, Supplementation, Sorghum Grain, Milo.)

## Introduction

Grazing livestock are generally supplemented in an attempt to address nutritional inadequacies in the basal forage diet. Most supplementation programs are employed when forage quality is low. Under such conditions, grain supplementation elicits poor results because of depression of fiber digestion and intake, unless the grain-based supplement contains adequate natural protein from some other feedstuff (a minimum of 20% total protein is typically recommended). However, low levels of grain supplements do not appear

to elicit those negative responses when offered daily to cattle grazing high-quality forages. Stocker cattle managed under an intensive-early stocking program graze forage during its period of highest nutritive value, but sometimes forage supply may be limited. Therefore, low-level grain supplementation in an intensive-early stocking program might enhance productivity and(or) help stabilize carrying capacity, which can fluctuate with changes in the forage supply. Because information was unavailable regarding the impact of low-level grain supplementation on animal and plant response under intensive-early stocking, a 4-year trial was conducted with the objective of monitoring average daily gain and changes in forage production when intensive-early stocked steers were supplemented with increasing levels of sorghum grain.

## Experimental Procedures

Crossbred beef steers were randomly assigned to six, 60-acre pastures during each of the 4 years. Average initial weights and numbers of steers used were; 1988: 554 lb, n= 240; 1989: 627 lb, n= 210; 1990: 590 lb, n= 216; 1991: 524 lb, n= 246. Stocking rate was based on the initial weight of the steers (.273 acres/100 lb of initial body weight) in order to ensure similar stocking rates among pastures and across years. Pastures were randomly assigned to three treatments (two pastures/treatment): no supplementation (control) and 2 or 4 lb rolled sorghum grain supplement per head. Supplemented groups were bunk-fed daily at approximately 1:00 to

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<sup>1</sup>Department of Agronomy. Thanks to Mr. Gary Ritter, Mr. Wayne Adolph, and the student workers at the Range Research Unit for their invaluable assistance in conducting this trial.

2:00 p.m. All pastures were burned in late April, then steers grazed the pastures from early May through mid-July. Weights were taken after an overnight stand without feed or water at trial initiation, in mid-June, and at trial termination. Conversion efficiency (lb feed/lb extra gain) was calculated by dividing the quantity of supplement fed by the amount of gain above the unsupplemented steers. All steers were implanted during initial processing and had unlimited access to a Bovatec®/mineral mixture during the entire trial. Consumption of the mixture was not different ( $P > .10$ ) among treatments and averaged .16 lb/day (approximately 115 mg Bovatec/head/day). Available forage production was measured in the pastures at the end of the grazing period (July 15) and at the end of the growing season (October 1) by clipping 10, .5 sq meter frames at random locations within the two major range sites in each pasture (loamy upland and breaks).

### Results

The total gained by steers in all treatment groups differed among years ( $P < .01$ );

however, response to supplementation was consistent throughout the four years. During the early portion of the grazing period (May to early June), supplementation did not significantly influence steer gains (Table 1), but average daily gain during the latter part of the period (early-June to mid-July) increased ( $P = .07$ ) in direct proportion to increasing level of supplement. Response to supplementation over the entire grazing period displayed a similar trend ( $P = .16$ ). The efficiency with which supplement was converted to additional gain followed the same pattern as daily gain. When averaged over the entire grazing period, 9 to 10 lb of grain were required for each additional lb of gain above the control group.

Grass and forbs remaining in the pasture at the end of the grazing period increased in direct proportion ( $P < .01$ ) to increasing level of grain supplementation. At the end of the growing season, grass left in the pastures tended to increase ( $P = .11$ ) with increasing level of supplementation. Quantity of forbs remaining was not different among treatments.

**Table 1. Influence of Level of Grain Supplementation on Daily Gain and Forage Available in Pastures at Mid-July and Early October (Four-year Average)**

Item	Supplement Level, lb/d			P-value	
	0	2	4	Linear	quadratic
Average daily gain, lb/d					
May to early-June	2.48	2.61	2.79	.33	.90
Early-June to Mid-July	1.90	2.25	2.39	.07	.53
May to Mid-July	2.19	2.43	2.59	.16	.86
Available Grass, lb/acre					
Mid-July	1105	1285	1398	< .01	.54
Early-October	1773	1888	2052	.11	.87
Available Forbs, lb/acre					
Mid-July	438	442	468	.65	.85
Early-October	496	474	461	.55	.94