

# SUPPLEMENTAL PROTEIN LEVELS FOR SPRING CALVING COWS GRAZING OLD WORLD BLUESTEM OR TALLGRASS PRAIRIE

S.I. Paisley<sup>1</sup>, G.W. Horn<sup>2</sup>, F.T. McCollum III<sup>3</sup>, G.E. Selk<sup>2</sup>,  
K.S. Swenson<sup>4</sup> and B.R. Karges<sup>5</sup>

## Story in Brief

Optimum winter supplementation strategies for cattle grazing Old World Bluestem (OWB) were evaluated utilizing 80 spring calving crossbred beef cows assigned to one of five treatments. Twenty cows grazed native tallgrass prairie and received cottonseed meal cubes (41% CP) to meet 100% of their estimated requirement for supplemental protein. Sixty cows grazed OWB and received either 25, 75, 125, or 175% of the supplemental protein fed to the cows grazing native tallgrass prairie. Protein supplementation began November 2, 1994 and ended April 18, 1995. Protein levels were altered during the supplementation period to adjust for the increased protein requirement for lactation. Weight and body condition were monitored both pre and postpartum until weaning. Initial weights and body condition scores (BCS) were similar. Cattle grazing OWB receiving 25 and 75% of their estimated protein requirement lost more weight during the prepartum period; cattle grazing tallgrass prairie gained weight. Body condition score at calving was lowest for cattle grazing OWB and receiving 25% of their protein requirement with no difference between the other four treatments. Condition score at the end of the supplementation period showed the same trends as BCS at calving. From April until weaning, cattle grazing OWB and fed 25 and 75% of their protein requirement regained more weight, resulting in similar body weights and BCS at weaning. Cows fed 25, 75, and 125% of their protein need had the largest increase in BCS during the summer months, resulting in similar condition for all treatments at weaning. These data stress the importance of adequate protein supplementation levels during the prepartum period to maintain BCS at calving and during the postpartum phase.

(Key Words: Beef Cows, Supplementation, Old World Bluestem.)

## Introduction

Old World Bluestem (*Bothriichloa* spp.) is a popular forage species that has been introduced in the southern rolling plains and prairies. This introduced species is easily established and recognized as having vigorous

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<sup>1</sup>Graduate Assistant <sup>2</sup>Professor <sup>3</sup>Former Professor <sup>4</sup>Lab Technician  
<sup>5</sup>Herdsmen

growth potential. However, there is little information on the overall value of OWB for spring calving beef cows in a continuous grazing situation. The objectives of this study were to compare the performance of spring calving cows grazing OWB and fed different levels of supplemental protein with that of cattle grazing native range fed an adequate amount of protein.

## Materials and Methods

Eighty multiparous crossbred beef cows blocked by age and weight were assigned to one of five treatment groups. All cattle received protein supplement from November 2, 1994 until April 18, 1995. Twenty cows grazed native tallgrass prairie and were fed pelleted cottonseed meal (41% CP) to provide 100% of their calculated protein requirements. The initial feeding rate (as-fed basis) for cows grazing native prairie was 2.2 lb/day. This rate was increased to 3.3 lb/day December 12. After calving, cows were individually fed approximately 4.4 lb/day. The remaining 60 cows grazed a common 200 acre pasture seeded to Plains Old World Bluestem (*Bothriochloa ischaemum* var. Plains). These cows were assigned to four treatments and fed either 25, 75, 125, or 175% of the amount of protein supplement fed to the cattle grazing native tallgrass prairie. Cows grazing tallgrass prairie and OWB were handled as separate herds with similar management practices. All cows had free choice access to trace mineralized salt.

Cow weights and body condition scores were recorded every 28 days following an 8 h shrink. During the calving season, gestating cows were weighed weekly; weights and condition scores for all cows were determined every 14 days. Calves were weaned on October 17 with pregnancy of cows determined by palpation. Data were analyzed as a completely randomized design with five treatments. Cows that failed to wean a calf were removed from the data set.

## Results and Discussion

**Prepartum Phase.** Initial BW and BCS were similar for cows on each treatment ( $P>.98$ ; Table 1, Figures 1 and 2), however, by calving, BCS was lower for cows grazing OWB and receiving the 25% supplement rate compared to all other treatments ( $P<.01$ ). Prepartum weight loss was also greatest for cows grazing OWB and receiving 25% of their protein requirement. Cows grazing tallgrass prairie were the only treatment group that gained weight during the prepartum period. Cows grazing OWB and receiving 25% of their protein requirement had the largest drop in body condition ( $P<.01$ ), followed by cows receiving 75 and 125%.

**Postpartum Phase.** Weight losses during the postpartum period were similar ( $P=.55$ ), causing cows grazing OWB and receiving 25% to remain in poorer body condition at the end of protein supplementation ( $P<.01$ ). All other treatments were similar in BCS ( $P>.05$ ).

**Grazing Phase.** Cows grazing OWB and receiving 25% of their protein requirement entered the grazing period in poorer body condition ( $P<.01$ ). During the grazing phase, cows grazing OWB and receiving 25, 75, and 125% improved in body condition ( $P<.01$ ), resulting in similar BW and condition scores for all treatments at weaning ( $P>.88$  and  $.26$ , respectively). Despite the lower BCS at calving for cows grazing OWB and receiving 25% of their protein requirement, there was no difference in pregnancy rate or calf weaning weight across treatment ( $P>.45$  and  $P>.29$ , respectively), however there were only 15 cows per treatment for cattle grazing OWB. Postpartum interval information was unavailable for this study.

Prepartum condition scores of cows grazing OWB and receiving 25% of their protein requirement were dangerously low, indicating that 25% of the required level of protein was not adequate to maintain BCS in cattle grazing OWB during the prepartum phase.

Postpartum performance was similar for all treatments; this may be partly due to the short time interval between calving and the end of supplementation. Nevertheless, BW and BCS changes were similar across treatments during this period, perhaps indicating that quality of forage was similar for OWB and tallgrass prairie during the postpartum phase.

Animals entering the grazing phase in poor condition improved their BCS during the summer months, resulting in similar weights and condition scores for all treatments at weaning.

Cows grazing OWB and receiving 25% of their protein requirement lost more weight and entered the calving period in poorer condition. These cattle were able to recover during the summer grazing period, improving in weight and condition scores. The results of this trial emphasize the importance of level of supplemental protein in maintaining weight and condition during the pre- and postpartum phase of spring calving beef cows.

**Table 1. Body weights (BW) and body condition scores (BCS) of cows grazing OWB and tallgrass prairie and receiving supplemental protein.**

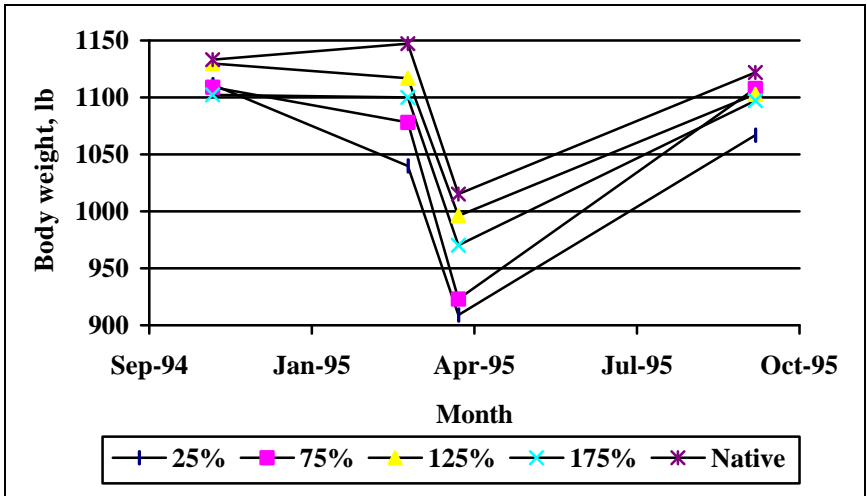
Forage type Supp. rate	Old World Bluestem				Tallgrass Prairie	SE <sup>b</sup>	P< <sup>c</sup>
	25%	75%	125%	175%	100%		
No. of cows	15	15	15	15	20		
Nov 2, 1994							
BW, lb	1111	1109	1130	1102	1133	42.5	.98
BCS	5.42	5.47	5.51	5.47	5.44	.125	.99
Calving							
BW, lb	1040	1078	1117	1100	1147	38.1	.29
BCS	4.35 <sup>e</sup>	4.89 <sup>d</sup>	5.05 <sup>d</sup>	5.23 <sup>d</sup>	5.13 <sup>d</sup>	.150	.01
Prepartum (Nov. 2 until calving)							
BW change, lb	-71 <sup>e</sup>	-30 <sup>ef</sup>	-13 <sup>df</sup>	-2 <sup>df</sup>	14 <sup>d</sup>	15.2	.01
BCS change	-1.08 <sup>e</sup>	-.57 <sup>ef</sup>	-.48 <sup>df</sup>	-.25 <sup>d</sup>	-.31 <sup>d</sup>	.100	.01
April 18, 1995							
BW, lb	909	923	996	970	1015	45.0	.33
BCS	3.82 <sup>e</sup>	4.65 <sup>d</sup>	4.95 <sup>d</sup>	4.98 <sup>d</sup>	4.97 <sup>d</sup>	.203	.01
Postpartum (Calving to April 18)							
BW change, lb	-103	-99	-114	-121	-111	10.9	.55
BCS change	-.07	.01	-.15	-.10	-.06	.107	.87
October 11, 1995							
BW, lb	1067	1108	1103	1097	1122	38.9	.88
BCS	5.54	5.97	5.96	5.87	5.63	.177	.26
Summer, 1995 (April 18 to October 11)							
BW change, lb	158	186	107	128	123	22.0	.08
BCS change	1.26 <sup>d</sup>	1.07 <sup>df</sup>	1.06 <sup>df</sup>	.74 <sup>ef</sup>	.54 <sup>e</sup>	.123	.01
Wean Wt.	505	536	497	518	542	18.2	.29
Preg. rate, %	69.2	86.7	84.6	80.0	94.4	10.3	.45

<sup>a</sup> Based on BCS scale of 1-9.

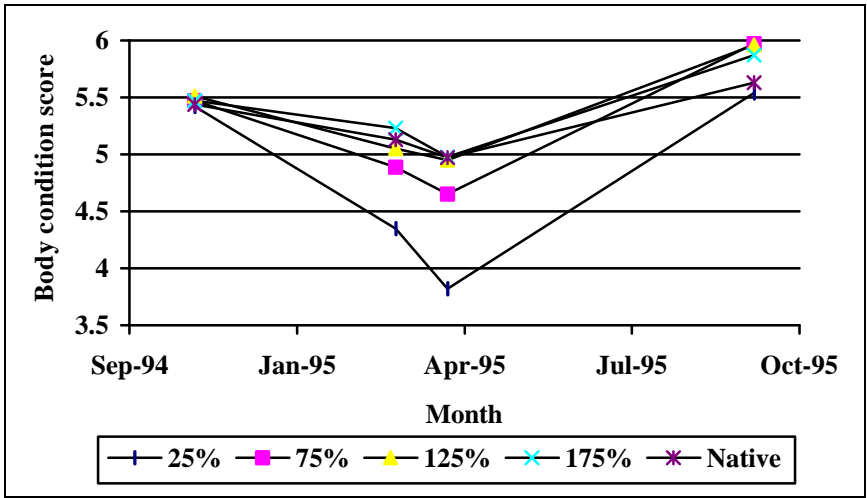
<sup>b</sup> Standard error of the mean.

<sup>c</sup> Overall level of significance.

<sup>d,e,f</sup> Means in the same row with different superscripts differ (P<.05).



**Figure 1. Body weights of cows grazing OWB and allgrass prairie receiving supplemental protein.**



**Figure 2. Body condition scores of cows grazing OWB and allgrass prairie and receiving supplemental protein.**