Orchardgrass Pastures for Early-Weaned Beef Calves

J. C. Waller
University of Tennessee, Knoxville

H. A. Fribourg
University of Tennessee, Knoxville

C. Dixon
University of Tennessee, Knoxville

A. E. Fisher
University of Tennessee, Knoxville

B. V. Conger
University of Tennessee, Knoxville

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J.C. Waller, H.A. Fribourg, C. Dixon, A.E. Fisher and B.V. Conger

congerbv@utk.edu, Department of Plant and Soil Sciences

University of Tennessee, Knoxville, TN, USA

Abstract

Orchardgrass (*Dactylis glomerata*) grown alone or with ladino white (*Trifolium repens*) and red (*T. pratense*) clovers, provides a high quality March to June pasture. However, many beef producers have their cows calving in January-March, thus producing offspring that are too young to utilize spring forage well. As an alternative, some producers have their cows bred so that calves are born in autumn (September-November). By spring, these calves are old enough to consume pasture forage. The few earlier studies on early weaning of fall-born calves consist of drylot feeding of high quality hay or concentrates. This study evaluated the potential of orchardgrass and orchardgrass-clover pastures to meet the nutritional needs of early-weaned fall-born beef calves (*Bos taurus*). Fall-born steers, 4.5-mo old, weighing about 144 kg, were used in each of 3 yr. Twenty-four were weaned and allotted at random to one of four duplicate pasture treatments: (1) TN-Syn-2 orchardgrass, grown alone or (2) with ladino white and red clovers ; (3) 'Benchmark' orchardgrass, grown alone or (4) with the clovers; another 24 remained with their dams. Early-weaned calves on high quality pastures performed well, with daily gains between 640 and 925 g d^{-1}. Dams which were not suckled were in better body condition going into the summer than those with calves.

Keywords: *Dactylis glomerata, Trifolium repens, Trifolium pratense*, orchardgrass-clover pastures, grazing

Introduction

Orchardgrass, grown alone or with clovers, provides a high quality spring (March through June) pasture. Although many beef producers have their cows calving early in the year, their offspring are too young to utilize well the spring forage growth. Other beef managers breed their cows to have calves born in autumn; when spring arrives, the calves are old enough to make substantial use of the forage. A few studies have evaluated the effect of early weaning on fall-born calves; however, calf nutrition in these studies consisted of drylot feeding high quality hay or concentrates (Peterson et al. 1987). The current study was undertaken to evaluate the potential of orchardgrass and orchardgrass-clover pastures to meet the nutritional needs of early-weaned fall-born beef calves. Due to decrease in nutritional demands, early weaning in spring also improves the body condition of the cow before she grazes pastures of lower quality in summer while in the third trimester of pregnancy. Therefore, body condition of cows and growth rates of early-weaned calves grazing high quality spring pastures were evaluated in this study.

Material and Methods

Forty-eight Angus and Angus crossbred fall-born steers, about 4.5 mo old and weighing about 144 kg (Table 1) were used each of 3 yr at Ames Plantation (35°6'N, 89°13'W). All were weighed in late March. Half remained with their dams until mid-June, the normal weaning time. The others were weaned and allotted at random (six each) to one of four pasture treatments: (1) TN-Syn-2 orchardgrass, an experimental synthetic developed at The University of Tennessee, grown alone or (2) with ‘Regal’ ladino white clover and ‘Concorde’ red clover, both inoculated with *Rhizobium*; (3) ‘Benchmark’ orchardgrass, grown alone or (4) with the clovers. Orchardgrasses were seeded at 16

kg ha^{-1}, Regal at 2.2 kg ha^{-1}, and Concorde at 4.4 kg ha^{-1}. The six clones that make up TN-Syn-2 were selected at the West Tennessee Experiment Station, Jackson, based on vigor, disease tolerance, synchronized maturity and progeny performance. They originated from a collection made from long-established stands maintained by farmers throughout Tennessee (Fribourg and Burns, 1961). All seedings were successful and resulted in spring stands containing 25 to 35% clover in the grass-clover mixtures. The pastures (0.65 ha each) were replicated twice in a randomized complete block design. Agricultural limestone was applied in March during the first two years at 2.2 Mg ha^{-1}; P and K soil tests indicated medium to high levels. Ammonium nitrate was applied each spring at 66 kg N ha^{-1} on pastures without clovers. Pastures were clipped each May and September to a height of 20 cm to maintain plants in a vegetative stage, to remove seedheads, and to prevent shading out of the clovers. When calves were early-weaned, limited amounts of wheat (*Triticum aestivum*) straw were available on the pastures during the first week to provide alternative feed during this stressful period. Steers on pastures were weighed every 21 d until grazing was terminated in mid-June. Pasture was the only source of feed, with free choice minerals, water and shade available. Forage availability was monitored every 21 d during the grazing season (mean of 85 d) from ten 50 ´ 300 cm strips ha^{-1} cut at a 5-cm stubble height. Calves remaining with their dams could suckle and graze a ‘Kentucky 31' tall fescue (*Festuca arundinacea*) pasture. The dams were weighed and rated for condition at calf weaning. At the end of the experiment, all dams and calves were weighed and dams again rated for condition. Data are presented as least squares means ± SEM (standard error of the mean). The Proc Mixed of SAS (1997) was used to compare the effects of treatments for early-weaned calves. Steer, treatment, year and pasture were treated as class variables. The final model for each analysis included treatment, year, treatment X year, and period/year as independent (fixed) variables. Pasture was included in the model as a random effect. Cow weights and condition scores were analyzed also with Proc Mixed, using

treatment, year and pasture as class variables.

Results and Discussion

Forage availability ranged between 37 and 50 kg dry matter ha^{-1} hd^{-1} d^{-1}; thus forage was vegetative throughout the experiment and never limiting (Table 1). The presence of clover substantially increased the productivity of the orchardgrasses. Calves that remained with their dams gained over 1150 g d^{-1} and weighed almost 250 kg at weaning., reflecting their access to both milk and pasture (Table 1). Calves that were weaned early and grazed excellent pastures gained less than those not weaned. However, the gains of the early-weaned calves, which ranged between 640 and 930 g d^{-1}, were acceptable. Calves that grazed orchardgrass without clover gained significantly less than those having access to grass-clover mixtures. There was no significant difference in calf gain due to orchardgrass cultivar. Although cow weights were not significantly affected by the early-weaning treatment, the condition of dams not subject to the nutritional demands for lactation was significantly better than that of cows with calves at their side (Table 2). Although a body condition score of about 5 is acceptable, the higher body condition score of cows from whom the calves were early-weaned may be desirable when summer pastures of low quality are expected to provide feed, since the cow can mobilize her body reserves to meet her nutritional requirements. On the other hand, if summer pastures are of good quality, the cow with a high body condition score may be more prone to heat stress.

Early-weaning of calves at 4.5 months of age and placing them on high quality pastures was successful. The condition of dams without calves improved going into the summer. Calf performance was the same on either grass alone, and was improved by the addition of clovers in the pastures.

References

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Table 1 - Least squares means† (±SEM‡) of available forage and performance of early- and normal-weaned calves during three spring seasons.

	Early weaning pastures				
	TN-Syn 2	TN-Syn 2 + clovers	Benchmark	Benchmark + clovers	Normal weaning (control)
Available forage, kg ha^{-1} d^{-1}	44.6 ± 5.1^{b}	50.4 ± 5.1^{c}	37.6 ± 5.1^{a}	43.8 ± 5.1^{b}	---
Initial calf weight, kg	143 ± 6.4	144 ± 6.6	144 ± 6.4	145 ± 6.6	144 ± 5.1
Final calf weight, kg	198 ± 6.4^{a}	222 ± 6.6^{b}	199 ± 6.4^{a}	218 ± 6.6^{b}	247 ± 5.1^{c}
Gain (ADG), g d^{-1}	637 ± 50^{a}	928 ± 51^{b}	641 ± 50^{a}	855 ± 51^{b}	1151 ± 47^{c}

† Numbers within a row followed by a different letter are different at P≤0.05.
‡ SEM = standard error of the mean.

Table 2 - Least squares means[†] of weight and condition scores of dams from which early- and normal-weaned steer calves were used during three spring grazing seasons.

	Early weaning	Normal weaning	SEM[‡]
Initial weight, kg	486	474	10.3
Final weight, kg	536	509	10.3
Initial condition [§]	5.0	5.1	0.12
Final condition [§]	7.0[b]	5.7[a]	0.12

[†] Numbers within a row followed by a different letter are different at P£0.05.
[‡] SEM = standard error of the mean.
[§] Condition score scale 1 to 9 (Herd, D.B. and Sprott, L.R. 1986. Body condition, nutrition, and reproduction of beef cows. Texas A&M Univ. Ext. Bull. 1526).