Level of corn-ration supplement and stocking rate on stocker performance from rye-ryegrass pasture and subsequent feedlot and carcass traits

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Application: Gain per animal and gain per acre of stockers on winter annual grass pastures provides information on management strategies for continuous ownership to harvest.

Introduction: Our objectives were to determine the effects of three levels of supplement and three stocking rates on gain per animal, gain per acre, and feedlot-carcass attributes.

Materials & Methods: 'Maton' rye at 100 lb/ac and 'TAM-90' annual ryegrass at 25 lb/ac were sod-seeded into bermudagrass in early October. Replicate pastures (n=18) were stocked from December 20 to May 17 at fixed stocking rates of 1.5, 2.1, and 3.0 hd/acre of 550-lb steers and heifers on the 3x3 experiment. The stockers were Simmental-sired from Angus x Brahman (F-1) dams. Corn-ration supplement was group-fed daily at 0, 0.4% BW, and 0.8% BW.
The corn-based ration consisted of 95.6% cracked corn, 2.5% dried molasses, 1.25% salt, 0.65% dicalcium phosphate, and Rumensin 80 at 0.0625% for 0.4% BW and 0.031% for the 0.8% BW to supply 150 mg/hd/da. At termination of stocking, cattle were shipped 425 miles to a commercial feedlot in South Texas. When feedlot cattle reached visual assessment of 0.5 inches backfat, they were transported 40 miles to an abattoir for harvest and carcass traits.

Results: On non-supplemented pastures, stocker ADG was affected ($P < 0.05$) by each stocking rate of low (1.5 hd/ac) at 2.80 lb/da, medium (2.1 hd/ac) at 2.21 lb/da, and high (3.0 hd/ac) at 1.12 lb/da (Table1). For both supplementation levels of 0.4% BW and 0.8% BW daily, ADG was similar at about 3 lb/da from cattle on low and medium stocked pastures. As stocking rate increased from 1.5 to 3.0 hd/da, ADG decreased ($P < 0.05$) by nearly 1 lb/hd/da. The efficiency of supplementation increased with increasing stocking rate, with cattle receiving 0.4% BW and on high stocking rate having the most efficient supplement:extra gain ratio of 3.9:1, and cattle receiving 0.8% BW and on low stocking rate having the least efficient ratio of 17:1.
High stocked cattle had higher feedlot ADG, greater dressing percent, and were on feed for a longer period of time (Table 3). All carcass traits were similar across stocking rates except Yield Grade, where low stocked cattle were graded lower (2.32) than high stocked (2.85). Steers were heavier off feed, had greater ADG, less days on feed, greater hot carcass weight, and larger ribeye area than heifers.

Conclusions and Implications: Low to moderate stocked rye + ryegrass pastures can result in daily gains of 2.2 to 2.8 lb. With daily supplement of an energy-based ration, ADG may range from 3.0 to 3.25 lb/day. Gain per acre can range from 650 to 700 lb/ac with non-supplement to 900 to 1000 lb/ac with 0.4% to 0.8% BW supplement. The supplement:extra gain efficiency was best on high stocked pastures.

Table 1. Effect of a corn ration supplement on stocker gains on rye + ryegrass pastures at three stocking rates.

	Daily Supplement[2] (%BW)		
Stocking Rate[1]	**0%**	**0.4%**	**0.8%**
	ADG (lb/da)		
Low	2.80 a[3]	3.11 a	3.24 a
Medium	2.21 b	2.86 a	3.11 a
High	1.12 c	1.93 b	2.10 b

[1] Stocking rates based on 550 lb BW = 1 stocker at initiation of grazing, with Low = 1.5 hd/ac, Medium = 2.1 hd/ac, High = 3.0 hd/ac.
[2] Supplement group fed at % body weight (BW) daily was a cracked corn ration containing Rumensin 80.
[3] Daily gains followed by a different letter in a supplement column are different at $P < 0.05$.

Table 2. Impact of stocking rate and sex of stockers on rye + ryegrass pastures with three daily levels of a corn ration supplement.

	Stocking Rate[1]		
	Low	**Medium**	**High**
Supplement[2]		ADG (lb/da)	
Pasture Only	2.80 b	2.21 b	1.12 b
0.4% BW CCR	3.13 a	2.86 a	1.93 a
0.8% BW CCR	3.24 a[3]	3.11 a	2.10 a
Sex of Stockers			
Steers	3.26 a	2.94 a	1.88 a
Heifers	2.86 b	2.51 b	1.56 b

[1] Stocking rates based on 550 lb BW = 1 stocker at initiation of grazing, with Low = 1.5 hd/ac, Medium = 2.1 hd/ac, High = 3.0 hd/ac.
[2] Supplement group fed at % body weight (BW) daily was a cracked corn ration (CCR) containing Rumensin 80.
[3] Daily gains followed by a different letter in a supplement column are different at $P < 0.05$.

Table 3. Feedlot and carcass traits of feeder calves previously stocked on rye-ryegrass pastures at three stocking rates with three levels of corn ration supplement

Carcass Trait	**Stocking Rate[1]**			**Feeder Sex**	
	Low	**Med**	**High**	**Steer**	**Heifer**
Final Feedlot wt (lb)	1400 a[2]	1390 a	1413 a	1442 a[3]	1360 b
Feedlot ADG, lb/d	3.51 b	3.56 b	3.96 a	3.88 a	3.47 b
Days on Feed	119 c	129 b	157 a	130 b	140 a
HCW, lb	882 a	881 a	912 a	915 a	869 b
Dressing %	63.0 b	63.4 b	64.5 a	63.5 a	63.9 a
Backfat, in	0.43 a	0.47 a	0.52 a	0.44 a	0.51 a
Rib Eye Area, in²	15.5 a	15.4 a	15.0 a	15.6 a	14.95 b
KPH, %	1.81 b	1.81 b	1.97 a	1.84 a	1.88 a
Marbling	379 a	390 a	393 a	390 a	385 a
Quality Grade	679 a	690 a	693 a	690 a	685 a
Yield Grade	2.32 b	2.48 ab	2.85 a	2.44 a	2.66 a

[1] Stocking rates based on 550 lb BW = 1 stocker at initiation of grazing, with Low = 1.5 hd/ac, Medium = 2.1 hd/ac, High = 3.0 hd/ac.
[2] Numbers followed by a different letter in a row for Stocking Rate are different at $P < 0.05$.
[3] Numbers followed by a different letter in a row for Feeder Sex are different at $P < 0.05$.