STOCKING RATE AND LEVEL OF SUPPLEMENT EFFECTS ON PERFORMANCE OF STOCKER STEERS AND HEIFERS GRAZING RYE-RYEGRASS PASTURES

F.M. Rouquette, Jr., J.L. Kerby, G.H. Nimr, and J.M. Vendramini

Background. Economic incentives for stocker cattle grazing winter annual pastures are associated with increased stocking rate to optimize gains per animal and per acre. The objective of this experiment was to ascertain relationships between stocking rates and level of supplementation on stocker calves grazing rye-ryegrass. 'Maton' rye and 'TAM-90' annual ryegrass pastures were stocked at 3 fixed SR, each with 2 replicate pastures (n=18) from 12-20-04 to 5-17-05 with crossbred steers and heifers (550 lb initial wt). A cracked corn ration was hand-fed daily at 0, 0.4% BW, and 0.8% BW/hd and adjusted monthly. The SUP ration was 95.6% cracked corn, 2.5 % dried molasses, 1.25% salt, .65% dicalcium phosphate, and Rumensin 80 at 0.0625% for 0.4% BW and 0.031% at 0.8% BW to supply 150 mg/hd/da. Hay was offered free choice from 12-20-04 until 3-15-05 to buffer impact of stocking rate during the winter months.

Research Findings. Both SR and SUP affected stocker performance. Stocker steer and heifer ADG ranged from 3.24 lbs/da on low (LO) SR plus 0.8% SUP to 1.13 lbs/da on high (HI) SR, non-SUP pasture (PAS) (Table 1). Increasing SR from 1.50 to 2.13 to 3.04 hd/ac on PAS decreased ADG ($P<.05$), respectively, at each level to 2.80, 2.21, and 1.13 lbs/da. At LO SR, there was no affect on ADG due to SUP. At both medium (ME) and HI SR, SUP increased ADG over PAS. For both 0.4% BW and 0.8 % BW SUP, ADG declined ($P<.05$) only at the HI SR (Table 2). Thus, SUP buffered the effects of stocking at 2.13 hd/ac. Figure 1 quantifies forage DM at each SR and shows treatment differences from Mar. - May. Final body condition scores of about 4.4 on all HI SR treatments were lower ($P<.05$) than those at ME (5.5) or LO SR (5.8). Gain per acre ranged from 502 lbs/ac on HI SR PAS to 1008 lbs/ac on ME SR 0.8% BW SUP pastures. Extra gain due to SUP ranged from .33 lbs/hd/day from LO SR 0.4% BW SUP to .97 lbs/hd/day from HI SR 0.8% BW SUP. The SUP:Extra gain was best at 3.9:1 on HI SR 0.4% BW SUP and worse at 16.9:1 on LO SR 0.8% BW SUP (Table 3).

Application. Without added SUP, ADG was maximized at LO SR of 1.5 hd/ac, and gain/ac of 700 lbs/ac was optimized at ME SR of 2.13 hd/ac. Using a SUP of 0.4% BW at either ME or HI SR produced the most biologically efficient conversion of SUP:Extra gain at 5.4:1 or 4:1. Increasing SUP level to 0.8% BW increased substitution of SUP for forage, especially at LO SR. The SUP level of 0.8% BW used with ME to HI SR could be a positive economical choice to reduce risks of stocking rate; however, ration cost and method of delivery needs consideration.

Table 1. Effect of stocking rate on average daily gain (ADG) on rye-ryegrass pastures.

Supplement	Stocking Rates[1] (hd/ac)		
	1.50	2.13	3.04
	ADG (lbs/day)		
Pasture Only	2.80 a[2]	2.21 b	1.13 b
0.4% BW	3.13 a	2.86 ab	1.94 a
0.8% BW	3.24 a	3.11 a	2.10 a

[1]Stocking rates based on 550lbs = 1 stocker at initiation of grazing on 12-20-04.
[2]ADG followed by a different letter in a **stocking rate** column, differ at P<.05.

Table 2. Effect of supplement level on average daily gain (ADG) on rye-ryegrass pastures.

Stocking Rate[1] hd/ac	Supplementation (% BW)		
	0	0.4%	0.8%
	ADG (lbs/da)		
1.5	2.80 a[2]	3.13 a	3.24 a
2.13	2.21 b	2.86 a	3.11 a
3.04	1.13 c	1.94 b	2.10 b

[1]Stocking rates based on 550 lbs = 1 stocker at initiation of grazing on 12-20-04.
[2]ADG followed by a different letter within a **supplement** column, differ at P<.05

Table 3. Gains per animal, per acre, and supplement (SUP) gains on rye-ryegrass pastures.

SUP	STK Rate	ADG	Gain/ Animal	Gain/ Acre	Extra Gain due to SUP	SUP Fed	SUP: Extra Gain Ratio
	hd/ac	lbs/da	lbs/hd	lbs/ac	lbs/hd/da	lbs/hd/da	lb:lb
PAS	1.52	2.80	414	630	-		-
PAS	2.13	2.21	327	697	-		-
PAS	3.00	1.13	167	502	-		-
0.4% BW	1.47	3.13	463	681	0.33	3.64	11:1
0.4% BW	2.07	2.86	423	876	0.65	3.53	5.4:1
0.4% BW	3.10	1.94	287	890	0.81	3.17	3.9:1
0.8% BW	1.51	3.24	480	725	0.44	7.44	16.9:1
0.8% BW	2.19	3.11	460	1008	0.90	7.52	8.4:1
0.8% BW	3.01	2.10	311	936	0.97	6.47	6.7:1

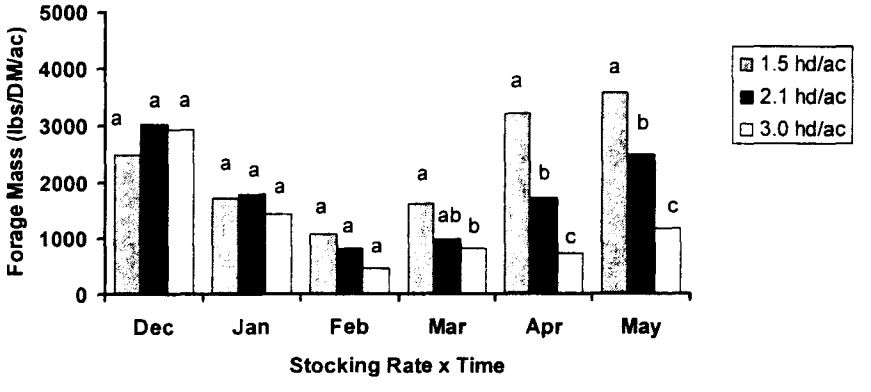

Figure 1. Forage mass of rye-ryegrass grazed at different stocking rates. Means within month, across supplement and not followed by the same letter, are different (P < 0.05).