

Calf Production from Native Range in Western North Dakota

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General summary of calf production from three grazing strategies on native range at DREC (Table 1).

< Relative differences in average daily gain (ADG; lb/d) among grazing strategies seems consistent across years and data sets. Calves in a 6.0 month seasonlong grazing strategy gain approximately .25 lb/d less than calves in 4.5 month seasonlong grazing strategy across the grazing season, which in turn produces approximately .12 lb/d less than 4.5 month rotational grazing strategy. Plotting ADG of calves from three grazing systems by date or by week of grazing helps explain some of these differences (Figures 1 and 2, Manske et al., 1988a,b).

When gain is expressed per week of grazing, there is considerable difference in grazing systems (Figure1). However when gains are expressed on a seasonal basis, much of the difference in performance due to grazing strategy is explained by an overall depression in gain late in the grazing season (Figure 2). Extended grazing into the fall at the expense of early summer grazing reduces overall gain. Nonetheless, rotational grazing produced higher ADG later in the season compared to seasonlong systems.

< Surprising, the differences in ADG among grazing strategies seems somewhat consistent across data sets and years, despite variances in stocking rates. Conventional thinking and classical data (Lewis et al., 1956; Patton et al., 2000) suggest a negative correlation within year between stocking rate and individual animal performance. Barker et al. (1991) and Kirby et al. (1991) also reported similar individual animal performance between seasonlong and rotational grazing strategies. The seasonlong treatments were stocked at 70 and 76%, respectively, of the rotational strategy. Similar animal performance with reduced stocking rates resulted in higher seasonal performance per acre with the rotational strategy. However when stocking rates were increased in the seasonlong treatment to be equal to the rotational treatment

(Kirby et al, 1991), individual animal performance was not affected and seasonal performance was similar between these grazing strategies. Hypotheses to help explain this disparity in increasing stocking rate with no change in individual animal performance are not currently available. Potential interactions in grazing strategy and stocking rate on grassland health and overall ecology have not been reported.

< Despite specific differences between grazing strategies on individual animal performance, ultimate stocking rate (anticipated and actual) stocking rate seems to have a larger impact in determining difference among grazing strategies on seasonal performance per acre. For example (Manske, 2000), a grazing strategy that increased ADG .1 lb/d over a 135-d grazing season would have similar seasonal performance (increased total performance by 13.5 lb/hd) if stocking rates were similar and total grazing days were reduced by 7 days (e.g. 128 vs 135 actual grazing days).

< Other data (Patton et al., 2000) demonstrate the need, biologically, ecologically and financially, for determining and implementing optimum stocking rates.

References

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(http://www.ag.ndsu.nodak.edu/streeter/2000report/grazing_intensity.htm; May 11, 2001)

Table 1. Comparisons of calf production from three grazing strategies on native range at Dickinson R/E Center.

Dataset		Grazing Strategy		
		6.0 m Seasonlong (6.0SL)	4.5 m Seasonlong (4.5SL)	4.5 m Rotational (4.5RT)
1983-1987^a	time ^b	-	18Jun - 30Oct	01Jun - 17Oct
Stocking rate ^c	ac/COWM ^d	-	2.08	2.01
Calf gain	lb/d	-	2.14 ^x	2.21 ^x
seasonal	lb/ac	-	24.2 ^x	28.4 ^x
1984-1987, 1989^e	time	-	-	-
Stocking rate	ac/AU	-	8.2	8.5
Calf gain ^f	lb/d	-	no difference in seasonal average daily gains	
- early			2.6 ^y	2.2 ^x
- late			2.0 ^x	2.5 ^y
1990^g	time	-	mid Jun - late Oct ^h	01Jun - 15Oct ^h
Stocking rate	ac/COWM	-	1.77	2.27
Calf gain	lb/d	-	2.54	2.60
seasonal	lb/ac	-	25.4	26.7
Unknownⁱ	time	15May - 15Nov	18Jun - 30Oct	01Jun - 15Oct
Stocking rate	ac/AUM	4.04	2.86	2.04
Calf gain	lb/d	1.80	2.09 ^x	2.21 ^x
seasonal	lb/ac	13.6	20.5 ^x	28.5 ^y
1998-2000^j		15May - 15Nov	01Jun - 15Oct	01Jun - 15Oct
Stocking rate	ac/AUM	2.22	2.22	2.27
Calf gain	lb/d	2.39	2.60	2.75
seasonal	lb/ac	32.3	35.0	33.1

^a Data taken from two sources: (1) Manske et al., 1988. 38th Livestock Research Roundup. Dxn R/E Center, NDSU pp1-4 and (2) Manske et al. 1988. ND Cow/Calf Conference. NDSU pp5-17.

^b Anticipated grazing periods.

^c Anticipated stocking rate assuming desired length of grazing period is achieved.

^d AUM and COWM refer to an animal unit (AU) month and a cow month, respectively. An AU is assumed to be equivalent to a 1000-lb cow and accompanying calf. An animal unit month is roughly the amount of forage consumed by one AU in one month. A cow unit is used when standardized units are not reported in original source. Note that extrapolating animal unit capacity to seasonal calf production may be confusing due to differences between actual and standardized cow size.

^e Biondini, M.E. and L. Manske. 1996. Ecol. Appl. 6(1):239-256.

^f No difference in calf mass gains between treatments or among years.

^g Manske et al. <http://www.ag.ndsu.nodak.edu/dickinso/research/1990/rpt8.htm>.

^h Drought conditions shortened actual grazing season to 20Jun-10Sep and 04Jun-17Sep for seasonlong and rotational grazing strategies, respectively.

ⁱ Data taken from three sources:

(1) Manske, L.L. <http://www.ag.ndsu.nodak.edu/dickinso/research/1994/grass94b.htm>,

(2) Manske, L.L. <http://www.ag.ndsu.nodak.edu/dickinso/research/1995/grass95e.htm>. and

(3) Manske, L.L. and K.K. Sedivec. <http://www.ag.ndsu.nodak.edu/dickinso/research/1999grass99h.htm>.

^j Data taken from L.L. Manske <http://www.ag.ndsu.nodak.edu/dickinso/research/2000/range00g.htm>.

^{x,y} Means within a row with differing superscripts differ ($P < .05$).

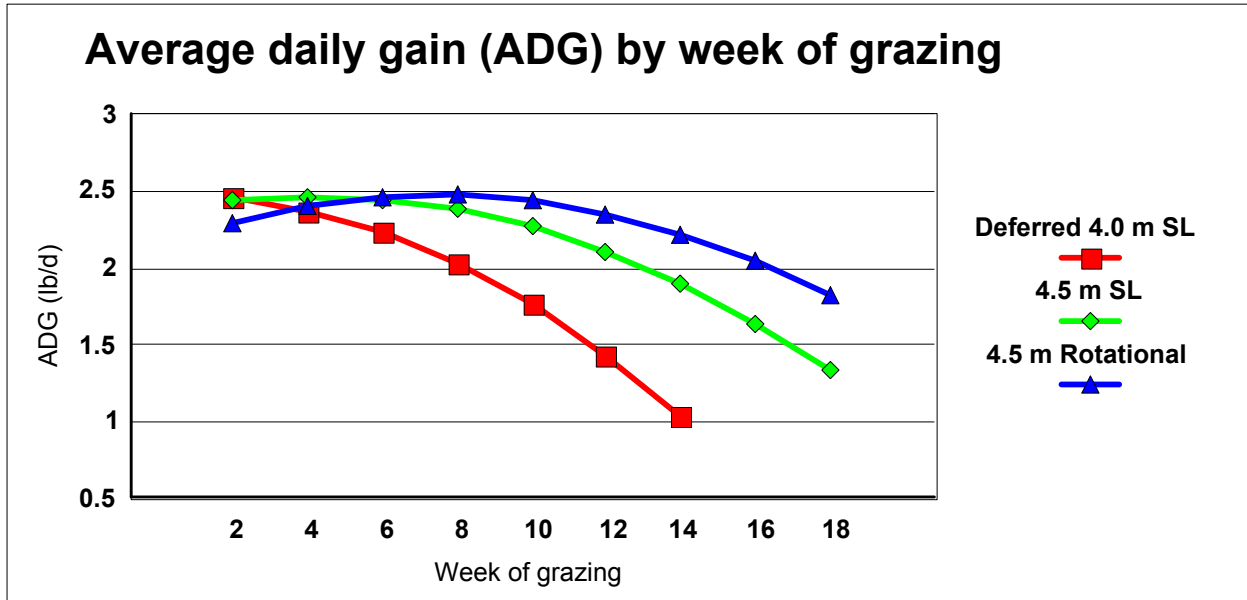


Figure 1. Effect of grazing week on suckling beef calves in three different grazing systems (Manske et al., 1988a,b).

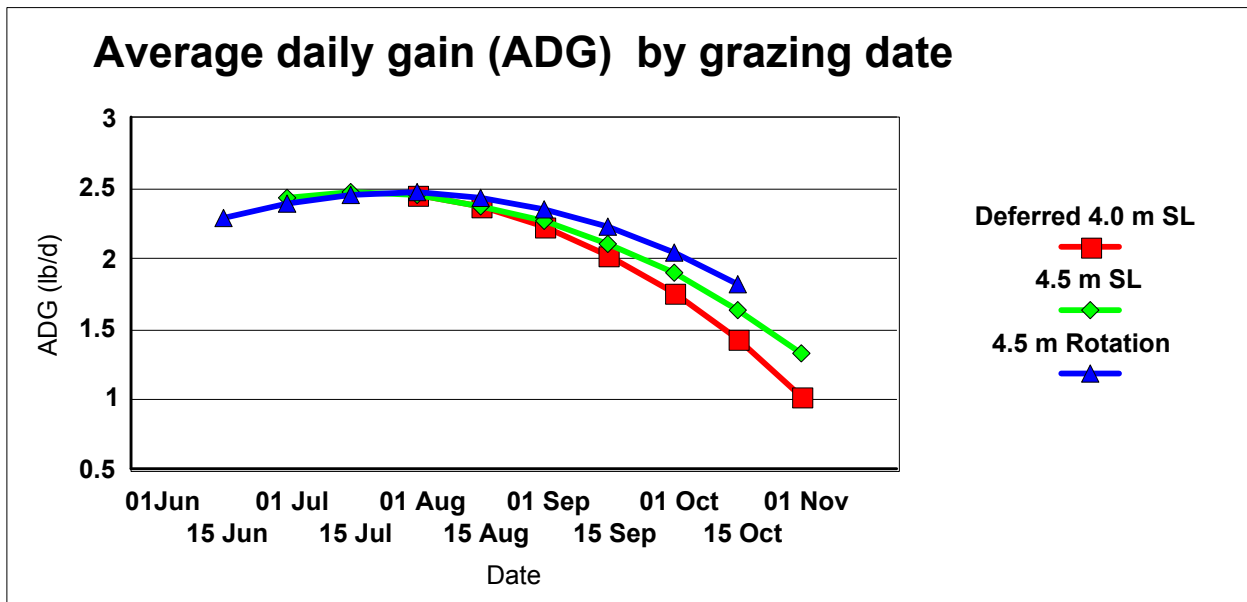


Figure 2. Effect of grazing date on suckling beef calves in three different grazing systems (Manske et al., 1988a,b).