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Effect of Summer Grazing on Crude Protein and Digestibility of Winter Diets of Cattle in the Nebraska Sandhills

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Year and winter sampling date significantly affect quality of winter diet samples from sandhills range, whereas summer stocking rate and date of summer grazing do not have a large impact.

Summary

Twenty-one pastures (three pastures/treatment) were used in a two-year study to determine the effects of summer grazing on winter diet quality of Sandhills range. Summer grazing treatments consisted of no summer grazing (control) and June or July grazing at three stocking rates. After summer grazing, pastures were then diet sampled using esophageally fistulated cows in November, January and March following summer treatments. Year and sampling date had a significant effect on CP and IVDMD of winter range diets, whereas summer grazing treatments did not have a large impact.

Introduction

Rotational grazing is a prevalent range management practice in the Nebraska Sandhills. Many ranches employing rotational grazing graze pastures one or more times during the spring and summer and graze residual/regrowth forage in the winter. The nutritional value of winter forage is variable, not well-defined and may vary with date and/or amount grazed during the growing season.

Winter diets of cattle on Sandhills range are usually less than 6% CP. Due to this low quality relative to cattle needs, winter grazing is normally coupled with protein supplementation. Lack of data describing winter diet quality variability and factors relating it to present difficulty in balancing supplementation needs with basal range diet quality. Since both over- and under-feeding of supplement can be costly, it is important to characterize winter diet quality as affected by summer grazing management.

The objective of this research was to determine the effects of June or July grazing at four levels of forage removal on the chemical composition and digestibility of sandhills winter range diets.

Procedure

In this study, 21 upland native range pastures, 2.47 acres each, were used at Gudmundsen Sandhills Laboratory. During the growing seasons of 1995 and 1996, seven grazing treatments were applied to these pastures (three pastures/treatment). Treatments consisted of a control with no summer grazing and June or July grazing at three stocking rates each. Stocking rates were 33, 67 and 100% of the stocking rate (.6

AUM's/acre) recommended for the upland range site where the study pastures are located.

Following summer grazing, pastures were winter diet sampled using two esophageally fistulated cows per pasture. Diet samples were obtained after allowing cows to graze each pasture for 45 minutes. Sampling dates for both study years were early November, early January and late March. After diet samples were freeze-dried and ground, the two samples obtained from each pasture were composited on an equal weight basis. Composited samples were then analyzed for CP and IVDMD.

Results

Table 1 shows the CP levels and digestibility of November, January and March diets from the two years of the study. There was a year "x" sampling date interaction ($P < .005$) which is reflective of different CP changes over sampling dates in year 1 relative to year 2. Lower CP in January diets compared to other sampling dates in year 1 may have been due to snow cover affecting the cows' ability to select a higher-quality diet. There was also snow cover offering a possible explanation for the lower observed CP in both January and March of year 2. Digestibility of winter

Table 1. Crude protein content and digestibility by year and month of winter diet samples from sandhills range, DM basis.

Item	Winter 1995-96			Winter 1996-97		
	Sampling date					
	Nov	Jan	Mar	Nov	Jan	Mar
CP ^a	6.5	6.0	7.0	5.5	4.7	4.2
IVDMD ^b	55.9	55.1	55.0	52.7	52.2	53.3

^aYear x sampling date interaction ($P < .005$).

^bYear main effect ($P < .05$).

Table 2. Crude protein and digestibility of winter diet samples from sandhills range listed by summer grazing treatment, DM basis.

Item	Control	June grazed			July grazed		
	0	Stocking rate ^a			Stocking rate ^a		
		33	67	100	33	67	100
CP	5.4	5.6	5.7	5.5	5.5	6.0	6.0
IVDMD ^b	55.1	54.4	54.3	53.9	53.8	53.1	53.7

^aPercentage of recommended annual stocking rate (e.g. % of .6 AUM's/acre).

^bControl vs. grazed ($P = .09$).

diets was affected ($P < .05$) by year but was not affected by winter sampling time.

In Table 2, mean crude protein and digestibility values are listed by summer treatment. Diets collected from control pastures tended to be higher (P

$= .09$) in digestibility than pastures grazed during the summer. There were no significant summer treatment effects on CP levels in winter diets.

Summer grazing treatments did not have a significant impact on winter diet quality of Sandhills range. However,

year-of-winter sampling caused variation in CP and digestibility and month-of-winter sampling affected CP of winter diet samples. Small differences in chemical composition, especially CP, could have a notable effect on supplementation and cow performance over a winter grazing season. The variation in CP and IVDMD observed in this study is evidence that winter diet quality is not static and is an important management consideration.

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