

## NORTH DAKOTA—Impacts of Advancing Season on Forage Intake & Digestibility in Grazing Livestock

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In evaluating some data from a few years back we were reminded of the importance of advancing season, or the progression of time during a season, on forage quality for grazing ruminants. In a grazing project previously conducted at the Central Grasslands REC, in Streeter, ND, we evaluated the impacts of grazing intensity and advancing season on forage intake and nutrient digestibility of forage from northern Plains rangelands in steers. All steers were supplemented with distillers dried grains with solubles at 0.3% of animal body weight throughout the grazing season to offset any potential deficits in protein supplied to the animals by forage alone. Regardless of grazing treatment, average daily gain of steers did not differ and averaged 2.6 lbs/day.

Forage nutrient compositions in the pastures were evaluated by collection of masticate samples, or samples of grazed forage removed from the animals' rumens after a short grazing period. Neutral detergent fiber (NDF) and acid detergent fiber (ADF) concentrations increased with advancing season. Crude protein (CP) content decreased from 18.3% in June to 12.3% in September. These CP values may seem higher than anticipated which is likely due to animal selectivity while grazing and data being presented on an organic matter vs. dry matter (DM) basis. In-vitro organic matter digestibility (IVOMD) of forage masticate samples decreased from 70.3% in June to 47.6% in September. Nutrient content of forage masticates in May was influenced by a high amount of ash in the samples and are likely not representative of actual forage nutrient values. Responses seen here would be typical in the northern plains where pastures dominated by cool-season forages decrease in nutritional value in summer months. Decline in forage quality often necessitates some form of supplemental feed to continue to meet production goals for livestock, especially later in the grazing season.

In regards to forage intake, the data clearly demonstrated that grazing treatment, in this case grazing intensity, did not impact forage intake. The impacts of advancing season resulted in dry matter intake (DMI) increasing from 10 lbs/day (May) to 17 lbs/day (June-July) and then increasing again to 19.4 lbs/day (August-September). Intakes in May were lower than expected but were attributed to inexperienced animals beginning grazing with less than ideal forage availability and adverse weather occurring the week of data collection. Total tract organic matter and DM digestibility demonstrated that digestibility increased early in the grazing season (May to June) followed by what we would typically expect in regards to a decrease



Forage masticate samples containing significant amounts of buckbrush.

**Table 1.** Nutrient content of forage masticate samples of steers grazing mixed-grass prairie.<sup>1</sup>

	May	June	July	August	September	SEM
NDF, %	58.4	69.9	67.5	70.7	75.2	3.81
ADF, %	37.2	38.5	37.1	39.5	43.1	4.05
CP, %	29.9	18.3	16.9	14.9	12.3	0.86
IVOMD <sup>2</sup> , %	75.9	70.3	62.1	52.8	47.6	3.35

<sup>1</sup>Data represents nutrient content of forage masticate samples (% organic matter basis) collected from cannulated steers across various grazing intensities. <sup>2</sup>In-vitro organic matter digestibility. SEM-standard error of the mean.

**Table 2.** Total tract digestibility and in situ rate of nutrient disappearance of mixed-grass prairie.<sup>1</sup>

	May	June	July	August	September	SEM
Forage DMI <sup>2</sup> , lb	10.0	17.0	17.1	19.5	19.2	0.8
Total Tract Digestibility <sup>3</sup>						
DM, %	62.3	64.0	61.3	55.9	49.4	1.2
OM, %	59.4	65.6	63.1	59.9	51.3	1.6
NDF, %	49.3	63.2	59.0	55.3	49.8	1.8
CP, %	75.2	68.1	64.4	60.0	45.2	2.0

<sup>1</sup>Data is representative of a given period across other grazing intensity treatments. <sup>2</sup>Forage dry matter intake, calculated with use of indigestible markers and in-vitro forage digestibility. <sup>3</sup>Calculated. SEM-standard error of the mean.



Cattle grazing rangelands at Central Grasslands REC, near Streeter, ND.



Cannulated steers being turned out on pasture.

in digestibility starting in July and continuing through September. Total tract CP digestibility decreased linearly throughout the grazing season.

A number of research projects over the years have demonstrated that advancing season decreases the nutrient profile and forage digestibility in the northern plains. There are many ways in which we have attempted to manipulate forage quality or availability through grazing systems over the years, but research has shown the impacts of plant maturity continues to be a major hurdle for nutritional management of grazing livestock. Cattle in the northern Plains may require supplementation to offset declining forage digestibility of northern Plains rangelands especially with higher production goals.

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Graduate student Kayla Chilcoat turning out cannulated steers on pasture.