## NORTH DAKOTA-Impact of Grazing Intensity & Advancing Season on Forage Intake and Digestion of Beef Steers Grazing Mixed Grass Prairie

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Project objectives were to determine impacts of grazing intensity and advancing season on: chemical composition, intake, and total nutrient digestion of forage grazed by beef cattle; ruminal fermentation, passage rate, and in situ rates and extent of nutrient digestion; and, relationships between intake, digestion, and animal body weight changes associated with advancing season. The grazing portion of this experiment was successfully conducted May-September 2015. The grazing trial was conducted at the Central Grasslands Research and Extension Center (CGREC) located on the Missouri Coteau in southcentral North Dakota, directly on the pastures established for long-term grazing intensity research (Patton et al., 2002; Patton and Nyren, 2014). Cattle grazed from May 15-September 11 on 12 native grass pastures. Major pasture grasses are Kentucky bluegrass (Poa pratensis), needle and thread (Stipa cornata), western wheatgrass (Agropyron smithii), and blue grama (Bouteloua gracilis). Fringed sage (Artemisia fridgida), rigid goldenrod (Solidago rigida), and cudweed sagewort (Artemisia ludouiciana) are the primary forbs. Western snowberry (Symphoricarpos occidentalis) is the only shrub species.

Experimental methodologies included ruminal cannulated and non-cannulated cattle co-grazing one of 12 pastures. Twelve ruminal cannulated steers (one/pasture) co-grazed with intact animals in each pasture. Intact animals were used to establish grazing intensity. Steers were stocked at densities so at the end of the grazing season (September 11), 65% (lightly grazed), 50% (moderately grazed), 35% (heavily grazed), and 20% (extremely grazed) of the long-term average annual forage production was remaining. Each treatment had been assigned 3 pastures. Cattle were allowed to freely graze and had free access to water and salt-based trace mineral supplements. In addition, all cattle were hand-fed known amounts of dried distiller's grains on a daily basis (0.3% of body weight). Five 10-day collection periods were conducted in May, June, July, August, and September. During each collection period, individual animal measurements were taken to accomplish specific objectives. On day one of each collection period, grazed masticate forage was collected on each study pasture using ruminal cannulated animals and ruminal evacuation technique. Grazed forage masticates were used for dietary chemical composition and rates and extent of in situ nutrient digestion. On days 6-10 of each collection period, samples were taken for measuring ruminal fermentation and passage, in situ and in vitro digestibility, and for determining fecal output, which will be used in equations to estimate forage intake. All collected samples are currently in the laboratory being analyzed. When completed, resulting data will be analyzed statistically and impacts of season and grazing intensity determined.