**Effects of Supplementation Strategy and Dormant Season Grazing on Cattle Use of Mixed-Grass Prairie Habitats

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Dormant season grazing reduces reliance on harvested feeds, but typically requires protein supplementation to be successful. However, information relating supplementation strategies to individual resource utilization on dormant forage is lacking. Thus, the intent of this research is to examine cattle resource utilization, residual cover of vegetation and utilization on rangelands grazed during the dormant season under two supplementation strategies. Thirty transects were randomly located within each pasture for measuring vegetation composition, production, canopy cover and visual obstruction readings (VOR) pre and post grazing. Grazing locations were monitored for seven individuals within each treatment with Lotek GPS collars containing head position sensors that record daily space use. Resource utilization effect size was variable by treatment and time period. Vegetation response to treatment was similar for both cake and protein treatments across time periods (44.2 ± 4.8% vs 41.7 ± 4.5%, 36.7 ± 4.8% vs 30.7 ± 4.3%, 10.4 ± 3.1% vs 16.5 ± 3.5%). VOR was affected by supplementation treatment during time period 1, such that protein treatment significantly decreased VOR in comparison to the Cake treatment (36.6 ± 5.6% vs 15.7 ± 3.6%). Herbaceous and ground cover effects were similar across both supplementation treatments during time periods 1 and 3, while time period 2, cake supplementation had greater percent decrease of litter cover than the protein treatment (28.2 ± 4.4% vs 10.4 ± 2.9%). This research addresses comprehensive agro-ecosystem responses of dormant season grazing while providing multidimensional insight to stakeholders concerning grazing behavior and the ecological impacts on Montana rangelands.