

PRELIMINARY RESULTS
DIGESTIBILITY AND METABOLIC RESPONSES
TO PROTEIN AND FAT SUPPLEMENTS
FED TO LACTATING RANGE COWS

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We evaluated the effects of providing different nutrients in cube supplements when fed to rumen-cannulated, lactating cows grazing winter-spring dormant range (primarily blue grama). Four, three-year old, Hereford x Angus x Hereford cows nursing their first calves were used in three periods to test the supplements fed in another study (Control, Bypass, Fat, and Bypass + Fat cubes). Cannulated cows were kept in the same pasture as those lactating two-year old cows at the NMSU Corona Range and Livestock Research Center in spring 1995. After at least a 10 day adjustment period to supplements, rumen and blood samples were collected from the cannulated cows. This was done simultaneous to incubating nylon bags filled with coarsely ground, supplemented cubes or diet samples in the rumen over a 96 hour period. Samples were taken and bags removed at 0, 3, 6, 9, 18, 32, 48, 72, and 96 hours. Cows were fed the supplements after the 0, 48, and 96 hour collections around noon. Morning (approximately 6-9 am) and evening (approximately 4 - 9 pm) grazing patterns were observed during collections. Observations of night grazing (9 pm to 6 am) were not conducted.

Diet samples used in the nylon bags

were collected at 0700 by evacuating the rumens of the four cannulated cows, allowing them to graze approximately 45 minutes, collecting the fresh material that they selected, and then refilling the rumen with the digesta that had first been removed. Samples collected on April 9, April 30, and May 27 had 16.7, 14.5, and 11.4% crude protein and 82.6, 85.9, and 83.9% neutral detergent fiber (organic matter basis), respectively.

In three periods, the Control, Bypass, Fat, and Bypass + Fat cubes were fed. Each cow received a different supplement in each period. The first period was April 21 to 25, during which a snow storm occurred on April 22 and prevented some sample collections. Forage samples collected on April 30 were used for the second and third periods (May 9 to 13 and May 22 to 26). Low quality hay (8.4% crude protein and 86.3% neutral detergent fiber, organic matter basis) was fed after the 9 (9 pm) and 18 (6 am) hour collections to keep the cows penned and ensure samples could be collected during periods 2 and 3. Other than between 0 and 32 hours, cannulated cows had free access to the range.

Preliminary results from diet samples

incubated for 0, 19, 48, and 96 hours during periods 2 and 3 indicate an interaction ($P < .01$) for forage organic matter disappearance at 19 hours. Cows fed the Bypass or Fat cube had digested the most organic matter (33.1% vs 29.0% disappearance for Bypass and Fat vs Control and Bypass + Fat cubes, respectively). At 48 hours, fiber disappearance was less ($P = .02$) when Bypass and Bypass + Fat cubes were fed (43.4 and 43.6% disappearance, respectively) than Control and Fat supplements (49.8 and 49.6% disappearance, respectively). A similar trend

($P = .12$) was found for OM digestibility. Disappearance of OM still tended ($P = .12$) to be less for high bypass protein treatments (Bypass and Bypass + Fat cubes) at 96 hours. Currently, data are being analyzed for blood metabolites (glucose, free fatty acids, cholesterol, and urea nitrogen), rumen samples (pH, volatile fatty acids and ammonia), and the remaining nylon bag samples (organic matter, cube protein, and forage fiber digestibility). These results will illustrate how the supplemental nutrients are being used in lactating range cows and if they are complementing the native forage.