ABSTRACT
SUPPLEMENTAL FEEDS TO MEET NUTRIENT LIMITATIONS OF RANGE LIVESTOCK IN NEW MEXICO

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New Mexico rangelands are sparse nutritional environments throughout much of the year, and supplementation of livestock is often necessary for optimal production. During drought, emergency feeds are often cost-prohibitive. Cholla cactus has been used in New Mexico as an emergency feed during drought for over 100 years. Wethers were fed a basal diet of mature blue grama hay with 3 levels of singed chopped cholla cactus to determine its digestibility. Mean cholla DM, OM, NDF, and CP digestibilities averaged 32.6%, 44.3%, 27.9% and 67.6%, respectively. As cholla increased in the diet, NDF digestibility decreased linearly ($P < 0.05$). Due to its poor feeding value and low DM content, the use of cholla cactus as an emergency feed should be carefully considered.

Young beef cows experience negative energy balance postpartum. Glucose tolerance tests were conducted to investigate the influences of seasonal forage quality changes and physiological state on nutrient status of young range cows. Glucose
half-life was shorter \((P < 0.01)\) in summer compared to winter/spring (87 vs. 50 ± 6 min). Glucose half-life was shorter \((P < 0.05)\) for lactating compared to non-lactating cows (53 ± 11 vs 95 ± 12 min). Cows grazing green summer forage were more insulin sensitive than cows consuming a poor quality diet, while lactating cows were more sensitive to insulin than non-lactating cows. Differences in cow performance between late winter and summer may be due to hormonally regulated differences in energy metabolism, and physiological state may influence tissue responsiveness to insulin.

The need for supplementation of cattle may be amplified due to increased nutrient demand postpartum. Three supplements containing increasing glucogenic precursors (0, 80, and 160 g propionate salt; UIP, UIP80, UIP160 respectively) were fed to young postpartum range cows. Return to cyclicity was similar \((P > 0.05)\) among treatments (51, 64, and 59 ± 4.5 d for UIP, UIP80, and UIP160, respectively). Cows produced similar \((P > 0.05)\) amounts of milk in all treatment groups (7392, 7570, and 8009 ± 384 g/d for UIP, UIP80, and UIP160, respectively) and exhibited similar \((P > 0.05)\) tissue response to insulin (glucose half-life 74, 75, and 85 ± 13 min for UIP, UIP80 and UIP160, respectively). Cows produced more milk and returned to estrus earlier than observed in previous postpartum experiments conducted at the Corona Range and Livestock Research Center. Increasing supplement glucogenic precursors had no effect on nutrient partitioning, and cows fed UIP80 and UIP160 may have used the additional glucose for milk production.

Key Words: Cholla Cactus, Insulin Sensitivity, Protein Supplements