

Utilization of Supplemental Fat by Dairy Cows Fed Diets Varying in Content of Nonstructural Carbohydrates

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Sixteen Jersey cows were used in a Latin square design to determine milk production and composition when the cows were fed supplemental fat in diets varying in nonstructural carbohydrate content. Eight cows were used in a second experiment to assess ruminal fermentation and nutrient digestibilities. Diets were 1) high nonstructural carbohydrates, no added fat; 2) high nonstructural carbohydrates, 2.5% added fat; 3) low nonstructural carbohydrates, no added fat; and 4) low nonstructural carbohydrates, 2.5% added fat. Diets consisted of alfalfa haylage, corn silage, and concentrate (22:22:56, DM basis). Soyhulls replaced corn grain in diets 3 and 4; high and low diets contained 37.3 and 27.2% nonstructural carbohydrate. The DMI, milk production, and milk fat content were not affected by fat or nonstructural carbohydrates, although milk production tended to be higher when cows were fed fat. Fatty acid composition and N distribution of milk were unchanged by nonstructural carbohydrates. Supplemental fat decreased contents of CP, casein N, and true protein N in milk. Low nonstructural carbohydrates increased total VFA concentration and percentage of acetate and decreased percentages of propionate and butyrate in ruminal fluid. Total fatty acid digestibility decreased when cows were fed fat. Digestibilities of fiber components and total fatty acids were higher for diets low in nonstructural carbohydrates. Dietary content of nonstructural carbohydrates did not affect production of milk or milk components by Jersey cows fed supplemental fat.

Key Words: dietary fat • nonstructural carbohydrates • soyhulls • dairy cows

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