The objective of this experiment was to assess the optimal levels of dietary fiber (DF) incorporated in high concentrate (HC) and low concentrate (LC) diets for limit-fed dairy heifers. Eight Holstein heifers (335.6 ± 7.41 kg BW) were randomly assigned to 2 levels of concentrate: HC (20% forage) and LC (80% forage) and to a forage type sequence (0% of forage as corn stover (CT), 100% corn silage (CS); 20% CT, 80% CS; 40% CT, 60% CS; 60% CT, 40% CS) within forage level administered according to a split-plot, 4 × 4 Latin square design (21-d periods). All diets provided similar intakes of ME and allowed 800 g/d of ADG. DF (NDF and ADF) and non-fiber carbohydrates composition were allowed to vary with the dietary ingredients. HC-fed heifers had higher apparent total tract (TD) digestibility of dry matter (DM; 72.6 vs. 64.9 ± 0.52%; \( P \leq 0.01 \)) than LC. Increasing DF level by increasing the amount of CT in the diet resulted in a linear decrease of DMTD (73.3, 71.5, 66.2 and 63.9 ± 0.51%, respectively; \( P \leq 0.01 \)). Organic matter TD followed the same pattern as DMTD. LC diets had higher NDF (\( P \leq 0.01 \)) and tended to have lower ADF TD than HC diets (\( P = 0.06 \)). As level of DF increased, NDF and ADF TD had a cubic response with 20% CT diets having the highest values. HC diets decreased fecal output on DM and wet-bases, and DF had a decreasing linear effect on these parameters (\( P \leq 0.01 \)). Urine volume excretion tended to be higher for HC-fed heifers (16.2 vs. 7.7 ± 2.51 kg/d; \( P = 0.06 \)) and increasing level of DF tended to decrease urine output (\( P = 0.10 \)). Total purine derivatives did not differ between treatments or CT level, but uric acid tended to be higher in HC-fed heifers (\( P = 0.06 \)), and tended to decrease linearly (\( P = 0.10 \)) when levels of DF increased. We conclude that CT decreased DM, and OM TD linearly while NDF, and ADF TD were maximized when 20% CT was added to HC and LC diets; HC diets were more digestible and generated less fecal output, but total manure was not different between HC or LC diets.

**Key Words:** high concentrate diet, fiber, limit-feeding, dairy heifer

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