Abstract


Consumption of High-Oleic Acid Ground Beef Increases HDL-Cholesterol Concentration but Both High- and Low-Oleic Acid Ground Beef Decrease HDL Particle Diameter in Normocholesterolemic Men.

Gilmore LA, Walzem RL, Crouse SF, Smith DR, Adams TH, Vaidyanathan V, Cao X, Smith SB.

Department of Animal Science, and Texas A&M University, College Station, TX 77843.

OBJECTIVE: On the basis of previous results from this laboratory, this study tested the hypothesis that ground beef high in MUFA and low in SFA would increase the HDL-cholesterol (HDL-C) concentration and LDL particle diameter.

METHODS: In a crossover dietary intervention, 27 free-living normocholesterolemic men completed treatments in which five 114-g ground beef patties/wk were consumed for 5 wk with an intervening 4-wk washout period. Patties contained 24% total fat with a MUFA:SFA ratio of either 0.71 (low MUFA, from pasture-fed cattle) or 1.10 (high MUFA, from grain-fed cattle). High-MUFA ground beef provided 3.21 g more 18:1(n-9), 1.26 g less 18:0, 0.89 g less 16:0, and 0.36 g less 18:1(trans) fatty acids per patty than did the low-MUFA ground beef.

RESULTS: Both ground beef interventions decreased plasma insulin and HDL(2) and HDL(3) particle diameters and increased plasma 18:0 and 20:4(n-6) (all P ≤ 0.05) relative to baseline values. Only the high-MUFA ground beef intervention increased the HDL-C concentration from baseline (P = 0.02). The plasma TG concentration was positively correlated with the plasma insulin concentration (r = 0.40; P < 0.001) and negatively correlated with HDL-C (r = -0.47; P < 0.001) and plasma 18:0 (r = -0.24; P < 0.01). Plasma insulin and HDL diameters were not correlated (r = 0.01; P > 0.50), indicating that reductions in these measures were not coordinately regulated.

CONCLUSIONS: The data indicate that dietary beef interventions have effects on risk factors for cardiovascular disease that are independent (insulin, HDL diameters) and dependent (HDL-C) on beef fatty acid composition.

PMID: 21525253