

Abstract

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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.

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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 $P \leq 0.05$) 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.

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