The Effects of Including Lean Unprocessed Beef in a Healthy Vegetarian Dietary Pattern on Cardiometabolic Disease Risk Factors

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Objectives: To assess the effects of transitioning a Healthy Vegetarian Dietary Pattern (VEG) to a healthy omnivorous dietary pattern (BEEF) by substituting predominantly starchy vegetables and refined grains with lean unprocessed beef on cardiometabolic disease (CMD) risk factors. We hypothesized that consuming the BEEF would improve CMD risk factors more so than the VEG.

Methods: In a 16-week randomized, crossover, controlled feeding trial, n = 41 subjects (22 female, 19 male; age: 39.9 $\pm$ 8.0 y; BMI: 29.6 $\pm$ 3.3 kg/m^2; mean $\pm$ SD) without a diagnosed disease completed two 5-week controlled feeding periods, separated by 5 weeks of consuming self-selected, unrestricted diets (washout). Both dietary patterns were weight maintenance, isocaloric, and US-style healthy eating patterns. The VEG diet was lacto-ovo and the BEEF diet substituted starchy vegetables and refined grains with 6 oz/d of lean unprocessed beef. Baseline and post intervention outcomes included fasting serum lipids, lipoproteins, lipoprotein particle sizes, glucose, insulin; systolic and diastolic blood pressures (SBP and DBP); and waist and hip circumferences (WC and HC). Data are presented as least squares means $\pm$ standard error (p < 0.05), adjusted for age, sex, and body mass.

Results: Over time, concentrations of serum total cholesterol (TC), HDL, apolipoprotein A1, small dense LDL IV, and buoyant HDL-2b, TC: HDL, and SBP decreased (p < 0.05), independent of diet. VEG but not BEEF reduced LDL (-10.6 ± 3.0 vs. -5.8 ± 2.9 mg/dL, respectively, intervention x time p = 0.035) and insulin (-1.4 ± 0.5 vs. -0.04 ± 0.5 μIU/mL, respectively, intervention x time p = 0.020). Triglycerides, VLDL, lipoprotein A, apolipoprotein B, remnant lipoprotein, small dense LDL III, glucose, DBP, WC, and HC were not influenced. Post intervention there were no statistical differences between VEG and BEEF for any outcome.

Conclusions: Adopting a US-style Healthy Vegetarian Dietary Pattern or a healthy omnivorous dietary pattern containing lean unprocessed beef improved multiple cardiometabolic disease risk factors among adults classified as overweight or obese.