

Type 2 Diabetes

Effects of coffee consumption on subclinical inflammation and other risk factors for type 2 diabetes: a clinical trial

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American Journal of Clinical Nutrition, Vol. 91, No. 4; pp. 950-957, 2010

Significance: Coffee consumption appears to have beneficial effects on subclinical inflammation and HDL cholesterol.

This study investigated the effects of daily coffee consumption on biomarkers of coffee intake, subclinical inflammation, oxidative stress, glucose, and lipid metabolism in 47 habitual coffee drinkers. Subjects refrained for 1 mo from coffee drinking; in the second month they consumed 4 cups of filtered coffee/d and in the third month 8 cups of filtered coffee/d (150 mL/cup). Results showed that coffee consumption led to an increase in coffee-derived compounds, mainly serum caffeine, chlorogenic acid, and caffeic acid metabolites. Significant changes were also observed for serum concentrations of interleukin-18, 8-isoprostane, and adiponectin (medians: -8%, -16%, and 6%, respectively; consumption of 8 compared with 0 cups coffee/d). Serum concentrations of total cholesterol, HDL cholesterol, and apolipoprotein A-I increased significantly by 12%, 7%, and 4%, respectively, whereas the ratios of LDL:HDL-cholesterol and of apolipoprotein B to apolipoprotein A-I decreased significantly by 8% and 9%, respectively (8 compared with 0 cups coffee/d).

Cardiovascular Disease

Food sources of individual plasma phospholipid *trans* fatty acid isomers: the Cardiovascular Health Study

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American Journal of Clinical Nutrition, Vol. 91, No. 4; pp. 883-893, 2010

Significance: Different *trans* fatty acid isomers and dietary sources should be considered when investigating health effects and interventions to lower *trans* fatty acids.

This study determined the major independent food sources of 10 plasma phospholipid *trans* fatty acid (TFA) isomers [5 *trans* (*t*-) 18:1, 3 *t*-18:2, and 2 *t*-16:1] in 3330 older adults. Results showed that all 5 *t*-18:1 isomers were similarly associated with foods commonly made with partially hydrogenated vegetable oils, including biscuits (0.51 higher SD of total 18:1 fatty acid concentrations/serving/d, $P<0.01$), chips and/or popcorn (0.33 higher SD/serving/d, $P=0.02$), margarine (0.32 higher SD/serving/d, $P<0.001$), fried foods (0.32 higher SD/serving/d, $P=0.04$), and bakery foods (0.23 higher SD/serving/d, $P=0.02$). Each of the *t*-18:2 isomers were associated only with bakery foods (0.50 higher SD of total 18:2 fatty acid concentrations/serving/d, $P<0.001$). Ruminant foods were major correlates of *t*-

16:1n-7, including red meats (0.72 higher SD/serving/d, $P < 0.001$), butter (0.43 higher SD/serving/d, $P < 0.001$), and higher-fat dairy (0.37 higher SD/serving/d, $P < 0.001$). In contrast, *t*-16:1n-9 was derived mainly from margarine (0.31 higher SD/serving/d, $P < 0.001$).

Lipids

Low-fat dietary pattern and lipoprotein risk factors: the Women's Health Initiative Dietary Modification Trial

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American Journal of Clinical Nutrition, Vol. 91, No. 4; pp. 860-874, 2010

Significance: The replacement of 7–8% of fat intake with complex carbohydrates over 6 y was not associated with clinically adverse effects on triglycerides, HDL-cholesterol, or lipoprotein subclasses.

The effects of dietary carbohydrate changes on lipids and lipoprotein composition were investigated in postmenopausal women who were randomly assigned to an intervention or a comparison group for a mean of 8.1 y. Lipoprotein analyses and subclasses were based on subsamples of 2730 and 209 participants, respectively. At year 6, the total reported fat intake was 7.8% lower and carbohydrate intake was 7.6% higher in the intervention group than in the comparison group. Triglyceride change between groups differed by 2.3, 3.8, and –0.8 mg/dL at 1, 3, and 6 y, respectively, and HDL-cholesterol change differed by –1.6, –0.7, and –1.0 mg/dL at 1, 3, and 6 y, respectively. In diabetic intervention women who were white, the triglyceride difference between the intervention and comparison groups was 33.8 mg/dL, whereas in black women with diabetes (intervention group (n=50); comparison group (n=83)), the triglyceride difference was 6.4 mg/dL (P for 3-factor interaction=0.049). Reductions in LDL-cholesterol varied by quartile of reported lowering of saturated or *trans* fat.

Caloric Sweetener Consumption and Dyslipidemia Among US Adults

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Journal of the American Medical Association, Vol. 303, No. 15; pp. 1490-1497, 2010

Significance: There was a statistically significant correlation between dietary added sugars and blood lipid levels among US adults.

This cross-sectional study assessed the association between consumption of added sugars and blood lipid levels in US adults (n=6113) from the NHANES 1999-2006. Respondents were grouped by intake of added sugars (<5% [reference group], 5%–<10%, 10%–<17.5%, 17.5%–<25%, and $\geq 25\%$ of total calories). Results showed a mean of 15.8% of consumed calories was from added sugars. Among participants consuming <5%, 5%–<17.5%, 17.5%–<25%, and $\geq 25\%$ of total energy as added sugars, adjusted mean HDL-C levels were, respectively, 58.7, 57.5, 53.7, 51.0, and 47.7 mg/dL ($P < .001$ for linear trend), geometric mean triglyceride levels were 105, 102, 111, 113, and 114 mg/dL ($P < .001$ for linear trend), and LDL-C levels modified by sex were 116, 115, 118, 121, and 123 mg/dL among

women ($P=.047$ for linear trend). Among higher consumers ($\geq 10\%$ added sugars) the odds of low HDL-C levels were 50% to more than 300% greater compared with the reference group ($<5\%$ added sugars).

Metabolic Syndrome

The effect of dietary phytosphingosine on cholesterol levels and insulin sensitivity in subjects with the metabolic syndrome

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European Journal of Clinical Nutrition, Vol. 64, No. 4; pp. 419–423, 2010

Significance: Dietary supplementation of phytosphingosine decreases plasma cholesterol levels and enhances insulin sensitivity in men with metabolic syndrome.

This double-blind cross-over study examined the effect of dietary supplementation with phytosphingosine (PS) on cholesterol and glucose metabolism in 12 men with metabolic syndrome (MetS). Subjects were randomly assigned to 4 weeks of PS (500mg twice daily) and 4 weeks of placebo with a 4-week wash-out period between both interventions. At the end of each intervention anthropometric measures and serum lipids were measured and an intravenous glucose tolerance test (IVGTT) was performed. Phytosphingosine did not affect body weight and fat mass compared with placebo (P). PS decreased serum total cholesterol (5.1 ± 0.3 (PS) vs 5.4 ± 0.3 mmol/l (P); $P<0.05$) and LDL-cholesterol (3.1 ± 0.3 (PS) vs 3.4 ± 0.3 (P) mmol/l; $P<0.05$), whereas it did not alter serum triglyceride and HDL-cholesterol levels. In addition, PS lowered fasting plasma glucose levels (6.2 ± 0.3 (PS) vs 6.5 ± 0.3 (P) mmol/l; $P<0.05$). PS increased the glucose disappearance rate (K -value) by 9.9% during the IVGTT (0.91 ± 0.06 (PS) vs 0.82 ± 0.05 (P) %/min; $P<0.05$) at similar insulin levels, compared with P, thus implying enhanced insulin sensitivity.

Calcium and Vitamin D Intakes

Estimation of Total Usual Calcium and Vitamin D Intakes in the United States

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Journal of Nutrition, Vol. 140, No. 4; pp. 817-822, 2010

Significance: Monitoring usual total nutrient intake is necessary to adequately characterize and evaluate the population's nutritional status and adherence to recommendations for nutrient intake.

This study estimated calcium intakes from food, water, dietary supplements, and antacids for U.S. citizens aged ≥ 1 y using NHANES 2003–2006 data and the Dietary Reference Intake panel age groupings. Similar estimates were calculated for vitamin D intake from food and dietary supplements using NHANES 2005–2006. A total of 53% of the U.S. population reported using any dietary supplement (2003–2006), 43% used calcium (2003–2006), and 37% used vitamin D (2005–2006). For users, dietary supplements provided the adequate intake (AI) recommendation for

calcium intake for ~12% of those ≥ 71 y. Males and females aged 1–3 y had the highest prevalence of meeting the AI from dietary and total calcium intakes. For total vitamin D intake, males and females ≥ 71 , and females 14–18 y had the lowest prevalence of meeting the AI. Dietary supplement use is associated with higher prevalence of groups meeting the AI for calcium and vitamin D.

Beverage Intake

Girls' Early Sweetened Carbonated Beverage Intake Predicts Different Patterns of Beverage and Nutrient Intake across Childhood and Adolescence

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Journal of the American Dietetic Association, Vol. 110, No. 4; pp. 543-550, 2010

Significance: A complex picture emerges about early beverage patterns and their predictive effects on nutrient intake across childhood and adolescence.

This longitudinal study described changes in beverage intake during childhood among 170 non-Hispanic white girls and also assessed beverage and nutrient intake from ages 5-15 years among girls who were consuming or not consuming sweetened carbonated beverages (soda) at age 5 years. Intakes of beverages (milk, fruit juice, fruit drinks, soda, and tea/coffee), energy, macronutrients, and micronutrients were assessed using three 24-hour recalls. Early differences in soda intake were predictive of later soda and milk intake and of differences in selected nutrients. Relative to girls who were not consuming soda at age 5 years, soda consumers at age 5 years had higher subsequent soda intake, lower milk intake, higher intake of added sugars, lower protein, fiber, vitamin D, calcium, magnesium, phosphorous, and potassium from ages 5 to 15 years. Soda consumption at age 5 years predicted patterns of nutrient intake that persisted during childhood and into adolescence.

Caffeine

Caffeine (1, 3, 7-trimethylxanthine) in Foods: A Comprehensive Review on Consumption, Functionality, Safety, and Regulatory Matters

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Journal of Food Science, Vol. 75, No. 3; pp. R77-R87, 2010

Significance: Despite reported benefits, the potential negative effects of excessive caffeine intake should be considered, particularly in children and pregnant women.

Caffeine ranks as one of the top most commonly consumed dietary ingredients throughout the world. It is naturally found in coffee beans, cacao beans, kola nuts, guarana berries, and tea leaves including yerba mate. The total daily intake, as well as the major source of caffeine varies globally; however, coffee and tea are the 2 most prominent sources. Soft drinks are also a common source of caffeine as well as energy drinks. Moderate caffeine consumption is considered safe and its use as a food ingredient has been approved, within certain limits. Performance benefits

attributed to caffeine include physical endurance, reduction of fatigue, and enhancing mental alertness and concentration. Caffeine has also been recently linked to weight loss and consequent reduction of the overall risks for developing the metabolic syndrome. However, the caloric contribution of caffeine-sweetened beverages needs to be considered in the overall energy balance.