

Cardiovascular Disease

The Effect of Grape Seed Extract on Cardiovascular Risk Markers: A Meta-Analysis of Randomized Controlled Trials

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Significance: Grape seed extract appears to significantly lower systolic blood pressure and heart rate, with no effect on lipid or C-reactive protein levels.

This systematic review assessed the effect of grape seed extract (GSE) on changes in blood pressure, heart rate, lipid levels, and C-reactive protein (CRP) levels. Nine randomized, controlled trials (N=390) met the inclusion criteria, and a meta-analysis was conducted. GSE significantly lowered systolic blood pressure (weighted mean difference -1.54 mm Hg (95% confidence interval -2.85 to -0.22 , $P=0.02$)), and heart rate (weighted mean difference -1.42 bpm (95% confidence interval -2.50 to -0.34 , $P=0.01$)). No significant effect on diastolic blood pressure, lipid levels, or CRP was found. No statistical heterogeneity was observed for any analysis ($I^2 < 39\%$ for all). Egger's weighted regression statistic suggested low likelihood of publication bias in all analysis ($P > 0.05$ for all), except for the effect on diastolic blood pressure ($P=0.046$).

Coronary Heart Disease

Fatty Acids in the de novo Lipogenesis Pathway and Risk of Coronary Heart Disease: The Cardiovascular Health Study

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Link to full text: <http://www.ajcn.org/content/94/2/431.full>

Significance: Higher plasma phospholipid 18:1n-7 and 16:1n-9 concentrations were prospectively associated with an elevated risk of SCA but not of other CHD events, except in secondary analyses.

This community-based prospective study investigated the relations of 4 fatty acids in the de novo lipogenesis (DNL) pathway—palmitic acid (16:0), palmitoleic acid (16:1n-7), 7-hexadecenoic acid (16:1n-9), and cis-vaccenic acid (18:1n-7)—with incident coronary heart disease (CHD), including fatal CHD, nonfatal myocardial infarction (NFMI), and sudden cardiac arrest (SCA) in 2890 men and women aged ≥ 65 y, who were free of known CHD at baseline and who were followed from 1992 to 2006. During 29,835 person-years of follow-up, 631 CHD and 71 SCA events occurred. Both 18:1n-7 and 16:1n-9 were associated with a higher risk of SCA [multivariable-adjusted

hazard ratio (95% CI) for the interquintile range: 7.63 (2.58, 22.6) for 18:1n-7 and 2.30 (1.16, 4.55) for 16:1n-9] but not of total CHD, fatal CHD, or NFMI. In secondary analyses, 16:1n-9 was also associated with a significantly higher risk of total CHD (2.11; 1.76, 2.54), including a higher risk of CHD death, NFMI, and SCA.

Metabolic Syndrome

Dairy Attenuates Oxidative and Inflammatory Stress in Metabolic Syndrome

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Significance: An increase in dairy intake attenuates oxidative and inflammatory stress in metabolic syndrome.

This study determined the early (7 d) and sustained (4 and 12 wk) effects of adequate-dairy (AD) compared with low-dairy (LD) diets in 40 overweight and obese adults with metabolic syndrome. Subjects were randomly assigned to receive AD (3.5 servings/day) or LD (<0.5 servings/day) weight-maintenance diets for 12 wk. AD decreased malondialdehyde and oxidized LDL-cholesterol at 7 d (35% and 11%, respectively; $P<0.01$), with further decreases by 12 wk. Inflammatory markers were suppressed with intake of AD, with decreases in tumor necrosis factor- α at 7 d and further reductions through 12 wk (35%; $P<0.05$); decreases in interleukin-6 (21%; $P<0.02$) and monocyte chemoattractant protein 1 (14% decrease at 4 wk, 24% decrease at 12 wk; $P<0.05$); and a corresponding 55% increase in adiponectin at 12 wk ($P<0.01$). LD exerted no effect on oxidative or inflammatory markers. Diet had no effect on body weight; however, AD significantly reduced waist circumference and trunk fat ($P<0.01$ for both), and LD exerted no effect.

Grains, Vegetables, and Fish Dietary Pattern is Inversely Associated with the Risk of Metabolic Syndrome in South Korean Adults

J. Kim, I. Jo

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Significance: A specific Korean dietary pattern that includes grains, vegetables, and fish may be associated with lower risk of metabolic syndrome in South Korean adults.

The association between habitual dietary patterns and the risk of metabolic syndrome (MS) in South Korean adults was examined in 9,850 Korean adults (aged ≥ 19 years) who participated in the second and third Korean National Health and Nutrition Examination Survey. Four dietary patterns were derived using factor analysis (white rice and kimchi pattern; meat and alcohol pattern; high fat, sweets, and coffee pattern; and grains, vegetables, and fish pattern). Each dietary pattern explained 8.6%, 6.7%, 5.7%, and 5.7% of the variation in food intakes, respectively.

The meat and alcohol pattern was adversely associated with hypertriglyceridemia (P for trend 0.01) and elevated blood pressure (P for trend 0.01) after adjustments for potential risk factors of MS such as age, sex, BMI, energy intake, alcohol intake, smoking status, and physical activity. In contrast, the grains, vegetables, and fish pattern was associated with lower risk of hypertriglyceridemia (P for trend 0.0002) and was also inversely associated with the risk of MS after adjusting for risk factors of the MS (P for trend 0.02).

Lipids

Effects of Cocoa Products/Dark Chocolate on Serum Lipids: A Meta-Analysis

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Link to full text: <http://www.nature.com/ejcn/journal/v65/n8/full/ejcn201164a.html>

Significance: There are beneficial effects of dark chocolate/cocoa products on total- and LDL-cholesterol and no major effects on HDL-cholesterol and triglycerides in short-term intervention trials.

This meta-analysis examined the effects of dark chocolate/cocoa product consumption on the lipid profile using published trials. A detailed literature search was conducted for randomized controlled clinical trials assessing the effects of flavanol-rich cocoa products or dark chocolate on lipid profile. Ten clinical trials consisting of 320 participants were included in the analysis. Treatment duration ranged from 2-12 weeks. Intervention with dark chocolate/cocoa products significantly reduced LDL- and total-cholesterol (TC) (differences in means (95% CI) were $-5.90 \pm \text{mg/dl}$ ($-10.47, -1.32 \pm \text{mg/dl}$) and $-6.23 \pm \text{mg/dl}$ ($-11.60, -0.85 \pm \text{mg/dl}$), respectively). No statistically significant effects were observed for HDL-cholesterol (difference in means (95% CI): $-0.76 \pm \text{mg/dl}$ (-3.02 to $1.51 \pm \text{mg/dl}$)) and triglyceride ($-5.06 \pm \text{mg/dl}$ (-13.45 to $3.32 \pm \text{mg/dl}$)).

Effect of a Dietary Portfolio of Cholesterol-Lowering Foods Given at 2 Levels of Intensity of Dietary Advice on Serum Lipids in Hyperlipidemia: A Randomized Controlled Trial

D.J.A. Jenkins, P.J.H. Jones, B. Lamarche, C.W.C. Kendall, D. Faulkner, L. Cermakova, et al.

Journal of the American Medical Association, Vol. 306, No. 8; pp. 831-839, 2011

Link to full text: <http://jama.ama-assn.org/content/306/8/831.full>

Significance: Use of a dietary portfolio compared with the low-saturated fat dietary advice resulted in greater LDL-C lowering during 6 months of follow-up.

This parallel-design study assessed the effect of a dietary portfolio (cholesterol-lowering foods) administered at 2 levels of intensity on percentage change in LDL-C among 351 participants with hyperlipidemia following self-selected diets. Subjects were randomized to 1 of 3 treatments lasting 6 months: intensive dietary portfolio, routine dietary portfolio, for which counseling was delivered at different frequencies, that emphasized dietary incorporation of plant sterols, soy protein, viscous fibers, and nuts, or a low-saturated fat therapeutic diet (control). The LDL-C

reductions from an overall mean of 171 mg/dL (95% CI, 168-174 mg/dL) were -13.8% (95% CI, -17.2% to -10.3%) for the intensive dietary portfolio; -13.1% (95% CI, -16.7% to -9.5%) for the routine dietary portfolio; and -3.0% (95% CI, -6.1% to 0.1%) for the control diet. Percentage LDL-C reductions for each dietary portfolio were significantly more than the control diet ($P<.001$, respectively). The 2 dietary portfolio interventions did not differ significantly. Among participants randomized to one of the dietary portfolio interventions, percentage reduction in LDL-C on the dietary portfolio was associated with dietary adherence ($r = -0.34$, $n=157$, $P<.001$).

Type 2 Diabetes

Decreases in Dietary Glycemic Index Are Related to Weight Loss among Individuals following Therapeutic Diets for Type 2 Diabetes

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Journal of Nutrition, Vol. 141, No. 8; pp. 1469-1474, 2011

Link to full text: <http://jn.nutrition.org/content/141/8/1469.full>

Significance: A low-GI diet appears to be one of the determinants of success of a vegan or ADA diet in reducing body weight among people with type 2 diabetes.

This 22-wk, randomized trial assessed the effect of changes in glycemic index (GI) and load (GL) on weight loss and glycated hemoglobin (HbA1c) among 99 individuals with type 2 diabetes beginning a vegan diet or diet following the 2003 American Diabetes Association (ADA) recommendations. The vegan group reduced GI to a greater extent than the ADA group ($P<0.05$), but GL was reduced further in the ADA than the vegan group ($P<0.001$). GI predicted changes in weight ($P=0.001$), adjusting for changes in fiber, carbohydrate, fat, alcohol, energy intake, steps/day, group, and demographics, such that for every point decrease in GI, participants lost ~0.2 kg (0.44 lb). GI was not a predictor for changes in HbA1C after controlling for weight loss ($P=0.33$). Weight loss was a predictor of changes in HbA1C ($P=0.047$).

Broccoli Sprouts Reduce Oxidative Stress in Type 2 Diabetes: A Randomized Double-Blind Clinical Trial

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European Journal of Clinical Nutrition, Vol. 65, No. 8; pp. 972-977, 2011

Link to full text: <http://www.nature.com/ejcn/journal/v65/n8/full/ejcn201159a.html>

Significance: Broccoli sprouts had favorable effects on oxidative stress status in type 2 diabetes patients.

This double-blind, placebo-controlled, randomized clinical trial investigated the effects of broccoli sprouts powder (BSP) on some oxidative stress parameters in 81 type 2 diabetics. Subjects were randomly assigned to one of three treatment groups for 4 weeks: 10 g/d BSP ($n=27$), 5 g/d BSP ($n=29$) or placebo ($n=25$). Serum total antioxidant capacity (TAC), total oxidant status (TOS), oxidative stress index (OSI), malondialdehyde (MDA) and oxidized LDL-cholesterol were measured at baseline and at 4 weeks after treatment. Sixty-three patients in three groups were

included in the analysis: 10 g/d BSP (n=21), 5 g/d (n=22) and placebo (n=20). After 4 weeks, consumption of BSP resulted in significant decrease in MDA (P=0.001 for treatment effect), oxidized LDL-cholesterol (P=0.03 for treatment effect), OSI (P=0.001 for treatment effect) and significant increase in TAC (P=0.001 for treatment effect).

Effects of Supplemented Isoenergetic Diets Differing in Cereal Fiber and Protein Content on Insulin Sensitivity in Overweight Humans

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American Journal of Clinical Nutrition, Vol. 94, No. 2; pp. 459-471, 2011

Link to full text: <http://www.ajcn.org/content/94/2/459.full>

Significance: Greater changes in insulin sensitivity after intake of an isoenergetic high-cereal-fiber than after intake of a high-protein diet might help to explain the diverse effects of these diets on diabetes risk.

This study compared the effects of isoenergetic high-protein (HP) and high-cereal-fiber (HCF) diets and a diet with moderate increases in both cereal fibers and dietary protein (mix diet) on insulin sensitivity, as measured by using euglycemic-hyperinsulinemic clamps with infusion of [6,6-²H₂] glucose. Overweight adults (n=111) with features of metabolic syndrome were randomly assigned to 1 of 4 two-phased, 18-wk isoenergetic diets by group-matching. Eighty-four participants were included in the final analyses. Insulin sensitivity expressed as an M value was 25% higher after 6 wk of the HCF diet than after 6 wk of the HP diet. Effects were attenuated after 18 wk (treatment × time interaction: P=0.054), which was likely explained by lower adherence to the HP diet. HP intake was associated with a tendency to increased protein expression in adipose tissue of the translation initiation factor serine-kinase-6-1, which is known to mediate amino acid-induced insulin resistance. Biomarkers of protein intake indicated interference of cereal fibers with dietary protein absorption.

Sugars

Low to Moderate Sugar-Sweetened Beverage Consumption Impairs Glucose and Lipid Metabolism and Promotes Inflammation in Healthy Young Men: A Randomized Controlled Trial

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American Journal of Clinical Nutrition, Vol. 94; No. 2; pp. 479-485, 2011

Link to full text: <http://www.ajcn.org/content/94/2/479.full>

Significance: There are potentially harmful effects of low- to moderate-consumption of sugar-sweetened beverages on markers of cardiovascular risk such as LDL particles, fasting glucose, and hs-CRP within just 3 wk in healthy young men.

This prospective, randomized, controlled crossover trial investigated the effects of sugar-sweetened beverages (SSBs) consumed in small to moderate quantities for 3 wk on LDL particle distribution and on other parameters of glucose and lipid metabolism as well as on inflammatory markers in 29 healthy young men. Six 3-wk interventions

were assigned in random order as follows: 600 mL SSBs containing 40 g fructose/d [medium fructose (MF)], 80 g fructose/d [high fructose (HF)], 40 g glucose/d [medium glucose (MG)], 80 g glucose/d [high glucose (HG)], 80 g sucrose/d [high sucrose (HS)], or dietary advice to consume low amounts of fructose. LDL particle size was reduced after HF by -0.51 nm (95% CI: $-0.19, -0.82$ nm) and after HS by -0.43 nm (95% CI: $-0.12, -0.74$). Similarly, a more atherogenic LDL subclass distribution was seen when fructose-containing SSBs were consumed (MF, HF, and HS: $P < 0.05$). Fasting glucose and high-sensitivity C-reactive protein increased significantly after all interventions (by 4–9% and 60–109%, respectively; $P < 0.05$); leptin increased during interventions with SSBs containing glucose only (MG and HG: $P < 0.05$).

Infant formula

Effect of a Partially Hydrolyzed Whey Infant Formula at Weaning on Risk of Allergic Disease in High-Risk Children: A Randomized Controlled Trial

A.J. Lowe, C.S. Hosking, C.M. Bennett, K.J. Allen, C. Axelrad, J.B. Carlin, et al.

Journal of Allergy and Clinical Immunology, Vol. 128, No. 2; pp. 360-365, 2011

Significance: Despite current dietary guidelines, there is no evidence to support recommending the use of partially hydrolyzed whey formula at weaning for the prevention of allergic disease in high-risk infants.

This single-blind (participant) randomized controlled trial determined whether feeding infants partially hydrolyzed whey formula (pHWF) reduces their risk of allergic disease. Allergic outcomes were compared between infants fed a conventional cow's milk formula, a pHWF, or a soy formula. Before birth, 620 infants with a family history of allergic disease were recruited and randomized to receive the allocated formula at cessation of breast-feeding. Skin prick tests to 6 common allergens (milk, egg, peanut, dust mite, rye grass, and cat dander) were performed at 6, 12, and 24 months. The primary outcome was development of allergic manifestations (eczema and food reactions) measured 18 times in the first 2 years of life. Follow-up was complete for 93% (575/620) at 2 years and 80% (495/620) at 6 or 7 years of age. There was no evidence that infants allocated to the pHWF (OR=1.21; 95% CI, 0.81-1.80) or the soy formula (OR=1.26; 95% CI, 0.84-1.88) were at a lower risk of allergic manifestations in infancy compared with conventional formula.

Protein

Longitudinal Association between Animal and Vegetable Protein Intake and Obesity among Men in the United States: The Chicago Western Electric Study

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Significance: Animal and vegetable protein may relate differently to occurrence of obesity in the long run.

This study aimed to determine the association between protein intake and obesity. A cohort of 1,730 men aged 40-55 years from the Chicago Western Electric Study was followed from 1958 to 1966. Diet was assessed twice with Burke's comprehensive diet history method at two baseline examinations; height, weight, and other covariates were measured annually. Dietary animal protein was positively related to overweight and obesity across 7 years of follow up. With adjustment for potential confounders (age, education, cigarette smoking, alcohol intake, energy, carbohydrate and saturated fat intake, and history of diabetes or other chronic disease), the odds ratios (95% CI) for obesity were 4.62 (2.68-7.98) for participants in the highest compared to the lowest quartile of animal protein and 0.58 (0.36, 0.95) for those in the highest quartile of vegetable protein intake. A statistically significant, positive association was seen between animal protein intake and obesity; those in higher quartiles of vegetable protein intake had lower odds of being obese.

Whey Protein but Not Soy Protein Supplementation Alters Body Weight and Composition in Free-Living Overweight and Obese Adults

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Journal of Nutrition, Vol. 141, No. 8; pp. 1489-1494, 2011

Link to full text: <http://jn.nutrition.org/content/141/8/1489.full>

Significance: Different sources of dietary protein may differentially facilitate weight loss and affect body composition.

A double-blind, randomized clinical trial was conducted to determine the effect of consumption of supplemental whey protein (WP), soy protein (SP), and an isoenergetic amount of carbohydrate (CHO) on body weight and composition in 90 overweight and obese participants. Subjects were randomly assigned to 1 of 3 treatment groups for 23 wk: WP; SP (each providing ~56 g/d of protein and 1670 kJ/d); or an isoenergetic amount of CHO. Supplements were consumed as a beverage twice daily. After 23 wk, body weight and composition did not differ between the groups consuming the SP and WP or between SP and CHO; however, body weight and fat mass of the group consuming the WP were lower by 1.8 kg ($P<0.006$) and 2.3 kg ($P<0.005$), respectively, than the group consuming CHO. Waist circumference was smaller in the participants consuming WP than in the other groups ($P<0.05$). Fasting ghrelin was lower in participants consuming WP compared with SP or CHO.

Omega 3-Fatty Acids

Plasma Omega-3 Fatty Acids and Incident Diabetes in Older Adults

L. Djoussé, M.L. Biggs, R.N. Lemaitre, I.B. King, X. Song, J.H. Ix, et al.

American Journal of Clinical Nutrition, Vol. 94, No. 2; pp. 527-533, 2011

Link to full text: <http://www.ajcn.org/content/94/2/527.full>

Significance: Long-chain omega-3 fatty acids and α -linolenic acid were not associated with a higher incidence of diabetes.

The relation between plasma phospholipid omega-3 fatty acid (n-3 FAs) and incident diabetes was examined in 3088 older men and women (mean age: 75 y) from the Cardiovascular Health Study (1992–2007). During a median follow-up of 10.6 y, 204 new cases of diabetes occurred. In a multivariable model that controlled for age, sex, race, clinic site, BMI, alcohol intake, smoking, physical activity, LDL-cholesterol, and linoleic acid, relative risks (95% CIs) for diabetes were 1.0 (reference), 0.96 (0.65, 1.43), 1.03 (0.69, 1.54), and 0.64 (0.41, 1.01) across consecutive quartiles of phospholipid eicosapentaenoic acid and docosahexaenoic acid (P for trend=0.05). Corresponding relative risks (95% CIs) for phospholipid α -linolenic acid were 1.0 (reference), 0.93 (0.65, 1.34), 0.99 (0.68, 1.44), and 0.57 (0.36, 0.90) (P for trend=0.03).