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North America

# Nutrition Briefs

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## Cardiovascular Disease

### Multivitamin Use and the Risk of Cardiovascular Disease in Men

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Link to full text: [Click here](#)

**Significance:** Multivitamin use for  $\geq 20$  years was associated with a lower risk of major CVD events

This long-term prospective study investigated how multivitamin use is associated with the risk of cardiovascular disease (CVD) in initially healthy male physicians ( $n=18530$ ) from the Physicians' Health Study I cohort who were free of CVD and cancer at baseline. During a mean follow-up of 12.2 y (total of 225,287 person-years), there were 1697 incident cases of major CVD (defined as nonfatal myocardial infarction, nonfatal stroke, and CVD death). In multivariable-adjusted analyses, no significant associations were observed among baseline multivitamin users compared with nonusers for the risk of major CVD events (HR: 0.94; 95% CI: 0.84, 1.05), whereas a self-reported duration of  $\geq 20$  y at baseline was associated with lower risk (HR: 0.56; 95% CI: 0.35, 0.90; P-trend = 0.05). Baseline multivitamin use was also significantly inversely associated with the risk of cardiac revascularization (HR: 0.86; 95% CI: 0.75, 0.98). Baseline use of multivitamins was not significantly associated with other CVD endpoints.

### Plasma Acylcarnitines and Risk of Cardiovascular Disease: Effect of Mediterranean Diet Interventions

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**Significance:** Metabolite profiles characterized by elevated concentrations of acylcarnitines are independently associated with risks of total CVD and stroke alone in participants at high risk of CVD.

The association between 28 plasma acylcarnitine species and risk of incident cardiovascular disease (CVD) and the potential modifying effect of Mediterranean diet (MedDiet) interventions were evaluated. Plasma acylcarnitines were measured at baseline and after 1 y of follow-up, both individually and classified into short-, medium-, or long-chain scores, in a case-cohort study within the PREDIMED study. A randomly selected subcohort ( $n=751$ ) and all available incident CVD cases ( $n=229$ ) after 4.8 y of follow-up were included in the current study. After

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adjustment for age, sex, BMI, and other CVD risk factors, participants in the highest quartile of baseline short- and medium-chain acylcarnitines had a higher risk of CVD than did participants in the lowest quartile [HRs: 1.80 (95% CI: 1.11, 2.91; P-trend 0.01) and 1.55 (95% CI: 1.01, 2.48; P-trend = 0.04), respectively]. Increased short-chain acylcarnitines after 1 y were associated with higher risks of total CVD and stroke. Participants with higher baseline concentrations of short-, medium-, and long-chain acylcarnitines who were randomly assigned to the control group had a higher risk of CVD than did subjects with lower concentrations of acylcarnitines who were assigned to the MedDiet group.

### Body-Mass Index in 2.3 Million Adolescents and Cardiovascular Death in Adulthood

G. Twig, G. Yaniv, H. Levine, A. Leiba, N. Goldberger, E. Derazne, et al.

*New England Journal of Medicine*, Vol. 374, No. 25; pp. 2430–2440

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**Significance:** A BMI in the 50th to 74th percentiles during adolescence was associated with increased cardiovascular and all-cause mortality during 40 years of follow-up.



This study examined the association between BMI in late adolescence and death from cardiovascular causes in adulthood. Data on BMI were grouped, as measured from 1967 through 2010 in 2.3 million Israeli adolescents (mean age, 17.3±0.4 years), according to age- and sex-specific percentiles from the CDC. Primary outcomes were the number of deaths attributed to coronary heart disease (CHD), stroke, sudden death from an unknown cause, or a combination of all three categories (total cardiovascular causes) by mid-2011. During 42,297,007 person-years of follow-up, 2918 of 32,127 deaths (9.1%) were from cardiovascular causes, including 1497 from CHD, 528 from stroke, and 893 from sudden death. On multivariable analysis, there was a graded increase in the risk of death from cardiovascular causes and all causes that started in the group with BMI in the 50th to 74th percentiles. Hazard ratios in the obese group (≥95th percentile for BMI), as compared with the reference group in the 5th to 24th percentiles, were 4.9 (95% CI, 3.9 to 6.1) for death from CHD, 2.6 (95% CI, 1.7 to 4.1) for death from stroke, 2.1 (95% CI, 1.5 to 2.9) for sudden death, and 3.5 (95% CI, 2.9 to 4.1) for death from total cardiovascular causes, after adjustment for covariates. Hazard ratios for death from cardiovascular causes in the same percentile groups increased from 2.0 (95% CI, 1.1 to 3.9) during follow-up for 0 to 10 years to 4.1 (95% CI, 3.1 to 5.4) during follow-up for 30 to 40 years.

### Intensive vs Standard Blood Pressure Control and Cardiovascular Disease Outcomes in Adults Aged ≥75 Years

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Link to full text: [Click here](#)

**Significance:** Among ambulatory adults ≥75 years of age, treating to a SBP target of <120 mm Hg compared with a SBP target of <140 mm Hg resulted in significantly lower rates of fatal and nonfatal major cardiovascular events and death from any cause.

This multicenter, randomized clinical trial evaluated the effects of intensive (<120 mm Hg) compared with standard (<140 mm Hg) systolic blood pressure

(SBP) targets in persons aged  $\geq 75$  years with hypertension but without diabetes. Participants were randomized to the intensive group ( $n=1317$ ) or to the standard group ( $n=1319$ ). Among 2636 participants (mean age, 79.9 years; 37.9% women), 2510 (95.2%) provided complete follow-up data. At a median follow-up of 3.14 years, there was a significantly lower rate of the primary composite outcome (102 events in the intensive group vs 148 events in the standard group; hazard ratio [HR], 0.66 [95% CI, 0.51-0.85]) and all-cause mortality (73 deaths vs 107 deaths, respectively; HR, 0.67 [95% CI, 0.49-0.91]). The overall rate of serious adverse events was not different between treatment groups (48.4% in the intensive group vs 48.3% in the standard group; HR, 0.99 [95% CI, 0.89-1.11]). Absolute rates of hypotension were 2.4% in the intensive group vs 1.4% in the standard group (HR, 1.71 [95% CI, 0.97-3.09]), 3.0% vs 2.4%, respectively, for syncope (HR, 1.23 [95% CI, 0.76-2.00]), 4.0% vs 2.7% for electrolyte abnormalities (HR, 1.51 [95% CI, 0.99-2.33]), 5.5% vs 4.0% for acute kidney injury (HR, 1.41 [95% CI, 0.98-2.04]), and 4.9% vs 5.5% for injurious falls (HR, 0.91 [95% CI, 0.65-1.29]).

## Fiber

### Addition of Orange Pomace to Orange Juice Attenuates the Increases in Peak Glucose and Insulin Concentrations After Sequential Meal Ingestion in Men With Elevated Cardiometabolic Risk

H. Dong, C. Rendeiro, A. Kristek, L.J. Sargent, C. Saunders, L. Harkness, et al.

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**Significance:** Orange pomace fiber consumed with breakfast may lower postprandial glycemic and insulinemic responses to typical meal ingestion in men with increased cardiometabolic risk.

The effects of orange beverages with differing fiber concentrations on postprandial glycemic responses after a sequential breakfast and lunch challenge were measured in 36 men (aged 30–65 y; BMI 25–30 kg/m<sup>2</sup>; fasting triacylglycerol or total cholesterol concentrations: 0.8–2.2 or 6.0–8.0 mmol/L, respectively) with increased cardiometabolic risk. Subjects were provided with a high-fat mixed breakfast and were randomly assigned to consume 240 mL Tropicana (PepsiCo, Inc.) pure premium orange juice without pulp (OJ), OJ with 5.5 g added orange pomace fiber (OPF), juice made from lightly blended whole orange, or an isocaloric sugar-matched control (Control) on 4 occasions separated by 2 wk. A medium-fat mixed lunch was provided at 330 min. OPF significantly reduced the maximal change in glucose concentrations ( $1.9 \pm 0.21$  mmol/L) reached after breakfast compared with other treatments (2.3–2.4 mmol/L) and after lunch ( $3.0 \pm 0.05$  mmol/L) compared with OJ ( $3.6 \pm 0.05$  mmol/L). The maximal change in insulin concentration ( $313 \pm 25$  pmol/L) was also lower compared with Control ( $387 \pm 30$  pmol/L) and OJ ( $418 \pm 39$  pmol/L) after breakfast. OPF significantly delayed the time to reach the peak glucose concentration compared with Control and OJ, and of insulin compared with Control after breakfast.

## Inflammation

### Paleolithic and Mediterranean Diet Pattern Scores Are Inversely Associated With Biomarkers of Inflammation and Oxidative Balance in Adults

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**Significance:** Diets that are more Paleolithic- or Mediterranean-like may be associated with lower levels of systemic inflammation and oxidative stress in humans.

This pooled cross-sectional study of 646 adult men and women in an elective outpatient colonoscopy population investigated associations between 2 diet pattern scores, the Paleolithic and the Mediterranean, and circulating concentrations of 2 related biomarkers, high-sensitivity C-reactive protein (hsCRP) and F<sub>2</sub>-isoprostane. There were statistically significant trends for decreasing geometric mean plasma hsCRP and F<sub>2</sub>-isoprostane concentrations with increasing quintiles of the Paleolithic and Mediterranean diet scores. The multivariable-adjusted ORs comparing those in the highest with those in the lowest quintiles of the Paleolithic and Mediterranean diet scores were 0.61 (95% CI: 0.36, 1.05; P-trend = 0.06) and 0.71 (95% CI: 0.42, 1.20; P-trend = 0.01), respectively, for a higher hsCRP concentration, and 0.51 (95% CI: 0.27, 0.95; P-trend 0.01) and 0.39 (95% CI: 0.21, 0.73; P-trend = 0.01), respectively, for a higher F<sub>2</sub>-isoprostane concentration.



## Sugars

### Fructose Acute Effects on Glucose, Insulin, and Triglyceride After a Solid Meal Compared With Sucralose and Sucrose in a Randomized Crossover Study

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**Significance:** Fructose showed a lower insulin response, which may be beneficial in the long term in individuals at risk of type 2 diabetes.

This randomized crossover design study determined the effects of sucrose, fructose, and sucralose on triglyceride, glucose, and insulin 27 in healthy, overweight and obese individuals (mean age 44 y; mean BMI 26 kg/m<sup>2</sup>). Fructose (52 g), sucrose (65 g), and sucralose (0.1 g) were delivered as sweet-taste-balanced muffins with a total fat load (66 g). No significant difference was shown between the 3 sweeteners for triglyceride and glucose concentrations and the area under the curve (AUC). The glucose incremental AUC (iAUC) was lower for fructose than for sucrose and sucralose (P < 0.05). Insulin concentrations differed significantly by the type of muffin (P = 0.001), the interaction of time by type of muffin (P = 0.035), the AUC (P < 0.001), and the iAUC (P < 0.001). Fructose had a significantly lower insulin response than that of either sucrose (P-treatment = 0.006) or sucralose (P-treatment = 0.041). Fructose, at a moderate dose, did not significantly elevate triglyceride compared with sucrose or sucralose and lowered the glucose incremental area under the curve.

## Probiotics

### The Comparison of Food and Supplement as Probiotic Delivery Vehicles

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**Significance:** Probiotic foods appear to be preferred to probiotic supplements.

Probiotics are live bacteria that have frequently been reported to be beneficial in preventing a wide range of diseases as well as playing a major role in treating the existing ailments. A variety of probiotic products have been developed which can be categorized into two groups: probiotic foods and supplements. Both foods and supplements have been able to confer the health benefits claimed for them. However, it is not known which one can be clinically more efficient, and to the best of our knowledge, until now no research has been conducted to investigate this issue. The present review aims to discuss this matter, based on the evidence available in the literature. Articles indexed in PubMed and ScienceDirect between 2000 and 2011 were reviewed. The articles included the clinical trials in which either foods or supplements were used to administer the probiotics to either patients suffering from different diseases or healthy subjects. Although both foods and supplements seem to have been efficient carriers for the beneficial bacteria, to generally promote public health in communities, probiotic foods appear to be preferred to probiotic supplements.

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