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North America

Nutrition Briefs

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Diabetes

Intake of Total Polyphenols and Some Classes of Polyphenols Is Inversely Associated with Diabetes in Elderly People at High Cardiovascular Disease Risk

A. Tresserra-Rimbau, M. Guasch-Ferré, J. Salas-Salvadó, E. Toledo, D. Corella, O. Castañer, et al. on behalf of the PREDIMED study investigators

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

Significance: A high intake of total polyphenols, total flavonoids (specifically flavanones and dihydroflavonols), and stilbenes is associated with a reduced risk of diabetes in elderly persons at high risk of cardiovascular disease.

This study observational cohort study examined the associations between the intake of total polyphenols and different groups of polyphenols (flavonoids, phenolic acids, stilbenes, lignans, and others) on the risk of incident diabetes in 3430 subjects from the PREDIMED (Prevención con Dieta Mediterránea) trial who were free of diabetes. The PREDIMED Trial assessed the effects of either a Mediterranean diet that was supplemented with extra-virgin olive oil or nuts or advice to adhere to a low-fat control diet on cardiovascular outcomes in elderly men and women at high cardiovascular disease risk. Over a mean of 5.51 y of follow-up (18,900 person-years), there were 314 new cases of diabetes. After multi-variable adjustment, we observed a 28% reduction in new-onset diabetes in the highest compared with the lowest tertile of total polyphenol intake (HR: 0.72; 95% CI: 0.52, 0.99; P-trend = 0.05). The intake of subclasses of polyphenols also was inversely associated with diabetes risk, including for total flavonoids (HR: 0.67; 95% CI: 0.48, 0.93; P-trend = 0.02), stilbenes (HR: 0.57; 95% CI: 0.38, 0.84; P-trend = 0.003), dihydroflavonols (HR: 0.59; 95% CI: 0.40, 0.88; P-trend = 0.003), and flavanones (HR: 0.69; 95% CI: 0.49, 0.97; P-trend = 0.03).

Consumption of Dairy Foods and Diabetes Incidence: A Dose-Response Meta-Analysis of Observational Studies

L. Gijbbers, E.L. Ding, V.S. Malik, J. de Goede, J. M. Geleijnse, S.S. Soedamah-Muthu

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Significance: This dose-response meta-analysis of observational studies suggests a possible role for dairy foods, particularly yogurt, in the prevention of T2D. Results should be considered in the context of the observed heterogeneity.

A meta-analysis was performed to quantify the associations of incident type 2 diabetes (T2D) with dairy foods at different levels of intake. A systematic literature

Contact Us

ILSI North America
1156 15th Street, NW
Suite 200
Washington, DC 20005

Tel: 202.659.0074
Fax: 202.659.3859
ilsina@ilsina.org

www.ilsina.org



search included prospective cohort studies that examined the association between dairy and incident T2D in healthy adults. Random-effects meta-analyses with summarized dose-response data were performed for total, low-fat, and high-fat dairy, (types of) milk, (types of) fermented dairy, cream, ice cream, and sherbet. The analysis included 22 cohort studies comprised of 579,832 individuals and 43,118 T2D cases. Total dairy was inversely associated with T2D risk (RR: 0.97 per 200-g/d increment; 95% CI: 0.95, 1.00; $P = 0.04$; $I^2 = 66\%$), with a suggestive but similar linear inverse association noted for low-fat dairy (RR: 0.96 per 200 g/d; 95% CI: 0.92, 1.00; $P = 0.072$; $I^2 = 68\%$). Nonlinear inverse associations were found for yogurt intake (at 80 g/d, RR: 0.86 compared with 0 g/d; 95% CI: 0.83, 0.90; $P < 0.001$; $I^2 = 73\%$) and ice cream intake (at ~ 10 g/d, RR: 0.81; 95% CI: 0.78, 0.85; $P < 0.001$; $I^2 = 86\%$), but no added incremental benefits were found at a higher intake. Other dairy types were not associated with T2D risk.

Obesity

Dairy Consumption in Association With Weight Change and Risk of Becoming Overweight or Obese in Middle-Aged and Older Women: A Prospective Cohort Study

S. Rautiainen, L. Wang, I-M. Lee, J.E. Manson, J.E. Buring, H. Sesso

American Journal of Clinical Nutrition, Vol. 103, No. 4.; pp. 979–988, 2016

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

Significance: Greater consumption of total dairy products may be of importance in the prevention of weight gain in middle-aged and elderly women who are initially normal weight.



This study investigated how dairy product intake was associated with weight change and risk of becoming overweight or obese in 18,438 initially normal-weight women aged ≥ 45 y from the Women's Health Study who were free of cardiovascular disease, cancer, and diabetes and had initial BMI from 18.5 to < 25 at baseline. During a mean follow-up of 11.2 y, 8238 women became overweight or obese. Multivariable-adjusted mean \pm SD changes in body weight during the follow-up (18 y) were 1.90 ± 0.09 , 1.88 ± 0.08 , 1.86 ± 0.09 , 1.82 ± 0.09 , and 1.65 ± 0.09 kg in quintiles 1–5 of total dairy intake, respectively (P -trend = 0.003). Greater intake of high-fat dairy products, but not intake of low-fat dairy products, was associated with less weight gain (P -trend = 0.004). In multivariable-adjusted analyses, lower risk of becoming overweight or obese was observed in the highest quintile of high-fat dairy product intake (HR: 0.92, 95% CI: 0.86, 0.99). Dietary or supplemental calcium or vitamin D was not associated with risk of becoming overweight or obese.

Fiber

High-Molecular-Weight β -Glucan Decreases Serum Cholesterol Differentially Based on the CYP7A1 rs3808607 Polymorphism in Mildly Hypercholesterolemic Adults

Y. Wang, S.V. Harding, P. Eck, S.J. Thandapilly, T.H. Gamel, E.M. Abdel-Aal, et al.

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Significance: High molecular weight β -glucan rather than low molecular weight β -glucan reduced circulating total cholesterol effectively in mildly hypercholesterolemic adults.

This randomized controlled crossover trial was designed to determine whether the cholesterol-lowering efficacy of barley β -glucan varied as a function of molecular weight (MW) and the daily dose consumed. This study also aimed to determine whether any gene-diet interactions are associated with the cholesterol-lowering efficacy of β -glucan. Thirty mildly hypercholesterolemic adults [12 men and 18 women, aged 27–78 y; BMI 20–40; total cholesterol (TC): 5.0–8.0 mmol/L; LDL cholesterol: 2.7–5.0 mmol/L] were randomly assigned to receive a breakfast that contained either barley β -glucan at 3 g high MW (HMW)/d, 5 g low MW (LMW)/d, or 3 g LMW/d or a control diet, each for 5 wk. The washout period between the phases was 4 wk. Consumption of 3 g HMW β -glucan/d lowered TC by -0.12 mmol/L (95% CI: -0.24 , -0.006 mmol/L) compared with the control diet ($P = 0.0046$), but the LMW β -glucan, at either 3 g/d or 5 g/d, did not change serum cholesterol concentrations. This effect of HMW β -glucan was associated with gene-diet interaction, whereby individuals with the single nucleotide polymorphism (SNP) rs3808607-G allele (GG or GT) of the cytochrome P450 family 7 subfamily A member 1 gene (CYP7A1) had greater responses to 3 g HMW β -glucan/d in lowering TC than TT carriers ($P = 0.0006$).

Omega-3 Fatty Acids

The Omega-3 Index Is Inversely Associated With Depressive Symptoms Among Individuals with Elevated Oxidative Stress Biomarkers

S.J. Bigornia⁴, W.S. Harris, L. M. Falcón, J.M. Ordovás, C-Q. Lai, K. L. Tucker

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Significance: An inverse association between the omega-3 index and depressive symptoms was observed among participants with elevated oxidative stress biomarkers.

This study examined the association between omega-3 (n-3) fatty acid (FA) biomarkers and depressive symptoms and the potential influence of oxidative stress. Baseline and longitudinal analyses were conducted in the Boston Puerto Rican Health Study ($n = 787$; participants aged 57 ± 0.52 y, 73% women). Urinary 8-hydroxy-2'-deoxyguanosine (8-OHdG) concentration, a measure of oxidative stress, and erythrocyte FA composition were collected at baseline. Baseline and 2-y depressive symptoms were characterized by using the Center for Epidemiological Studies–Depression Scale (CES-D). Results showed that urinary 8-OHdG concentration tended to modify the relation between the erythrocyte omega-3 index and baseline CES-D score (P -interaction = 0.10). In stratified analyses, the omega-3 index was inversely associated with CES-D score ($\beta = -1.74$, $SE = 0.88$; $P = 0.02$) among those in the top quartile of 8-OHdG concentration but not among those in the lower quartiles. The relation between the omega-3 index and CES-D at 2 y was more clearly modified by 8-OHdG concentration (P -interaction = 0.04), where the omega-3 index was inversely associated with CES-D at 2 y, adjusted for baseline ($\beta = -1.66$, $SE = 0.66$; $P = 0.02$), only among those with elevated 8-OHdG concentrations. Among individuals not taking antidepressant medications and in the top tertile of urinary 8-OHdG concentration, the omega-3 index was associated



with significantly lower odds of a CES-D score ≥ 16 at baseline (OR: 0.72; 95% CI: 0.53, 0.96) but not at 2 y (OR: 0.83; 95% CI: 0.60, 1.15).

Cardiovascular Disease

Intake of Whole Grains Is Associated With Lower Risk of Myocardial Infarction: The Danish Diet, Cancer and Health Cohort

A. Helnæs, C. Kyrø, I. Andersen, S. Lacoppidan, K. Overvad, J. Christensen, et al.

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Significance: Whole-grain intake is related to lower risk of myocardial infarction and suggest that the cereals rye and oats might especially hold a beneficial effect.

This prospective study investigated the association between whole-grain intake in terms of total intake and intakes of different cereals and myocardial infarction in 54,871 Danish adults aged 50–64 y, of whom 2329 individuals developed myocardial infarction (MI) (13.6 y of follow-up). The association between intake of whole grains and risk of myocardial infarction was examined with the use of a Cox proportional hazards model adjusted for potential confounders. For both men and women with total whole-grain intake in the highest quartile, lower risks of MI were shown [HRs: 0.75 (95% CI: 0.65, 0.86) and 0.73 (95% CI: 0.58, 0.91), respectively] than for individuals with intake in the lowest quartile. When the specific cereal species were considered, rye and oats, but not wheat, were associated with lower MI risk in men. No significant associations were seen in women. For total whole-grain products, significantly lower MI risks were seen with higher intakes in both men and women. Rye bread (in men and women) and oatmeal (in men) were associated with significantly lower risk of MI, whereas no significant association was shown for whole-grain bread, crispbread, and wheat.



Fresh Fruit Consumption and Major Cardiovascular Disease in China

H. Du, L. Li, D. Bennett, Y. Guo, T.J. Key, Z. Bian, et al. for the China Kadoorie Biobank Study

New England Journal of Medicine, Vol. 374, No. 14; pp. 1332–1343, 2016

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

Significance: Among Chinese adults, a higher level of fruit consumption was associated with lower blood pressure and blood glucose levels with significantly lower risks of major cardiovascular diseases.

In Western populations, a higher level of fruit consumption has been associated with a lower risk of cardiovascular disease, but little is known about such associations in China, where the consumption level is low and rates of stroke are high. Between 2004 and 2008, 512,891 adults, 30 to 79 years of age, from 10 diverse localities in China were recruited. During 3.2 million person-years of follow-up, 5173 deaths from cardiovascular disease, 2551 incident major coronary events (fatal or nonfatal), 14,579 ischemic strokes, and 3523 intracerebral hemorrhages were recorded among the 451,665 participants who did not have a history of cardiovascular disease or antihypertensive treatments at baseline. Overall, 18.0% of participants reported consuming fresh fruit daily. As compared with participants

who never or rarely consumed fresh fruit (the “nonconsumption” category), those who ate fresh fruit daily had lower systolic blood pressure (by 4.0 mm Hg) and blood glucose levels (by 0.5 mmol/L [9.0 mg/dL]) ($P < 0.001$ for trend for both comparisons). The adjusted hazard ratios for daily consumption versus nonconsumption were 0.60 (95% CI 0.54 to 0.67) for cardiovascular death, and 0.66 (95% CI, 0.58 to 0.75), 0.75 (95% CI, 0.72 to 0.79), and 0.64 (95% CI, 0.56 to 0.74), respectively, for incident major coronary events, ischemic stroke, and hemorrhagic stroke. There was a strong log-linear dose–response relationship between the incidence of each outcome and the amount of fresh fruit consumed. These associations were similar across the 10 study regions and in subgroups of participants defined by baseline characteristics.

Coconut Oil Consumption and Cardiovascular Risk Factors in Humans

L. Eyres, M.F. Eyres, A. Chisholm, R.C. Brown

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Significance: The weight of the evidence from intervention studies to date suggests that replacing coconut oil with *cis* unsaturated fats would alter blood lipid profiles in a manner consistent with a reduction in risk factors for cardiovascular disease.

Coconut oil is being heavily promoted as a healthy oil, with benefits that include support of heart health. To assess the merits of this claim, the literature on the effect of coconut consumption on cardiovascular risk factors and outcomes in humans was reviewed. Twenty-one research papers were identified for inclusion in the review: 8 clinical trials and 13 observational studies. The majority examined the effect of coconut oil or coconut products on serum lipid profiles. Coconut oil generally raised total and LDL-cholesterol to a greater extent than *cis* unsaturated plant oils, but to a lesser extent than butter. The effect of coconut consumption on the ratio of total cholesterol to HDL-cholesterol was often not examined. Observational evidence suggests that consumption of coconut flesh or squeezed coconut in the context of traditional dietary patterns does not lead to adverse cardiovascular outcomes. However, due to large differences in dietary and lifestyle patterns, these findings cannot be applied to a typical Western diet.



Hypertension

Flavonoid Intake and Incident Hypertension in Women

M. Lajous, E. Rossignol, G. Fagherazzi, F. Perquier, A. Scalbert, F. Clavel-Chapelon, et al.

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

Significance: Participants with greater flavonol, anthocyanin, and polymeric flavonoid intakes and greater total flavonoid intake were less likely to develop hypertension.

This prospective cohort study evaluated the relation between flavonoid subclasses and total flavonoid intakes and incidence of hypertension in 40,574 disease-free French women. 9350 incident cases of hypertension between 1993 and 2008 were observed. Women in the highest quintile of flavonol intake had a 10% lower rate of hypertension than women in the lowest quintile (HR: 0.90; 95% CI: 0.84, 0.97;

P-trend = 0.031). Similarly, there was a 9% lower rate for women in the highest category of intake than for women in the lowest category of intake for both anthocyanins and proanthocyanidin polymers [HRs: 0.91 (95% CI: 0.84, 0.97; P-trend = 0.0075) and 0.91 (95% CI: 0.85, 0.97; P-trend = 0.0051), respectively]. An inverse association for total flavonoid intake was observed with a similar magnitude.

Caffeine

Caffeine Intake Is Related to Successful Weight Loss Maintenance

D. Icken, S. Feller, S. Engeli, A. Mayr, A. Müller, A. Hilbert, et al.

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

Significance: Consumption of caffeinated beverages might support weight loss maintenance.

The effect of caffeine intake on weight loss maintenance has not been examined in humans. The daily consumption of coffee and caffeinated beverages between 494 weight loss maintainers and 2129 individuals from the general population were compared controlling for sociodemographic variables, body mass index and physical activity level. Weight loss maintainers reported to consume significantly more cups of coffee and caffeinated beverages compared with the participants in the general population sample.

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1156 15th Street, NW
Suite 200
Washington, DC 20005

Tel: 202.659.0074
Fax: 202.659.3859
ilsina@ilsina.org

www.ilsina.org

