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North America

Nutrition Briefs

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Cardiovascular Disease

Intake of Legumes and the Risk of Cardiovascular Disease: Frailty Modeling of a Prospective Cohort Study in the Iranian Middle-Aged and Older Population

F. Nouri, N. Sarrafzadegan, N. Mohammadifard, M. Sadeghi, M. Mansourian

European Journal of Clinical Nutrition, Vol. 70, No. 2; pp. 217–221, 2016

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

Significance: A strong inverse relationship was observed between legume intake and the risk of cardiovascular events in old-aged Iranian people.

This study explored the association of legume intake (beans, chickpeas, lentils and so on), as part of a low-glycemic index diet, with the risk of cardiovascular events in 6,323 Iranian middle- and old-aged subjects who were free of cardiovascular disease (CVD) at their baseline examination. Of these individuals, 5,398 remained in the study for 7 years of follow-up and contacted every 2 years for possible occurrence of CVD events. After a median follow-up of 6.8 years, 427 cardiovascular events occurred. The intake of legumes in different tertiles of consuming measure was associated with 34% lower risk of CVD in old-aged people, after controlling for the other probable confounders (hazard ratio and 95% CI: 0.66 (0.45, 0.98), P-value=0.039). However, there was no significant association between the frequency of consuming legumes and CVD events in the middle-aged people.

Lipids

Comparison of the DASH (Dietary Approaches to Stop Hypertension) Diet and a Higher-Fat DASH Diet on Blood Pressure and Lipids And Lipoproteins: A Randomized Controlled Trial

S. Chiu, N. Bergeron, P.T. Williams, G.A. Bray, B. Sutherland, R.M. Krauss

American Journal of Clinical Nutrition, Vol. 103, No. 2; pp. 341–347, 2016

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

Significance: The higher fat, lower carbohydrate modification of the DASH diet lowered blood pressure to the same extent as the DASH diet but also reduced plasma triglyceride and VLDL concentrations without significantly increasing LDL-cholesterol.

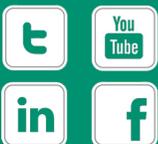
This 3-period randomized crossover trial in free-living healthy individuals was designed to test the effects of substituting full fat for low-fat dairy foods in the DASH diet, with a corresponding increase in fat and a reduction in sugar intake, on blood pressure and plasma lipids and lipoproteins. Subjects consumed in random order a control diet, a standard DASH diet, and a higher-fat, lower-carbohydrate

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modification of the DASH diet (HF-DASH diet) for 3 wk each, separated by 2-wk washout periods. Thirty-six participants completed all 3 dietary periods. Blood pressure was reduced similarly with the DASH and HF-DASH diets compared with the control diet. The HF-DASH diet significantly reduced triglycerides and large and medium very-low-density lipoprotein (VLDL) particle concentrations and increased LDL peak particle diameter compared with the DASH diet. The DASH diet, but not the HF-DASH diet, significantly reduced LDL-cholesterol, HDL-cholesterol, apolipoprotein A-I, intermediate-density lipoprotein and large LDL particles, and LDL peak diameter compared with the control diet.

Diabetes

Artificially Sweetened Beverage Consumption Is Positively Associated With Newly Diagnosed Diabetes in Normal-Weight But Not in Overweight or Obese Brazilian Adults

J. Yarmolinsky, B.B. Duncan, L.E. Chambless, I.M. Bensenor, S.M. Barreto, A.C. Goulart, et al.

Journal of Nutrition, Vol. 146, No. 2; pp. 290–297, 2016

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



Significance: Normal-weight, but not excess-weight, individuals with greater artificially sweetened beverage consumption presented diabetes more frequently and had higher fasting glucose and poorer β -cell function.

The relation of artificially sweetened beverage (ASB) intake with newly diagnosed diabetes and measures of glucose homeostasis were measured in a cross-sectional study of 12,884 adults from the Brazilian Longitudinal Study of Adult Health (ELSA-Brasil). Although ASB consumption was not associated with diabetes in logistic regression analyses after adjustment for BMI overall, the association varied across BMI categories (P -interaction = 0.04). Among those with a BMI <25, a 15% increase in the adjusted odds of diabetes for each increase in the frequency of ASB consumption per day (P = 0.001) was found; compared with nonusers, ASB users presented monotonic increases in the adjusted ORs (95% CIs) of diabetes with increased frequency of consumption: 1.03 (0.60, 1.77), 1.43 (0.93, 2.20), 1.62 (1.08, 2.44), and 2.51 (1.40, 4.50) for infrequent, 1–2, 3–4, and >4 times/d, respectively. In linear regression analyses, among normal-weight individuals, greater ASB consumption was also associated with increased fasting glucose concentrations (P = 0.01) and poorer β -cell function (P = 0.009). In overweight or obese participants, greater ASB consumption was significantly associated with improved indexes of insulin resistance and 2-h postload glucose.

High Fiber and Low Starch Intakes Are Associated With Circulating Intermediate Biomarkers of Type 2 Diabetes Among Women

H.B. AlEsa, S.H. Ley, B. Rosner, V.S. Malik, W.C. Willett, H. Campos, et al.

Journal of Nutrition, Vol. 146, No. 2; pp. 306–317, 2016

doi: 10.3945/jn.115.219915

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

Significance: A greater fiber intake and a lower starch-to-fiber intake ratio are favorably associated with adiponectin and HbA1c, but only cereal fiber intake was associated with CRP in women.

This cross-sectional analysis examined the associations of carbohydrate quality measures (CQMs) including carbohydrate intake; starch intake; glycemic

index; glycemic load; total, cereal, fruit, and vegetable fiber intakes; and different combinations of these nutrients with plasma concentrations of adiponectin, C-reactive protein (CRP), and glycated hemoglobin (HbA1c). Diabetes-free women (n=2,458), ages 43–70 y, in the Nurses Health Study were included. After age, BMI, lifestyle, and dietary variables were adjusted, total fiber intake was positively associated with adiponectin (P-trend = 0.004); cereal fiber intake was positively associated with adiponectin and inversely associated with CRP, and fruit fiber intake was negatively associated with HbA1c concentrations (all P-trend < 0.03); starch intake was inversely associated with adiponectin (P-trend = 0.02); a higher glycemic index was associated with lower adiponectin and higher HbA1c (both P-trend < 0.05); a higher carbohydrate-to-total fiber intake ratio was associated with lower adiponectin (P-trend = 0.005); a higher starch-to-total fiber intake ratio was associated with lower adiponectin and higher HbA1c (both P-trend < 0.05); and a higher starch-to-cereal fiber intake ratio was associated with lower adiponectin (P-trend = 0.002).

Potential of Dietary Non-Provitamin A Carotenoids in the Prevention and Treatment of Diabetic Microvascular Complications

A.G. Murillo, M.L. Fernandez

Advances in Nutrition, Vol. 7, January 2016; pp. 14–24, 2016

doi: 10.3945/an.115.009803

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

Significance: This review highlights the potential protective effects of 4 non-provitamin A carotenoids—lutein, zeaxanthin, lycopene, and astaxanthin—in the development and progression of diabetic microvascular complications.

Diabetes is a chronic condition that has serious macro- and micro-vascular complications. Microvascular complications include diabetic retinopathy, nephropathy, and neuropathy. These complications share a common factor: glucose-induced damage. In the progression of diabetic complications, oxidative stress, inflammation, and the formation of glycation end products play an important role. Previous studies have shown that a healthy diet is vital in preventing these complications; in particular, the intake of antioxidants has been studied for their potential effect in ameliorating hyperglycemic injuries. Carotenoids are lipid-soluble pigments synthesized by plants, bacteria, and some kinds of algae that are responsible for the yellow, red, and orange colors in food. These compounds are part of the antioxidant machinery in plants and have also shown their efficacy in quenching free radicals, scavenging reactive oxygen species, modulating gene expression, and reducing inflammation in vitro and in vivo, showing that they can potentially be used as part of a preventive strategy for metabolic disorders, including diabetes and its related complications.

Egg Consumption and Risk of Type 2 Diabetes: A Meta-Analysis of Prospective Studies

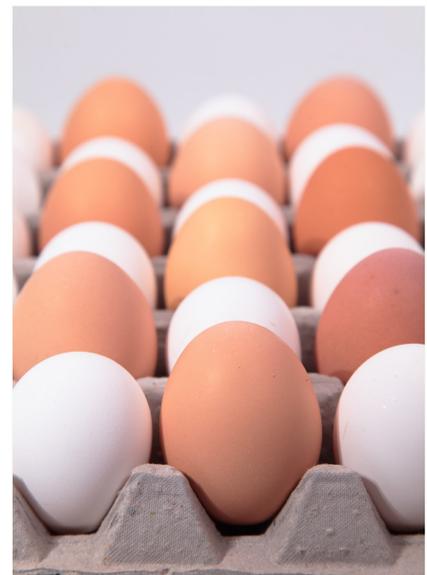
L. Djoussé, O.A. Khawaja, J.M. Gaziano

American Journal of Clinical Nutrition, Vol. 103, No. 2; pp. 474–480, 2016

doi: 10.3945/ajcn.115.119933

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

Significance: There was no relationship found between infrequent egg consumption and diabetes risk but suggests a modest elevated risk of diabetes with ≥ 3 eggs/wk that is restricted to US studies.



A meta-analysis of published prospective cohort studies was conducted to evaluate the relation of egg consumption with the risk of type 2 diabetes mellitus (DM). Twelve cohorts for a total of 219,979 subjects and 8,911 cases of DM were identified. When comparing the highest with the lowest category of egg intake, pooled multivariate RRs of DM were 1.09 (95% CI: 0.99, 1.20) using the fixed-effect model and 1.06 (95% CI: 0.86, 1.30) using the random-effect model. There was evidence for heterogeneity ($I^2 = 73.6\%$, $P < 0.001$). When stratified by geographic area, there was a 39% higher risk of DM (95% CI: 21%, 60%) comparing highest with lowest egg consumption in US studies ($I^2 = 45.4\%$, $P = 0.089$) and no elevated risk of DM with egg intake in non-US studies (RR = 0.89; 95% CI: 0.79, 1.02 using the fixed-effect model, $P < 0.001$ comparing US with non-US studies). In a dose-response assessment using cubic splines, elevated risk of DM was observed in US studies among people consuming ≥ 3 eggs/wk but not in non-US studies.

Fiber

Dietary Fiber and Satiety: The Effects of Oats on Satiety

C.J. Rebello, C.E. O'Neil, F.L. Greenway

Nutrition Reviews, Vol. 74, No. 2; pp. 131–147, 2016

doi: 10.1093/nutrit/nuv063

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



Significance: There is sufficient evidence to suggest that oat β -glucan has a positive effect on perceptions of satiety.

This review examines the effect of β -glucan, the viscous soluble fiber in oats, on satiety. A literature search for studies that examined delivery of the fiber in whole foods or as an extract was conducted. Viscosity interferes with the peristaltic mixing process in the small intestine to impede digestion and absorption of nutrients, which precipitates satiety signals. From measurements of the physicochemical and rheological properties of β -glucan, it appears that viscosity plays a key role in modulating satiety. However, the lack of standardized methods to measure viscosity and the inherent nature of appetite make it difficult to pinpoint the reasons for inconsistent results of the effects of oats on satiety.

Appetite

Altered Appetite-Mediating Hormone Concentrations Precede Compensatory Overeating After Severe, Short-Term Energy Deprivation in Healthy Adults

K.L. O'Connor, J.L. Scisco, T.J. Smith, A.J. Young, S.J. Montain, L.L. Price, et al.

Journal of Nutrition, Vol. 146, No. 2; pp. 209–217, 2016

doi: 10.3945/jn.115.217976

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

Significance: Short-term, severe energy deprivation suppressed acyl ghrelin concentrations and increased postprandial anorexigenic hormone concentrations.

The effects of short-term, severe energy deprivation (ED) on appetite and appetite-mediating hormone concentrations were determined in 21 adults (mean age 21 ± 3 yrs and BMI 25 ± 3 kg/m²) who consumed isovolumetric diets provided over separate 48-h periods while increasing habitual energy expenditure by $1,683 \pm 329$

kcal/d through light- and moderate-intensity exercise. Fasting insulin ($-56\% \pm 42\%$) and acyl ghrelin ($-60\% \pm 17\%$) concentrations decreased during ED but not during energy balance (EB), whereas fasting leptin concentrations decreased more during ED compared with during EB ($-47\% \pm 27\%$ compared with $-20\% \pm 27\%$; P -interaction = 0.05). Postprandial insulin ($57\% \pm 63\%$; $P < 0.001$), glucagon-like peptide-1 ($14\% \pm 28\%$; $P = 0.04$), and pancreatic polypeptide ($54\% \pm 52\%$; $P < 0.001$) areas under the curve (AUCs) were higher, whereas the acyl ghrelin AUC was lower ($-56\% \pm 13\%$; $P < 0.001$) after ED compared with after EB. After ED, self-rated appetite was greater, and ad libitum energy intake was 811 kcal/36 h (95% CI: 184, 1,439 kcal/36 h) higher relative to after EB ($P = 0.01$).

Obesity

Long-Term Supplementation of Green Tea Extract Does Not Modify Adiposity or Bone Mineral Density in a Randomized Trial of Overweight and Obese Postmenopausal Women

A.M. Dostal, A. Arikawa, L. Espejo, M.S. Kurzer

Journal of Nutrition, Vol. 146, No. 2; pp. 256–264, 2016

doi: 10.3945/jn.115.219238

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

Significance: Decaffeinated green tea extract was not associated with overall reductions in adiposity or improvements in bone mineral density in overweight/obese postmenopausal women.

The impact of decaffeinated green tea extract (GTE) on body composition and obesity-associated hormones were examined in the Minnesota Green Tea Trial, a 12-mo randomized, double-blind, placebo-controlled clinical trial. Postmenopausal overweight/obese women ($n=121$) were assigned to receive either GTE containing 843 mg (–)–epigallocatechin-3-gallate or placebo. Results found no differences in changes in BMI, total fat mass, percentage of body fat, or BMD over 12 mo between women taking GTE ($n=61$) and those taking a placebo ($n=60$). Interactions were observed between treatment and time for gynoid percentage of fat (%fat) and tissue %fat. Gynoid %fat increased from baseline to month 12 in the placebo group as baseline BMI increased and decreased over time as baseline BMI increased in the GTE group (P -interaction = 0.02). Tissue %fat increased from baseline to month 12 in the placebo group as baseline BMI increased. In the GTE group, tissue %fat decreased during the intervention as baseline BMI increased (P -interaction = 0.04). No changes were seen in circulating leptin, ghrelin, adiponectin, or insulin concentrations.



Immune Function

Impact of Obesity and Metabolic Syndrome on Immunity

C.J. Andersen, K.E. Murphy, M.L. Fernandez

Advances in Nutrition, Vol. 7, January 2016; pp. 66–75, 2016

doi: 10.3945/an.115.010207

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

Significance: An overview of the impact that obesity and metabolic syndrome parameters have on immune system function is presented.

Obesity is associated with metabolic disturbances that cause tissue stress and dysfunction. Obese individuals are at a greater risk for chronic disease and often

present with clinical parameters of metabolic syndrome (MetS), insulin resistance, and systemic markers of chronic low-grade inflammation. It has been well established that cells of the immune system play an important role in the pathogenesis of obesity- and MetS-related chronic diseases, as evidenced by leukocyte activation and dysfunction in metabolic tissues such as adipose tissue, liver, pancreas, and the vasculature. However, recent findings have highlighted the substantial impact that obesity and MetS parameters have on immunity and pathogen defense, including the disruption of lymphoid tissue integrity; alterations in leukocyte development, phenotypes, and activity; and the coordination of innate and adaptive immune responses. These changes are associated with an overall negative impact on chronic disease progression, immunity from infection, and vaccine efficacy.

Probiotics

Comparison of the Effect of Daily Consumption of Probiotic Compared With Low-Fat Conventional Yogurt on Weight Loss in Healthy Obese Women Following an Energy-Restricted Diet: A Randomized Controlled Trial

A. Madjd, M.A. Taylor, N. Mousavi, A. Delavari, R. Malekzadeh, I.A. Macdonald, et al.

American Journal of Clinical Nutrition, Vol. 103, No. 2; pp. 323–329, 2016

doi: 10.3945/ajcn.115.120170

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

Significance: Consumption of probiotic yogurt compared with low-fat yogurt with main meals showed no significant effects on weight loss.

The effect of the probiotic yogurt (PY) with low-fat yogurt (LF) yogurt consumption on body weight and cardiometabolic risk factors was compared in 89 overweight and obese women during a weight-loss program. Subjects who usually consumed standard LFs were asked to consume either PY or LF every day with their main meals for 12 wk while following a weight-loss program. Subjects were randomly assigned to one of the 2 intervention groups. A statistically significant reduction in anthropometric measurements and significant improvements in cardiometabolic risk characteristics were observed over the 12 wk in both groups. No significant differences in weight loss and anthropometric measurements were seen between groups after the intervention. Compared with the LF group, the PY group had a greater decrease in total cholesterol ($P = 0.024$), LDL-cholesterol ($P = 0.018$), homeostasis model assessment of insulin resistance ($P = 0.002$), 2-h postprandial glucose ($P < 0.001$), and fasting insulin concentration ($P = 0.002$). No significant differences were found for fasting plasma glucose, HDL-cholesterol, or triglycerides within both groups after the 12 wk.

About Us

The North American branch of the International Life Sciences Institute (ILSI North America) is a public, non-profit scientific foundation that advances the understanding and application of science related to the nutritional quality and safety of the food supply.

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