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Nutrition Briefs

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Cardiovascular Disease

Dietary Sodium Intake and Prediction of Cardiovascular Events

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European Journal of Clinical Nutrition, Vol. 69, No. 9; pp. 1042–1047, 2015.

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

Significance: Dietary sodium intake is a significant independent predictor of cardiovascular events in the study population.

This population-based cohort study of 1045 subjects examined whether sodium consumption is a risk factor for fatal and non-fatal cardiovascular disease (CVD). Subjects were followed for approximately 19 years. At baseline, 716 subjects completed a 1-week food diary, which was used to calculate daily sodium intake (mg/1000 kcal). Results showed that baseline sodium intake correlated significantly with age ($r_s=0.117$, $P=0.002$), BMI ($r_s=0.216$, $P=0.000$), waist circumference ($r_s=0.268$, $P=0.000$), smoking ($r_s=0.144$, $P=0.000$), alcohol consumption ($r_s=0.111$, $P=0.003$), systolic blood pressure ($r_s=0.106$, $P=0.005$) and LDL-cholesterol ($r_s=0.081$, $P=0.033$). Those who had cardiovascular events during follow-up consumed more sodium at baseline (mean 2010.4 ± 435.2 mg/1000 kcal/day, $n=101$) compared with those without events (mean 1849.9 ± 361.2 mg/1000 kcal/day, $n=589$; t-test; $P=0.001$). The incidence of cardiovascular events was greater in the highest quartile (22.1%) than in the lower quartiles (first 11.0%, second 9.9% and third 15.6%; X^2 ; $P=0.005$). Results also showed that sodium intake predicted CVD events ($P=0.031$) independently when adjusted for covariates. This predictive role is seen especially in the group of subjects on hypertensive medication ($P=0.001$).

Diets With High-Fat Cheese, High-Fat Meat, or Carbohydrate on Cardiovascular Risk Markers in Overweight Postmenopausal Women: A Randomized Crossover Trial

T.K. Thorning, F. Raziani, N.T. Bendtsen, A. Astrup, T. Tholstrup, A. Raben

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

Significance: Diets with cheese and meat as primary sources of saturated fatty acids cause higher HDL cholesterol and apo A-I and, therefore, appear to be less atherogenic than is a low-fat, high-carbohydrate diet.

The effects of cheese and meat as sources of saturated fatty acids (SFAs) or isocaloric replacement with carbohydrates on blood lipids, lipoproteins, and fecal excretion of fat and bile acids were explored in this randomized, crossover, open-label intervention in 14 overweight postmenopausal women. Three full-diet periods of 2-wk duration were provided separated by 2-wk washout periods.

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The isocaloric diets were: 1) a high-cheese (96–120-g) intervention (CHEESE), 2) a macronutrient-matched nondairy, high-meat control (high-fat processed and unprocessed meat in amounts matching the saturated fat content from the CHEESE intervention [MEAT]), and 3) a nondairy, low-fat, high-carbohydrate control (the energy from cheese fat and protein was isocalorically replaced by carbohydrates and lean meat [CARB]). Results showed that the CHEESE diet caused a 5% higher HDL-cholesterol concentration ($P=0.012$), an 8% higher apo A-I concentration ($P<0.001$), and a 5% lower apoB:apo A-I ratio ($P=0.008$) than the CARB diet. Also, the MEAT diet caused an 8% higher HDL-cholesterol concentration ($P<0.001$) and a 4% higher apo A-I concentration ($P=0.033$) than the CARB diet. Fecal fat excretion was 1.8 and 0.9 g higher with the CHEESE diet than with CARB and MEAT diets ($P<0.001$ and $P=0.004$, respectively) and 0.9 g higher with the MEAT diet than with the CARB diet ($P=0.005$). CHEESE and MEAT diets caused higher fecal bile acid excretion than did the CARB diet ($P<0.05$ and $P=0.006$, respectively).

Lean-Seafood Intake Reduces Cardiovascular Lipid Risk Factors in Healthy Subjects: Results From A Randomized Controlled Trial With A Crossover Design

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



Significance: The dietary protein source determines fasting and postprandial lipids in healthy individuals in a manner that may have an effect on the long-term development of cardiovascular disease.

This randomized controlled crossover trial with a 3-wk run-in period and a 5-wk washout period was designed to elucidate the potentials of 2 main dietary protein sources, lean-seafood and nonseafood, to modulate fasting and postprandial lipids in 20 healthy subjects. The researchers hypothesized that lean-seafood intake would reduce cardiovascular lipid risk factors in healthy subjects more than would the intake of nonseafood protein sources. Subjects consumed 2 balanced diets that varied in main protein sources (60% from lean-seafood or nonseafood sources for 4 wk). Results showed that relative to the nonseafood intervention, the lean-seafood intervention reduced fasting (relative difference by diets: 0.31 mmol/L; $P=0.03$) and postprandial ($P=0.01$) serum triacylglycerol concentrations. The lower serum triacylglycerol concentration was associated with reduced fasting triacylglycerol in chylomicrons and very-low-density lipoproteins (VLDLs) ($P=0.004$), reduced fasting VLDL particle size ($P=0.04$), and a reduced postprandial concentration of medium-sized VLDL particles ($P=0.02$). The lean-seafood intervention prevented the elevated ratio of total cholesterol to HDL-cholesterol in the fasted serum ($P=0.03$) and postprandial serum ($P=0.01$) that was observed after the nonseafood intervention.

Adherence to a DASH-Style Diet in Relation to Stroke: A Case-Control Study

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Journal of the American College of Nutrition, Vol. 34, No. 5; pp. 408-415, 2015.

DOI:10.1080/07315724.2014.943851

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

Significance: There is an inverse relationship between the DASH-style diet and prevalence of stroke.

This hospital-based case-control study examined the association between adherence to the Dietary Approaches to Stop Hypertension (DASH) diet and risk of stroke among an Iranian population. The study included 194 hospitalized stroke patients (cases) and 194 controls who were randomly selected from among hospitalized patients. A DASH diet score was constructed based on food and nutrients emphasized or minimized in the DASH diet. Results showed that the prevalence of stroke among those in the top quartile of the DASH diet score was 40%, which was 15% lower than among those in the bottom quartile ($p=0.10$). After controlling for age, sex, and total energy intake, adherence to the DASH diet was inversely associated with the risk of stroke (OR: 0.52; 95% CI: 0.28; 0.98). These associations remained significant even after additionally controlling for physical activity, smoking, hypertension, and diabetes, such that individuals in the highest quartile of the DASH diet score had a 58% lower risk of stroke than those in the lowest category (OR: 0.48; 95% CI: 0.24, 0.96). However, after further adjustment for BMI, the association disappeared (OR: 0.62; 95% CI: 0.29, 1.31), indicating an obesity-dependent association.

Diabetes

Prevalence of and Trends in Diabetes Among Adults in the United States, 1988-2012

A. Menke, S. Casagrande, L. Geiss, C.C. Cowie

Journal of the American Medical Association, Vol. 314, No. 10; pp. 1021-1029, 2015.

DOI: 10.1001/jama.2015.10029.

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

Significance: In 2011-2012, the estimated prevalence of diabetes was 12% to 14% among US adults with a higher prevalence among participants who were non-Hispanic black, non-Hispanic Asian, and Hispanic.

Cross-sectional surveys conducted between 1988-1994 and 1999-2012 of nationally representative samples of the US population were used to estimate the recent prevalence and update US trends in total diabetes, diagnosed diabetes, and undiagnosed diabetes. Adults from 2011-2012 ($n=2781$) were used to estimate recent prevalence and additional adults from 1988-2010 ($n=23,634$) were used to estimate trends. Results found that in the overall 2011-2012 population, the unadjusted prevalence was 14.3% (95% CI, 12.2%-16.8%) for total diabetes, 9.1% (95% CI, 7.8%-10.6%) for diagnosed diabetes, 5.2% (95% CI, 4.0%-6.9%) for undiagnosed diabetes, and 38.0% (95% CI, 34.7%-41.3%) for prediabetes; among those with diabetes, 36.4% (95% CI, 30.5%-42.7%) were undiagnosed. The unadjusted prevalence of total diabetes was 12.3% (95% CI, 10.8%-14.1%); among those with diabetes, 25.2% (95% CI, 21.1%-29.8%) were undiagnosed. Compared with non-Hispanic white participants (11.3% [95% CI, 9.0%-14.1%]), the age-standardized prevalence of total diabetes was higher among non-Hispanic black participants (21.8% [95% CI, 17.7%-26.7%]), non-Hispanic Asian participants (20.6% [95% CI, 15.0%-27.6%]), and Hispanic participants (22.6% [95% CI, 18.4%-27.5%]). The age-standardized percentage of cases that were undiagnosed was higher among non-Hispanic Asian participants (50.9% [95% CI, 38.3%-63.4%]) and Hispanic participants (49.0% [95% CI, 40.8%-57.2%]) than all other racial/ethnic groups. The age-standardized



prevalence of total diabetes increased from 9.8% (95% CI, 8.9%-10.6%) in 1988-1994 to 10.8% (95% CI, 9.5%-12.0%) in 2001-2002 to 12.4% (95% CI, 10.8%-14.2%) in 2011-2012 ($P < .001$ for trend) and increased significantly in every age group, in both sexes, in every racial/ethnic group, by all education levels, and in all poverty income ratio tertiles.

Lipids

Whole-Grain and Blood Lipid Changes in Apparently Healthy Adults: A Systematic Review and Meta-Analysis of Randomized Controlled Studies

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

Significance: Consumption of whole-grain diets lowers LDL-cholesterol and total cholesterol, but not HDL-cholesterol or triglycerides, compared with consumption of non-whole-grain control diets.



This meta-analysis assessed the effect of whole-grain compared with non-whole-grain foods on changes in total cholesterol (TC), LDL-cholesterol, HDL-cholesterol, and triglycerides. A systematic literature search included studies that were randomized controlled comparisons between whole-grain foods and a non-whole-grain control in adults. A total of 6069 articles were screened for eligibility; data were extracted from 24. Weighted mean differences were calculated, and meta-regression analyses were performed for whole-grain dose, study duration, and baseline TC concentration. Overall, whole-grain intake lowered LDL-cholesterol (weighted difference: -0.09 mmol/L; 95% CI: -0.15 , -0.03 mmol/L; $P < 0.01$) and TC (weighted difference: -0.12 mmol/L; 95% CI: -0.19 , -0.05 mmol/L; $P < 0.001$) compared with the control. Whole-grain oat had the greatest effect on TC (weighted difference: -0.17 mmol/L; 95% CI: -0.10 , -0.25 mmol/L; $P < 0.001$). Whole-grain foods tended to lower triglycerides compared with the control (weighted difference: -0.04 mmol/L; 95% CI: -0.08 , 0.01 ; $P = 0.10$). Study duration was positively associated with changes in TC and LDL-cholesterol.

Protein

Higher Total Protein Intake and Change in Total Protein Intake Affect Body Composition but Not Metabolic Syndrome Indexes in Middle-Aged Overweight and Obese Adults Who Perform Resistance and Aerobic Exercise for 36 Weeks

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Journal of Nutrition, Vol. 145, No. 9; pp. 2076-2083, 2015.

DOI: 10.3945/jn.115.213595

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

Significance: In conjunction with exercise training, higher total protein promoted positive changes in body composition but not in metabolic syndrome indexes in overweight and obese middle-aged adults.

This secondary data analysis assessed the impact of total protein intake (TPro) and change in TPro (CTPro) on changes in body composition (BC) and metabolic

syndrome (MetS) indexes in 117 overweight and obese middle-aged adults (50 ± 0.7 y, BMI 30.1 ± 0.3 kg/m²). Subjects performed resistance exercise 2 d/wk and aerobic exercise 1 d/wk and consumed an unrestricted diet along with 200-kcal supplements (0, 10, 20, or 30 g whey protein) twice daily for 36 wk. Protein intake was assessed via 4-d food records. Among all subjects, TPro and CTPro were inversely associated ($P < 0.05$) with changes in body mass, fat mass (FM), and BMI. Changes in BC were different ($P < 0.05$) among groups that consumed < 1.0 (n=43) vs. ≥ 1.0 to < 1.2 (n=29) vs. ≥ 1.2 g · kg⁻¹ · d⁻¹ (n=45). The TPro group with ≥ 1.0 to < 1.2 g · kg⁻¹ · d⁻¹ reduced FM and %FM and increased percentage of LM (%LM) compared with the lowest TPro group, whereas the TPro group with ≥ 1.2 g · kg⁻¹ · d⁻¹ presented intermediate responses on changes in FM, %FM, and %LM. The gain in LM was not different among groups. In addition, MetS indexes were not influenced by TPro and CTPro.

Isoflavones

Dietary Isoflavones, Urinary Isoflavonoids, and Risk of Ischemic Stroke in Women

D. Yu, X-O. Shu, H. Li, G. Yang, Q. Cai, Y-B. Xiang, et al.

American Journal of Clinical Nutrition, Vol. 102, No. 3; pp. 680-686, 2015.

DOI: 10.3945/ajcn.115.111591

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

Significance: A habitually high intake of soy isoflavones may be associated with a modest but significant increase in risk of ischemic stroke in women.

The dietary intake of isoflavones and the urinary excretion of isoflavonoids in relation to risk of ischemic stroke in women was examined in this prospective cohort study in 66,832 Chinese women (aged 40–70 y) who had no cardiovascular disease or cancer at baseline. A nested case-control study was also conducted in postmenopausal women who had never used hormone therapy, including 1422 incident ischemic stroke cases and 1422 controls individually matched by age, date and time of urine sample collection, time since last meal, and use of antibiotics. During a mean follow-up of 10 y, 3110 incident ischemic strokes were verified. Dietary isoflavone intake was associated with increased risk of ischemic stroke; multivariable-adjusted HRs from lowest to highest quintiles were 1.00, 1.05, 1.10, 1.11, and 1.24, respectively (95% CI: 1.08, 1.42; P-trend = 0.002). In the case-control study, a similar positive association was observed for dietary isoflavones, but no significant associations were shown for the urinary isoflavonoid concentration [OR: 1.01 (95% CI: 0.77, 1.32) for comparison of extreme quintiles].

Sodium

Effects of A Behavioral Intervention that Emphasizes Spices and Herbs on Adherence to Recommended Sodium Intake: Results of the SPICE Randomized Clinical Trial

C.A.M. Anderson, L.K. Cobb, E.R. Miller III, M. Woodward, A. Hottenstein, A.R. Chang, et al.

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



Significance: A multifactorial behavioral intervention emphasizing spices and herbs significantly reduced sodium intake.

This 2-phase study (conducted from 2012 to 2014) examined the effects of a behavioral intervention, which emphasized spices and herbs, on the maintenance of sodium intake at the recommended intake of 1500 mg/d in adults ≥ 18 y of age for whom Dietary Guidelines for Americans recommends this level of sodium per day. In phase 1, 55 individuals consumed a low-sodium diet for 4 wk. Participants were provided all foods, snacks, and calorie-containing drinks. In phase 2, 40 participants from phase 1 were randomly assigned to either a behavioral intervention to reduce sodium intake (n=20) or a self-directed control group (n=20) for 20 wk. The primary study outcome was the change in mean 24-h urinary sodium excretion during phase 2. Participant characteristics were as follows: 65% women; 88% African American; 63% with hypertension; 18% with diabetes; mean age 61 y; and mean BMI 30 kg/m². At the end of phase 2, mean 24-h sodium excretion was lower in the behavioral intervention than in the self-directed group (mean difference: -956.8 mg/d; 95% CI: -1538.7 , -374.9 mg/d) after sodium intake at screening was controlled for (P=0.002). These findings persisted in sensitivity analyses that excluded potentially incomplete urine collections [Mage's equation mean difference: -1090 mg/d (P=0.001); Joosens' equation mean difference: -796 mg/d (P=0.04)].

Special Report

Goals in Nutrition Science 2015–2020

D.B. Allison, J. Bassaganya-Riera, B. Burlingame, A.W. Brown, J. le Coutre, S.L. Dickson, et al.

Frontiers in Nutrition, 08 September 2015; Vol. 2, No. 26, 2015.

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

Significance: This Field Grand Challenge Article covers various topics, which is a collection of thoughts from active minds, rather than a complete integration or consensus.

With the definition of goals in Nutrition Science, *Frontiers in Nutrition* took a brave step and a leap of faith with regard to predicting the scope and direction of nutrition science over the next 5 years. The topics presented in this article represent the key opportunities in the field, but also the biggest challenges. Eight categories are presented in this article, which include: sustainable development goals for food and nutrition; identifying and mitigating errors in nutritional science; building the foundation--procurement of relevant measures and big data analysis; authenticity and safety of foods; the science behind food-related behavior in humans; the molecular and physiological science underlying nutrition and brain health; the science of the human microbiome; and nourishing the immune system and preventing disease.

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