Heart Disease and Diet

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No Disclosures
"Off hand, I'd say you're suffering from an arrow through your head, but just to play it safe, I'm ordering a bunch of tests."
The ACC is the PROFESSIONAL HOME for cardiovascular specialists and the care team.
Over 47,000 Members Strong
Local Chapters
Evidence-Based Science
Population Health

- Develop partnerships with organizations and other stakeholder groups to pursue national and international population health objectives related to CV disease health.

- Support members in their expanded accountability to improve the health of populations.

- Encourage CV team-facilitated patient education.

- WHO 25 by 25
Burden of Coronary Heart Disease

- CHD: 1 of every 6 deaths = 379,559 Americans
- 1\textsuperscript{st} MI: \approx 620,000 Americans
- Recurrent MI: \approx 295,000
- Silent 1\textsuperscript{st} MI: \approx 150,000

“Every 34 seconds, 1 American has a coronary event, and approximately every 1 minute 23 seconds, an American will die of one.”

http://circ.ahajournals.org/content/129/3/e28.full.pdf+html
Major Causes of Death in the U.S.

- Heart disease & stroke: 752,019
- Cancer: 562,875
- Chronic lower respiratory diseases: 127,924
- Accidents: 123,706
- Alzheimer's disease: 74,632
- Diabetes: 71,382
- Influenza & Pneumonia: 52,717
Death Rates* for Cardiovascular Diseases, U.S., 1900–2008

* Not age-adjusted.

Source: Vital Statistics of the United States, NCHS.
Figure 1. Decline in Deaths from Cardiovascular Disease in Relation to Scientific Advances.

The timeline shows the steady decline in cardiovascular deaths over the late 20th and early 21st centuries, along with major advances in cardiovascular science and medicine. ALLHAT denotes Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial, CASS Coronary Artery Surgery Study, GISSI Italian Group for the Study of Streptokinase in Myocardial Infarction, HMG-CoA 1-hydroxy-3-methylglutaryl coenzyme A, ISIS-2 Second International Study of Infarct Survival, MI myocardial infarction, NCEP National Cholesterol Education Program, NHBPEP National High Blood Pressure Education Program, PCI percutaneous coronary intervention, SAVE Survival and Ventricular Enlargement, and TIMI 1 Thrombolysis in Myocardial Infarction.
Good News

- Reduction in heart disease deaths
  - **Medications**
    - Statins
    - Beta-blockers
    - Antiplatelet
    - Antithrombotic
  - **Revascularization**
    - PCI
    - CABG
  - **Diagnostic imaging**
    - Nuclear
    - Echo
    - CTA
Trustees raise concerns over long-term sustainability of Medicare, Social Security

- Trustees yesterday released their annual reports on Social Security and Medicare. Major print and online media outlets reported on the story and, while coverage focused on trustees’ worries over Social Security’s disability benefits fund, most outlets also noted the concerns raised over Medicare’s long-term sustainability.
Trustees raise concerns over long-term sustainability of Medicare, Social Security

The New York Times (7/23, Pear, Subscription Publication) reports that the trustees who oversee Social Security and Medicare said Wednesday that 11 million people face a deep cut in disability benefits in late 2016 if Congress does not replenish Social Security’s disability trust fund. According to the Times, the report “sets up a fight” between congressional Republicans and President Obama, who wants to bolster the disability trust fund by shifting some payroll tax revenues from Social Security’s retirement trust fund. Trustees also “predicted that Medicare’s hospital insurance trust fund would be exhausted in 2030, the same as projected last year,” though HHS Secretary Sylvia Burwell “said the Affordable Care Act had extended the life of Medicare’s hospital insurance trust fund by 13 years.” Previously, officials had “estimated that the trust fund would be depleted in 2017.”
Trustees raise concerns over long-term sustainability of Medicare, Social Security

- Reuters (7/23) reports that at the current rate of payroll tax revenues, Medicare would be able to cover about 86 percent of costs for the fund in 2030, declining to 80 percent by 2050.

- The Wall Street Journal (7/23, Timiraos, Subscription Publication) reports that Medicare costs are projected to rise from 3.5 percent of GDP currently to 6 percent over the next 75 years, down from 6.84 percent in last year’s report. The Journal adds that low inflation will trigger a provision restricting premium increases for about 70 percent of Medicare beneficiaries next year, but the remaining 30 percent – including new enrollees and those who don’t receive Social Security – will see their premiums raised significantly, under current law.
Cholesterol Reduction Only?

- **Niacin**
  - HPS2-THRIVE
  - AIM-HIGH
  - Increased risk of all-cause mortality

- **Fibrates**
  - FIELD
  - Less CHD events, increased overall mortality

- **Ezetimibe**
  - ENHANCE, ARBITER 6-HALTS, SEAS
  - IMPROVE-IT, SHARP
Torcetrapib in High-risk Patients: ILLUMINATE Study

Lipid Levels

CV Events

% change

without an event (%)

Days

TC  HDL  LDL

Atorvastatin

Atorvastatin + Torcetrapib

p=0.001

Barter PJ: NEJM 2008
<table>
<thead>
<tr>
<th>Food Name</th>
<th>Cholesterol</th>
<th>Calories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brains, cooked</td>
<td>3074</td>
<td>150</td>
</tr>
<tr>
<td>Breaded brains, Puerto Rican style (Sesos rebosados)</td>
<td>1766</td>
<td>251</td>
</tr>
<tr>
<td>Egg, yolk only, raw</td>
<td>1234</td>
<td>322</td>
</tr>
<tr>
<td>Egg, yolk only, cooked</td>
<td>1229</td>
<td>321</td>
</tr>
<tr>
<td>Goat head, cooked</td>
<td>1069</td>
<td>145</td>
</tr>
<tr>
<td>Squid, dried</td>
<td>883</td>
<td>349</td>
</tr>
<tr>
<td>Duck egg, cooked</td>
<td>880</td>
<td>184</td>
</tr>
<tr>
<td>Goose egg, cooked</td>
<td>849</td>
<td>184</td>
</tr>
<tr>
<td>Quail egg, canned</td>
<td>836</td>
<td>156</td>
</tr>
<tr>
<td>Kidney, cooked</td>
<td>710</td>
<td>157</td>
</tr>
<tr>
<td>Shrimp, dried</td>
<td>638</td>
<td>253</td>
</tr>
<tr>
<td>Roe, sturgeon</td>
<td>588</td>
<td>252</td>
</tr>
<tr>
<td>Chicken liver, braised</td>
<td>558</td>
<td>166</td>
</tr>
<tr>
<td>Chicken liver, fried</td>
<td>550</td>
<td>261</td>
</tr>
</tbody>
</table>
Effects of eggs on plasma lipoproteins in healthy populations†

Maria Luz Fernandez*

Received 19th July 2010, Accepted 6th September 2010
DOI: 10.1039/c0fo00088d

Extensive research has not clearly established a link between egg consumption and risk for coronary heart disease. This lack of connection can be explained by two major reasons: First, eggs are a good source of numerous nutrients including lutein and zeaxanthin, potent antioxidants, which may exert a protective effect against lipoprotein oxidation. Second, it has been well established that dietary cholesterol increases the concentrations of both circulating LDL and HDL cholesterol in those individuals who experience a higher increase in plasma cholesterol following egg consumption (hyper-responders). It is also important to note that 75% of the population experiences a mild increase or no alterations in plasma cholesterol concentrations when challenged with high amounts of dietary cholesterol (normal responders and hypo-responders). Egg intake has been shown to promote the formation of large LDL and HDL subclasses in addition to shifting individuals from the LDL pattern B to pattern A, which is less atherogenic. For these reasons, dietary recommendations aimed at restricting egg consumption should be taken with caution and not include all individuals. We need to acknowledge that diverse healthy populations experience no risk in developing coronary heart disease by increasing their intake of cholesterol but in contrast, they may have multiple beneficial effects by the inclusion of eggs in their regular diet.
Nutrition Panel Calls for Less Sugar and Eases Cholesterol and Fat Restrictions

By ANAHAD O’CONNOR    FEBRUARY 19, 2015 2:47 PM

Andrew Scrivani for The New York Times and Barton Silverman/The New York Times
BUCKET LIST

- Bucket of Fried Chicken
- Bucket of Shrimp
- Bucket of Tartar Sauce
- Bucket of Chili
- Bucket of Popcorn
- Bucket of Cholesterol Medicine
February 19, 2015

Nutrition panel announces new dietary recommendations

- *Dietary Guidelines Advisory Committee (2015)*
  - coffee
  - cholesterol
  - fat
  - meat
  - sugar consumption
Nutrition panel announces new dietary recommendations.

• Americans are “eating too much salt, sugar and saturated fat, and not enough foods that fit a ‘healthy dietary pattern’ like fruits, vegetables, nuts, whole grains, fish and moderate levels of alcohol.”

• limit sugar to no more than 10 percent of daily calories

– link to obesity and chronic disease
Nutrition panel announces new dietary recommendations.

- Americans consume 22 to 30 teaspoons of added sugar daily, half of which come from soda, juices and other sugary drinks.
- Sugary drinks should be removed from schools.
- Consider the impact on the environment when they are choosing what to eat.
- Discourage people from eating red meat.
Nutrition panel announces new dietary recommendations.

• Meat and Cholesterol:
  – “don’t eat as much red and processed meats, but lean meats can be a part of a healthy diet.”
  – “cholesterol is not considered a nutrient of concern”
  – “research tells us eating cholesterol rich foods doesn’t necessarily translate into high blood cholesterol levels.”
Cholesterol. Previously, the Dietary Guidelines for Americans recommended that cholesterol intake be limited to no more than 300 mg/day. The 2015 DGAC will not bring forward this recommendation because available evidence shows no appreciable relationship between consumption of dietary cholesterol and serum cholesterol, consistent with the conclusions of the AHA/ACC report.\textsuperscript{2,35} Cholesterol is not a nutrient of concern for overconsumption.


Dietary Cholesterol

There is insufficient evidence to determine whether lowering dietary cholesterol reduces LDL-C.
FIGURE 2. Pooled HRs and 95% CIs for incident IHD, stroke, and overall CVD. The pooled estimates were obtained by using a random-effects model. The dots indicate the adjusted HRs from a comparison of the highest category of egg consumption (≥1 egg/d) with the lowest (<1 egg/wk or never). The size of the shaded square is proportional to the weight of the individual study. The horizontal lines represent 95% CIs. The diamond data markers indicate the pooled HRs. CVD, cardiovascular disease; IHD, ischemic heart disease.
Egg consumption in relation to risk of cardiovascular disease and diabetes: a systematic review and meta-analysis$^{1-3}$

Jang Yel Shin, Pengcheng Xun, Yasuyuki Nakamura, and Ka He

ABSTRACT
Background: The associations of egg consumption with cardiovascular disease (CVD) and diabetes are still unclear.
Objective: We aimed to quantitatively summarize the literature on egg consumption and risk of CVD, cardiac mortality, and type 2 diabetes by conducting a meta-analysis of prospective cohort studies.
Design: A systematic literature review was conducted for published studies in PubMed and EMBASE through March 2012. Additional information was retrieved through Google or a hand review of the reference from relevant articles. Studies were included if they had a prospective study design, were published in English-language journals, and provided HRs and 95% CIs for the associations of interest. Data were independently extracted by 2 investigators, and the weighted HRs and 95% CIs for the associations of interest were estimated by using a random-effects model.
Results: A total of 22 independent cohorts from 16 studies were identified, including participants ranging in number from 1600 to 90,735 and in follow-up time from 5.8 to 20.0 y. Comparison of the highest category (≥1 egg/d) of egg consumption with the lowest (<1 egg/wk or never) resulted in a pooled HR (95% CI) of 0.96 (0.88, 1.05) for overall CVD, 0.97 (0.86, 1.09) for ischemic heart disease, 0.93 (0.81, 1.07) for stroke, 0.98 (0.77, 1.24) for ischemic heart disease mortality, 0.92 (0.56, 1.50) for stroke mortality, and 1.42 (1.00, 1.96) for type 2 diabetes. Of the studies conducted in

Egg consumption is one of the main sources of dietary cholesterol. A medium egg contains ~225 mg cholesterol (21). A meta-analysis of clinical trials (22) found that the addition of 100 mg dietary cholesterol from eggs increased the ratio of total to HDL cholesterol by 0.02 units as well as plasma total cholesterol by 2.2 mg/dL and HDL cholesterol by 0.3 mg/dL. However, a few randomized controlled trials (RCTs) published later reported that egg consumption did not appreciably alter plasma total cholesterol, LDL cholesterol (23–25), HDL cholesterol (24, 25), or the ratio of total to HDL cholesterol (19, 25, 26). In addition, 2 RCTs (27, 28) found that consuming 2 eggs/d for 6 wk had no adverse effect on endothelial function. To date, no RCT data are available, whereas many observational studies relating egg consumption to the risk of CVD (29–36) and diabetes (37–41) have been published. However, the findings from these studies are inconsistent. To quantitatively investigate the overall longitudinal associations of egg consumption with incidence of CVD, type 2 diabetes, and cardiac mortality, we conducted a meta-analysis of prospective cohort studies.

SUBJECTS AND METHODS

Egg consumption in relation to risk of cardiovascular disease and diabetes: a systematic review and meta-analysis¹⁻³

**Results:** A total of 22 independent cohorts from 16 studies were identified, including participants ranging in number from 1600 to 90,735 and in follow-up time from 5.8 to 20.0 y. Comparison of the highest category (≥1 egg/d) of egg consumption with the lowest (<1 egg/wk or never) resulted in a pooled HR (95% CI) of 0.96 (0.88, 1.05) for overall CVD, 0.97 (0.86, 1.09) for ischemic heart disease, 0.93 (0.81, 1.07) for stroke, 0.98 (0.77, 1.24) for ischemic heart disease mortality, 0.92 (0.56, 1.50) for stroke mortality, and 1.42 (1.09, 1.86) for type 2 diabetes. Of the studies conducted in diabetic patients, the pooled HR (95% CI) was 1.69 (1.09, 2.62) for overall CVD.

**Conclusions:** This meta-analysis suggests that egg consumption is not associated with the risk of CVD and cardiac mortality in the general population. However, egg consumption may be associated with an increased incidence of type 2 diabetes among the general population and CVD comorbidity among diabetic patients.
Original Contribution

Risk Factors for Mortality in the Nurses’ Health Study: A Competing Risks Analysis

Heather J. Baer*, Robert J. Glynn, Frank B. Hu, Susan E. Hankinson, Walter C. Willett, Graham A. Colditz, Meir Stampfer, and Bernard Rosner

* Correspondence to Dr. Heather J. Baer, Division of General Medicine and Primary Care, Brigham and Women’s Hospital, 1620 Tremont Street, Boston, MA 02120 (e-mail: hbaer@partners.org).
Table 2. Associations of Risk Factors With All-Cause Mortality From a Cox Proportional Hazards Model Among 50,112 Participants in the Nurses’ Health Study, 1986–2004

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>HR(^b)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (per 19 years)</td>
<td>5.78</td>
<td>5.06, 6.61</td>
</tr>
<tr>
<td>Body mass index at age 18 years (per 7 kg/m(^2))</td>
<td>1.23</td>
<td>1.15, 1.31</td>
</tr>
<tr>
<td>Weight change since age</td>
<td>1.07</td>
<td>1.00, 1.15</td>
</tr>
<tr>
<td>Glycemic load (per 41 units)</td>
<td>1.22</td>
<td>1.12, 1.34</td>
</tr>
<tr>
<td>Dietary cholesterol (per 105 mg/1,000 kcal)</td>
<td>1.17</td>
<td>1.08, 1.26</td>
</tr>
<tr>
<td>Cereal fiber (per 4 g, energy adjusted)</td>
<td>0.84</td>
<td>0.78, 0.91</td>
</tr>
</tbody>
</table>

Note: Nut consumption, servings/week:

<table>
<thead>
<tr>
<th>Servings/week</th>
<th>HR(^b)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>1.0</td>
<td>Referent</td>
</tr>
<tr>
<td>≤1</td>
<td>0.92</td>
<td>0.87, 0.98</td>
</tr>
<tr>
<td>≥2</td>
<td>0.86</td>
<td>0.77, 0.95</td>
</tr>
<tr>
<td>Polyunsaturated fat (per 3% energy)</td>
<td>0.85</td>
<td>0.79, 0.91</td>
</tr>
</tbody>
</table>

Table continues.

abolic equivalent; MI, myocardial infarction.

\(^a\) Units for continuous variables correspond to the difference between the 90th and 10th percentile values.

\(^b\) Adjusted for all other risk factors in table.

\(^c\) From 1986 questionnaire.

\(^d\) From 1980 questionnaire.

\(^e\) From 1976 questionnaire; 1 inch = 2.54 cm.

\(^f\) Average of values from 1980, 1984, and 1986 questionnaires.

\(^g\) From 1988 questionnaire.

\(^h\) From 1986 or previous questionnaires.
Vegetarian diets and blood pressure among white subjects: results from the Adventist Health Study-2 (AHS-2)

Betty J Pettersen¹,†, Ramtin Anousheh¹, Jing Fan¹, Karen Jaceldo-Siegl², and Gary E Fraser¹,*

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² Department of Nutrition, School of Public Health, Loma Linda University, Loma Linda, CA, USA

Abstract

Objective—Previous work studying vegetarians has often found that they have lower blood pressure (BP). Reasons may include their lower BMI and higher intake levels of fruit and vegetables. Here we seek to extend this evidence in a geographically diverse population containing vegans, lacto-ovo vegetarians and omnivores.
<table>
<thead>
<tr>
<th>Diet Type</th>
<th>%</th>
<th>Beef</th>
<th>Poultry/Fish</th>
<th>Dairy/Eggs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegan</td>
<td>4.3</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Lacto-Ovo</td>
<td>34.0</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Pesco-Vege</td>
<td>9.7</td>
<td>None</td>
<td>Fish</td>
<td>Dairy</td>
</tr>
<tr>
<td>Semi-Vege</td>
<td>8.3</td>
<td>Meat</td>
<td>Chicken, Fish</td>
<td>Dairy</td>
</tr>
<tr>
<td>Non-Vege</td>
<td>43.7</td>
<td>Meat</td>
<td>Fish</td>
<td>Dairy</td>
</tr>
</tbody>
</table>
TABLE 1
Mean BMI (in kg/m²) and the prevalence of diabetes and hypertension in different types of vegetarians compared with nonvegetarians in California Seventh-day Adventists: preliminary analyses adjusted for age, sex, and race\(^1\)

<table>
<thead>
<tr>
<th>Diet group</th>
<th>BMI(^2)</th>
<th>Diabetes(^3)</th>
<th>Hypertension(^3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonvegetarian</td>
<td>28.26 (28.22, 28.30)</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Semivegetarian</td>
<td>27.00 (26.96, 27.04)</td>
<td>0.72 (0.65, 0.79)</td>
<td>0.77 (0.72, 0.82)</td>
</tr>
<tr>
<td>Pescovegetarian</td>
<td>25.73 (25.69, 25.77)</td>
<td>0.49 (0.44, 0.55)</td>
<td>0.62 (0.59, 0.66)</td>
</tr>
<tr>
<td>Lactoovo-vegetarian</td>
<td>25.48 (25.44, 25.52)</td>
<td>0.39 (0.36, 0.42)</td>
<td>0.45 (0.44, 0.47)</td>
</tr>
<tr>
<td>Vegan</td>
<td>23.13 (23.09, 23.16)</td>
<td>0.22 (0.18, 0.28)</td>
<td>0.25 (0.22, 0.28)</td>
</tr>
</tbody>
</table>

\(^{1}\) \(n = 89,224\).
Cutting down on meat for health: More people are trying it

President Clinton adopted a vegan diet in 2010 to protect his health after heart surgery. (Daniel Berehulak / Getty Images)
Master illusionist Penn Jillette, of Penn and Teller, recently lost 105 pounds, and not with a supplement or gimmick but with strict diet and exercise. His incentive went beyond vanity; he was on several medications to manage his high blood pressure and he weighed 330 pounds. When Jillette's doctor told him, "If you got down to 230 you probably wouldn't need any of the meds," he decided to change, he told *People* on April 8.

His strategy? He ate 1,000 calories a day and lost just under 1 pound a day, from last December through March of this year, for a total loss of 105 pounds. Now at 225 he no longer needs his meds and finds he has more energy. Take a bow, Penn, but read on.

**It's Not Magic**

His diet? Jillette went vegan. He now eats no animal products, no processed grains, no added sugar or salt. Jillette got what he wanted from his weight loss – he's healthier, no doubt. But no magic was performed here. Jillette lost weight because he "extreme dieted." When you're 6'7" and 330 pounds (150 kg), it takes a lot of calories to just maintain that weight; at least 3,300 per day at bare minimum and likely 4,000 or more. So 1,000 calories a day represents probably a 3,000 calorie deficit for this man, enough to explain his 0.9 pound per day weight loss.
Effects of a Dietary Portfolio of Cholesterol-Lowering Foods vs Lovastatin on Serum Lipids and C-Reactive Protein

David J. A. Jenkins, MD
Cyril W. C. Kendall, PhD
Augustine Marchie, BSc
Dorothea A. Faulkner, PhD
Julia M. W. Wong, RD
Russell de Souza, RD
Azadeh Emam, BSc
Tina L. Parker, RD
Edward Vidgen, BSc
Karen G. Lapsley, DSc
Elke A. Trautwein, PhD

Context To enhance the effectiveness of diet in lowering cholesterol, recommendations of the Adult Treatment Panel III of the National Cholesterol Education Program emphasize diets low in saturated fat together with plant sterols and viscous fibers, and the American Heart Association supports the use of soy protein and nuts.

Objective To determine whether a diet containing all of these recommended food components leads to cholesterol reduction comparable with that of 3-hydroxy-3-methylglutaryl coenzyme A reductase inhibitors (statins).

Design Randomized controlled trial conducted between October and December 2002.

Setting and Participants Forty-six healthy, hyperlipidemic adults (25 men and 21 postmenopausal women) with a mean (SE) age of 59 (1) years and body mass index of 27.6 (0.5), recruited from a Canadian hospital-affiliated nutrition research center and the community.

Interventions Participants were randomly assigned to undergo 1 of 3 interventions
Participants were randomly assigned to undergo 1 of 3 interventions on an outpatient basis for 1 month:

• a diet very low in saturated fat, based on milled whole-wheat cereals and low-fat dairy foods (n = 16; control);

• the same diet plus lovastatin, 20 mg/d (n = 14); or

• a diet high in plant sterols (1.0 g/1000 kcal), soy protein (21.4 g/1000 kcal), viscous fibers (9.8 g/1000 kcal), and almonds (14 g/1000 kcal) (n = 16; dietary portfolio).
Figure 2. Change From Baseline in LDL-C, LDL-C–HDL-C Ratio, and C-Reactive Protein

LDL-C indicates low-density lipoprotein cholesterol; HDL-C, high-density lipoprotein cholesterol. Values are expressed as mean (SE) because, with the number of participants involved, approximately twice the SE represents a significant difference.
Anterior  Scores: 0=Normal  1=Equivocal  2=Moderately Reduced  3=Severely Reduced  4=Absent

Scores  Septal  Lateral  Inferior

Summed Rest Score = 14
Summed Difference Score = 17

Summed Stress Score = 31
Probability of Survival: 1yr:81%  2yr:77%  3yr:63%  4yr:62%

Stress Total Severity Score = 671

Anterior  Scores: 0=Normal  1=Equivocal  2=Moderately Reduced  3=Severely Reduced  4=Absent

Scores  Septal  Lateral  Inferior

Summed Rest Score = 9
Summed Difference Score = 5

Summed Stress Score = 14
Probability of Survival: 1yr:95%  2yr:80%  3yr:72%  4yr:62%
Context.—The Lifestyle Heart Trial demonstrated that intensive lifestyle changes may lead to regression of coronary atherosclerosis after 1 year.

Objectives.—To determine the feasibility of patients to sustain intensive lifestyle changes for a total of 5 years and the effects of these lifestyle changes (without lipid-lowering drugs) on coronary heart disease.

Design.—Randomized controlled trial conducted from 1986 to 1992 using a randomized invitational design.

Patients.—Forty-eight patients with moderate to severe coronary heart disease were randomized to an intensive lifestyle change group or to a usual-care control group, and 35 completed the 5-year follow-up quantitative coronary arteriography.

Setting.—Two tertiary care university medical centers.

Intervention.—Intensive lifestyle changes (10% fat whole foods vegetarian diet, aerobic exercise, stress management training, smoking cessation, group psycho-social support) for 5 years.

Main Outcome Measures.—Adherence to intensive lifestyle changes, changes in coronary artery percent diameter stenosis, and cardiac events.
Figure 2.—Changes in percentage diameter stenosis by 5-year adherence tertiles for the experimental group.

Figure 1.—Mean percentage diameter stenosis in treatment and control groups at baseline, 1 year, and 5 years. Error bars represent SEM; asterisk, $P=.02$ by between-group 2-tailed test; dagger, $P=.001$ by between-group 2-tailed test.
Figure 4

Plaque Regression with Diet
Side Effects of Lipid-Lowering Drugs

At each visit, the patients were asked about known side effects of lipid-lowering drugs. After adjustment for base-line prevalence, moderate or severe constipation occurred at some time in 20 percent and 6 percent, respectively, of 118 patients taking colestipol, as did moderate or severe hemorrhoids in 10 percent and 5 percent. With niacin and colestipol, the uric acid level increased (from 6.9 to 7.5 mmol per liter, P<0.005), and gout developed in two patients. The serum aspartate aminotransferase level increased by about 20 percent (P<0.03) in both the niacin–colestipol and the lovastatin–colestipol groups, but in no patient did the level exceed three times the normal value. The alkaline phosphatase level increased by 22 percent (P<0.01) in the patients who received niacin and colestipol. Two patients in the niacin–colestipol group required the addition of antidiabetic drugs to their regimens. Niacin and colestipol were continued despite the development of acanthosis nigricans in three patients and a pruritic skin rash in four. Cataracts and cystic macular edema were not observed despite ophthalmologic evaluation of visual changes reported by the patients.

Brown G, Albers JJ, Fisher LD, et al. Regression of coronary artery disease as a result of intensive lipid-lowering therapy in men with high levels of apolipoprotein B. 

Effect of Intensive Compared With Moderate Lipid-Lowering Therapy on Progression of Coronary Atherosclerosis
A Randomized Controlled Trial

Context Statin drugs reduce both atherogenic lipoproteins and cardiovascular morbidity and mortality. However, the optimal strategy and target level for lipid reduction remain uncertain.

Objective To compare the effect of regimens designed to produce intensive lipid lowering or moderate lipid lowering on coronary artery atheroma burden and progression.

Design, Setting, and Patients Double-blind, randomized active control multicenter trial (Reversal of Atherosclerosis with Aggressive Lipid Lowering [REVERSAL]) performed at 34 community and tertiary care centers in the United States comparing the effects of 2 different statins administered for 18 months. Intravascular ultrasound was used to measure progression of atherosclerosis. Between June 1999 and September 2001, 654 patients were randomized and received study drug; 502 had evaluable intravascular ultrasound examinations at baseline and after 18 months of treatment.

Interventions Patients were randomly assigned to receive a moderate lipid-lowering regimen consisting of 40 mg of pravastatin or an intensive lipid-lowering regimen consisting of 80 mg of atorvastatin.

Main Outcome Measures The primary efficacy parameter was the percentage change in atheroma volume (follow-up minus baseline).
Effect of Two Intensive Statin Regimens on Progression of Coronary Disease


Abstract

Statins reduce adverse cardiovascular outcomes and slow the progression of coronary atherosclerosis in proportion to their ability to reduce low-density lipoprotein (LDL) cholesterol. However, few studies have either assessed the ability of intensive statin treatments to achieve disease regression or compared alternative approaches to maximal statin administration.

We performed serial intravascular ultrasonography in 1039 patients with coronary disease, at baseline and after 104 weeks of treatment with either atorvastatin, 80 mg daily, or rosuvastatin, 40 mg daily, to compare the effect of these two intensive statin regimens on the progression of coronary atherosclerosis, as well as to assess their safety and side-effect profiles.
LOW-CARBOHYDRATE–HIGH-PROTEIN DIET AND LONG-TERM SURVIVAL IN A GENERAL POPULATION COHORT

A Trichopoulou¹, T Psaltopoulou¹, P Orfanos¹, C-C Hsieh²,³ and D Trichopoulous¹,³

¹Department of Hygiene and Epidemiology, School of Medicine, University of Athens, Athens, Greece; ²University of Massachusetts Cancer Centre, Worcester, MA, USA and ³Department of Epidemiology, Harvard School of Public Health, Boston, MA, USA

Objective: We have evaluated the effects on mortality of habitual low carbohydrate–high-protein diets that are thought to
Results: During 113,230 persons years of follow-up, there were 455 deaths. In models with energy adjustment, higher intake of carbohydrates was associated with significant reduction of total mortality, whereas higher intake of protein was associated with nonsignificant increase of total mortality (per decile, mortality ratios 0.94 with 95% CI 0.89 –0.99, and 1.02 with 95% CI 0.98 –1.07 respectively). Even more predictive of higher mortality were high values of the additive low carbohydrate–high protein score (per 5 units, mortality ratio 1.22 with 95% CI 1.09 –to 1.36). Positive associations of this score were noted with respect to both cardiovascular and cancer mortality.

Conclusion: Prolonged consumption of diets low in carbohydrates and high in protein is associated with an increase in total mortality.

### Table 1. Comparison of Vegetarian With Nonvegetarian Dietary Patterns With Respect to All-Cause and Cause-Specific Mortality From a Cox Proportional Hazards Regression Model Among Participants in the Adventist Health Study 2, 2002-2009

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>All-Cause</th>
<th>Ischemic Heart Disease</th>
<th>Cardiovascular Disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>All (N = 73,308), No. of deaths&lt;sup&gt;a,b&lt;/sup&gt;</td>
<td>2560</td>
<td>372</td>
<td>987</td>
</tr>
<tr>
<td>Vegetarian</td>
<td>0.88 (0.80-0.97)</td>
<td>0.81 (0.64-1.02)</td>
<td>0.87 (0.75-1.01)</td>
</tr>
<tr>
<td>Nonvegetarian</td>
<td>1 [Reference]</td>
<td>1 [Reference]</td>
<td>1 [Reference]</td>
</tr>
<tr>
<td>Men (n = 25,105), No. of deaths&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1031</td>
<td>169</td>
<td>390</td>
</tr>
<tr>
<td>Vegetarian</td>
<td>0.82 (0.72-0.94)</td>
<td>0.71 (0.51-1.00)</td>
<td>0.71 (0.57-0.90)</td>
</tr>
<tr>
<td>Nonvegetarian</td>
<td>1 [Reference]</td>
<td>1 [Reference]</td>
<td>1 [Reference]</td>
</tr>
</tbody>
</table>

**Figure Legend:**

Table 1. Comparison of Vegetarian With Nonvegetarian Dietary Patterns With Respect to All-Cause and Cause-Specific Mortality From a Cox Proportional Hazards Regression Model Among Participants in the Adventist Health Study 2, 2002-2009.
Conclusions: Red meat consumption is associated with an increased risk of total, CVD, and cancer mortality. Substitution of other healthy protein sources for red meat is associated with a lower mortality risk.
Figure 1. Dose-response relationship between red meat intake and risk of all-cause mortality in the Health Professionals Follow-up Study (A) and the Nurses’ Health Study (B). The results were adjusted for age (continuous); body mass index (calculated as weight in kilograms divided by height in meters squared) category (23.0, 23.0-24.9, 25.0-29.9, 30.0-34.9, or 35); alcohol consumption (0, 0.1-4.9, 5.0-29.9, 30.0 g/d in men; 0, 0.1-4.9, 5.0-14.9, or 15.0 g/d in women); physical activity level (3.0, 3.0-8.9, 9.0-17.9, 18.0-26.9, or 27.0 hours of metabolic equivalent tasks per week); smoking status (never, past, or current [1-14, 15-24, or 25 cigarettes per day]); race (white or nonwhite); menopausal status and hormone use in women (premenopausal, postmenopausal never users, postmenopausal past users, or postmenopausal current users); family history of diabetes mellitus, myocardial infarction, or cancer; history of diabetes mellitus, hypertension, or hypercholesterolemia; and intakes of total energy, whole grains, fruits, and vegetables, all in quintiles. Broken lines represent 95% CI.
Nuts for unprocessed red meat
Legumes for unprocessed red meat
Low-fat dairy for unprocessed red meat
Whole grains for unprocessed red meat
Poultry for unprocessed red meat
Fish for unprocessed red meat

Nuts for processed red meat
Legumes for processed red meat
Low-fat dairy for processed red meat
Whole grains for processed red meat
Poultry for processed red meat
Fish for processed red meat

Nuts for total red meat
Legumes for total red meat
Low-fat dairy for total red meat
Whole grains for total red meat
Poultry for total red meat
Fish for total red meat

Hazard Ratios for Total Mortality

0.65 0.70 0.75 0.80 0.85 0.90 0.95 1.00
Nut consumption and risk of mortality in the Physicians' Health Study.

Hsieh TT¹, Petrone AB¹, Gaziano JM¹, Droussé L¹.

Abstract

BACKGROUND: Previous studies have suggested that nut consumption is associated with beneficial cardiovascular outcomes. However, limited data are available on the association between nut intakes and all-cause mortality.

OBJECTIVE: Our aim was to test the hypothesis that nut consumption is inversely associated with the risk of all-cause mortality.

DESIGN: In this prospective cohort study in 20,742 male physicians, we assessed nut intake between 1999 and 2002 via a food-frequency questionnaire and ascertained deaths through an endpoint committee. We used Cox regression to estimate multivariable-adjusted HRs for death according to nut consumption. In secondary analyses, we evaluated associations of nut consumption with cause-specific mortality.

RESULTS: During a mean follow-up of 9.6 y, there were 2732 deaths. The mean (±SD) age at baseline was 66.6 ± 9.3 y. Median nut consumption was 1 serving/wk. Multivariable-adjusted HRs (95% CIs) were 1.0 (reference), 0.92 (0.83, 1.01), 0.85 (0.76, 0.96), 0.86 (0.75, 0.98), and 0.74 (0.63, 0.87) for nut consumption of never or <1 serving/mo, 1-3 servings/mo, 1 serving/wk, 2-4 servings/wk, and ≥5 servings/wk, respectively (P-linear trend < 0.0001), after adjustment for age, body mass index, alcohol use, smoking, exercise, prevalent diabetes and hypertension, and intakes of energy, saturated fat, fruit and vegetables, and red meat. In a secondary analysis, results were consistent for cardiovascular disease mortality but only suggestive and non-statistically significant for coronary artery disease and cancer mortality.

CONCLUSION: Our data are consistent with an inverse association between nut consumption and the risk of all-cause and cardiovascular disease mortality in US male physicians.

RESULTS:
During a mean follow-up of 9.6 y, there were 2732 deaths. The mean (±SD) age at baseline was 66.6 ± 9.3 y. Median nut consumption was 1 serving/wk. Multivariable-adjusted HRs (95% CIs) were 1.0 (reference), 0.92 (0.83, 1.01), 0.85 (0.76, 0.96), 0.86 (0.75, 0.98), and 0.74 (0.63, 0.87) for nut consumption of never or <1 serving/mo, 1-3 servings/mo, 1 serving/wk, 2-4 servings/wk, and ≥5 servings/wk, respectively (P-linear trend < 0.00001).

Nut consumption and 5-y all-cause mortality in a Mediterranean cohort: the SUN p [Nutrition. 2014]

Nut consumption and risk of stroke in US male physicians. [Clin Nutr. 2010]

Fruit and vegetable consumption and mortality from all causes, cardiovascular [BMJ. 2014]

Nut consumption, vegetarian diets, ischemic heart disease risk [Am J Clin Nutr. 1999]

Adjusted Hazard Ratio (HR) of the Usual Percentage of Calories From Added Sugar for Cardiovascular Disease Mortality Among US Adults 20 Years or Older: National Health and Nutrition Examination Survey Linked Mortality Files, 1988-2006

Histogram of the distribution of usual percentage of calories from added sugar in the population. Lines show the adjusted HRs from Cox models. Midvalue of quintile 1 (7.4%) was the reference standard. The model was adjusted for age, sex, race/ethnicity, educational attainment, smoking status, alcohol consumption, physical activity level, family history of cardiovascular disease, antihypertensive medication use, Healthy Eating Index score, body mass index, systolic blood pressure, total serum cholesterol, and total calories. Solid line indicates point estimates; dashed lines indicate 95% CIs.

Figure Legend:
Too much animal-based protein could lead to early death, study says
Low Protein Intake Is Associated with a Major Reduction in IGF-1, Cancer, and Overall Mortality in the 65 and Younger but Not Older Population
Insulin-like growth factor 1
(somatomedin C)
• High IGF-1 levels increased the relationship between mortality and high protein

• High protein intake is linked to increased cancer, diabetes, and overall mortality

• Higher protein consumption may be protective for older adults

• Plant-derived proteins are associated with lower mortality than animal-derived proteins
Pathways Linking Dietary Phosphatidylcholine, Intestinal Microbiota, and Incident Adverse Cardiovascular Events.

Dietary phosphatidylcholine → Choline → Hepatic FMOs → Trimethylamine → Trimethylamine-N-oxide → Atherosclerosis → Stroke, Heart attack, Death

Gut flora

Kaplan–Meier Estimates of Major Adverse Cardiovascular Events, According to the Quartile of TMAO Level.

From: Prognostic Value of Elevated Levels of Intestinal Microbe-Generated Metabolite Trimethylamine-N-Oxide in Patients With Heart Failure: Refining the Gut Hypothesis


Kaplan-Meier Estimates of Risk of All-Cause Mortality According to Quartiles of Plasma Levels of TMAO

Kaplan-Meier curves for 5-year all-cause mortality with trimethylamine-N-oxide (TMAO) stratified as quartiles.

Figure Legend:
Excessive dietary phosphorus intake may be harmful even in the absence of high serum phosphorus concentrations. Serum phosphorus concentrations are tightly regulated by parathyroid hormone and fibroblast growth factor-23 (FGF-23), which is a hormone that increases urinary phosphorus excretion. Individuals with normal kidney function are largely able to maintain serum phosphorus in a physiologic range, even in the setting of high phosphorus consumption because increased phosphorus consumption leads to physiologic increases in parathyroid hormone and FGF-23 (8–10). Over the long term, high FGF-23 concentrations may stimulate left ventricular hypertrophy (11), and epidemiologic studies have linked high FGF-23 concentrations with heart failure (12), cardiovascular events, chronic kidney disease (CKD) progression, and mortality (7, 13).

<table>
<thead>
<tr>
<th></th>
<th>Quartile 1 ( (n = 2424) )</th>
<th>Quartile 4 ( (n = 2419) )</th>
<th>( P )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absolute phosphorus intake (mg/d)</td>
<td>629 (503–737)²</td>
<td>1992 (1769–2355)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Phosphorus density (mg/kcal)</td>
<td>0.48 (0.40–0.58)</td>
<td>0.67 (0.57–0.79)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Total energy intake (kcal)</td>
<td>1309 ± 11³</td>
<td>3253 ± 28</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>HEI⁴ score</td>
<td>58.9 ± 0.4</td>
<td>63.7 ± 0.6</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Consumed any soda (%)⁵</td>
<td>56.9</td>
<td>61.2</td>
<td>0.07</td>
</tr>
<tr>
<td>Consumed any fast food (%)⁶</td>
<td>14.9</td>
<td>17.4</td>
<td>0.2</td>
</tr>
<tr>
<td>Nutrient and food group intakes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standardized by total energy intake⁷</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sodium (mg/d)</td>
<td>3149 ± 40</td>
<td>3364 ± 31</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Potassium (mg/d)</td>
<td>2699 ± 46</td>
<td>2742 ± 33</td>
<td>0.5</td>
</tr>
<tr>
<td>Calcium (mg/d)</td>
<td>581 ± 9</td>
<td>944 ± 17</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Protein (g/d)</td>
<td>67.4 ± 0.8</td>
<td>82.1 ± 0.7</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Total fat (g/d)</td>
<td>70.0 ± 0.7</td>
<td>78.8 ± 0.9</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Saturated fat (g/d)</td>
<td>22.4 ± 0.4</td>
<td>27.5 ± 0.4</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Fiber (g/d)</td>
<td>15.4 ± 0.3</td>
<td>15.6 ± 0.2</td>
<td>0.9</td>
</tr>
<tr>
<td>Grains (servings/d)</td>
<td>6.69 ± 0.09</td>
<td>6.04 ± 0.10</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Fruit (servings/d)</td>
<td>1.89 ± 0.09</td>
<td>1.23 ± 0.08</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Vegetables (servings/d)</td>
<td>3.49 ± 0.10</td>
<td>2.86 ± 0.07</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Dairy (servings/d)</td>
<td>1.14 ± 0.04</td>
<td>2.52 ± 0.06</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Meat (servings/d)</td>
<td>1.95 ± 0.04</td>
<td>2.12 ± 0.04</td>
<td>0.01</td>
</tr>
<tr>
<td>Legumes (servings/d)</td>
<td>0.07 ± 0.01</td>
<td>0.12 ± 0.01</td>
<td>0.001</td>
</tr>
</tbody>
</table>
High Stored Iron Levels Are Associated With Excess Risk of Myocardial Infarction in Eastern Finnish Men

Jukka T. Salonen, MD, PhD, MPH; Kristiina Nyyssönen, MPh; Heikki Korpela, MD, PhD; Jaakko Tuomilehto, MD, PhD; Ritva Seppänen, DSc; and Riitta Salonen, MD, PhD

Background. Iron can induce lipid peroxidation in vitro and in vivo in humans and has promoted ischemic myocardial injury in experimental animals. We tested the hypothesis that high serum ferritin concentration and high dietary iron intake are associated with an excess risk of acute myocardial infarction.

Methods and Results. Randomly selected men (n=1,931), aged 42, 48, 54, or 60 years, who had no symptomatic coronary heart disease at entry, were examined in the Kuopio Ischaemic Heart Disease Risk Factor Study (KIHD) in Eastern Finland between 1984 and 1989. Fifty-one of these men experienced an acute myocardial infarction during an average follow-up of 3 years. On the basis of a Cox proportional hazards model adjusting for age, examination year, cigarette pack-years, ischemic ECG in exercise test, maximal oxygen uptake, systolic blood pressure, blood glucose, serum copper, blood leukocyte count, and serum high density lipoprotein cholesterol, apolipoprotein B, and triglyceride concentrations, men with serum ferritin ≥200 μg/l had a 2.2-fold (95% CI, 1.2–4.0; p<0.01) risk factor–adjusted risk of acute myocardial infarction compared with men with a lower serum ferritin. An elevated serum ferritin was a strong risk factor for acute myocardial infarction in all multivariate models. This association was stronger in men with serum low density lipoprotein cholesterol concentration of 5.0 mmol/l (193 mg/dl) or more than in others. Also, dietary iron intake had a significant association with the disease risk in a Cox model with the same covariates.

Conclusions. Our data suggest that a high stored iron level, as assessed by elevated serum ferritin concentration, is a risk factor for coronary heart disease. (Circulation 1992;86:803–811)
High Stored Iron Levels Are Associated With Excess Risk of Myocardial Infarction in

On the basis of a Cox proportional hazards model adjusting for age, examination year, cigarette pack-years, ischemic ECG in exercise test, maximal oxygen uptake, systolic blood pressure, blood glucose, serum copper, blood leukocyte count, and serum high density lipoprotein cholesterol, apolipoprotein B, and triglyceride concentrations, men with serum ferritin $> 200$ mcg/l had a 2.2-fold (95% CI, 1.2-4.0; $p<0.01$) risk factor-adjusted risk of acute myocardial infarction compared with men with a lower serum ferritin. An elevated serum ferritin was a strong risk factor for acute myocardial infarction in all multivariate models.
Heme Iron and Coronary Heart Disease in Women With Type 2 Diabetes

Charge of Lifestyle Work Group

Lifestyle Recommendations

Evidence Review on Diet and Physical Activity (in the absence of weight loss) to be integrated with the recommendations of the Blood Cholesterol and High Blood Pressure Panels
Lifestyle Inclusion/Exclusion Criteria

- Included: adults ≥18 years; with and without CVD risk factors/CVD; Normal, overweight, obese
- Excluded: weight change ±3%; cross-sectional studies
- Used systematic reviews/meta-analyses in some cases
- Sample sizes
  - ≥50–100 (risk factor assessments)
  - 500 (hard outcomes)
- Date range 1998-2009
  - Sodium extended to April 2012
  - Dietary fat and cholesterol accepted evidence back to 1990
Lifestyle Topics: Dietary Patterns

- Mediterranean Diet
  - BP and lipids
- DASH and DASH variations
  - BP and lipids, and in subpopulations
- High- vs. Low-Glycemic Diets
  - BP and lipids
Mediterranean-Style Dietary Pattern Description

• There is no uniform definition of the Mediterranean-style dietary pattern diet in the randomized trials and cohort studies examined.

• The most common features in these studies were diets that were:
  • high in fruits (particularly fresh) and vegetables (emphasizing root and green varieties)
  • high in whole grains (cereals, breads, rice, or pasta)
  • fatty fish (rich in omega–3 fatty acids)
  • low in red meat (and emphasizing lean meats); substituted lower-fat or fat-free dairy products for higher-fat dairy foods
Mediterranean-Style Dietary Pattern Description (cont.)

• **used oils** (olive or canola), **nuts** (walnuts, almonds, or hazelnuts), or **margarines** blended with rapeseed or flaxseed oils in lieu of butter and other fats

• The Mediterranean-style dietary patterns examined tended to be:
  • moderate in total fat (32%–35% of total calories)
  • relatively low in saturated fat (9%–10% of total calories)
  • high in fiber (27–37g/day)
  • high in PUFA
    • particularly omega-3s
Mediterranean Diet and BP

- Counseling to eat a Mediterranean-style dietary pattern compared to minimal advice to consume a low-fat dietary pattern, in free-living middle-aged or older adults (with type 2 diabetes mellitus or at least 3 CVD risk factors):
  ↓BP by 6–7/2–3 mm Hg

- In an observational study of healthy younger adults, adherence to a Mediterranean-style dietary pattern was associated with:
  ↓BP 2–3/1–2 mm Hg

*Strength of Evidence: Low*
Counseling to eat a Mediterranean-style dietary pattern compared to minimal or no dietary advice, in free-living middle aged or older adults (with or without CVD or at high risk for CVD) resulted in no consistent effect on plasma LDL-C, HDL-C, and TG; in part due to substantial differences and limitations in the studies.

Strength of Evidence: Low

A Primary End Point (acute myocardial infarction, stroke, or death from cardiovascular causes)

- Med diet, EVOO: hazard ratio 0.70 (95% CI, 0.53–0.91); P=0.009
- Med diet, nuts: hazard ratio 0.70 (95% CI, 0.53–0.94); P=0.02

### No. at Risk

<table>
<thead>
<tr>
<th></th>
<th>Years</th>
<th>Control diet</th>
<th>Med diet, EVOO</th>
<th>Med diet, nuts</th>
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</thead>
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<td>2454</td>
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<td>1583</td>
<td>1987</td>
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<td>1268</td>
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<td>1389</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>946</td>
<td>1310</td>
<td>1031</td>
</tr>
</tbody>
</table>
DASH: Dietary Approaches to Stop Hypertension

- 2 RCTs (6 citations) evaluating the DASH pattern met eligibility criteria.
- DASH dietary pattern description:
  - higher in vegetables, fruits, and low-fat dairy products
  - higher in whole grains, poultry, fish, and nuts
  - low in sweets, sugar-sweetened beverages, and red meats
  - low in saturated fat, total fat, and cholesterol
  - high in potassium, magnesium, calcium
  - rich in protein and fiber
DASH and BP

When all food was supplied to adults with BP 120–159/80–95 mm Hg and both body weight and sodium intake were kept stable, the DASH dietary pattern, when compared to a typical American diet of the 1990s:

\[ \downarrow \text{BP} \ 5–6/3 \ \text{mm Hg} \]

*Strength of Evidence: High*
When food was supplied to adults with a total cholesterol level <260 mg/dL, LDL-C <160 mg/dL, and body weight was kept stable, the DASH dietary pattern, when compared to a typical American diet of the 1990s:

- ↓LDL-C by 11 mg/dL
- ↓HDL-C by 4 mg/dL
- no effect on TG

Strength of Evidence: High
Vegetarians Have Lower Rates

- overweight and obesity
- cardiovascular disease (CVD)
- hypertension
- type 2 diabetes
- some cancers
- gallstones
- kidney stones
- constipation
- diverticular disease
- anti-inflammatory

Cardiovascular Disease

– Reduced risk of coronary heart disease (CHD) and coronary disease mortality

– 5 prospective studies reported a combined:
  • 24% lower risk of mortality from IHD in vegetarians
  • 34% reduced in lacto-ovo vegetarians
  • 26% reduced risk in vegans

– The benefit was apparent if diet followed for at least 5 years and was greater in younger age groups
Increased Longevity Among Vegetarians

– Reduced consumption of saturated fat, cholesterol, animal protein, red meat, heme iron, IGF-1, suPAR, phosphorus and phosphatidyl choline

– Increased consumption of beneficial dietary components, including fruit, vegetables, whole grains, legumes, and nuts, all rich in dietary fiber, antioxidants, and phytochemicals

– Other healthy lifestyle choices (sugar, seatbelts)
Conclusions

• Well-planned vegetarian diets are not only nutritionally adequate but also provide many health benefits, particularly in the prevention and treatment of many chronic diseases, including heart disease.

• A vegetarian diet may present a significant advantage over meat-based diets, and a number of studies have shown increased longevity in vegetarians.
Conclusions

• Widespread acceptance of plant-based dieting for prevention or treatment of CV disease requires large, well-designed, long-term, randomized, prospective trials in free-living populations.

• In view of the “strength of signal” with smaller trials and weight of observational evidence, these may be difficult to accomplish.
"All truth passes through three stages. First, it is *ridiculed*. Second, it is *violently opposed*. Third, it is accepted as being *self-evident*.

Arthur Schopenhauer

German Philosopher

(1788-1866)