Diet & Cardiology

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Consuming the right amounts of the proper foods

may be the single most important thing you can do to lower your risk.

Barriers to Dietary Adherence

- Restrictive dietary pattern
- Required changes in lifestyle and behavior
- Symptom relief may not be noticable
- Interference of diet with family/personal habits
- Cost, access to proper foods, preparation effort
- Denial or perceiving disease not serious
- Poor understanding of diet/disease link
- Misinformation from unreliable sources

Populations on diets high in
total fat, saturated fat, cholesterol, and sugar
have high age-adjusted CHD death rates
as well as
more obesity, hypercholesterolaemia, and diabetes

Associations between the percent of calories derived from specific foods and CHD mortality in the 20 Countries Study*

Food Source	Correlation Coefficient†
Butter	0.546
All dairy products	0.619
Eggs	0.592
Meat and poultry	0.561
Sugar and syrup	0.676
Grains, fruits, and starchy and nonstarchy vegetables	-0.633

*1973 data, all subjects. From Stamler J: Population studies. *In* Levy R: Nutrition, Lipids, and CHD. New York, Raven, 1979.
†All coefficients are significant at the $P<0.05$ level.

Recommendations to reduce your risk

1/2 Limit your intake of added sugars to no more than ½ of your daily discretionary calories

Limit saturated fat to less than 7 % and trans fat to less than1 % of daily calorie intake **<7%**

<300 mg Limit cholesterol intake to less than 300 mg per day.

Limit sodium intake to 1,500 mg per day (this is about 1 teaspoon of salt). **1 tsp**

Diets commonly followed in cardiology

Nutrient Composition of TLC Diet

Nutrient	Recommended Intake
Saturated fat	Less than 7% of total calories
Polyunsaturated fat	Up to 10% of total calories
Monounsaturated fat	Up to 20% of total calories
Total fat	25–35% of total calories
Carbohydrate	50–60% of total calories
Fiber	20–30 grams per day
Protein	Approximately 15% of total calories
Cholesterol	Less than 200 mg/day
Total calories (energy)	Balance energy intake and expenditure to maintain desirable body weight

Two Examples of Daily Dietary Patterns That Are Consistent With AHA-Recommended Dietary Goals at 2000 Calories

Eating Pattern	DASH*	TLC†	Serving Sizes
Grains‡	6 to 8 servings per day	7 servings§ per day	1 slice bread; 1 oz dry cereal¶; ½ cup cooked rice, pasta, or cereal
Vegetables	4 to 5 servings per day	5 servings§ per day	1 cup raw leafy vegetable, ½ cup cut-up raw or cooked vegetable, ½ cup vegetable juice
Fruits	4 to 5 servings per day	4 servings§ per day	1 medium fruit; ¼ cup dried fruit; ½ cup fresh, frozen, or canned fruit; ½ cup fruit juice
Fat-free or low-fat milk and milk products	2 to 3 servings per day	2 to 3 servings per day	1 cup milk, 1 cup yogurt, 1½ oz cheese
Lean‖ meats, poultry, and fish	<6 oz per day	≤5 oz per day	
Nuts, seeds, and legumes	4 to 5 servings per week	Counted in vegetable servings.	⅓ cup (1½ oz), 2 Tbsp peanut butter, 2 Tbsp or ½ oz seeds, ½ cup dry beans or peas
Fats and oils	2 to 3 servings# per day	Amount depends on daily calorie level	1 tsp soft margarine, 1 Tbsp mayonnaise, 2 Tbsp salad dressing, 1 tsp vegetable oil
Sweets and added sugars	5 or fewer servings per week	No recommendation	1 Tbsp sugar, 1 Tbsp jelly or jam, ½ cup sorbet and ices, 1 cup

Polyunsaturated Fats

- High levels found in
  - Soybean oil
  - Corn oil
  - Canola oil
  - Safflower oil
  - Nuts and seeds
  - Fatty fish
    - Salmon
    - Herring

Polyunsaturated Fats: Essential Fatty Acids

- Omega-3 and Omega-6 polyunsaturated fatty acids
- Must be consumed in the diet
- Balance the consumption between the two
  - Ratio of Omega-6 to Omega-3 ideally should be **4:1**

Essential Fatty Acids

Omega 3

- Linolenic acid
  - Converted to eicosapentanoic acid (EPA) and docosahexaenoic acid (DHA)
  - Anti-inflammatory effect
- Found in: flaxseed, canola oil, walnuts, salmon, cod

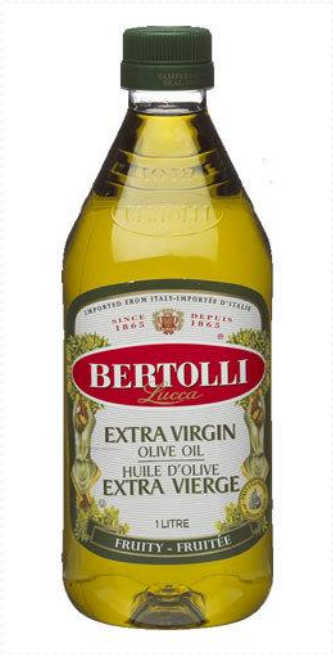
Omega 6

- Linoleic acid
  - Converted to arachidonic acid
  - Important for immune system function
  - Pro-inflammatory effect
- Very prevalent in American diet:
  - Corn oil, soybean oil, peanut oil, eggs, dairy

Monounsaturated Fats

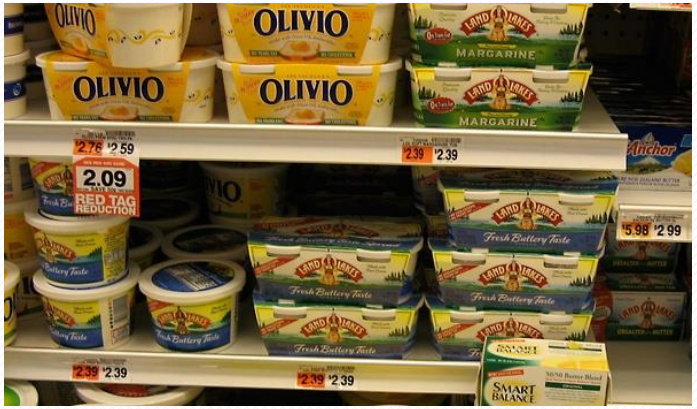
- Liquid at room temperature

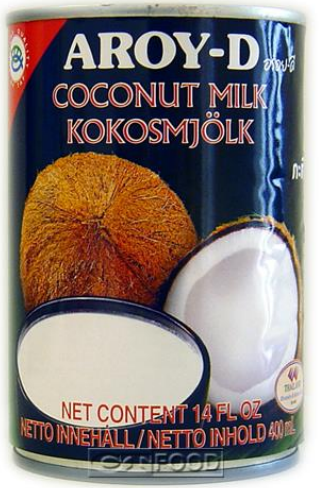
- Come from plant sources
  - Nuts and seeds
  - Flaxseed oil, olive oil, canola oil
  - Avocado



Saturated Fats

- Typically solid at room temperature
- Found in animal sources: red meat and dairy
- Plant sources: coconut oil, palm oil





Trans Fats

- Come from process of hydrogenation: converting double bond in polyunsaturated fats to a single bond
- Process provides foods with longer shelf life
- USDA now requires trans fat to be listed on Nutrition Facts label

Donuts fried in hydrogenated fats were a major source of trans fats – most processors have changed their formulas to reduce trans fats in their products

Hidden Trans Fats

- Foods labeled ‘0 grams trans fat’ ***may still contain trans fat***

- Look for ‘partially hydrogenated’ oil on food labels to identify if that food product contains trans fat.

Benefits of fish oil supplementation

- In the Diet and Reinfarction Trial (DART) in 2033 men with CHD increased intake of fish or use of 2 fish oil caps/day reduced CHD mortality 29% over 2 years

- In GISSI 11324 men and woman with CHD use of 1 gr. of n-3 PUFA decreased CVD events including mortality 15%

***Lancet* 1989; 2;757-761, and 1999; 345:447-455.**

Margarine vs Butter

- The combined amount of saturated fat and trans fat in butter is higher than that in margarine

- Soft or liquid margarine is the preferred spread

Nuts

- Tree nuts can reduce risk of CHD via lipid-lowering effects;
- Peanuts also cardioprotective
- Almonds, hazelnuts, pecans, pistachio nuts, and walnuts modestly reduce serum cholesterol
- Nuts are a rich source of fiber, vitamin E, magnesium, and MUFA and PUFA
- Antioxidant and antithrombotic effects
- May reduce insulin resistance

Alcohol

- Affects total triglyceride and HDL-C
- Effects on TG are dose dependent and are greater in persons with TG>150 mg/dl
- Moderate alcohol consumption has been associated with decreased risk of MI and CHD mortality in white men
- Alcohol raises both HDL2 and HDL3 subfractions
- Current intake in US is 2% of total kcals
- No increase is recommended to decrease CHD risk

Coffee

- Mixed results in studies on effect of coffee on lipids
- Heavy intake of regular coffee (720 ml) causes minor increases in TC (9 mg/dl) LDL-C (6 mg/dl) and HDL-C (4 mg/dl)
- Boiled coffee (European) produces greater elevations than filtered coffee

Coffee

- Large population studies have failed to find associations between coffee consumption and CHD incidence or mortality
- Coffee drinkers consume more saturated fat and cholesterol, smoked more cigarettes, and were less likely to exercise

Calcium

- Supplementation produces small decreases in LDL-C in hypercholesterolemic men

Choose Whole-Grain, High-Fiber Foods

- Whole-grain products and fiber have been associated with increased diet quality and decreased risk of CVD.
- Soluble or viscous fibers (notably β-glucan and pectin) modestly reduce LDL cholesterol levels beyond those achieved by a diet low in saturated and *trans* fatty acids and cholesterol alone.
- Insoluble fiber has been associated with decreased CVD risk and slower progression of CVD in high-risk individuals.
- Dietary fiber may promote satiety by slowing gastric emptying, leading to an overall decrease in calorie intake.
- The AHA recommends that at least half of grain intake come from whole grains.

Plant Stanols/Sterols

- Plant stanols/sterols lower LDL cholesterol levels by up to 15%
- Maximum effects are observed at plant stanol/sterol intakes of >2 g per day.
- Plant stanol/sterols are currently available in a wide variety of foods, drinks, and soft gel capsules.

Take Home Message

- Know your caloric needs to achieve and maintain a healthy weight.
- Know the calorie content of the foods and beverages you consume.
- Track your weight, physical activity, and calorie intake.
- Prepare and eat smaller portions.
- Track and, when possible, decrease screen time (eg, watching television, surfing the Web, playing computer games).
- Incorporate physical movement into habitual activities.
- Do not smoke or use tobacco products.
- If you consume alcohol, do so in moderation (equivalent of no more than 1 drink in women or 2 drinks in men per day).

Thank You