



# Health Connections

LINKING NUTRITION RESEARCH TO PRACTICE

## DIETARY FATS AND HEALTH:

# Time to Take Another Look?

In consumers' minds, 'dietary fat' has become synonymous with heart disease and obesity; and 'low-fat' and 'fat-free' synonymous with heart health.<sup>1</sup> Such a simplistic approach fails to recognize the complexity of chronic disease. It also fails to recognize the role of fat as an essential nutrient—and the important metabolic functions of the many different types of fat and their component fatty acids. Research has broadened our understanding of the role of dietary fats and health. This issue of *Health Connections* describes some of the recent research surrounding dietary fats and fatty acids, including their potential health benefits, so that health professionals can craft—and consumers can begin to accept—new messages about the role of fats in a balanced diet.

### Introduction

Fat-avoidance messages of previous decades are no longer consistent with research on the diversity of the broad categories of saturated fatty acids (SFA), monounsaturated fatty acids (MUFA), polyunsaturated fatty acids (PUFA) and their metabolic functions. Fatty acids—including individual saturated fatty acids—can have vastly different biological effects. Research has expanded our understanding of how they are metabolized in the body and how they interact with each other.<sup>2</sup> Hence, each should be evaluated with respect to the range of variables related to their roles in growth and development and optimal functioning, as well as nutrition-related chronic diseases.

### Fats and Essential Nutrients

Derived from both plants and animals, dietary fats contribute to the palatability of food, supply energy and the essential fatty acids—including linoleic and linolenic—and help carry and absorb fat-soluble vitamins A, D, E and K and carotenoids. Fats are a source of antioxidants and numerous

bioactive compounds, serve as building blocks of membranes and play a key regulatory role in numerous biological functions.<sup>3</sup>

Fats—plural, as there is no one type—are combinations of many different fatty acids that have different physiologic and metabolic effects in the body. These include:

- regulating many intracellular biological mechanisms related to changes in intracellular signaling and gene expression
- modulating lipid metabolism and other physiological systems involved in chronic-disease risk factors.<sup>3</sup>

Technically a sterol and not a fat, dietary cholesterol can influence blood cholesterol levels, but not to the same degree in all individuals. The effect of cholesterol on health outcomes depends on the type and mix of fatty acids in the diet, an individual's underlying genetic profile and other lifestyle factors.

### The "Challenge to Change" Perspective

Prevention of cardiovascular disease (CVD)—still the leading cause of death in the United States—is a major public-health effort. Diet has been core to the management of CVD risk factors for more than five decades, since the American Heart Association (AHA) published its first dietary recommendations. In 1977, the Dietary Goals for the United States

*continued on page 2*



Mary Jo Feeney, MS, RD, FADA

### HEALTH CONNECTIONS EDITOR

Mary Jo Feeney specializes in nutrition communications and marketing. With over 30 years experience in public health nutrition and education, she currently is a leading consultant to the food, agriculture and health care industries. A charter Fellow of the American Dietetic Association, Mary Jo served on the Board of Directors of both the American Dietetic Association (ADA) and its Foundation (ADAF) and received the association's Medallion Award in 1996.

recommendations were that saturated fat should be reduced to 10 percent of all calories to lower the risk of CVD by lowering serum total and low-density lipoprotein cholesterol (LDL-C) levels in the general population.

This diet-heart paradigm, however, may be changing (see Side Bar). Research is discovering how other dietary components such as the type and amount of carbohydrate and protein in the diet, marine and plant-based omega-3 fatty acids and other polyunsaturated fatty acids, trans fatty acids, and the overall quality of the diet influence CVD risk. In addition, total LDL-C may not be as predictive, as analyses of LDL subtypes and other factors beyond dietary fat intake—inflammation, immunity, blood pressure, physical activity and overweight/obesity—are also critical in CVD risk.

#### **Fat—Quantity, quality and different effects**

Currently, the Dietary Reference Intakes (DRI) Acceptable Macronutrient Distribution Range (AMDR) from the Institute of Medicine (IOM) is 20 to 35 percent of calories from fat for adults. The lower range was set to meet nutrient adequacy and to prevent serum triacylglycerol concentrations from increasing and serum HDL cholesterol concentrations from decreasing when fat intake is low and carbohydrate intake is high.<sup>3</sup> The Dietary Guidelines Report recommends that SFA be less than 10 percent of energy.<sup>3</sup>

Based on their potential beneficial effects on CVD, the AMDR for omega-6 fatty acids is 5 to 10 percent of total calories; for omega-3 fatty acids, it is 0.6 to 1.2 percent of calories. Although considered a “good fat,” moderating intake of omega-3 fatty acids is important, as high amounts may have harmful effects. Various attempts have been made to develop guidelines or ratios for intake of omega-6 to omega-3; however, a review of fatty-acid requirements states that there is no compelling scientific rationale for a specific ratio of omega-6 to omega-3 fatty acids.<sup>6</sup>

Population studies demonstrate associations between dairy fat and CVD; however, results are less consistent for specific foods in which dairy fats are eaten.<sup>7</sup> Although over half of the fatty acids in milk fat are saturated, there is consensus that several of these individual fatty acids, such as stearic acid and very short-chain fatty acids, are neutral in terms of effects on LDL-C.<sup>8</sup> Some research suggests that dairy fats raise solely the large and less atherogenic subpopulation of LDL particles.<sup>9</sup> According to a reappraisal of available scientific evidence examining the impact of dairy foods on CVD risk, despite the contribution of dairy foods to the saturated fatty acid composition of the diet, there is no clear evidence to consistently link dairy-food intake with a higher risk of CVD.<sup>8</sup>

## **SIDE BAR — A PARADIGM SHIFT?**

# Rethinking the Diet-Heart Paradigm

**Mente, Arch Intern Med 2009. Evidence supporting causal link between diet and heart disease.**

- Harmful associations:
  - TFA
  - High glycemic-index foods
- Protective associations:
  - Vegetables, nuts
  - “Mediterranean” and “high quality” diets
- Weak associations:
  - Saturated fatty acids
  - Milk

**“It is unlikely that modifying the intake of a few nutrients or foods would substantially influence coronary outcomes.”**

**Mozaffarian, Amer. Oil Chemists’ Society Hot Topic May 2009.**

***Is SFA a major dietary risk factor for CHD—what is the evidence?***

- “Essential” dietary habits:
  - Seafood (omega-3 fatty acids)
  - No artificial trans fat
  - Whole grains
  - Fruits and vegetables
  - Polyunsaturated fatty acids
  - Nuts and seeds
  - Reduced salt
  - Reduced portion sizes
  - Rarely consumed sweetened beverages

**“Risk factors for heart disease should not be limited to dietary saturated fat and blood cholesterol levels.”**

Slide: Courtesy Cindy Schweitzer, PhD, Technical Director, Global Dairy Platform

## Interview — Ronald M. Krauss, M.D., Director of Atherosclerosis Research at Children’s Hospital Oakland Research Institute, Oakland, CA

### Q. What has contributed to the paradigm shift regarding the role of fats in chronic-disease risk?

A. When considering cardiovascular disease, data suggest that substituting unsaturated fats for saturated fats offers benefits. The paradigm shift involves focusing not so much on good or bad fats, but on what is substituted when intake of fats is limited. Often the trade-off for saturated fat is carbohydrate. Although there is not total consensus, more rapidly or easily digested carbohydrate could be a greater threat to cardiovascular risk than so-called ‘bad fat.’ By limiting total and saturated fat, we run the risk of exposing individuals susceptible by genetic disposition to the adverse metabolic effects of carbohydrates in the diet.

### Q. How can health professionals make the scientific complexity of the different sources and effects of dietary fats actionable for consumers?

A. Crafting consumer messages is a challenge when considering the overall effect of nutrition on heart-disease risk. We currently are surveying the literature reviewing the effects of the types of fat on heart-disease risk. What comes across is the limitation of the research on dietary effects on health. When diet is changed in one way, it is also changed in other ways by the presence or absence of other foods, individual components of foods or even other lifestyle factors that can change with a dietary change. It is hard to separate out beneficial

or detrimental effects of a particular food or component in a food. There just isn’t strong scientific basis to support simple messages.

Offer guidance on a balanced diet to meet a spectrum of nutritional needs that can include a moderate amount of fat. Guidance should not be extrapolated to result in extreme changes. We know that extremes in any direction can throw off the benefits we are trying to achieve. We should help consumers achieve balance and not focus exclusively on limiting fat.

### Q. What is ahead in terms of public-health recommendations around dietary fat?

A. We would like to see the use of factors such as weight, family history, cholesterol, triglycerides and insulin resistance to construct and individualize guidance. But I think we are a long way off from being able to do that.

The tendency is to think that the ‘public’ is a collection of individuals representing an average. However, there is a great variation in responses to foods and/or diets based on individual parameters. Health professionals match particular recommendations with individuals most likely to respond and benefit from interventions that optimize their health and lower their chronic-disease risk.

### Q. What areas of research need to be addressed on the role of dietary fats and health?

A. There is more unknown than known. We need more comparative effectiveness research—in particular, comparing different dietary programs—that will provide a systematic and evidence-based approach to modifying CVD risk factors. CVD is not all about serum cholesterol, but a spectrum of factors including inflammation and other lifestyle factors. Fat is just one dimension in such a systematic approach.

We also need to understand the metabolic effects of different types of fatty acids, and how these effects translate into the real world in the food we eat. Although the same fatty acid may be present in different foods, its effects may be influenced by a particular food’s own ‘environment’—its composition, state of processing and use in the total diet. It is dangerous to focus on individual components. We still need better ways to evaluate the effect of food sources of fat as consumed in a balanced diet on chronic-disease risk.



Ronald M. Krauss, M.D.,  
Director of Atherosclerosis  
Research at Children’s Hospital  
Oakland Research Institute,  
Oakland, CA

### REFERENCES

- 1 Hu FB, Manson JE, Willett WC. 2001 J Am Coll Nutr 20:1:5-19.
- 2 Burlingame B et al. Ann Nutri Metab 2009; 55:5-7.
- 3 [http://www.health.gov/dietaryguidelines/dga2005/report/HTML/D4\\_Fats.htm](http://www.health.gov/dietaryguidelines/dga2005/report/HTML/D4_Fats.htm). Accessed 9/07/09.
- 4 Page IH et al. Ref.7 in Roussel M, Grieger, and Kris-Etherton. The role of diet in the prevention and treatment of cardiovascular disease. Nutrition in the Prevention and Treatment of Disease, 2nd ed. 2008 Coulston AM and Boushey C Editors.
- 5 Clemens R and Bidlack W. FoodTechnology 2009. [www.ift.org](http://www.ift.org).
- 6 Smit LA, Mozaffarian D and Willett W. Ann Nutr Metab 2009; 55:44-55.
- 7 Nestel PF. J Am Coll Nutr 2008; 27:735-740.
- 8 Lock AL et al. J Am Coll Nutr 2008;27: 720S-722S.
- 9 Reference 93 in German JB et al Eur J Nutr 2009;48;191-203.
- 10 Concept developed by Julie M. Jones, PhD, CNS, LND, Professor Emeritus of Food & Nutrition, Dept. of Family, Consumer & Nutrition Sciences, St. Catherine University, St. Paul MN. Used with permission.

### Practice Points for the Health Professional

- Help clients adopt a ‘management not banishment’<sup>10</sup> approach to food choices and adopt a dietary pattern and lifestyle-based approach to meet overall nutrition and health needs, rather than focus on a single factor to prevent chronic disease.
- Stay current on the research of the various metabolic effects of different dietary fats to help clients individualize their intake of different types of fat based on disease risk and health goals.
- Consider a food’s nutrient density and contribution to total nutrient intake. Consumed in moderation, even higher-fat meat and dairy foods provide a range of nutrients critical to health that are not always available from other food sources.
- Remember that consuming excessive amounts of any type of fat can add excess calories—and might replace more nutritious options such as fruits, vegetables, low-fat dairy, lean protein and whole grains.