



Are Low-Fat or Fat-Free Products Problem-Free?

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A healthy eating pattern recommended by the 2015-2020 Dietary Guidelines for Americans (HHS and USDA 2015) includes fat-free or low-fat dairy products and limits saturated fats and trans fats. For more than 40 years, nutrition recommendations emphasized reducing dietary intake of animal fats and cholesterol. The U.S. Department of Agriculture has recommended dietary fat reduction in the wake of increasing obesity and its associated health risks (including cardiovascular disease, stroke, and cancer). Americans are becoming more health conscious in their food choices; many are interested in reducing their dietary fat intake (Brewer 2012). More than 80 percent of consumers regularly consume low-fat or fat-free products (Calorie Control Council 2009). But there is little and inconsistent evidence that low-fat products are healthier choices. In this article, we talk about the types of fats and their effects on our health; the definitions of low fat, reduced fat, and fat free; and the nutritional component differences between reduced-fat/fat-free products and their fat-containing counterparts.

What Are Fats?

Fats (also called lipids) are the most concentrated form of energy. Fats supply greater energy (9 calories per gram) than carbohydrates or proteins (each with 4 calories per gram). Dietary fat is a carrier of the fat-soluble vitamins A, D, E, and K, and it facilitates their absorption. It is also important for proper growth and maintaining bodily functions (Gibney et al. 2009; CDC 2015). Any excess amount of fat is stored in fat tissue and contributes to weight gain. Therefore, controlling fat intake is one of the approaches to losing or maintaining weight and preventing or delaying heart disease or Type 2 diabetes.

What Are the Different Types of Dietary Fats?

There are four main types of dietary fats: saturated fats, unsaturated fats (mono- and polyunsaturated fats), trans fats, and cholesterol.

Saturated fats. Saturated fats are very stable and are solid at room temperature. Saturated fats increase low-density lipoproteins (also called LDL or “bad” cholesterol), and diets high in saturated fat have been linked to an increased risk of heart disease. The 2015-2020 Dietary Guidelines for Americans (HHS and USDA 2015) recommends keeping saturated fat consumption to less than 10 percent of daily calories and replacing saturated fats with polyunsaturated and monounsaturated fats. Animal fats are a primary source of saturated fat while plant oils, such as palm oil, coconut oil, and cocoa butter, are other sources. Palm or coconut oils are often added to commercially prepared foods such as cookies, cakes, doughnuts, and pies. Solid vegetable shortening often contains palm oils, while some whipped dessert toppings contain coconut oil. Reduced-fat versions of these foods usually contain smaller quantities of saturated fats than the regular versions.

Unsaturated fats. Unsaturated fatty acids are further divided into monounsaturated fatty acids and polyunsaturated fatty acids. Both monounsaturated fatty acids and omega-3 polyunsaturated fatty acids are considered healthy fats.

Monounsaturated fatty acids are fairly stable and liquid or gel-like at room temperature. Common sources of monounsaturated fatty acids include olive oil, sunflower oil, avocados, and nuts. Monounsaturated fatty acids lower bad cholesterol

(LDL), increase good cholesterol (HDL), and therefore are considered beneficial in the diet (Hammad, Pu, and Jones 2015; Khodarahmi and Azadbakht 2014). In addition, some studies suggest that monounsaturated fatty acids may have a protective effect in regard to the development of breast cancer (Khodarahmi and Azadbakht).

Polyunsaturated fatty acids include essential fatty acids such as omega-3 and omega-6 fatty acids. Omega-3 fatty acids (e.g., alpha-linolenic acid) are found in fish such as salmon, trout, herring, tuna, and mackerel, as well as in plants like flax seeds, cotton seeds, pumpkin seeds, and walnuts. Eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) are omega-3 fatty acids found in human milk, shellfish, fish (mackerel, tuna, salmon, bluefish, mullet, sturgeon, menhaden, anchovy, herring, trout, and sardines), algae oil, and krill oil. Omega-6 fatty acids (e.g., linoleic acids) are contained in leafy vegetables, seeds, nuts, grains, and vegetable oils such as corn, safflower, soybean, cottonseed, sesame, and sunflower oils.

Trans fats. Polyunsaturated fatty acids are liquid at room temperature and are unstable; therefore, they are susceptible to oxidative rancidity. In order to prevent oxidative rancidity, vegetable oils are partially hydrogenated. Although this process can increase shelf life, it also generates trans fats. Food manufacturers often use artificial trans fat in food products because it is inexpensive and it increases the food's shelf life, stability, and texture. Small amounts of trans fat also occur naturally in the fatty parts of meat and dairy products. Consumption of trans fat (both animal sources and artificial sources) is associated with an increased level of LDL, or bad cholesterol (Stender 2015). The 2015-2020 Dietary Guidelines for Americans (HHS and USDA 2015) recommends keeping trans fat consumption as low as possible. Today, trans fat intake has significantly decreased in the U.S. as a result of efforts to increase awareness of its health effects, changes to the nutrition facts label (since 2006), efforts by industry to voluntarily reformulate foods, and restrictions on the use of trans fats in restaurants and other food service outlets by some state and local governments. However, on average, Americans still consume 1.3 g (0.6 percent of the average American's daily caloric intake) of artificial trans fat each day (FDA 2013b). Major

artificial trans fat sources are fried items, savory snacks, frozen pizzas, cakes, cookies, pies, margarine and other imitation butter spreads, ready-to-use frostings, and coffee creamers.

Cholesterol. The recommendation from the 2010 Dietary Guidelines for Americans (USDA and HHS 2010) to limit consumption of dietary cholesterol to 300 mg per day is not included in the 2015-2020 Guidelines for Americans (HHS and USDA 2015), but this change does not mean that dietary cholesterol is not important. Cholesterol is present in animal food sources such as meats, eggs, fish, poultry, and dairy products. Current average intake of dietary cholesterol among people 1 year and older in the U.S. is approximately 270 mg per day. The role of blood cholesterol levels in coronary heart disease is debatable, but elevated blood cholesterol is a major risk factor for cardiovascular disease.

Dietary Recommendations

Beginning in the 1970s, nutrition guidelines emphasized concerns about cardiovascular disease and the health risks of saturated fat and cholesterol. These perceived risks were translated into public health recommendations, and the relationship between consumers and the food industry became more intertwined. In order to reduce fat intake, dietary guidelines (AHA 2014; ADA 2015; CDC 2015; HHS and USDA 2015) have recommended using fat-free or low-fat dairy products or butter replacers instead of whole or regular products.

A Food Labeling Guide

Since the end of World War II, the food industry and consumers have had a mutually beneficial relationship. Consumers wanted more-convenient, better-tasting, low-cost, safe, and diverse choices (Layman 2014). Food companies developed products that were reduced-fat, low-fat, or fat-free, often compensating for differences in flavor and texture by increasing the amounts of salt, sugar, or refined grains. To meet guidelines and consumers' food preferences, marketing statements and functional food statements that the food industry has used are "reduced fat," "low fat," "fat free," and "light." Table 1 summarizes the translations offered by the U.S. Food and Drug Administration (FDA 2013a).

Table 1. Food labeling guide.

| Content claim | FDA guide for industry | Labels allowed |
|---------------|--|--------------------|
| Fat free | <0.5 gram total fat/serving | Zero, no, without |
| Low fat | ≤3 grams total fat/serving | Little, few |
| Reduced fat | ≥25% less fat than regular version | Less, lower, fewer |
| Light | Reduced by at least 50% of fat per RACC* (if ≥50% of the calories are from fat) Reduced by at least 50% of fat or at least 1/3 of calories per RACC | Lite |

*Reference amounts customarily consumed.

How Do Low-Fat and Fat-Free Claims Influence Consumption?

When people determine how much to eat, labels (including serving-size information and nutrition claims) can influence food consumption (Wansink and Chandon 2006; Chandon and Wansink 2012; Cohen and Babey 2012). Low-fat labels encourage people to eat more (up to 50 percent more) because they assume that low-fat products have fewer calories.

In one study (Wansink and Chandon), people believed that low-fat foods had about 260 fewer calories, and the label caused them to increase their perception of an appropriate serving size by 25.1 percent. This study also observed that low-fat claims reduce guilt, and feelings of pleasure and guilt affect food consumption decisions. For example, consumers expect better taste when potato chips are labeled “25 percent fat” than when they are labeled “75 percent less fat.” Subjects in this study were more likely to feel guilty about overeating an indulgent, hedonic food, such as chocolate candies, than they are about eating a food they view as relatively more healthy, such as granola.

These findings suggest that nutrition claims and labels can mislead consumers. Policymakers, food manufacturers, and researchers are all responsible for providing accurate information so consumers can make informed decisions about how much fat and calories they consume.

What Is Removed and What Is Added To Make Low-Fat and Fat-Free Products?

Most low-fat and fat-free foods are more processed than their fat-containing counterparts, and they are supplemented with other ingredients that can

contribute to health problems, including salt, sugar, additives, etc. For example, skim, low-fat, and whole milks are all processed similarly in the U.S. The cream is separated from the whey and then added back, except in skim (fat-free) milk. Low-fat milk may contain 1 percent or 2 percent fat, while whole milk contains 3.25 percent fat. Whole-fat milk contains fewer carbohydrates than low-fat or skim milk and has less protein. Some fat-free and low-fat products are labeled “heart healthy” but contain polyunsaturated oils such as canola, cottonseed, soybean, etc.

The following examples compare low-fat or fat-free products with their regular counterparts.

Table 2 shows that one serving of one-third less fat Philadelphia brand cream cheese contains fewer calories and less total fat, saturated fat, and cholesterol compared to original Philadelphia cream cheese, but the reduced-fat variety contains more sodium and sugar and less vitamin A. Excess sodium, over time, can increase blood pressure and the risk of heart disease and stroke, and it can lower bone density. There is an association between excess sugar intake and risk of obesity, diabetes, heart disease, death from heart disease, dental caries, and liver disease.

Table 2. Nutritional components in Philadelphia Cream Cheese, original versus one-third less fat version.

| | Original | 1/3 less fat |
|---------------------------|----------|--------------|
| Calories/serving | 100 | 70 |
| Total fat (g) | 9 | 6 |
| Saturated fat (g) | 6 | 4 |
| Cholesterol (mg) | 12 | 7 |
| Sodium (mg) | 105 | 120 |
| Sugar (g) | 0 | 1 |
| Vitamin A (% Daily Value) | 6 | 4 |

Table 3 shows that one serving of Kraft Singles with 2 percent milk contains fewer calories and less fat compared to original Kraft Singles. Fat-free Kraft Singles, made with skim milk, contains no fat but has more sodium and less vitamin A and calcium compared to the original and the 2 percent milk versions.

Table 3. Nutritional components in Kraft Singles, original versus 2% milk and fat-free versions.

| | Original | 2% milk | Fat-free |
|---------------------------|----------|---------|----------|
| Calories/serving | 60 | 45 | 25 |
| Total fat (g) | 4 | 2.5 | 0 |
| Saturated fat (g) | 2.5 | 1.5 | 0 |
| Cholesterol (mg) | 5 | 3 | 1 |
| Sodium (mg) | 240 | 250 | 250 |
| Vitamin A (% Daily Value) | 6 | 6 | 4 |
| Calcium (% Daily Value) | 20 | 20 | 15 |

Table 4 shows that one serving of Kraft Light Ranch salad dressing contains fewer calories and less fat, but more sodium and sugar compared with Kraft's Original Ranch dressing. The reduced-fat ranch dressing contains higher amounts of sodium and sugar, while fat-free dressing contains no fat but has more sodium and sugar and no vitamin C compared to the original and light dressings.

Table 4. Nutritional components in Hidden Valley Ranch Dressing, original versus light and fat-free versions.

| | Original | Light | Fat-free |
|---------------------------|----------|-------|----------|
| Calories/serving | 140 | 80 | 30 |
| Total fat (g) | 14 | 7 | 0 |
| Saturated fat (g) | 2.5 | 1 | 0 |
| Cholesterol (mg) | 10 | 5 | 0 |
| Sodium (mg) | 260 | 290 | 310 |
| Sugar (g) | 1 | 2 | 3 |
| Vitamin C (% Daily Value) | 2 | 0 | 0 |

Table 5 shows that one serving of Kraft Reduced-Fat Ritz crackers contains fewer calories and less fat but more sodium and sugar than the original Ritz crackers.

Table 5. Nutritional components in Ritz crackers, original versus reduced-fat version.

| | Original | Reduced fat |
|-------------------|----------|-------------|
| Calories/serving | 80 | 70 |
| Total fat (g) | 4.6 | 2 |
| Saturated fat (g) | 1 | 0 |
| Sodium (mg) | 96 | 120 |
| Sugar (g) | 1 | 2 |

Table 6 shows that one serving of 25 percent reduced-fat Skippy peanut butter contains fewer calories and less fat but more sodium and sugar.

Table 6. Nutritional components in Skippy peanut butter, original versus the 25 percent reduced-fat version.

| | Original | 25% reduced fat |
|-------------------|----------|-----------------|
| Calories/serving | 190 | 180 |
| Total fat (g) | 16 | 12 |
| Saturated fat (g) | 3 | 2 |
| Sodium (mg) | 150 | 170 |
| Sugar (g) | 3 | 4 |

Summary

We all need fat in our diets because, nutritionally, fats do more than simply supply calories. Fats provide and assist with the absorption of essential fat-soluble vitamins and maintain immunity and bone health.

For more than 40 years, low-fat diets that recommended cutting back on full-fat dairy products and red meat has been emphasized as a way to lose weight and prevent or control heart disease and other chronic conditions. However, as a nation, following a low-fat diet has not helped us control weight or become healthier. In the 1960s, fats and oils supplied Americans with about 45 percent of calories, about 13 percent of adults were obese, and less than 1 percent had Type 2 diabetes. Today Americans take in less fat — getting about 33 percent of calories from fats and oils — yet 34 percent of adults are obese, and 11 percent have diabetes (CDC 2012). In the U.S., most fats that are consumed are from packaged products such as fried foods, dairy products, salad dressings,

mayonnaise, preserved vegetables, snacks, and nuts and seeds.

While it is true that saturated fats are the type of fat primarily responsible for building up fatty plaque in the arteries (atherosclerosis) and increasing cholesterol levels (hypercholesterolemia), the focus on overall diet quality is often lost in the dietary recommendation of lowering fat intake. This publication does not say that fat-free products have no role in a heart-healthy diet, but it suggests that they should be consumed in moderation. It is better to focus on choosing healthier fats, eating proper portions, and reducing the consumption of processed foods.

Take-Home Message

- Read nutrition labels and be aware of serving sizes.
- Understand what health claims like “low fat,” “reduced fat,” etc., really mean.
- Consume reduced-fat products in moderation.

References

- ADA (American Diabetes Association). 2015. “Fats.” ADA website. www.diabetes.org/food-and-fitness/food/what-can-i-eat/making-healthy-food-choices/fats-and-diabetes.html.
- AHA (American Heart Association). 2014. “Know Your Fats.” AHA website. www.heart.org/HEARTORG/Conditions/Cholesterol/PreventionTreatmentofHighCholesterol/Know-Your-Fats_UCM_305628_Article.jsp#.VpUI3k3ru-s.
- Brewer, M. S. 2012. “Reducing the Fat Content in Ground Beef Without Sacrificing Quality: A Review.” *Meat Science* 91 (4): 385-95. doi: 10.1016/j.meatsci.2012.02.024.
- CCC (Calorie Control Council). 2009. “Fat Replacers.” CCC website. <http://caloriecontrol.org/fat-replacers/>.
- CDC (Centers for Disease Control and Prevention). 2012. “Fat-Soluble Vitamins and Nutrients.” In *Second National Report on Biochemical Indicators of Diet and Nutrition in the U.S. Population*, 87-296. National Center for Environmental Health, Division of Laboratory Sciences. Atlanta: CDC. www.cdc.gov/nutritionreport/pdf/Fat.pdf.
- CDC (Centers for Disease Control and Prevention). 2015. “Diet/Nutrition.” National Center for Health Statistics website. www.cdc.gov/nchs/fastats/diet.htm.
- Chandon, P., and B. Wansink. 2012. “Does Food Marketing Need To Make Us Fat? A Review and Solutions.” *Nutrition Reviews* 70 (10): 571-93. doi: 10.1111/j.1753-4887.2012.00518.x.
- Cohen, D. A., and S. H. Babey. 2012. “Contextual Influences on Eating Behaviours: Heuristic Processing and Dietary Choices.” *Obesity Reviews* 13 (9): 766-79. doi: 10.1111/j.1467-789X.2012.01001.x.
- FDA (U.S. Food and Drug Administration). 2013a. “Definitions of Nutrient Content Claims.” Appendix A in *Guidance for Industry: A Food Labeling Guide*, 87-90. Office of Nutrition, Labeling, and Dietary Supplements. College Park, MD: FDA. www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/LabelingNutrition/ucm064911.htm.
- FDA (U.S. Food and Drug Administration). 2013b. “Tentative Determination Regarding Partially Hydrogenated Oils; Request for Comments and for Scientific Data and Information.” FDA Notice: Request for Comments and for Scientific Data and Information, Nov. 8, 2013.
- Gibney, M. J., S. A. Lanham-New, A. Cassidy, and H. H. Vorster. 2009. *Introduction to Human Nutrition*. 2nd ed. Ames, IA: Wiley-Blackwell.
- Hammad, S., S. Pu, and P. J. Jones. 2016. “Current Evidence Supporting the Link Between Dietary Fatty Acids and Cardiovascular Disease.” *Lipids* 5 (51): 507-17. doi: 10.1007/s11745-015-4113-x.
- HHS and USDA (U.S. Department of Health and Human Services and U.S. Department of Agriculture). 2015. *2015-2020 Dietary Guidelines for Americans*. 8th ed. U.S. Department of Health and Human Services. Washington, DC: U.S. Government Printing Office. <http://health.gov/dietaryguidelines/2015/guidelines/>.
- Khodarahmi, M., and L. Azadbakht. 2014. “The Association Between Different Kinds of Fat Intake and Breast Cancer Risk in Women.” *International Journal of Preventive Medicine* 5:6-15.

Layman, D. K. 2014. "Eating Patterns, Diet Quality and Energy Balance: A Perspective About Applications and Future Directions for the Food Industry." *Physiology & Behavior* 134:126-30. doi: 10.1016/j.physbeh.2013.12.005.

Stender, S. 2015. "In Equal Amounts, the Major Ruminant Trans Fatty Acid Is as Bad for LDL Cholesterol as Industrially Produced Trans Fatty Acids, but the Latter Are Easier To Remove From Foods." *American Journal of Clinical Nutrition* 102 (6): 1301-02. doi: 10.3945/ajcn.115.123646.

USDA and HHS (U.S. Department of Agriculture and U.S. Department of Health and Human Services). 2010. *Dietary Guidelines for Americans, 2010*. 7th ed. Washington, DC: U.S. Government Printing Office. <https://health.gov/dietaryguidelines/2010/>.

Wansink, B., and P. Chandon. 2006. "Can 'Low Fat' Nutrition Labels Lead to Obesity?" *Journal of Marketing Research* 43 (4): 605-17.