

HealthConnections

Added and Naturally Occurring Sugar: Their Difference and Role in Dietary Patterns

The term “added sugars” is appearing more frequently in popular literature, reflecting efforts that it be regulated like alcohol and tobacco due to concerns about obesity and cardiometabolic diseases. As a result, current dietary-guidance messages limit foods with “added sugars” and encourage foods such as fruit and dairy products with “naturally occurring” sugar.

Consumers are faced with many food choices to satisfy their innate preference for sweet taste that adds to the enjoyment of foods. When making packaged-food or beverage decisions over the past 12 months, more than half of Americans (58 percent) say they are trying to limit or avoid sugars in general, and about 75 percent say they are cutting back on foods that are high in added sugar in order to improve their diet.¹ This issue of *Health Connections* describes how health professionals can help clients distinguish between naturally occurring and added sugars, and help guide consumers to meet their individual health goals, maintain dietary quality and satisfy their personal taste preferences.

Carbohydrate Basics

Carbohydrates include the sugars, starches and fibers naturally present in fruits, vegetables, grains and milk products. Carbohydrates differ in their chemical composition, digestibility, speed of digestion and absorption, fermentability and physical structure. “Sugars” are conventionally used to describe the monosaccharides that have one sugar unit (glucose, fructose and galactose) and disaccharides that have two sugar units (sucrose; lactose, the principal carbohydrate in milk; and maltose). Sugar often refers to table sugar or sucrose, which is metabolized to fructose and glucose. Like sucrose, high-fructose



corn syrup (HFCS) is also a mixture of fructose and glucose (usually about 50/50). (See *Health Connections* <http://tinyurl.com/k5766cw> for more information about HFCS.)

The United States Department of Agriculture (USDA) defines “added sugars” as sugars and syrups added to foods during processing, preparation or by the consumer at the table prior to consumption. Analytical laboratory methods cannot distinguish between added sugars and those that occur naturally in food. While there is no molecular difference in sugar molecules—whether naturally occurring or added—foods and beverages that provide sugars generally differ in their nutrient composition and role in the total diet and on health.

In the body, digestible carbohydrates are metabolized to glucose—the primary energy source for the brain—or stored as glycogen in the liver and muscle for energy. In food, added sugars provide taste/sweetness, preservation

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HEALTH CONNECTIONS EDITOR

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and other attributes, such as supporting yeast for leavening or fermentation and providing coloring through browning.

Dietary Recommendations and Sources

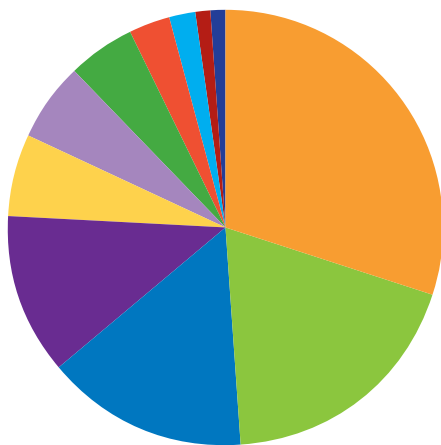
The amount of dietary carbohydrate that confers optimal health in humans is unknown.² Although it did not quantify a specific amount, the 2010 Dietary Guidelines Advisory Committee recommended reducing intake of added sugars










as a strategy to lower calorie intake, particularly for those needing to lower body weight. The *2010 Dietary Guidelines for Americans*, based on the committee’s scientific report, introduced the acronym SoFAS (which stands for solid fats and added sugars), to identify non-nutrient-dense components of the diet that contribute energy without providing important nutrients.

Reducing calories from SoFAS allows for increased intakes of nutrient-dense foods such as vegetables (including cooked beans and peas), fruits, whole grains and fat-free and low-fat fluid milk and milk products, without exceeding overall calorie needs. These foods help increase intakes of shortfall nutrients and nutrients of concern—vitamin D, calcium, potassium and fiber. *MyPlate* recommends foods with naturally occurring sugar through consumer messages such as: make half your plate fruits and vegetables; make at least half your grains whole grains; switch to fat-free or low-fat (1 percent) milk; and avoid sugary drinks. Food survey data indicate that soda, energy drinks and sports drinks are the major sources of added sugars in the U.S. diet for those 2 years of age and over.³

Sidebar

Sources of Added Sugars in Children’s Diets



	Soda and soft drinks	30%
	Candy, sugar, sugary foods	19%
	Fruit drinks	15%
	Grain-based desserts	12%
	Ready-to-eat cereals	6%
	Dairy desserts	6%
	All other food categories	5%
	Flavored milk	3%
	Yeast bread and rolls	2%
	Yogurt	1%
	Condiments and sauces	1%

Note: Table represents average values.

Source: NHANES (2003–2006), ages 2–18 years

Nutrition and Health Consequences

Concerns about dental health and displacement of essential nutrients and fiber historically have been cited as reasons to limit added sugar in the diet. More recently, sugar’s “downstream” health effects on obesity and cardiometabolic conditions are of concern. However, the risk of chronic disease cannot be predicted simply by the content of a single nutrient in a food group, and food and lifestyle choices do not exist in isolation. Looking only at a single food or behavior has limitations, as free-living conditions represent numerous interactions and variation in response. Reduction of calorie intake for weight management requires a broad and balanced approach.

References

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Interview

Joanne Slavin, Ph.D., R.D., Professor, Department of Food Science and Nutrition, University of Minnesota, Twin Cities

What are the challenges when developing nutrition guidance regarding the amount of total/naturally occurring/added sugar in the diet?

It is very difficult—and expensive—to do definitive studies. Our ability to measure sugar in the total diet is marginal. Added sugar is calculated and not analytically determined, and the molecular structure of sugar molecules is the same whether sugar occurs naturally in the food or is added. Although sugar-sweetened beverages can be counted in food-frequency questionnaires, there is no perfect way to get at exposure to different types of sugar in the diet and thus its health consequences. This is frustrating because, as nutritionists, when research data on health outcomes is weak, it is hard to discuss the role of sugar in the diet—especially given the media attention—without looking like sugar advocates.

What is the current state of research on the role of total, naturally occurring and added sugars in the diet?

Healthy diets are relatively high in carbohydrate. Nutrition guidance over recent decades has supported an increase in carbohydrate intake in order to lower fat intake. More recent guidance has attempted to dial in on the quality or type of carbohydrate. When I served as Chair of the Carbohydrate and Protein Subcommittee of the 2010 Dietary Guidelines Advisory Committee, we looked at the role of carbohydrates and health, used an evidence-based systemic review and formed conclusions based on the strength of the data. Associations between carbohydrate foods and specific health outcomes were inconsistent or modest. Other than a source of calories, limited data existed linking “added sugar” to any adverse health outcome. The *2010 Dietary Guidelines for Americans* recommendation to limit SoFAS is also based on lowering energy intake and improving micronutrient and fiber intake, rather than on health outcomes.

Should we continue to try to minimize sugar intake if it just perpetuates the reductionist view of health?

Why do we focus and spend time thinking there is a magic approach to complicated issues? Calories and sugar are only part of the puzzle. A general concept regarding added

sugar is that it is more beneficial for consumers to control calorie intake. If consumers lower sugar without reducing calories—who cares? Why focus on minutia

when we might be missing the bigger picture—such as whether a child is having family meals and developing a healthy relationship with food? We need to think about whether our obsession with the ‘bad’ guys is driving needed nutrients out of the diet. Trying to micromanage the diet with strict rules may lead to unintended consequences if we miss the boat on how people eat.

How do health professionals provide guidance to bridge the research/ communications gap?

We do know a lot—priority dietary/nutrition principles include the need to obtain sufficient nutrients/vitamins/minerals to support growth and maintain good health and appropriate body weight by balancing intake with physical activity. But there will never be a perfect answer to a perfect diet—even a systematic, evidence-based review is still not a blueprint for the perfect diet—and nutrient needs vary over the lifespan. For example, breast milk contains 50 percent fat and is suitable for a growing infant; sedentary adults have different needs. And there are and will be uneven, individual responses to nutrition guidance.

We need to help consumers find the best way to get nutrients without exceeding calorie needs. Because so many foods contain carbohydrates—fruits, vegetables, whole grains, low-fat dairy—we are, in effect, telling consumers to eat sugar. This recommendation is valid, however, as it is based on synergy and the package of nutrients provided. If it were only about the nutrient of the month, we could take supplements ... and what's the enjoyment in that? There is a variety of ways to obtain nutrients. Health professionals can encourage options and choices based on individual needs and preferences—to bring nutrition guidance and cultural backgrounds together. *MyPlate*, with its broadly illustrated food groups, suggests how to pull together such a variety, in moderation.



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Practice Points

- Encourage consumers to be selective when consuming carbohydrates/sugars and focus on nutrient-dense food choices. Also, recognize that small amounts of added sugar can increase the palatability of nutrient-dense foods.
- Show consumers how to read the ingredient list on packaged foods for sources of added sugar. The *Nutrition Facts* panel does not differentiate between naturally occurring and added sugars.
- Consider the total nutrient profile of the food in the diet. An unintended consequence of omitting foods with naturally occurring sugar found in fruits, whole grains and milk could be low intakes of fiber, calcium, vitamin D and B-vitamins.
- Consider also the unintended consequences of well-intentioned policies that restrict foods with added sugar. For example, omitting flavored milk in schools, which contributes 3 percent of added sugar overall to children's diets (see Sidebar), results in 37 percent less total milk consumption, which could lead to lower intakes of vitamin D and calcium—nutrients of concern in children and adolescents.^{4,5}
- Increase clients' awareness of different foods within food groups that contain varying amounts of carbohydrate and sugars. For example, yogurt contains lower amounts of lactose than milk because bacterial cultures convert lactose to lactic acid—which helps lessen the effects of lactose intolerance.
- Keep current on legislative efforts to strengthen requirements related to nutrition information on food labels, such as disclosing information on added sugars in addition to total sugars on the *Nutrition Facts* panel.