

FOOD Insight™

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Shopping for Health? Check Out these Food Components

More and more consumers are aware of the relationship between diet and health and are interested in learning more about foods that can promote health. With this in mind, it is important that consumers understand how to put nutrition information into practice.

Where better to practice nutrition knowledge than the grocery store! Even the most savvy shoppers can discover something new when it comes to shopping for foods that promote health. Nutrition communicators can assist shoppers by applying the latest nutrition science to everyday tasks, such as grocery shopping.

Fortunately, there are tools all over the grocery store to direct consumers to make healthful food choices. In-store nutrition staff and pamphlets are two resources consumers can be directed to. They can also consult food packages for Food and Drug Administration regulated nutrition information including the Nutrition Facts panel, claims about the nutrient content of foods, and claims related to how that food might be beneficial in reducing risk of disease or promoting health.

The Produce Department— A Cornucopia of Healthful Components

Fruits and vegetables are especially praised for being chock-full of an array of plant components that contribute to good health including vitamins, minerals, fiber and phytonutrients, not to mention their high levels of antioxidants, which defend against damaging free radicals that occur in the body. Free radicals are linked to diseases such as cancer, cardiovascular disease, cognitive impairment, Alzheimer's disease, immune dysfunction, cataracts and macular degeneration.

Some common antioxidants in fruits and vegetables are beta-carotene (which the body also converts to vitamin A) in carrots, pumpkin, sweet potato and cantaloupe; vitamin C in strawberries, guava, sweet red or green pepper, kiwi, and citrus fruits such as oranges, grapefruit, lemons, and limes; sulforaphane and dithiolthiones in cabbage and its cousins cauliflower, broccoli, Brussels sprouts, kohlrabi and kale; sulfides in garlic, onions, and leeks,

and many different flavonoids in berries, cherries, grapes, cranberries, apples, onions, and more. The tongue-twisting antioxidants, lutein and zeaxanthin, may contribute to maintenance of healthy vision. Look for them in kale, collard greens, spinach, corn, and citrus fruits.



- **Shopping tip: Eggs are also an excellent source of lutein and zeaxanthin.**

The antioxidant lycopene in tomatoes, watermelon, papaya, and red or pink grapefruit may help keep the prostate healthy and may also contribute to heart health.

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Carbohydrate Confusion: What You Need to Know about the Glycemic Index

Carbohydrates are an important nutrient and a significant part of a balanced diet. Experts generally encourage people to build their diets around nutrient-dense carbohydrates, incorporating a moderate amount of protein and some fat. Exercise and weight control are key elements of a healthful lifestyle to help reduce risk for heart disease, diabetes, and high blood pressure.

About 20 years ago a group of researchers developed the glycemic index as a tool to measure how much a carbohydrate-containing food is likely to raise blood sugar. Since that time “glycemic index” has become a popular nutritional catchphrase and the basis for some popular “magic bullet” diets that advocate strict limitations on carbohydrate intake. The National Academies’ *Dietary Reference Intake for Energy, Carbohydrates, and Fiber* states, “Research is needed to determine the effect of low glycemic index foods and low glycemic load diets on serum lipids and other risk factors for chronic disease and complications, especially in high risk groups.” Is it really necessary to “eat by the numbers” to lose or maintain weight? Here are some answers to questions about the glycemic index, glycemic load, and their relationship to diet and health.

What is the Glycemic Index?

Almost all carbohydrates (sugars and starches), regardless of the form in which they are consumed, are digested to glucose which enters the bloodstream, causing a temporary rise in blood glucose levels. This glycemic response is influenced by many factors, including how much food is eaten, the amount and type of carbohydrate in the food, how the food is processed, or how it is prepared. Under laboratory conditions, glycemic index (GI) is assessed by having a group of people eat a specific amount of a single food (usually 50 grams of digestible carbohydrate, i.e., total carbohydrate minus fiber) and then measuring the change in blood sugar levels compared with the levels achieved after they have eaten a control food (either glucose or white bread) containing the same amount of digestible carbohydrate. The International Table of Glycemic Index and Load lists the values of both control foods. The average change in blood sugar levels over a set period of time, relative to the levels after consumption of the control food, is the food’s glycemic index.

The index assigns foods a number on a scale of one to 100, in comparison with pure glucose, which has a reference score of 100. Regular pasta has a glycemic index of 41, meaning

that it raises blood sugar levels by less than half (41 percent) of what an equal amount of glucose does.

What Is Glycemic Load?

Glycemic load (GL) is a related concept that considers both the glycemic index and the amount of carbohydrate in a typical serving of food, giving a somewhat more accurate picture of a food’s effect on blood sugar. For example, carrots have a relatively high glycemic index because the carbohydrates in carrots are mostly sugars. But a serving of carrots contains a low amount of carbohydrate compared to high GI foods such as bread and potatoes. To calculate glycemic load, you multiply the grams of carbohydrate in a serving of food by that food’s glycemic index. Carrots, which have a glycemic index of 71, have 8 grams of carbohydrates per serving and are assigned a glycemic load of 6 (8 x 0.71).

It’s Not That Simple

On the surface GI and GL sound like straightforward concepts for enabling meal and diet planning, but experts say it’s not that simple. Here’s why.

The GI value of a food varies depending on how ripe it is, its variety and how it is cooked and processed. Also, GI is determined using standard test portions of foods, which are not the usual portion sizes that people consume.

Many variables affect GI calculations, including the fact that the GI of a food depends on whether it is eaten alone or consumed with another food. “In the real world, people eat meals and diets, not single foods,” says Susan Borra, a registered dietitian and president of

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Carbohydrate Confusion

the International Food Information Council Foundation. A high GI food combined with a low GI food produces a moderate response. Think of spreading some strawberry jam on whole wheat bread with peanut butter. The protein, fat, and fiber in the sandwich temper the relatively high GI of the jam.

What about using glycemic load instead of GI? Again, it's not that simple, since the GL calculation begins with a food's glycemic index and thus includes all the inherent uncertainties that pertain to GI.

GI's rising popularity has been fueled by claims that low GI foods can help control appetite, weight, and may be useful to people with diabetes. These claims are based on the theory that high GI foods raise blood sugar levels, cause excess insulin to be secreted, and lead to the storage of fat. However, the American Dietetic Association (ADA) says: "At this time, research does not support the claim that a low GI diet causes significant weight loss or helps control appetite." For people with diabetes, monitoring total grams of carbohydrate continues to be the key strategy, ADA says, although the GI concept may supplement blood glucose monitoring to "fine-tune" food choices and modestly improve blood glucose levels.

A recent recommendation for people with diabetes from the American Diabetes Association, published in the September 2006 issue of *Diabetes Care* says, "The use of glycemic index and load may provide a modest additional benefit over that observed when total carbohydrate is considered alone."

... using glycemic index or glycemic load... it's not that simple.

Think Nutrient Density

GI and GL calculations depend on too many factors to enable science-based meal planning. However, most nutrition scientists concur that a food's nutrient density (a measure of the proportion of nutrients a food supplies to the calories it contains) is more important than the glycemic index. The good news is that consumers can plan healthful meals and diets without complicated calculations for each item on their dinner plates.

It is helpful to remember that many low glycemic index foods are naturally high in fiber. They take longer to digest, and may, therefore, be more satisfying. Often they are less energy dense than their higher GI counterparts. These are the very foods—whole grains, fruits, vegetables, legumes—that nutrition experts have always recommended and continue to emphasize as the cornerstones of a healthful diet.

The Bottom Line

Over its 20-year history the glycemic index has generated much interest and controversy. A number of hypotheses relate high GI foods to increased blood sugar and insulin levels, suggesting the potential for increased disease risk. While worthy of further

investigation, these theories remain unproven. Also, concerns about the measurement and reliability of GI have yet to be resolved. Glycemic index may have the potential to be a valuable clinical tool, but it is clear that more research, including long-term clinical studies, is needed to prove its worth in reducing risk of disease.

Prevailing nutrition wisdom is represented by the 2005 Report of the Dietary Guidelines Advisory Committee which states, "Current evidence suggests that the glycemic index and/or glycemic load are of little utility for providing dietary guidance for Americans."

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Nutrition and Food Safety

MYTHS and FACTS

It comes as no surprise that Americans are suffering from “information overload.” Most are also aware that the current information environment is a breeding ground for the propagation of myths. This situation certainly applies to nutrition and food safety issues. The following seeks to shed some light and provide the scientific facts to address some common myths about the food you eat.

MYTH: *Low-calorie sweeteners increase the risk of cancer in humans.*

FACT: There is no scientific evidence of a link between low-calorie sweeteners and cancer in humans. Questions arose when early studies indicated a possible (bladder) cancer link between cyclamate in combination with saccharin in laboratory animals. However, according to the National Cancer Institute, recent research results from subsequent studies on these and other approved low-calorie sweeteners have not provided any evidence of a link. Recent research by the National Cancer Institute confers no association between aspartame consumption with an increase of cancer risk. *Cancer Epidemiol Biomarkers Prev* 2006;15(9):1654-1659. Additional resource materials about the safety and use of low-calorie sweeteners are available at: <http://www.ific.org/publications/other/lcsresources.cfm>.

MYTH: *Low-calorie sweeteners have an effect on appetite and promote weight gain.*

FACT: Research on the effect of consuming foods and beverages containing aspartame, for example, has not been shown to increase food intake or hunger in children, nor does it indicate an increase in food intake in normal weight or overweight adults. (*Blackburn GL World Rev Nutr Diet* 1999;85:77-87). Additional studies in overweight individuals showed improved body weight when they consumed a diet that included foods sweetened with low-calorie sweeteners instead of foods sweetened with sugar. (Raben A, Vasilaras TH, Moller AC, Astrup A *Am J Clin Nutr* 2002;76:721-9). In fact, low-calorie sweeteners can be an essential tool in weight management when used as part of the caloric equation for the general population and help to achieve the calorie goals/limits of people with diabetes.

MYTH: *Lactose intolerant children should not drink milk.*

FACT: New guidelines by the American Academy of Pediatrics actually recommend that lactose intolerant children not only consume milk, but other dairy products such as cheese and yogurt. While tolerance varies among individuals, it is recommended to introduce small amounts of dairy to determine how much can be tolerated without triggering symptoms. This is especially important as many lactose intolerant children may not be getting enough calcium. The guidelines are explained in detail in the September 2006 issues of *Pediatrics*. *Pediatrics* 2006;118:1279-1286.

MYTH: *Fats in food are bad.*

FACT: Fats got a bad rap many years ago and that reputation seems to have stuck. Over the years, scientific knowledge has evolved yielding interesting new developments.

The focus now is also on consuming a moderate intake (20 to 30 percent of calories or 44 to 77 grams per 2,000 calorie diet) with more of some types of fats (fatty acids) and less of others (i.e., higher intake from polyunsaturated and monounsaturated fats from sources such as vegetable oils, nuts, and fish. Keeping intake of *trans* fat and saturated fat as low as possible, while consuming a nutritionally balanced diet, which can be determined by looking at the Nutrition Facts panel on the food label.

MYTH: *It is better to look at the ingredients list to see if there is trans fat in a product than the Nutrition Facts box.*

FACT: Consumers were told to look for “partially hydrogenated vegetable oil” in the ingredient statement before *trans* fat was listed on the label. Now that grams per serving are listed consumers have the necessary tool to determine if *trans* fat is in the product and also how much. Sometimes it can be

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Nutrition and Food Safety — MYTHS and FACTS

confusing to mesh old and new advice. For instance, a product may have 0 grams of *trans* fat on the label and still contain some partially hydrogenated vegetable oil. The reason for this is that partially hydrogenated vegetable oil, depending on a variety of factors including how much it is hydrogenated, can contain varying amounts of *trans* fat and sometimes only a small amount will be used. The FDA says that if a product contains less than .5 grams per serving, it is considered nutritionally insignificant and therefore is rounded to zero. Another point: many people confuse the terms “hydrogenated” and “partially hydrogenated.” If a product contains “partially hydrogenated” oils then it will contain some amount of *trans* fat, but if a product contains “hydrogenated” oil it will contain no *trans*, only saturated fat.

MYTH: *Filling your sink with water and putting your produce in the standing water is the best way to clean it.*

FACT: According to the Partnership for Food Safety Education (PFSE), soaking your produce is risky business. Sinks with standing water can harbor bacteria which can transfer to foods and make you sick.

They advise; to properly clean fresh fruits and vegetables including those with skins and rinds that are not eaten, rinse them under running tap water. Rub firm-skin fruits and vegetables under running tap water or scrub with a clean cloth towel or paper towel. Never use detergent or bleach to wash fresh fruits or vegetables. Bleach and other cleansers are not intended for consumption.

The PFSE is a not-for-profit organization that unites industry associations, professional societies in food science, nutrition and health, consumer groups, and the U.S. government to educate the public about safe food handling. www.fightbac.org, the website of the PFSE, is a resource for food safety and safe food handling information.

MYTH: *“If it tastes okay, it’s safe to eat.”*

FACT: If you trust your taste buds to detect unsafe food, you will eventually be in trouble. Taking even a tiny bite to test the safety of a questionable food can be dangerous. For some foodborne illnesses, such as botulism, eating just a small amount of a contaminated

food can be fatal. The Centers for Disease Control and Prevention (CDC) estimates that foodborne diseases cause approximately 76 million illnesses, 325,000 hospitalizations, and 5,000 deaths in the United States each year. For more information visit the IFIC Foundation’s *Consumer’s Guide to Microbial Risks to Food Safety* at <http://ific.org>.

MYTH: *Sugar causes diabetes.*

FACT: There are two types of diabetes: type 1 and type 2. In type 1 diabetes, the pancreas fails to produce the hormone, insulin, which is required by the body for energy utilization by muscles and other cells. Type 2 diabetes results when the body is unable to respond properly to the insulin produced by the pancreas. Type 2 diabetes is the most common. Individuals who are overweight or obese may be more at risk for developing type 2 diabetes. Consumption of sugars and carbohydrates does not cause either type of diabetes. People with diabetes need to be especially careful about the carbohydrates that they consume, usually by counting grams of carbohydrate, but sugars are not “off limits” even for people with diabetes. Regular exercise improves insulin sensitivity for people with diabetes and everyone else, too.

MYTH: *High fructose corn syrup (HFCS) causes obesity.*

FACT: No single food or ingredient is the sole cause of obesity. Too many calories combined with too little exercise is the primary cause. Like dietary fats, carbohydrates, and proteins, HFCS, if consumed in excess, can contribute to weight gain. However, there is no scientific proof of cause and effect with respect to the consumption of HFCS rather than other sugars, such as sucrose, regarding obesity rates. Speculation of a cause-and-effect relationship between HFCS and weight gain is based on preliminary research that tested fructose levels at least three to four times higher than the average amount consumed by Americans. The research did not test HFCS, which, like sucrose, is made up of almost equal amounts of fructose and glucose.

Shopping for Health?

- **Shopping tip: Processed tomato products such as canned tomatoes, tomato paste, and ketchup are more bioavailable and concentrated sources of lycopene.**

The mineral potassium, which may reduce the risk of high blood pressure and stroke as part of a low-sodium diet, is plentiful in orange and grapefruit juice, bananas and potatoes. Potassium chloride, a salt replacement, is another option for those looking to increase potassium intake. Look for it in the spice and baking aisle. Spinach, nuts, soy, pumpkin, beans, and squash all contain magnesium, which helps maintain normal muscle, immune, and nerve function, and also contributes to bone health.

Consumers can be adventurous and discover other aisles of the grocery store where they may find a variety of foods that are full of healthful components. For instance, frozen and canned fruits and vegetables are also great choices because they are picked, packed, frozen, or canned at peak of ripeness, when antioxidant and nutrient content are also at their peak.

Great Grains: The Bread, Cereal, Rice, and Pasta Aisles

Here's where you can find whole grains, which may reduce risk of heart disease, certain types of cancer, type 2 diabetes, and may even help with weight management.

How? A whole host of components in whole grains work together to provide protection. These include fiber, vitamins, minerals, beneficial enzyme inhibitors, and hundreds of phytonutrients, such as phytoestrogens, antioxidants, and polyphenols.

To reap the benefits, consumers should try for at least three daily

servings of whole grains such as oatmeal, ready-to-eat cereals, and breads containing whole grains (look for the phrase "whole grain" or "whole" before the grain's name), brown rice, barley, popcorn, pasta, crackers, and couscous, wild rice, buckwheat, triticale, bulgur, millet, quinoa, and amaranth.

Fiber is found both in whole grains and in certain enriched grain-based foods. A special type of soluble fiber called beta glucan, found in oatmeal and barley, may reduce the risk of coronary heart disease by binding cholesterol in the gut and transporting it out of the body. Insoluble fiber found in wheat bran and corn bran, and in some cereals and breads may contribute to a healthy digestive tract and reduce risk of certain cancers.

- **Shopping tip: Fruits and vegetables also contain a mix of soluble and insoluble fibers. Legumes like lentils and kidney beans are especially rich in soluble fiber and can be found with dried and canned foods.**

Many grain foods are fortified with folate (called folic acid on the label), which may reduce a woman's risk of having a child with a brain or spinal cord defect. Folate, when consumed with a diet rich in other B-vitamins, may also help reduce the risk of cardiovascular disease.

- **Shopping tip: Folate is also found in legumes such as beans, peas, soybeans and lentils, as well as citrus fruits and juices, spinach, and peanuts.**

The Case for Dairy and Calcium-Fortified Soy Milk

Dairy products such as milk, cheese and yogurt are well-known as exceptional sources of calcium, needed for strong bones and to reduce risk of osteoporosis. Vitamin D, found in fortified milk and some

yogurts and cheese, helps the body absorb calcium for strong bones. Emerging research on vitamin D shows that it may also play a role in promoting immune function as well as reducing risk of certain cancers, and improving balance in the elderly.

- **Shopping tip: Calcium and vitamin D are also added to some cereals and juices.**

Probiotics are beneficial bacteria that may improve gastrointestinal health and immunity by increasing the population of friendly bacteria in the digestive tract. Examples are certain strains of *Lactobacilli* and *Bifidobacteria*. Look for these specific strains of probiotic bacteria in certain fermented dairy products like yogurt and kefir (a tangy milk drink). Probiotics are also becoming available in shelf-stable foods.

- **Shopping tip: Prebiotics are non-digestible food components that help beneficial probiotics multiply in the intestine, so pair them up to maximize effectiveness. Foods with prebiotics include certain whole grains such as oatmeal and barley, bananas, berries, onions, garlic, leeks, artichokes, greens like spinach and kale, legumes and honey.**

Soy milk—plain or flavored—contains the same amount of calcium as an equivalent glass of milk. Research shows that soy protein may reduce the risk of coronary heart disease.

- **Shopping tip: Soy-based foods are found all over the store. Scan the shelves for soy nuts, soy butter and soy-containing drink powders, and the refrigerated section for tofu and tempeh. Check the freezer and refrigerator cases for meat alternatives such as soy burgers, hot dogs, and sausage, and for bags of edamame (eh-dah-MAH-meh)—green soybeans sold shelled or in the pod.**

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Shopping for Health?

The Meat & Seafood Shoppe

Protein-packed meats, poultry, and fish provide an assortment of B-vitamins that may help regulate metabolism, support cell growth and contribute to healthy immune function. Red meat and fish contain the antioxidant mineral, selenium, too. Researchers are studying conjugated linoleic acid (CLA), a fatty acid in beef, lamb and dairy products, for its possible role in helping to maintain desirable body composition and healthy immune function.

Salmon, sardines, herring, trout, and tuna are terrific sources of the omega-3 fatty acids, docosahexaenoic acid (DHA), and eicosapentaenoic acid (EPA), types of polyunsaturated fats shown to reduce the risk of coronary heart disease.

- **Shopping tip: Walnuts, flaxseed, and canola oil contain an omega-3 fatty acid called alpha-linolenic acid (ALA), which may help keep the heart healthy. Eggs from hens fed a high-flax diet contain omega-3s. Check the label, omega-3s are also added to some brands of peanut butter, mayonnaise, cooking oil, cereal, pasta and nutrition bars.**

Slick Choices for Oils and Spreads

Times have changed and consumers are now instructed to enjoy the health benefits of a moderate fat diet by choosing oils and spreads rich in monounsaturated fat (olive, canola, peanut, or high oleic safflower oil) or polyunsaturated fat (sunflower, corn or soybean oil).

- **Shopping tip: Nuts and seeds and the butters made from them also contain mostly monounsaturated and polyunsaturated oils plus the antioxidant, vitamin E.**

Some margarine-like spreads are fortified with plant sterols and stanol esters, which, when consumed in appropriate amounts, may reduce

the risk of coronary heart disease by lowering LDL (bad) blood cholesterol.

- **Shopping tip: Some brands of salad dressing, orange juice, yogurt, and snack bars are also fortified with plant sterol and stanol esters.**

Coffee, Tea or Wine?

Like many fruits and vegetables, these beverages contain beneficial antioxidants. In particular, flavonoids in tea and wine and phenolic acids in coffee may promote heart health, if you choose to drink these beverages.

- **Shopping tip: Cocoa and dark chocolate also contain flavonoids.**

Chew on this in the Checkout Line

Satisfy your sweet tooth with chewing gum made with a sugar alcohol such as xylitol, sorbitol, mannitol, or lactitol. They help reduce the risk for dental caries (cavities).

Don't rely on one food or food component as a shortcut to good health—no single food can do it all. It is best to encourage consumers to utilize the whole grocery store and to choose a wide variety of foods as part of a balanced diet. And don't eat too much just because a food contains a healthful constituent—calories are important and more of a nutrient may not necessarily be better. Also engage in a lifestyle that includes other healthful habits such as regular physical activity, stress management, and not smoking.

Finally, adding new foods or food components to a diet may necessitate removing or reducing others in order to maintain a healthful weight. To determine your ideal daily calorie intake, go to: www.mypyramid.gov.

For more information on functional foods and beneficial food components, go to <http://www.ific.org/nutrition/functional/index.cfm>.

NewsBites

Myths & Facts about Low-Calorie Sweeteners

Low-calorie sweeteners play a safe and healthful role in providing a variety of foods, beverages, and other products for consumers. In today's age of increasing rates of obesity and obesity-related illness, low-calorie sweeteners can play a role as a weight management tool. For more information visit <http://www.ific.org/publications/other/lcsresources.cfm>.

Up-to-Date Crop Composition Database: A Resource for Multiple Uses

The International Life Sciences Institute (ILSI) released Version 3.0 of its crop composition database, which provides up-to-date information on the natural variability in the composition of conventional crops and provides a reference for comparing the composition of new crop varieties, including those developed through biotechnology.

The information in this database includes data on the nutrients, anti-nutrients, and secondary metabolites for corn and soybean samples obtained from controlled field trials, in multiple locations worldwide over a six-year period. The approximately 118,000 data points may be searched and accessed on the basis of user-selected queries.

The database complements existing food and nutrient databases and should be of interest to research and regulatory scientists in many areas, such as plant biology, food science, and human and animal nutrition.

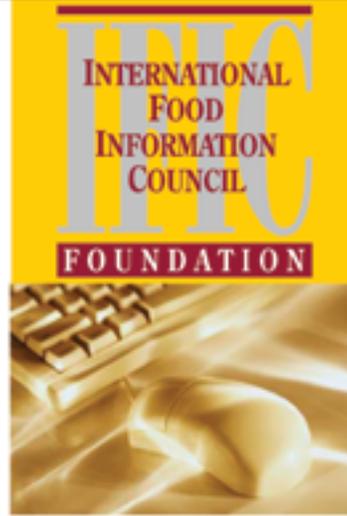
For more information and to access the ILSI Crop Composition Database, visit <http://www.cropcomposition.org>. For background information on food biotechnology, go to <http://ific.org/food/biotechnology>.

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