

the alphabet soup of nutrition terminology

Bone up on these 10 essential nutrition terms that are making news today.

Staying abreast of emerging nutrition research studies can be a real challenge for busy fitness professionals. Half the battle is making sense of the terms used to describe new scientific findings. One day “genetics” is making headlines, while the next day everyone is talking about the “glycemic index.”

Things get even trickier when your clients pose questions about these new-fangled buzz words and you don’t have a clue as to what they mean. That’s why we devised this primer to explain 10 key terms related to the latest food and nutrition research news.

1. Nutrigenomics

Topping the list of popular terms used in many studies this year is **nutrigenomics**, defined as the study of how different foods interact with specific genes to increase or decrease the risk of diseases such as type 2 diabetes, heart disease or cancers (DeBusk et al. 2005). Because nutrigenomics is still in its infancy, the applications of personalized medical nutrition therapy to human genetics are not yet widely understood. However, as science expands the body of knowledge on this topic, more practitioners will likely begin tailoring meal plans based on individuals’ unique genetic profiles. As more studies confirm the efficacy of this approach, personalized nutrition plans based on nutrigenomics will be used to treat, manage and maybe even cure diet-related diseases. For example, men with a family history of prostate cancer may be encouraged to increase their intake of tomatoes, which contain high levels of the antioxidant lycopene; studies have

shown that lycopene can reduce the risk of prostate cancer, in addition to offering protection against heart disease.

2. Daily Value

Intended to help consumers plan healthier diets, the term **Daily Value (DV)** was coined back in 1994 to comply with the U.S. Food and Drug Administration’s (FDA) Nutrition Labeling and Education Act (USFDA 2005). DVs serve two functions. First, they quantify the percent of each nutrient (e.g., fat, carbs or fiber) contained within the food product, based on the total daily amount that is recommended for a healthy person on a typical 2,000-calorie-per-day diet. According to current federal guidelines, a 2,000-calorie diet should provide approximately 600 calories from fat, 1,200 calories from carbs and 25 grams (g) of fiber (USFDA 2005). Second, DVs help consumers understand descriptive terms used on food packaging, such as *low sodium* and *low fat*. Visit <http://vm.cfsan.fda.gov/~dms/flg7a.html> for a complete listing of DVs that appear on food labels.

3. Dietary Reference Intakes

In the mid 1990s, the Institute of Medicine established the concept of **Dietary Reference Intakes (DRIs)**. The DRI values expand upon or replace the older Recommended Dietary Allowances (RDAs), which set recommended daily levels of nutrients needed to prevent deficiencies. The DRIs take this one step further by recommending up to four different values for nutrients: the RDAs themselves; Estimated Average Requirements (EARs); Adequate Intakes (AIs); and Tolerable Upper Intake Levels (ULs) (U.S. Department of Agriculture [USDA] 1999). An EAR is the average daily intake level typically used for research purposes to determine the needs

of half the people in a particular population, such as older adults. An AI is used by nutrition experts to make a recommendation for a nutrient when there is currently insufficient scientific support to determine an EAR. A UL is the highest average daily nutrient intake level likely to pose no risk of adverse health effects for nearly all individuals in a particular life stage or gender group (USDA 2005).

4. Phytochemicals

Here’s a term that is being bandied about often in research studies these days. **Phytochemicals** are naturally occurring bioactive substances contained in plants. These mighty chemicals perform a host of functions to protect plants from the elements, and those protective properties are passed on to humans when we ingest the plants or plant-based foods. In addition to having protective health properties, phytochemicals impart spectacular color, aroma and flavor to fruits and vegetables and other plant products.

Phytochemicals work in myriad ways. These antioxidants protect cells from damage; boost immunity levels; improve cardiovascular health; slow the aging process; improve eye health; promote the death of malformed cells; render carcinogens harmless; and repair DNA (Duyff 2002). What an impressive list of reasons to give to your clients when recommending that they consume plenty of fruits, vegetables and whole grains each day!

There are different categories of phytochemicals, such as terpenes, phenols and thiols, and each category contains numerous subgroups of phytochemicals. Clearly, the research behind phytochemicals is in its infancy, so expect much more to come with each passing day. In the meantime, you can learn more about these essential plant com-

pounds by checking the U.S. Department of Agriculture's phytochemical database at www.ars.usda.gov/Services/docs.htm?docid=8875.

5. Irradiation

Here's a term that is raising curiosity and concern in consumers. According to the USDA, **irradiation** is an emerging technology that uses radiant energy to reduce potentially harmful, disease-causing pathogens and insects in food (USDA 2003). Although the process destroys microscopic germs and other bugs, it does not alter the nutritive value or wholesomeness of the food itself. According to the USDA's Food Safety Research Information Office, irradiation enhances food quality and safety (USDA 2003). And despite myths about irradiation, the food does not become radioactive in the process.

That said, many nutrition experts (myself included!) caution that irradiation should not be used in place of fundamental safe food-handling practices. Encourage your clients to wash their hands properly prior to handling food, to avoid cross-contamination, and to cook irradiated food to the appropriate internal temperature.

So, how do you know if the food you purchased has been irradiated? Food manufacturers use a radura symbol on the nutrition facts label to show that a particular food has undergone irradiation.



6. Organic

This is another term that is used incorrectly and often these days. According to the USDA, the term **organic** refers solely to a farming practice that eschews the use of antibiotics, conventional pesticides, growth hormones and irradiation in animal or plant products. Contrary to popular opinion and manufacturers' claims, the term is *not* synonymous with "nutritionally better for you" or "having improved nutritional status."

When shopping, consumers should look for the USDA's "organic" symbol, which indicates that the food was raised using organic farming procedures and



that the product is at least 95% organic (some foods are 100% organic, whereas others contain only one organic ingredient) (USDA 2002). However, it is not currently a federal requirement to use this symbol; manufacturers display it on a voluntary basis. Anything less than 95% organic will not carry the USDA's symbol. Urge your clients always to read the food packaging and labels for clarification.

It should be noted that the terms *organic* and *natural* are often used interchangeably and incorrectly. In fact, the term *natural* simply indicates that the product was made without artificial ingredients or colorings and possibly with minimal processing. As with the term *organic*, the word *natural* on a food label does not guarantee that it is healthy.

7. Bioavailability

Bioavailability refers to the body's ability to absorb and use the nutrients derived from food. For example, certain nutrients, such as sodium and potassium, are readily available for use by the body, whereas others, such as iron and chromium, are less available.

What's more, studies have shown that some nutrients enhance absorption of other nutrients, while others actually detract from adequate absorption. For example, vitamin C augments iron absorption, and vitamin D boosts calcium absorption. On the other hand, oxalic acid, found in spinach and chard, and phytic acid, found in whole grains, both work to decrease calcium absorption (Mahan & Escott-Stump 2000).

8. Hydrogenation

Hydrogenation refers to the process of adding hydrogen molecules to unsaturated fatty acids in certain foods, such as snack cakes, cookies, baked goods and, especially, stick margarine and vegetable shortening. The process of forcing hydrogen into the fat creates a chemical formation that results in the formation of trans fats, which have been shown to have negative health effects. Once hydrogenated, the fat solidifies, allowing the product to withstand longer time on store shelves and in our cupboards at home.

As of January 2006, all food labels are required to display trans fat levels. Although there is still no recommended daily intake for trans fats, the Institute of

Medicine (IOM) has gone on record as stating that no level of trans fats is safe (IOM 2002). Many nutrition experts tell their clients to avoid or minimize consumption of products that contain partially hydrogenated fat, in order to cut trans fat intake. One note of caution when scouring labels for trans fats: The FDA permits manufacturers to "round down" for any product that contains less than 0.5 g of trans fat per serving (IFIC 2005). That means a label may say "0 grams of trans fat," yet you may be consuming 0.4 g with each serving!

9. Glycemic Index

According to the International Food Information Council (IFIC), the term **glycemic index** (GI) is a measure of how the carbohydrates in a particular food influence blood sugar levels (IFIC 2003). Researchers determined the GI of a host of individual foods by measuring subjects' blood sugar response after eating a given amount of a carbohydrate food and then comparing that value to their blood sugar response after eating a control food (usually white bread or glucose). For example, researchers measured the blood sugar response after subjects ate 50 g of potatoes and compared this to their response after eating a 50 g serving of white bread. The average change in blood sugar levels over a set period of time relative to the change in levels after consumption of the control food determined the test food's glycemic index.

While this may sound like a straightforward procedure, it is not without its limitations. In fact, the concept is complex and not particularly user-friendly, given all the different foods one might ingest in a given day. Additionally, the GI of a particular food can be altered by its ripeness, how it is prepared or cooked, and its overall nutrient composition (IFIC 2003).

10. Glycemic Load

Glycemic load (GL) is a relative of GI and may ultimately prove to be the better method for determining glycemic response. The GL takes into account not only the GI of a particular food but also the serving size of that food. (A food's GL is calculated by multiplying the food's GI by the serving size and then dividing by 100.) In other words, the GL is more prac-

tical than the GI because it addresses both the quality and quantity of the carbohydrate in question. For details on how to calculate GI and GL, see “Using Glycemic Index to Improve Athletic Performance” in the November–December 2004 issue of *IDEA Fitness Journal*.

D. Milton Stokes, MPH, RD, is chief dietitian at St. Barnabas Hospital in New York City. He's also a spokesman for the American Dietetic Association and managing partner of Culinary Nutrition Consultants Inc. Contact him at miltonstokes@gmail.com.

© 2006 by IDEA Health & Fitness Inc. All rights reserved. Reproduction without permission is strictly prohibited.

References

- American Dietetic Association (ADA). 2005. Various values and other nutrition facts. www.eatright.org; retrieved Nov. 2005.
- DeBusk, R.M., et al. 2005. Nutritional genomics in practice: Where do we begin? *Journal of the American Dietetic Association*, 105, 589–98.
- Duyff, R.L. 2002. *Complete Food and Nutrition Guide* (2nd ed.). Hoboken, NJ: Wiley & Sons.
- International Food Information Council (IFIC). 2003. Glycemic index: The ups and downs of indexing blood sugar. www.ific.org/foodinsight/2003/mj/glycemicfi 303.cfm; retrieved Dec. 1, 2005.
- IFIC. 2005. Translating the facts about trans fat. www.ific.org/foodinsight/2005/ma/transfatfi2005.cfm; retrieved Dec. 1, 2005.
- Institute of Medicine (IOM). 2002. *Dietary Reference Intakes for Energy, Carbohydrate, Fiber, Fat, Fatty Acids, Cholesterol, Protein, and Amino Acids*. Washington, DC: National Academies Press.
- Mahan, L.K., & Escott-Stump, S. 2000. *Krause's Food, Nutrition, & Diet Therapy* (10th ed.). Philadelphia: W.B. Saunders Company.
- U.S. Department of Agriculture (USDA). 1999. Dietary reference intakes—new dietary guidelines really are new! www.gfnrc.ars.usda.gov/News/news_9912a.html; retrieved Dec. 1, 2005.
- U.S. Department of Agriculture (USDA). 2002. Organic food standards and labels: The facts. www.ams.usda.gov/nop/Consumers/brochure.html; retrieved Dec. 1, 2005.
- U.S. Department of Agriculture (USDA). 2003. Food Safety Research Information Office data on food irradiation. www.nal.usda.gov/fsrio/topics/tpfdirrad.htm; retrieved Dec. 1, 2005.
- U.S. Department of Agriculture (USDA). 2005. Appendix C: Glossary of terms. *Dietary Guidelines for Americans 2005*. www.health.gov/dietaryguidelines/dga2005/document/html/appendixC.htm; retrieved Dec. 9, 2005.
- U.S. Food and Drug Administration (FDA). 2000. Food irradiation: A safe measure. www.fda.gov/opacom/catalog/irradbro.html; retrieved Dec. 1, 2005.
- U.S. Food and Drug Administration (FDA). 2005. “Daily values” encourage healthy diet. www.fda.gov/fdac/special/foodlabel/dvs.html; retrieved Dec. 1, 2005.