These tips can help you explain food-labeling rules to clients.

Cracking the Code on Food and Nutrition Labels

By Steve Hertzler, PhD, RD, LD

About half of shoppers report reading nutrition labels “most of the time” or “always” (Johnsen 2013). However, reading labels and understanding them are two different things. Even seasoned fitness professionals with extensive knowledge of nutrition can have trouble interpreting food labels. How much more confusing must it be for the average consumer? In addition, food-labeling regulations are complex and can contain excessive jargon. Still, with some basic guidance, fitness professionals can help their clients become smart label readers.

Translating the “Alphabet Soup” of Nutrient-Intake and Food-Labeling Standards

To make sense of food labels, you have to be able to distinguish among multiple individual nutrient-intake standards—which can apply to people of different ages, genders and life stages (pregnancy and lactation, for instance)—and the nutrient-intake standards used in food labeling. A two- or three-letter acronym represents each of these standards; here’s a look at the principles behind them:

RDA. Recommended Dietary Allowances were first published by the Food and Nutrition Board of the U.S. Institute of Medicine in 1943 (Harper 1985) and were revised every 5–10 years as new scientific information became available. Still updated periodically, RDAs are now a subcategory of the Dietary Reference Intakes (see below).

DRI. Dietary Reference Intakes were introduced in 1997 when the IOM broadened its scope by including not only RDAs but also new nutrient-intake standards that apply to several life-stage and gender groups (see Table 1). DRI tables can be downloaded at http://fnic.nal.usda.gov/dietary-guidance/dietary-reference-intakes/dri-tables.

DV. Daily Values are defined by the U.S. Food and Drug Administration; they’ve been required on food labels since 1994. DVs have two subclasses: >>
• **DRV.** Daily Reference Values can vary depending on caloric requirements. Information on the labels is intended to apply to people aged 4 years and older. DRVs typically apply to daily diets of 2,000 and 2,500 calories, although there are also DRVs for 3,200 calories.

• **RDI.** Reference Daily Intakes are similar to the U.S. RDAs found on food labels before 1994. RDIs apply mainly to essential vitamins and minerals, with four sets that apply to infants, toddlers, people aged 4 years and older, and pregnant or lactating women. DV tables for each group are available at http://ods.od.nih.gov/HealthInformation/daily values.aspx.

One problem with DVs on food labels is that many foods, like breakfast cereals, are consumed by people with dramatically different individual nutrient requirements. Owing to space limitations, labels on most food packages will list DRVs for two calorie levels and one set of RDI numbers (typically the 4-and-older category). Thus, DVs provide only a general guideline for comparison, and they won’t necessarily match the specific nutrient needs of the consumer of that product.

**TRANS FATS, SUGARS, % DF DV**

You may have noticed that food labels have no DVs for trans fats or sugars. That’s because the IOM (2006) simply advises consumers to keep their trans fat intake as low as possible; it does not offer a specific recommendation. As for sugars, the IOM advises that no more than 25% of our overall energy intake should come from added sugars (IOM 2006). Unfortunately, sugar values reported on the Nutrition Facts panel do not distinguish between added sugars and naturally occurring sugars.

You also might have noticed that some products list a “% Daily Value” for protein, while others do not. If a product makes a claim like “high protein,” its protein content must be listed in grams and % DV (Food Consulting Company 2013). Otherwise, listing the protein content only in grams is acceptable.

**UNDERSTANDING SERVING SIZE, CALORIES, AND CALORIES FROM FAT**

**Serving size.** The FDA has established serving sizes, or Reference Amounts Customarily Consumed, for 139 food product categories. For example, a typical RACC for a beverage is 8 fluid ounces. For more about the RACC standards, go to www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcfr/CFRSearch.cfm?fr=101.12.

Be careful to note the serving size and number of servings per container on food labels. For example, the label on a 20-ounce bottle of soda may list 120 calories per 8-ounce serving, but if you drink the whole bottle, all the label values (and % DV) must be multiplied by 2.5. Failing to take the number of servings into account is one of the most common slip-ups consumers make when reading food labels. >>

8 | IDEA Food and Nutrition Tips November-December 2013
**ANATOMY OF A FOOD LABEL**

The best way to understand a food label is to dissect one and examine its anatomy. Let's look at the label of a whole-grain flatbread product:

- **Serving size** is set in household units according to labeling laws. It is not arbitrarily set by the manufacturer. One of the most common label slips-ups for consumers is to not pay close attention to Serving Size. Careless reading can quickly add up to overconsumption (without intending it).

- **Calories from Fat:** This percentage is calculated by dividing the calories from fat by the total calories in food and then multiplying by 100. This example has been rounded up to 50 from 45.

- **Daily Values** incorporate either the Dietary Reference Value for each nutrient in the top section or the Reference Dietary Intake, which applies mainly to vitamins and minerals.

- Listing these four vitamins and minerals is required by law. Manufacturers may list others if they wish, or if they make a claim regarding the content of a nutrient.

- The amounts of total fat and saturated fat (grams per day) reflect approximately 30% and 10% of dietary calories, respectively.

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**Table 1. THE “ALPHABET SOUP” OF NUTRIENT-INTAKE AND FOOD-LABELING STANDARDS**

<table>
<thead>
<tr>
<th>Established by</th>
<th>Nutrient-Intake Standards</th>
<th>Food-Labeling Standards</th>
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<tbody>
<tr>
<td>Institute of Medicine</td>
<td>Nutrient-Intake Standards</td>
<td>FDA</td>
</tr>
<tr>
<td>Type of Standard</td>
<td>Dietary Reference Intake (DRI)</td>
<td>Daily Value (DV)</td>
</tr>
<tr>
<td>Categories Within the Standard</td>
<td>Estimated Average Requirement (EAR): Average daily nutrient intake at which 50% of healthy individuals in a particular life stage and gender group would be deficient.</td>
<td>Daily Reference Value (DRV): Established for total fat, saturated fatty acids, protein, cholesterol, carbohydrate, fiber, sodium, and potassium. Varies by calorie level: DRV's are for 2,000-, 2,500- and 3,200-calorie levels (2,000 and 2,500 appear on food labels).</td>
</tr>
<tr>
<td></td>
<td>Recommended Dietary Allowance (RDA): Higher than EAR; average daily nutrient intake that meets the needs of nearly all (97%-98%) healthy individuals in a particular age group and gender group.</td>
<td>Reference Daily Intake (RDI): Established for 25 essential vitamins and minerals. Separate RDIs exist for infants, toddlers, persons aged 4+ years and pregnant or lactating women.</td>
</tr>
<tr>
<td></td>
<td>Adequate Intake (AI): Recommended average daily intake level based on observed or experimentally determined approximations or estimates of nutrient intake by a group (or groups) of apparently healthy people that is assumed to be adequate; used when an RDA cannot be determined.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tolerable Upper Intake Level (UL): The highest average daily nutrient intake that is likely to pose no risk of adverse health effects to almost all individuals. As intake rises above the UL, potential risk of adverse effects may increase.</td>
<td></td>
</tr>
</tbody>
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### Table 2. **Other Important Definitions of Food-Labeling Terms**

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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</table>
| gluten-free (FDA 2011) | The food does not contain any of the following:  
- an ingredient that is any type of wheat, rye, barley or crossbreeds of these grains  
- an ingredient that is derived from these grains and has not been processed to remove gluten  
- an ingredient that is derived from these grains and has not been processed to remove gluten, if it results in the food containing 20 or more parts per million of gluten  
- 20 ppm or more of gluten |
| natural (Long, Park-Suk & Tyler 2013) | The FDA has no official definition for natural. However, current policy is not to restrict the use of the term natural except for added color, synthetic substances and flavors as provided in [21 CFR 101.22]. |
| organic (USDA 2012a) | The FDA has no official definition for organic. However, the FDA works closely with the U.S. Department of Agriculture, which has established the meaning of organic and the standards that products must meet in order to be labeled "organic." Organic products must meet the following requirements:  
- They must be produced without excluded methods (such as genetic engineering, ionizing radiation or sewage sludge).  
- They must be produced per the National List of Allowed and Prohibited Substances (available at www.ecfr.gov [search: Title 7, part 205 for National Organic Program]).  
- They must be overseen by a USDA National Organic Program-authorized certifying agent, following all USDA organic regulations. |

Definitions for three types of organic labels:  
100% organic:  
- All ingredients must be certified organic.  
- Any processing aids must be organic.  
- Product labels must state the name of the certifying agent on the information panel.  
Organic:  
- All agricultural products must be certified organic except where specified on the National List.  
- Nonorganic ingredients allowed per the National List may be used, up to a combined total of 5% of nonorganic content (excluding salt and water).  
- Product labels must state the name of the certifying agent on the information panel.  
"Made with" organic ingredients:  
- At least 70% of the product must be certified organic ingredients (excluding salt and water).  
- Any remaining agricultural products are not required to be organically produced, but they must be produced without excluded methods.  
- Nonagricultural products must be specifically allowed on the National List.  
- Product labels must state the name of the certifying agent on the information panel.  

**Calories.** Carbohydrates, proteins and fats have 4, 4 and 9 calories per gram, respectively, so the calorie value on a food label should be represented by this mathematical formula: (fat grams × 9) + (carbohydrate grams × 4) + (protein grams × 4). However, the calorie value on the label will not always match this calculation exactly. Dietary fiber is included in the carbohydrate gram count, and dietary fibers typically have 0–2 calories per gram. In addition, some rounding is allowed.

**Calories from fat.** This percentage is calculated by dividing the calories from fat by the total calories in the food and then multiplying that result by 100. For example, the flatbread in our example (see the sidebar "Anatomy of a Food Label") contains 5 g fat; multiplying that by 9 cal/g equals 45 calories from fat (rounded up to 50 on the label). Thus, 50 calories from fat divided by 180 calories total is 0.28, which converts to 28%.

**Interpreting the Ingredient Listing.** Ingredients in a food are listed in decreasing order by their weight in the product. Thus, ingredients at the top of the list are more plentiful than ingredients at the end. Our whole-grain flatbread lists these ingredients:

Whole wheat flour (whole wheat flour, ascorbic acid as dough conditioner, enzyme), enriched wheat flour (wheat flour, ascorbic acid as dough conditioner, niacin, reduced iron, thiamine mononitrate, riboflavin, enzyme, folic acid), buttermilk (skim milk, dry buttermilk, bacterial culture), water, soybean oil, wheat bran, cultured wheat flour, sugar, baking powder (sodium acid pyrophosphate, sodium bicarbonate, corn starch, monocalcium phosphate), wheat germ, dextrin, wheat gluten, vegetable fiber, yeast.

The first ingredient is "whole wheat flour," which meets the FDA definition of whole grain: cereal grain consisting of the intact, ground, cracked or flaked kernel, which includes the bran, germ and endosperm (FDA 2009a).

**Allergen claims.**  
FDA rules come from the Food Allergen Labeling and Consumer Protection Act of 2004. The FDA (2010) has identified eight major food allergens that account for more than 90% of all food allergies: milk, eggs, fish, crustacean shellfish (crab, lobster, shrimp), tree nuts (for example, walnuts, almonds and pecans), peanuts, wheat and soy. The law requires that the label list the food source name of all major allergens used to make the food. Good manufacturing practices dictate that food companies appropriately clean food-manufacturing equipment between processing batches of allergen-containing and non-allergen-containing foods to avoid cross-contamination. However, some manufacturers may say on the label that the product is made on equipment that is also used to process a
Table 3. COMMON FOOD-LABELING TERMS AND HOW THE FDA GENERALLY DEFINES THEM*

Reference Amounts Customarily Consumed, or RACC, is the technical term for serving size.

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>“Free”</th>
<th>“Low”</th>
<th>“Reduced/Less”</th>
</tr>
</thead>
<tbody>
<tr>
<td>calories</td>
<td>&lt;5 calories per RACC</td>
<td>≤40 calories per RACC</td>
<td>at least 25% fewer calories per RACC than an appropriate reference food</td>
</tr>
<tr>
<td>total fat</td>
<td>&lt;0.5 g per RACC</td>
<td>≤3 g per RACC</td>
<td>at least 25% less fat per RACC than an appropriate reference food</td>
</tr>
<tr>
<td>saturated fat</td>
<td>&lt;0.5 g saturated fat and &lt;0.05 g trans fat per RACC</td>
<td>≤1 g per RACC and 15% or less of calories from saturated fat</td>
<td>at least 25% less saturated fat per RACC than an appropriate reference food</td>
</tr>
<tr>
<td>cholesterol</td>
<td>&lt;2 mg per RACC</td>
<td>≤20 mg per RACC</td>
<td>at least 25% less cholesterol per RACC than an appropriate reference food</td>
</tr>
<tr>
<td>sodium</td>
<td>&lt;5 mg per RACC</td>
<td>low: ≤140 mg per RACC</td>
<td>at least 25% less sodium per RACC than an appropriate reference food</td>
</tr>
<tr>
<td>sugars</td>
<td>&lt;0.5 g sugars per RACC</td>
<td>not defined; may not be used</td>
<td>at least 25% less sugar per RACC than an appropriate reference food</td>
</tr>
</tbody>
</table>

* This information is presented in simplified form. There are multiple complexities in the rules that are fully described in FDA 2009b.
Not necessarily. The product could still have a high level of naturally occurring sugar. Or it may contain carbohydrate ingredients that might not be technically classified as sugars (such as maltodextrin) but can still raise blood sugar levels substantially.

The FDA has no definition for "lightly sweetened," so it is difficult to tell how much sugar was used to sweeten the product.

Multigrain simply refers to the presence of different grains in the product. However, it is not specific about which parts of the grain (such as the bran, where dietary fiber resides) are present and in what ratios. For more fiber, you need to specifically look for terms like "whole grain," "100% whole grain" or "100% whole wheat." Caramel coloring can be added to "multigrain" products to make them look whole-wheat, but they will typically not have as much dietary fiber.

For a product to be labeled 98% fat-free, it would have to be a low-fat product. As indicated in Table 3, for a product to be classified as "low fat," it must contain no more than 3 g total fat per serving. Generally, 2% milk is 2% fat by weight. For an 8-ounce serving (~240 g), 2% milk contains about 6 g fat. It does qualify for the reduced-fat label when compared with whole milk, but it does not qualify for "low fat."

The USDA definition of free-range basically means the chicken had shelter, unlimited access to food and fresh water and continuous access to the outdoors during the production cycle (USDA 2012b). However, there are no rules for how large the outdoor space must be. For answers to similar questions (cage-free, grass-fed, pasture-raised, etc.), see the USDA website page on the National Organic Program (USDA 2012b).

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References

Understanding definitions for nutrient content claims

The FDA has definitions for a large number of terms related to nutrient content claims. For example, if a product claims to be a "good" source of, say, vitamin A, it must have at least 10% of the DV; if it claims to be an "excellent" source of vitamin A or be "high in" vitamin A, it must have at least 20% of the DV (FDA 2009b). Table 3 lists several other common nutrient content claims.

Interpreting food labels can be confusing. We hope that this article will help you clear up some of your clients' uncertainties about food labels. Being a skilled label reader can be of great help in making better nutritional choices.

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