

## Practice Paper of the American Dietetic Association: Using the Dietary Reference Intakes

### ABSTRACT

The Dietary Reference Intakes, a set of nutrient reference standards developed for the United States and Canada by the Institute of Medicine, provide tools for dietary assessment and planning for individuals and groups. Because a distribution of requirements is provided for most nutrients, it is possible to estimate a probability of nutrient inadequacy for an individual's usual intake, and the prevalence of nutrient inadequacy among the intakes of a group of people. The availability of a Tolerable Upper Intake Level for many nutrients also allows an evaluation of the risk of excessive intakes. However, some of these new applications are complex, and their implementation would be facilitated by better training aids and improved computer software. These new tools would help registered dietitians become more familiar with the appropriate applications of the Dietary Reference Intakes in the Nutrition Care Process, and better recognize both the benefits and challenges associated with their use. Ultimately, use of more comprehensive methods of assessing and planning nutrient intakes has the potential to further enhance recognition of registered dietitians' essential roles in nutrition care.

*J Am Diet Assoc. 2011;111:762-770.*

In the past the only nutrient reference standard available for use by food and nutrition practitioners was the Recommended Dietary Allowance (RDA). RDAs were used for dietary planning and assessment for both individuals and groups, although in some cases use of RDAs for these applications was inappropriate. In 1997 the Institute of Medicine be-

gan to release the Dietary Reference Intakes (DRIs), a set of nutrient reference standards for use in the United States and Canada (1). The DRIs were developed using a paradigm that considers the distribution of nutrient requirements as well as the possibility of excess (accordingly, for many nutrients several DRIs are available, each with specific applications for dietary assessment [2] or planning [3]). DRIs for groups of related nutrients were released periodically between 1997 and 2004 (1,4-8) (a summary of the DRI reports was released in 2006 [9]). In the future, updated DRIs will be issued on a nutrient-specific basis as warranted based on advances in the science; for example, revised DRIs for calcium and vitamin D have recently been released (10).

The purpose of this Practice Paper is to provide guidance for use of DRIs by registered dietitians (RDs). First, each of the DRIs are defined and briefly described. Methods for using DRIs with individuals are presented in the next section, followed by methods for using DRIs with groups. Information is presented on interpreting food package labels and claims, and the article concludes with recommendations for training and tools for RDs.

### DEFINITIONS OF DRIs

The DRIs include the Estimated Average Requirement (EAR), RDA, the Adequate Intake (AI), the Tolerable Upper Intake Level (UL), the Estimated Energy Requirement (EER), and the Acceptable Macronutrient Distribution Range (AMDR). Definitions and brief comments about the primary intended uses of each of these DRIs are provided below (see reference 9 for more details). Figure 1 shows the relationships among the EAR, RDA, AI, and UL.

### EAR

"The average daily nutrient intake that is estimated to meet the requirement of half the healthy individuals in a particular life stage and [sex] group" (9). In this context, "requirement" refers to a specific indicator of adequacy for each nutrient. In many cases, the requirement is based on intake needed for a desirable level of function rather than the amount needed to prevent deficiency disease. For example, the requirement for vitamin C is based on its role as an antioxidant rather than prevention of scurvy (5). The EAR is not a recommended intake; by definition, it is inadequate for half the healthy individuals in a life stage and sex group. However, the EAR is used to calculate the RDA for nutrients with requirement distributions that are normally distributed (which is assumed to be true for most nutrients). The EAR has important applications in assessing the prevalence of nutrient inadequacy in groups, as described in the section in this article on using DRIs with groups of people.

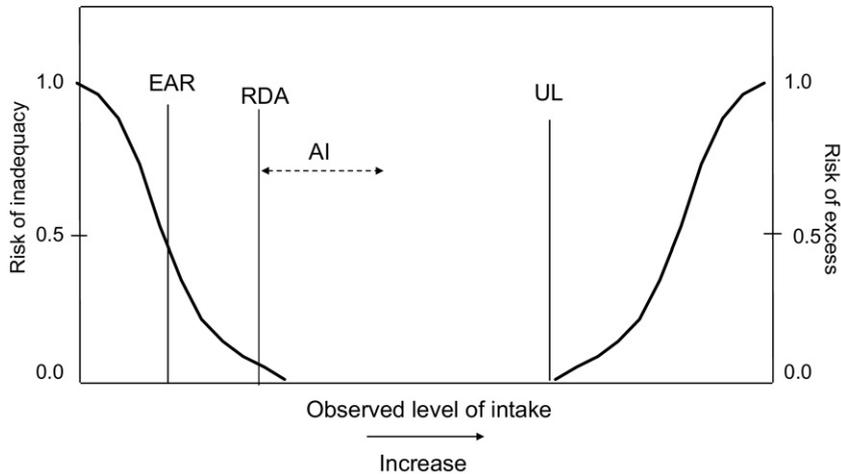
### RDA

"The average daily dietary nutrient intake that is sufficient to meet the nutrient requirements of nearly all (97% to 98%) healthy individuals in a particular life stage and [sex] group" (9). Individuals with usual intakes at or above the RDA almost certainly have adequate intakes; however, because the RDA exceeds the requirement of most individuals, it is not appropriate to infer that individuals with intakes below the RDA are inadequate. The RDA should not be used in assessment or planning intakes of groups. Its primary use is as a goal for intake by individuals.

### AI

"The recommended average daily intake level based on observed or exper-

0002-8223/\$36.00  
doi: 10.1016/j.jada.2011.03.022



**Figure 1.** Relationship between Dietary Reference Intakes. This figure shows that the Estimated Average Requirement (EAR) is the intake at which the risk of inadequacy is 0.5 (50%) to an individual. The Recommended Dietary Allowance (RDA) is the intake at which the risk of inadequacy is very small—only 0.02 to 0.03 (2% to 3%). The Adequate Intake (AI) does not bear a consistent relationship to the EAR or the RDA because it is set without knowledge of the requirement. At intakes between the RDA and the Tolerable Upper Intake Level (UL), the risks of inadequacy and of excess are both close to zero. At intakes above the UL, the risk of adverse effects may increase. (Adapted and reprinted with permission from reference 9, ©2006 by the National Academy of Sciences, Courtesy of the National Academies Press, Washington, DC.)

imentally determined approximations or estimates of nutrient intake by a group (or groups) of apparently healthy people that are assumed to be adequate; used when an RDA cannot be determined” (9). RDAs could not be determined for some nutrients because scientific evidence on the requirement distribution was considered inadequate. Accordingly, uses of the AI in dietary assessment and planning are limited. The primary use of the AI is as an intake goal for individuals and groups.

#### UL

“The highest average daily nutrient intake level that is likely to pose no risk of adverse health effects to almost all individuals in the general population. As intake increases above the UL, the risk of adverse effects may increase” (9). Note that the UL does not apply to individuals being treated for nutrient deficiency: therapeutic doses of vitamins and minerals used to treat deficiency states often exceed the UL, but it is assumed that these individuals would be monitored for adverse effects, and that the high intake would not continue indefinitely. In most cases, the UL represents an intake that should not be exceeded.

#### EER

“The EER is the average dietary energy intake that is predicted to maintain energy balance in healthy adults of defined age, [sex], weight, height, and level of physical activity consistent with good health. In children and pregnant and lactating women, the EER is taken to include the needs associated with the deposition of tissues or the secretion of milk at rates consistent with good health” (9). Although the EER provides a rough estimate of an individual’s energy needs, by definition, energy needs of half the individuals with defined characteristics will fall below the EER, whereas the other half will have needs that exceed the EER. The EER may be used as a starting point to plan appropriate energy intakes, but body weight, because it is a readily monitored index, may be a more useful method of assessing the adequacy of energy intake.

#### AMDR

The AMDR represents “a range of intakes for a particular energy source that is associated with reduced risk of chronic disease while providing adequate intakes of essential nutrients” (8). AMDRs, expressed as a percentage of total energy intake, were estab-

lished for carbohydrate, protein, total fat, and for n-3 and n-6 polyunsaturated fatty acids. Intake within the AMDR is a goal for both individuals and groups.

#### KEY CONCEPTS ABOUT DRIs

Several key concepts apply to the DRIs: they are intended for use with generally healthy people; unless otherwise specified they apply to all sources of a nutrient, including dietary supplements; and they apply to usual intake, over time, rather than to intake on a given day. Each of these concepts is expanded on below.

#### DRIs Are Intended for Use with Generally Healthy People

DRIs do not consider the effects of disease processes on nutrient requirements or toxicity, nor do they consider drug–nutrient interactions. They are also based on the assumption that diets consumed have nutrient bioavailability similar to those typically consumed in the United States and Canada. For some nutrients, guidance is provided for diets with altered bioavailability (eg, for those consuming vegetarian diets higher iron intakes are recommended [6]).

#### In Most Cases, DRIs Apply to all Sources of A Nutrient, Including Food, Beverages, and Dietary Supplements

Nutrient supplements are consumed by approximately half the US population (11), and contribute to both nutrient adequacy and potential risk of excessive intakes (12). Thus, with a few exceptions, when assessing or planning nutrient intakes using the DRIs, intakes from all sources of the nutrient must be considered. The exceptions include: the UL for magnesium applies only to intake from non-food sources (1); the ULs for vitamin E, niacin, and folate apply only to intake from fortified foods or supplements (4,5); and the UL for vitamin A applies only to intake of preformed retinol, whether present in foods or supplements (6).

#### DRIs Apply to Usual Intake, rather than to Intake on Any Given Day

Although the duration of time that reflects *usual* intake is difficult to de-

Download English Version:

<https://daneshyari.com/en/article/2654266>

Download Persian Version:

<https://daneshyari.com/article/2654266>

[Daneshyari.com](https://daneshyari.com)