

# Uses of the Recommended Dietary Allowances: A commentary

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Those who originally formulated the Recommended Dietary Allowances (RDAs) (1) in 1941 as a “guide for advising on nutrition problems in connection with national defense” (p 10) also recognized that these values would become “standards to serve as a goal for good nutrition” (p 1). As scientific knowledge has advanced and allowances have been established for additional nutrients, so too have the uses of the RDA expanded to meet a variety of purposes, most of which were never envisioned by the creators of the RDAs.

## USES OF THE RECOMMENDED DIETARY ALLOWANCES

Ten major uses of the RDA (which originally appeared in the 1983 unpublished document, *Uses of the Recommended Dietary Allowances*) were described in the 1994 Institute of Medicine publication, *How Should the Recommended Dietary Allowances be Revised?* (2) (Table 1). Dietitians' perspectives on these uses were obtained from professionals accustomed to using the RDAs in educational, practice, or policy settings. These views serve as the basis for most of the conclusions expressed in this commentary. For purposes of discussion, the information presented in Table 1 was further combined into the following four categories of RDA uses: nutrition standards for policy purposes; education and dietary guidance; descriptive research; and food standards.

### Uses of the RDA in Public Policy

Public policy uses are based on the assumption that the RDAs serve as the starting point for determining desirable nutrient intakes for federal food assistance programs and for establishing the comparison standards for protein and for the micronutrients that appear on food labeling (3).

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**Nutrient standards for food assistance programs** The RDAs have been used as the nutritional standard for food assistance programs for half a century. The designated meal pattern system developed for use in the National School Lunch Program is based on a standard that assumes that over the period of 1 week, school lunches provide, on the average, one third of the RDA for protein, vitamins, and minerals (4). Further, the legislation on the School Breakfast Program specifies that one quarter of the RDA will be the basis for the meals served to children, and each noon meal served in the Nutrition Program for Older Americans must meet at least one third of the RDA.

Other food assistance programs use the RDA as a nutrient standard somewhat differently. Because the Special Supplemental Nutrition Program for Women, Infants, and Children provides “supplemental” foods, the RDAs are only one of a number of tools used in choosing those foods to be included in the standardized food packages. In addition, the RDAs serve as the basis for evaluating the “average nutrient content” of commodity food packages distributed to Native Americans.

The Food Stamp Program, the largest of all food assistance programs, uses the RDAs in an entirely different manner altogether. Rather than serving as a nutrient standard, the RDAs are used as the nutritional goal for the Thrifty Food Plan, the least costly of four food plans developed by US Department of Agriculture (USDA) nutritionists. The monetary value of the TFP is used to set food stamp allotments (5). Many have contended that the benefit levels for the Food Stamp Program are not adequate for those who are truly dependent on food assistance programs for meeting their nutrition needs because the RDAs are used to set a “minimum” or “floor” level for nutrients the Thrifty Food Plan is designed to include (3).

However, the RDAs do not tell the complete story as a nutrient standard. They have been used successfully as reference points for evaluating the nutrient quality (ie, protein,

**Table**  
Uses of the Recommended Dietary Allowances (RDAs)<sup>a</sup>

Use	Examples	Comments on the use of RDAs
Food planning and procurement	Use to develop plans for feeding groups of healthy people	Use as an appropriate nutrient standard for a period of at least a week, but also use as one of many food planning criteria; should be adjusted as group varies from RDA reference individual
	Use for food purchasing, cost control, and budgeting	Use as an appropriate nutrient standard with knowledge of such factors as food composition, availability, acceptability, and storage changes and losses
Food programs	Serve as a basis for the nutritional goal for feeding programs	Use as a standard for nutritional quality of meals along with other food selection criteria
	Provide the nutritional standard for the Thrifty Food Plan, the basis for allotments in the Food Stamp Program	Use as a guideline along with other food selection criteria
	Provide nutritional guidelines for food distribution programs	Use as a standard for nutritional quality of food packages
Evaluating dietary survey data	Evaluate dietary intake of individuals	Use as a standard for evaluating dietary status, but not for evaluating individual nutritional status
	Evaluate household food use	Use as a benchmark to compare households and to identify nutrient shortfalls
	Evaluate national food supply (food disappearance data)	Use only as a benchmark for comparison over time and to identify nutrient shortfalls
Guides for food selection	Develop and evaluate food guides and family food plans	Use along with other food selection criteria
Food and nutrition information and education	Provide guidelines for obtaining nutritious diets	Use as a point of reference; becomes more useful to consumers when translated into food selection goals
	Use as a basis for educators to discuss individuals' nutrient needs	Use in combination with information in the text accompanying the RDA table and with recognition that the RDAs are for reference individuals
	Evaluate an individual's diet as a basis for recommending specific changes in food patterns and/or dietary supplements	Use to identify nutrient shortfalls and as a tool to assess nutrient contribution of diet; do not use in prescriptive manner
Food labeling	Provide basis for nutritional labeling of foods	Use as a basis for labeling standards (US RDA); such standards should not be used to determine nutritional intake of individuals or groups
Food fortification	Serve as a guide for fortification for general population	Use as a guide, but such other factors as food consumption patterns and contribution to the total diet must also be considered
Developing new or modified food products	Provide guidance in establishing nutritional levels for new food products	Use in combination with information or probable products; use within the context of the total diet
Clinical dietetics	Develop therapeutic diet manuals	Use to assess the nutritional quality of modified diets
	Plan modified diets	Use as a starting point along with information on the patient's nutritional status and individual needs
	Counsel patients requiring modified diets Plan menus and food served in institutions for the developmentally disabled	Use as one basis for advice on food selection Use as a starting point, but modify for individual's developmental status and body size
Nutrient supplements and special dietary foods	Use as a basis to formulate supplements and special dietary foods	Use as a basis in developing infant formulas and other oral supplements or foods, but also consider nutrient bioavailability and nutrient balance; cannot be used as the only guide for parenteral feeding products

<sup>a</sup>Source: Adapted from *Uses of the Recommended Dietary Allowances*, unpublished manuscript, 1983. Reprinted with permission from *How Should the Recommended Dietary Allowances Be Revised?* Copyright 1994 by the National Academy of Sciences. Courtesy of the National Academy Press, Washington, DC.

vitamin, and minerals) of these food programs, but do *not* include recommendations for macronutrients, such as total fat or saturated fat, for chronic disease prevention and health maintenance (6). To this end, in 1995 the USDA promulgated regulations that set guidelines for school meals that included *both* the RDAs (9) and recommendations for macronutrients from authoritative sources (7,8).

**Food labeling** Use of the RDAs as a nutrient standard on food labels is one of its more visible public policy applications. In the 1973 voluntary nutrition labeling program for processed foods administered by the Food and Drug Administration, the 1968 revision of the RDA formed the basis for the US RDA, as the label reference value for vitamins, minerals, and protein. In 1990, the FDA changed the term “US RDA” to RDI (Reference Daily Intake) in an effort to decrease confusion between the terms “RDA” and “US RDA.” In regulations written to implement the Nutrition Labeling and Education Act of 1990 (NLEA) (Pub LNo. 101-535), FDA combined two sets of label reference values, the RDIs, which pertain to vitamins and minerals, and Daily Reference Values (DRVs), which pertain to macronutrients for which there are no RDAs (eg, fat), into one new term, “Daily Value” (DV). The “% DV” appears on the new food label to indicate the percentage of the total amount recommended for that nutrient each day that is supplied by one serving of that food (11).

#### **Uses of the RDA for Education and Dietary Guidance**

This set of uses for the RDA encompasses the following topics from Table 1: food and nutrition information and education, guides for food selection, food planning and procurement, and clinical dietetics.

**Nutrition education** The RDAs have long served as the reference standard for discussing nutrient needs with patients or for comparing how the nutritional value of a food, groups of food, or meals contribute to a person’s total nutrition needs. However, the difficulty in using the RDA for such educational purposes is that dietitians must first translate RDA nutrient data into food-based information to meet the educational needs of most of their clients/patients. For this reason, most dietitian educators favor a food-oriented approach, rather than an RDA nutrient-based approach, for nutrition education with consumers.

**Food selection guides** Food guides, developed for educational purposes, generally group foods according to their major nutrient contributions, and the RDAs have long served as the nutrient basis for the development of these guides. However, it has become increasingly difficult to develop food guides for selecting diets that satisfy the RDAs. USDA nutritionists who developed the food guidance system “Better Eating for Better Health” (11) (the forerunner of the Food Guide Pyramid) attempted to meet all the RDAs in their plan, but found that at low food energy levels, diets fell short of recommendations for a few nutrients (primarily iron, zinc, and vitamin E).

**Food planning and procurement** The examples given in Table 1 for this use distinguish between development of dietary plans for healthy people (the original purpose of the RDA) and use of the RDA as a basis for food purchasing and budgeting. When the RDAs are used as a guide for planning diets, it is inappropriate to strive to meet a specific proportion of the RDA for every meal or even for a day; it is much more reasonable to strive to meet 100% of the RDAs over a period of a week or longer. A number of dietitians believe it is inappro-

priate to use the RDAs as a guide for food purchasing and budgeting purposes because these values serve as standards for nutrient intakes, not food intakes. These nutrient intakes must be translated into food equivalents before purchasing and budgeting decisions can be made.

**Clinical dietetics** The RDAs customarily serve as a basis for menu plans for patients receiving “normal” diets and as a reference point for making modifications for patients receiving therapeutic diets. The RDAs were designed to meet the needs of essentially all healthy persons, however, not those with specific therapeutic needs. This assumption should be kept in mind when planning diets for those in clinical settings. Only to the extent that a patient’s nutrient requirements are not altered by his or her medical condition can the RDAs (which were designed as a nutrient standard for “normal, healthy” people) be used as a reference standard for assessing the adequacy of a patient’s diet. Many dietitians in clinical practice believe it is inappropriate to use the RDA as a nutrient standard for patients who require therapeutic diets.

One example of a use of the RDA in clinical dietetics that is cited in Table 1 is to “plan menus and food served in institutions for the developmentally disabled.” Many professionals working with persons who are developmentally disabled are skeptical about court-ordered use of the RDAs as a minimum level for individual dietary intake, citing the fact that these persons are clearly *not* “healthy”; not only do they have different nutrition needs, but many also experience problems with the mechanics of eating (12).

#### **Uses of the RDA for Descriptive Research**

This use corresponds to the topic evaluating dietary survey data, which is shown in Table 1. The RDAs have been used as a standard to evaluate data collected from different surveys that vary in the type of data they collect, for example, dietary intakes of individuals or population groups, food uses by households, or nutrient content of the food supply.

Use of the RDA as the nutritional standard or “cutoff” value to evaluate the dietary intake of individuals is problematic. Authors of the 10th edition of the RDAs (1) acknowledged that RDAs were most appropriate when applied to the analysis of dietary intakes of groups of people but suggested that applying the RDAs to individual intakes, averaged over a sufficient length of time, might permit investigators to estimate the “probable risk of [nutrient] deficiency” (p 9) for that individual.

Use of the RDAs as a nutritional standard for smaller, individual studies also presents challenges. If the characteristics of the study subjects do not match those of the RDA “reference” individuals, what criteria can be used to obtain a correct interpretation? What is the most accurate way of obtaining food intake data, and what valid conclusions vis a vis the RDA can be drawn from such data (13-15)?

The USDA has also used the RDAs as the reference standard for the analysis of household food data to coordinate with data collected as part of the Nationwide Food Consumption Surveys. However, the RDAs can only be used for comparing *groups* of households, not for appraising individual household food use. Further, the distribution of food within the household may not be appropriate or proportional to each person’s needs; therefore, it serves no purpose to analyze household intake and secondarily infer the nutritional intake of its individual members from those data.

USDA’s Economic Research Service is responsible for collecting food disappearance data to which nutrient composition data are applied to estimate the nutrient content of the US food supply. Such analyses overestimate the nutri-

ents available to individuals and households because they do not take into account the waste that occurs during storage, marketing, processing, and preparation of food or the distribution of food within the population. Thus, comparison of such data with the RDAs is not an appropriate measure of the nutrient adequacy of the national food supply. Such analyses should only be used to point to areas of concern in those instances where the availability of a nutrient in the food supply may be substantially lower than the amount estimated to meet the needs of the population.

### Uses of the RDA as Food Standards

This set of uses encompasses the following topics from Table 1: food fortification, developing new or modified food products, and nutrition supplements and special dietary foods.

**Food fortification** The RDAs have been successfully used as guides for food fortification in two instances: (a) as guides for amounts of nutrients to be added to a given food product, as in adding vitamin D to fortify milk, and (b) as guides in establishing the necessity of adding a nutrient to the food supply. When the fortified food or food product is the sole or major source of a nutrient, the expected intake should contain the RDA for that nutrient in a bioavailable form, as in the example of adding vitamin C to imitation orange juice.

**Developing new or modified food products** In general, the RDAs may be useful in helping food manufacturers evaluate the nutrient contribution of new food products. However, the RDA cannot serve as an absolute guide to the nutrient value of any newly formulated food, and must be used in concert with a variety of other factors, most notably the estimated level and frequency of consumption of that food over a defined period. Failure to consider the level of use of the new food product in the total diet may contribute to certain nutrient imbalances or toxicities.

**Nutrient supplements and special dietary foods** Both the RDAs and the US RDAs have been used in the past as a basis for formulating special dietary foods, including nutrient supplements, infant formulas, and products intended for use by persons consuming modified diets (eg, low sodium or low calorie diets). By using the RDAs in this way, one can make a direct comparison between nutrients contained in the reformulated product and a reasonable standard of nutrient intake. For products that are the sole dietary source of nutrients, such as infant formula, the product should contain levels of nutrients adequate for that specific population. However, for supplements or special dietary foods intended as a partial replacement of or an addition to the daily diet, RDAs simply cannot serve as a sole guide for ensuring nutritional adequacy.

### CONCLUSION

Consistent with the original definition, the RDAs were initially designed as amounts of essential nutrients designed to meet, with a margin of safety, the known needs of groups of persons with like characteristics, such as age and gender. Since the RDAs were established more than 50 years ago, they have been used to describe the nutritional content of foods, meals and menus, diets, and even the food supply, and have expanded their application beyond individuals to households and even to populations. I submit that the further the uses of the RDAs are stretched from their original formulations as nutrient standards for healthy population groups (based primarily on gender and age distinctions), their value as a nutrient standard becomes strained and the conclusions reached become spurious.

Let us remember that, for most of these uses described, RDAs provide only a portion of the information needed. Thus, although the RDAs only refer to recommended nutrient levels, this information must be combined with a vast amount of other information to make valid conclusions about dietary adequacy. These additional factors include food costs, food availability, food preferences/acceptability, nutrient interactions, and bioavailability.

In the next revision of the RDA, the Food and Nutrition Board's Committee on Dietary Allowances has proposed to present current knowledge about essential nutrients and important food components at four reference points: deficient nutrition levels, average requirements, RDA requirements, and upper safe limits (16). Further, the committee will prepare a separate publication that is intended to describe uses of the RDA for the variety of purposes to which they are applied. It is important that dietitians communicate with the Food and Nutrition Board to express their views about the proposed four reference intakes and whether recommendations at those four intake levels will overcome some of the flaws inherent in the current uses of the RDAs. Our challenge is this: If the RDAs as currently formulated do not meet our needs, what reference guidelines would? ■

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