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Recommended Dietary Allowances (RDAs) are levels of essential nutrients considered to be adequate to meet the known nutritional needs of most persons. They are established and updated by the National Academy of Sciences' (NAS') Food and Nutrition Board. RDAs have been criticized for the following: they are based on limited data; they overstate the needs of most individuals; they are limited to needs of healthy people; and they do not cover all the essential nutrients. Most of these criticisms reflect limited scientific knowledge or misunderstandings of the purpose of RDAs. The high levels are established to cover variations in human needs and to cover the needs of most healthy individuals. RDAs are used in planning diets for groups, nutritional surveys, nutritional education, establishing guidelines for labeling, and in research-related activities. Comparisons with nutritional guidelines established in other countries revealed differences in dietary recommendations resulting from variations in people and lifestyles and differences of scientific opinion. RDAs are established through a reasonable process and serve their intended purpose. Additional research is needed to expand knowledge concerning nutrient requirements. The NAS should identify these needs and establish priorities relating to human nutritional requirements. Also, more meaningful food planning and food choice guides for the consumer should be developed. (HTW)

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STATEMENT OF
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BEFORE THE SUBCOMMITTEE ON DOMESTIC AND INTERNATIONAL
SCIENTIFIC PLANNING, ANALYSIS AND COOPERATION
OF THE HOUSE COMMITTEE ON SCIENCE AND TECHNOLOGY
ON
RECOMMENDED DIETARY ALLOWANCES

Mr. Chairman and members of the Subcommittee:

I am pleased to be here to discuss the results of the review you requested us to make on the Recommended Dietary Allowances, also known as RDAs.

RDAs are the levels of intake of essential nutrients considered to be adequate to meet the known nutritional needs of practically all healthy persons.

We were asked to (1) examine the characteristics and limitations of the RDAS; (2) review the process by which RDAs are established; (3) identify the uses and users of the RDAs; (4) compare the RDAs of the United States with similar standards established by other countries; and (5) conclude, if possible, whether the RDAs provide the best set of standards, or whether a different set of nutritional standards is needed. Today we will be discussing each of these five areas.

CHARACTERISTICS AND LIMITATIONS OF RDAs

RDAs have been criticized for a number of reasons. These criticisms include: RDAs are based on limited data; they over-

state the needs of most individuals; they are limited to needs of healthy people; and they do not cover all the essential nutrients. Most of the criticisms of RDAs we encountered appear to be either a reflection of the limited scientific knowledge of human nutrition, or of the misunderstanding of what RDAs are or are not.

RDAs are established at a level sufficiently above the average requirement to cover the normal variation in needs of individuals. They are intended to cover the needs of most healthy individuals. Consequently, the RDAs exceed the nutrient requirements of nearly all individuals.

People's nutrient requirements vary due to such factors as age, sex, genetic differences, body size, physiological state, and activity patterns. The nutrient requirements of specific individuals are ordinarily unknown. Therefore, as there is no practical way of identifying whose needs are high and whose are low, RDAs should not be interpreted as requirements of specific individuals.

The basis for estimating RDAs is such that even if a person habitually consumes less than the RDA, his or her diet is not necessarily inadequate. However, the farther the habitual intake falls below the RDA and the longer the low intake continues the greater is the risk of deficiency.

The RDAs do not take into account special needs arising from infections, metabolic disorders, or chronic diseases. In addition, large doses of some nutrients may have some drug-like action. These are special problems or uses and are outside the scope of the RDAs.

RDAs have not been established for all essential nutrients. RDAs are established when there is sufficient scientific evidence to recommend a specific level of consumption. Of the approximately 50 known essential nutrients, RDAs have been established for only 25. The Board states that additional nutrients may some day be proven essential. To ensure that these unrecognized nutritional needs are met, the Board recommends the RDA be provided from as varied a selection of foods as is practicable on the assumption that a varied diet will do this.

A criticism of the RDAs is that they do not adequately deal with other food components such as fat, cholesterol, and carbohydrates, including sugar and fiber. The Board makes no recommendations for intakes of these food components, but cites the recommendations of others, such as the American Heart Association.

We believe that these limitations are due to the lack of information on human nutritional requirements. Since the RDAs are the basis of most nutrition efforts, they must be expanded and supported by more nutrition research. There is a need to identify and to set pricrities of research needs, to improve the basis and expand the coverage of the RDAs.

PROCESS OF ESTABLISHING RDAs

RDAs are established and updated by the Food and Nutrition Board of the National Research Council, National Academy of Sciences. The National Institutes of Health provides financial support through a grant to the Academy to evaluate the research and revise the RDAs. First published in 1943, RDAs are revised

about every 5 years. For each revision, a Committee on Dietary Allowances is established to evaluate new information on human nutrition requirements and recommend to the Board, changes in the RDAs.

The Board nominates candidates for Committee membership, with the objective of selecting experts with specialized knowledge of a particular nutrient or group of nutrients so that the Committee as a whole will have in-depth expertise on all the essential nutrients. The Committee is currently composed of nutrition experts from academia, medical centers, and government. In addition, the Academy investigates the nominees' consulting ties and investments for any conflicts of interest. The final selection of Committee members is made by the Academy. In recent years, the Board and the Committee have been criticized by consumer groups for being biased toward the food industry. Although we did not attempt to verify this, we know of two recent reports that cleared the Board and the Committee of these allegations. These reports are from a 1977 Visiting Committee of the National Academy of Sciences and a 1976 special court hearing on FDA regulations on food for special dietary uses.

The Committee reviews the scientific literature from all over the world for consideration in revising the RDAs. Committee members are then assigned responsibility for reviewing the data on specific nutrients in greater detail. Study groups or workshops involving other scientists and users are convened for in-depth study of particularly difficult or controversial aspects of the RDAs.

The many drafts of the revised RDA are reviewed by numerous experts both within and outside of the Committee and the Academy. The final draft must be approved by 3 major bodies in the Academy.

The task of establishing and revising RDAs is complicated and characterized by the limited nutrition research data base and a major dependence on scientific judgement; difficulty in deciding upon the appropriate criteria for determining when the requirements for some nutrients have been met; and the need for a scientific base, free from special interest group pressures.

Although the RDAs are based on limited scientific evidence and substantial judgement is involved in estimating the allowances, we believe that the participation of numerous experts in the process, all of whom are chosen for their technical competence, is a reasonable approach to a difficult task.

USES OF THE RDAs

RDAs are used in five major ways. First, RDAs are used in planning diets and providing food supplies for groups. For example, the Department of Defense uses RDAs which are adjusted to the specific needs of military personnel to develop its menus. Although the RDAs are designed for groups of healthy people, hospital dietitians told us that they also use RDAs in planning basic hospital menus because the RDAs are a good nutritional standard.

Many federally funded programs, which provide either food and/or financial assistance for food, use the RDA as their nutritional standards or guidelines. Examples are the School

Lunch Program, the Special Supplemental Food Program for Women, Infants, and Children, and the Nutrition Program for the Elderly.

A second use of RDAs is in evaluating the adequacy of diets. Since 1964, there have been six major national nutritional surveys aimed at identifying and assessing major nutritional problems. The RDAs were modified to some degree for all surveys in order to evaluate the survey data. For example, in the Ten State Nutrition Survey, dietary standards for calories, protein, and iron were based on the RDAs. However, the standards used for calcium and vitamins A and C were lower than the RDAs because the RDAs for these nutrients have large margins of safety and were therefore considered inappropriate for the survey's goal of identifying persons at risk of having nutritional deficiencies.

A third major use of the RDAs is in nutrition education. Professionals and students in the nutrition field are usually taught the RDAs. However, because they are often considered too technical and complex to teach to the average consumer, RDAs are often translated into basic food groups for consumer education. A commonly used alternative to RDAs is the Four Basic Food Groups--milk; meat; vegetable and fruit; and bread and cereal--a concept developed by the Department of Agriculture. Despite widespread use of the food groups, many criticisms have been expressed by consumer groups and others about these food groups. The criticisms include: using the four food groups does not assure that persons are obtaining 100 percent of all the RDAs; they are ineffective as a nutrition guide because almost any type of diet can fit under the groups; and there is too much emphasis on meat and milk and not enough on fruits, vegetables, and grains.

Fourth, RDAs are used in establishing guidelines for nutritional labeling and developing new food products. Food manufacturers use RDAs indirectly in food labeling because they are the basis for the U.S. Recommended Daily Allowances (USRDA). The USRDA is a simplification of the RDA and is used by the Food and Drug Administration (FDA) as a standard for nutrition labeling. There are 4 sets of USRDAs compared to 17 age-sex categories of the RDAs. The USRDA should not be confused with the RDA. Not all foods are required to have labels, such as fresh fruits and vegetables.

Federal regulations require that foods which have a nutrient added or for which a nutritional claim is made, must have a nutritional label which specifies the USRDA percentage of nutrients. The label often includes at least 8 nutrients which are protein, vitamins A and C, thiamin, riboflavin, niacin, calcium, and iron.

Consumer groups and nutritionists have several reservations about the use of the USRDAs. They say the USRDA listings on labels overstate nutrient requirements for many individuals since for most foods, USRDAs are based on the highest level of RDA, without regard to sex, age, or weight. Additionally, a false sense of nutritional security is conveyed to the public that eating foods with the 8 vitamins and minerals, often added, provides good nutrition.

Consumer groups, nutritionists, and educators agree that fortification of food is sometimes appropriate to prevent deficiency diseases such as adding vitamin D to milk to prevent rickets. They point out, however, that fortification may have detrimen-

tal effects on diet habits. The consumption of fortified foods does not necessarily assure a person of satisfying nutritional needs. For instance, processing of foods frequently removes nutrients from them which may not be replaced through fortification.

Finally, the fifth use of RDAs is in stimulating, conducting, and reporting on research. The process of establishing the RDAs has revealed great gaps in knowledge about nutrient requirements.

COMPARISON OF RDAs WITH NUTRITIONAL GUIDELINES OF OTHER COUNTRIES

At least two dozen countries and an international organization have established nutritional guidelines to satisfy their specific needs. We compared the nutritional guidelines of Canada United Kingdom, and the Food and Agriculture Organization and World Health Organization, with the RDAs of the United States to determine the reasons for the different levels of recommended nutrient intake.

The United States' RDAs and the Canadian guidelines recommend intake levels for energy and 17 nutrients; the FAO/WHO, energy and 11 nutrients; and the United Kingdom, energy and 9 nutrients. Energy or calorie requirements differ among the countries due to different activity levels and body size. The United States' RDAs for adults assume a sedentary activity level; FAO/WHO assumes a moderately active activity level; Canada assumes a "characteristic activity pattern;" and the United Kingdom presents recommendations for three activity levels. Differences in the number of nutrients covered are due to differences of opinion as to the adequacy of scientific

evidence for some nutrients to support recommending a specific intake level, and in some cases, to the different dates of revision of the guidelines.

Factors affecting human requirements include (1) physical characteristics (age, sex, prior nutritional state, health, rate of growth, stage of maturity, and genetic background), (2) environmental characteristics (temperature, climate, and presence of infectious organisms or parasites), (3) social characteristics (physical activity, type of clothing worn, and sanitary conditions), and (4) dietary characteristics (the efficiency with which nutrients are absorbed and utilized by the body, the composition and nature of the foods consumed, and the normal dietary consumption habits).

The limited scientific evidence on human nutrient requirements, nutrient interactions, and the way nutrients are absorbed and used by the body, requires substantial judgement in recommending nutrient intake levels. Given the limitation of available scientific evidence, it is not surprising that different countries have come up with different nutrient intake recommendations.

We found no evidence to suggest that any of the tables of recommended nutrient intake we reviewed is better than any of the others. Also, since human nutrient requirements vary among population groups and differ from country to country due to physical, environmental, social, and dietary characteristics, we do not believe it is feasible to expect standardization of nutrient intake recommendations among the countries.

VIEWS ON RDAs AND TYPE OF STANDARD NEEDED

The establishment of RDAs requires the use of substantial judgement to estimate human nutritional needs from limited available scientific evidence. Although our review did not assess the accuracy of these scientific judgements, we believe the process by which RDAs are established is reasonable. The RDAs are adequate for their originally intended purpose, that is, to serve as scientifically based goals towards which to aim until such time as new evidence justifies changing them.

We believe the participation of numerous experts throughout the RDA committee process, all of whom are chosen for their technical competence, is a reasonable approach to follow in setting and updating the RDAs.

Additional research is needed to expand the knowledge of nutrient requirements of many age and sex groups and to establish RDAs for the remaining essential nutrients. The RDA Committee is in an excellent position to determine nutrition research needs and priorities since it reviews the literature during the process of updating the RDAs.

One of the greatest potentials for RDAs to impact public health, lies in their translation to food selection guides for consumer use. Unfortunately, RDAs are too complex for the general public. The complexity of matching RDAs with nutrient contents of unlimited numbers of food combinations makes it impractical for individuals to use RDAs directly in planning diets. The Food and Nutrition Board publishes

the RDAs for nutrition professionals; it does not translate them into simpler food selection guides for consumers. Two widely used translations or simplifications of RDAs are the USDA's Four Food Group diet guide and FDA's USRDAs used in food labeling. Nutrition scientists, educators, and consumer groups we interviewed cited various shortcomings of both consumer guides. FDA and USDA have plans to review and revise these guides to make them more effective.

Current nutrition concerns center on the statistical link established between common degenerative diseases and diet and other lifestyle factors. In many cases, cause-effect relations have not been clearly established, but these statistical relations suggest that the dietary pattern of fat, saturated fat, cholesterol, carbohydrate, fiber, sugar, and salt may be causing or contributing to diseases common in the United States. Other lifestyle factors similarly implicated in these diseases include smoking, lack of activity, alcohol, and stress.

Current nutritional concerns regarding these food components and lifestyle factors have not been effectively addressed by either the Food and Nutrition Board's RDA manual for professionals, the USDAs Four Food Group guide for consumers, or the FDAs USRDAs for food labeling.

PROPOSALS

We have two proposals which we feel will expand and improve the scientific base of the RDAs, and will help satisfy the public's interest and concern in food, nutrition, and health.

Our first proposal is that the Director of the National Institutes of Health should request the National Academy of Sciences, as part of its RDA revision process, to identify nutrition research needs and establish priorities relating to human nutritional requirements.

Second, we propose that the Congress should direct the Secretaries of Agriculture and Health, Education, and Welfare to jointly develop, with the National Academy of Sciences, more meaningful food planning and food choice guides for the consumer to supplement other government nutrition education efforts. These guides should enable the consumer to develop diets that satisfy the RDA values and nutrition guidelines discussed in the RDA Manual. The guides should also address the current nutrition concerns regarding food components, lifestyle factors, and diet and health. There should also be periodic evaluation of the effectiveness of these guides. These guides should be developed by a multidisciplinary team of medical, nutrition, and food scientists, practitioners, and educators, as well as user-consumer group representatives, to provide balance between scientific accuracy and practicality.

This concludes my statement.

I will be pleased to respond to your questions.

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