

Background Information  
IOM/FNB Workshop on Dietary Reference Intakes  
***The Development of DRIs 1994-2004: Lessons Learned & New Challenges***  
September 18-20, 2007  
Washington, DC

Information Compiled and Posted July 11, 2007

Purpose: To Provide Useful/Relevant Information for  
Workshop Participants and Attendees

Opportunity for interested parties to comment electronically through August 11, 2007:  
[www.iom.edu/driworkshop2007](http://www.iom.edu/driworkshop2007)

**DOCUMENTS:**

**Uses and Challenges Related to Use of the DRIs**

Developed by:

Document 1  
US Federal DRI Steering Committee

Document 2  
Health Canada

Document 3  
American Dietetic Association

Document 4  
Dietitians of Canada

Date: June 2007

# **Uses and Challenges Related to Use of the DRIs**

## **DOCUMENT 1:**

### **Background: Uses of Dietary Reference Intakes in United States Government Programs and Initiatives**

**Developed by:**

**US Federal DRI Steering Committee**

**Date: June 2007**

## *Development of DRIs, 1994-2004: Lessons Learned and New Challenges*

### **Background: Uses of Dietary Reference Intakes in United States Government Programs and Initiatives**

#### **INTRODUCTION**

The Dietary Reference Intakes (DRIs) are recognized in the food, nutrition, and health fields as the accepted source on nutrient allowances for the maintenance of good health. They serve as authoritative reference standards for Federal nutrition programs and regulations related to food fortification, nutrition labeling, military meals, and food expenditures and guidelines for food assistance programs. Since the publication of the final volume of the series of DRI nutrient reports in 2004, the Federal agencies have been working toward incorporating the DRIs within federally-sponsored policy development, program improvement and other activities.

This background paper describes four key themes and provides two case studies of U.S. Government initiatives that illustrate some of the challenges faced so that speakers and participants at the September 18-20, 2007 *Development of DRIs, 1994-2004: Lessons Learned and New Challenges* workshop can consider these issues in advance of the workshop. In addition, a chart depicting the categories of use of DRIs in Federal applications and a table listing challenges encountered in applying the DRIs to a broad range of Federal applications are provided (Appendices A and B).

This information is submitted on behalf of the U.S. members of the Federal DRI Steering Committee, a subcommittee of the Interagency Committee on Human Nutrition Research. Membership includes representatives from various agencies of the U.S. Departments of Agriculture (USDA), Defense, and Health and Human Services (HHS), with liaison representatives from Health Canada. This Steering Committee has provided guidance and coordinated Federal funding for the series of DRI studies undertaken by the Food and Nutrition Board, Institute of Medicine of the National Academies.

#### **SUMMARY OF KEY THEMES**

The members of the Federal DRI Steering Committee have considered a range of successes and challenges encountered in the practical application of the full set of DRIs. From this exploration, four major interrelated themes have emerged, all relating to efforts to integrate the various DRIs (or guidance without reference intakes) across the various nutrients into a cohesive platform for action. These applications have reconfirmed the important benefits of the DRIs for many purposes and have identified areas which could benefit from refinements.

### ***Total Diet Approach***

The *Dietary Guidelines for Americans* forms the basis of Federal food, nutrition education, and information programs. A basic premise of the Dietary Guidelines is that nutrient needs should be met primarily through consuming foods. While some Federal activities focus on one nutrient, or a small group of nutrients, most Federal nutrition activities must address the total diet and the aggregate risk associated with pooled nutrient consumption. Challenges arise when assessing nutrient adequacy and planning nutritionally adequate, but not excessive, diets across the full range of nutrients.

The goal of dietary planning is to plan diets that are nutritionally adequate over the long term such that the probability of nutrient inadequacy or excess is acceptably low, and the consumption of dietary components which increase health risks is acceptably low. For several nutrients, there were insufficient data for setting an Estimated Average Requirements/Recommended Daily Allowance (EAR/RDA) and therefore an Adequate Intake (AI) was set. A major limiting factor of the AI is the inability to assess inadequacy of nutrient intakes. For other nutrients, Tolerable Upper Intake Levels (ULs) were not set because any level of intake increases health risks (e.g., saturated fat) or because insufficient data were available.

Science-based numeric values are needed for those nutrients for which no DRI was set to facilitate incorporation into meaningful dietary recommendations. For those nutrients for which data were only sufficient to set an AI, the scientific community should be encouraged to conduct research in these areas to enable EARs to be established.

### ***Public Health Perspective***

From a clinical or biological perspective (health-related outcome), the seriousness of the risk related to the inadequacy may vary by nutrient. For instance, the overall prevalence of dietary inadequacy may be low for a particular nutrient, but the health-related consequences of inadequate intakes may be considerable. In contrast, a population may have a high prevalence of dietary inadequacy for a nutrient with few known clinical or biochemical manifestations in the population.

Science-based guidance that compares relative public health risks of inadequacy or excess across the full range of nutrients would be useful for dietary planning.

### ***Categories of Use***

The applications of the DRIs include: (1) assessment of nutrient intake by individuals, and (2) assessment of nutrient adequacy in groups, (3) dietary planning for individuals, and (4) dietary planning for groups. Several Federal programs and initiatives have components or stages that include more than one of these four categories of use. This does not result in problems as long as the appropriate methods and DRIs are used at each point. The chart in Appendix A illustrates the categorization of many Federal applications that utilize the DRIs.

### ***Policy Development***

In every application, there are real world constraints that preclude achievement of nutrient consumption from foods that in aggregate imparts no risk or even very low risk for all nutrients while providing optimal consumption of sufficient levels of healthful food components. Finding the proper balance for public policy is and should remain within the purview of the government legislative, regulatory and policy bodies.

However, refinement of the DRI model and increased transparency in the documentation of the basis for the scientific decisions made in setting the DRIs would facilitate government efforts to use the DRIs appropriately in policy development. Additionally, greater clarity in describing the level of precision of the DRI values would be useful.

## **DISCUSSION OF TWO EXAMPLES OF FEDERAL APPLICATIONS**

Below, two examples of Federal applications of DRIs are discussed to further elaborate on the key issues noted above, as well as to identify some challenges particular to each program. These and additional examples of challenges encountered in applying DRIs in Federal programs and initiatives are included in Appendix B.

### **SCHOOL LUNCH AS AN EXAMPLE OF GROUP PLANNING ISSUES**

By Jay Hirschman and Anita Singh, USDA Food and Nutrition Service

#### **Background**

The National School Lunch Program (NSLP) is an example of a multi-component structure that fits more than one of the IOM categories of use of the DRIs. It illustrates two scientific issues in the group planning arena.

NSLP, originally authorized in 1946, is best known today for providing over 28 million meals to school children on a typical school day in 100,000 schools in the U.S. The primary component of NSLP provides reimbursement to school districts for each meal served to students that meets the Federally-established meal requirements. NSLP also includes training and technical assistance for State and local school food service personnel and a nutrition education component referred to as "Team Nutrition." While planning standards for reimbursable meals and the training and technical assistance to support serving of nutritious meals falls in the categories of group assessment and planning, the Team Nutrition activities include educating children as individuals for improving their diets. In this aspect, individual planning concepts apply, and children are instructed in a manner that promotes their personal consumption at levels that meet the RDA or AI without exceeding the UL. An example would be instruction using USDA's *MyPyramid for Kids* [see <http://www.mypyramid.gov/kids/index.html>]. Although such instruction may be conducted in a group setting (e.g., the classroom), the objective remains educating the students as individuals regarding improvement of their diet both at school and elsewhere.

Since 1981, USDA's Food and Nutrition Service (FNS) has periodically sponsored nationally representative studies to assess the nutritional status of NSLP participants and other students. The National Evaluation of School Nutrition Programs (NESNP) collected one 24-hour recall and other nutrition-related data in school year 1980-81 on over 6,500 students. The first School Nutrition Dietary Assessment Study (SNDA-I) collected one 24-hour recall and other data on over 3,300 students in school year 1991-92. Most recently, SNDA-III collected 24-hour recall and other data on over 2,300 students in school year 2004-2005, including 2 non-consecutive days of 24-hour recall data on a sub-sample of 800 students<sup>1</sup>. The SNDA-III dietary intake data have been analyzed using the methods for group assessment recommended in the report of the IOM Subcommittee on Interpretation and Uses of DRIs, and as of this writing (June 2007) has been submitted for pre-publication peer review.

### **Challenges in Utilizing the DRIs in the National School Lunch Program**

Efforts to apply the IOM group planning methods to NSLP have raised a large number of policy issues and two key scientific issues. One example of a policy issue is the question: "What is the appropriate method for determining the minimum nutrient standards for meals served that will be given a Federal reimbursement?" The two scientific questions should be considered as part of the forthcoming round of DRI updates. The two scientific issues are 1) the shape of the target distribution, and 2) the need for risk assessment with consideration of multiple end points for single nutrients in the context of the total diet.

#### ***Shape of the Target Distribution***

For NSLP, the target population is all school-aged children in the U.S. This is a large, heterogeneous group, covering a number of DRI age groups, including some which provide separate DRIs for boys and girls, and some where a single set of DRIs is provided. Population surveys such as NHANES and SNDA provide sufficient sample size for assessment of the shape of the current usual intake distribution for the total school age population and many subgroups. They also allow determination of the percent who have intakes of nutrients below their requirements (using either the probability approach or the EAR cut-point method), determination of the percent exceeding the UL, and an estimate of the mean usual intake for comparison to the AI. The IOM DRI planning report section "Planning Interventions to Change the Shape of the Intake Distribution" (IOM, 2003 pp.87-88) concludes "*...limited guidance can be offered to planners at this time because detailed examinations of the impact of various types of interventions on the shape of an intake distribution are almost nonexistent.*" This limitation in scientific information leaves planners to make assumptions that can have a critical effect on the results of the various quantitative targets.

The IOM planning report provides two general approaches to setting nutrient targets: homogeneous group planning based on absolute intakes, and heterogeneous group planning based on intake as nutrient densities. To clarify this point using vitamin C as an example, FNS has applied the IOM group planning method to NHANES 2003-2004 data

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<sup>1</sup> SNDA-II collected data in school year 1998-99, but focused on meals offered and selected by students. It did not collect dietary intake data.

for school-aged children. If the target were to reduce the percent inadequate to 2.5 percent, and one assumes a shift in the distribution without a change in the shape of the distribution, the target median nutrient densities for different subgroups range from 36.7 mg/1000kcal (for boys 9-13 years of age) to 55.5 mg/1000kcal (for girls 14-18 years of age). If considered within homogeneous age-gender groups, each group would require some modest increase in the absolute median intake of of vitamin C intake based on the amount needed to increase the 2.5 percentile to the EAR. The resulting homogeneous group targets would show a modest increase in vitamin C density. If considered under heterogeneous group planning, which is more appropriate for NSLP, the highest nutrient density, 55.5 mg/1000kcal, would be the target for secondary school meals and the target for elementary school meals would be 46.3 mg/1000kcal based on the highest density for a subgroup of students in this grade range (girls 9-13 years). These heterogeneous group targets would require a considerable increase in nutrient density for all age-gender groups. However, if the intervention could reasonably be expected to skew the distribution by targeting the vitamin C increases to those with lower intakes, it is possible that the target median nutrient densities would be only a slight shift, or possibly even remain unchanged from current consumption levels.

In practical terms, a policy change resulting in such a focused intervention change is not unreasonable. NSLP meal pattern requirements historically allow offering either a fruit or vegetable as part of the meal as though these two food groups were interchangeable. The pattern could be changed to either increase the quantity, or require offering both fruit and vegetable, or both. While these would not ensure increased dietary intake, it would be very likely to increase the vitamin C density regularly available for selection by some students who otherwise have no fruit offered to them at any point in the day. However, there is rather little scientific information to assist in predicting the impact such intervention changes would have on the usual intake distribution of school-age children.

Review of the scientific literature to identify what is known, and perhaps using this information to develop an approach to predict effects on the usual intake distribution from different types of interventions, would be most useful to those involved in planning for improved nutrition of population groups. Consideration of information emerging from systematic reviews being conducted by CDC's Guide to Community Preventive Services [see <http://www.thecommunityguide.org/nutrition/>] and other new developments may provide additional information regarding nutrition intervention impacts for consideration in the future DRI updates.

### ***Expanded Risk Assessment and Consideration of Multiple End Points***

The DRI development process reflects to some degree some of the scientific principles that underlie risk assessment. Guidance based on risk assessment is needed to provide options for meal planners to use for targeting the prevalence of nutrient inadequacies (e.g. vitamin C, calcium) while preventing nutrient excesses (e.g. calories, fat). This approach requires considering the total diet (a food-based concept) when interpreting the findings of the risk assessment for individual nutrients.

From a clinical or biological perspective (health-related outcome), the risk related to the prevalence of inadequacy may vary by nutrient. For instance, the overall prevalence of dietary inadequacy in a population may be low for a particular nutrient, but the health-related consequences of inadequate intakes may be considerable (e.g., iron intake among boys). In contrast, a nutrient may have a high prevalence for dietary inadequacy with few known clinical or biochemical manifestations in the population (e.g. vitamin E). There is also the issue of nutrient-nutrient interactions (e.g. trace minerals and phytate). In such cases, targeting the intakes of one nutrient may have the unintended impact of reducing the absorption and, therefore, bioavailability of another nutrient, thus increasing the level of intake needed to avoid inadequacy. Furthermore, for some nutrients, targeting based on prevalence of inadequacy might shift intakes at the higher end of the distribution further to the right. This could be a concern for nutrients where targeting could result in shifting the distribution beyond the UL (e.g., zinc). As such, the target for prevalence of inadequacy could, hypothetically, vary from 2.5 percent for one nutrient to 10 percent or more for another nutrient, if the guidance were to be applied in the context of the total diet.

Therefore, for planning purposes for the NSLP, it would be useful to have science-based guidance that is informed by risk assessment when simultaneously targeting intakes of multiple key nutrients to reduce the prevalence of inadequacy while preventing excessive intakes. For transparency, the various steps in the risk assessment process, including those that consider interactions among different nutrients, should be fully documented and concisely summarized in the DRI publications. Using risk assessment methods, the pros and cons of developing multiple endpoints for single nutrients for addressing nutrient inadequacy to facilitate planning total diets for groups should be explored in the future DRI updates.

## **NUTRITION LABELING**

By Paula Trumbo, HHS Food and Drug Administration (FDA)

### **Background**

#### **Development of the Daily Values**

In response to the 1990 Nutrition Labeling and Education Act (NLEA), FDA amended its regulations in 1993 to establish two sets of label reference values: Reference Daily Intakes (RDIs) (formerly known as the U.S. RDAs) and Daily Reference Values (DRVs) for use in declaring the nutrient content of a food on its label or labeling. These two reference values were used to establish a single set of label reference values known as the Daily Values (DVs). FDA identified DRVs for those nutrients that are important to diet and health (e.g., total fat, saturated fat, cholesterol, total carbohydrate, protein, dietary fiber, sodium, and potassium). The DRVs are based on the National Academy of Science's (NAS) *Diet and Health* report (sodium, potassium, fat, saturated fat, cholesterol, carbohydrate, and dietary fiber), the *Surgeon General's Report on Nutrition and Health* (dietary fiber), and the 1990 *Dietary Guidelines for Americans*. The DRV for protein (50 grams per day) was set at 10 percent of 2,000 calories based on an adjusted

average of the 1989 RDA. Most of the RDIs are based on the NAS RDAs set in 1968 and a single set of label reference values for adults and children 4 or more years of age were identified. The population-coverage approach was used for setting a single DV for each nutrient which represents the highest recommended intake level among all life stage and gender groups, excluding pregnant and lactating women.

In 1995, FDA amended its regulations to establish RDIs for vitamin K and selenium based on the 1989 NAS RDAs, and for manganese, chromium, molybdenum, and chloride based on the 1989 Estimated Safe and Adequate Daily Dietary Intakes (ESADDIs).

In 2001, a notification under the Food and Drug Administration Modernization Act was submitted for the use of certain nutrient content claims for choline. The notification identified the DV for choline as 550 milligrams (mg). This value is based on the AI set for choline. Although not part of FDA's regulations, the agency has not acted to prohibit or modify the claims, and therefore, manufacturers may use the specified claims on the label and in the labeling of any food or dietary supplement product that qualifies for the claims described in the notification.

### **Nutrient Labeling of Conventional Foods and Dietary Supplements**

With respect to nutrition labeling of foods, FDA declared that nutrition information on the Nutrition Facts label and in labeling of foods shall contain information about the level of certain nutrients (e.g., total fat). There are also voluntary nutrients that can be declared in the Nutrition Facts label (e.g., polyunsaturated fat). However, those nutrients that can be declared voluntarily must be declared when a nutrient content or health claim is made about that nutrient.

A statement about the percent of the RDI, expressed as the percent of the DV for vitamin A, vitamin C, calcium, and iron, in that order, is required. These four vitamin and mineral nutrients are required to be declared because, at the time of implementing NLEA, there were public health concerns of inadequate intake of these nutrients by specific portions of the population, as well as the possible association between the lack of several of these nutrients in the diet and the risk of chronic disease.

The Supplement Facts label is similar to the Nutrition Facts label in both content and format. The Supplement Facts label must include the amount and percent DV of the same nutrients that are required for conventional foods if the nutrients are present in the supplement, as well as the amount of other dietary ingredients present.

### **Application of the Nutrition/Supplements Facts Label**

FDA can require information about nutrients on the food label when the agency determines such information will "assist consumers in maintaining healthy dietary practices." NLEA states that nutrition labeling must "be conveyed to the public in a manner which enables the public to readily observe and comprehend such information and to understand its relative significance in context of a total daily diet." The food label was also foreseen as important in motivating manufacturers to reformulate food products

to make them more healthful. While the DVs do not represent dietary goals for individuals, their intended use is to provide an overall population reference value on the food label for the consumer.

Based on the results of several consumer studies that evaluated the ability of nutrition label formats to enable consumers to understand the relative significance of product nutrition information in the context of a total daily diet, FDA concluded the following: (1) the declaration of nutrient amount information as percentages of DV or the placement of adjectives (e.g., high, medium, or low) next to the nutrient amount information are effective ways to help consumers understand the significance of product nutrition information in the context of the total daily diet; (2) the percent DV declarations moderate dietary judgments about a food; and (3) other format elements, such as a list of DRVs for important macronutrients, highlighting, or grouping nutrients according to *Dietary Guidelines for Americans*, did not help consumers to make better dietary judgments. Upon reviewing the results of several studies that evaluated the consumer's use of the nutrition label, the two most reported uses identified by FDA were to evaluate nutrition characteristics of single products and to assist in making choices between products. Findings from the FDA Food Label Use and Nutrition Education Surveys (FLUNES) conducted in 1994 and 1995 showed that more than half of consumers used the Nutrition Facts label to make a judgment about the overall nutritional quality of a food product.

### **Challenges in Utilizing the DRIs in the Modernization of the Nutrition/Supplements Facts Label**

#### **Public Health Perspectives**

##### ***Absence of DRIs***

In attempting to set a UL for cholesterol, saturated fat and *trans* fat, it was determined by the DRI Macronutrient Panel that any increase in the intake of each nutrient can result in increased risk of heart disease. Thus, any intake level above zero increases the risk of heart disease, suggesting a UL of zero g/day. Because these nutrients are unavoidable in the diet or it is not advisable to consume zero g/day due to limiting the intake of other nutrients, a UL was not set. There was also an attempt by the DRI Macronutrient Panel to set a UL for sugars, however, there was insufficient evidence to set a UL.

As discussed in the background section, it is currently mandatory to provide the cholesterol, *trans* fat, saturated fat and sugars content per serving in the Nutrition Facts label. If these nutrients remain mandatory, FDA will not be able to rely on the DRI reports in setting DVs for these four nutrients. Thus, FDA may need to rely on other approaches or authoritative sources or not provide a DV for each of these nutrients as is currently the situation for *trans* fat and sugars.

##### ***Nutrients Assigned an AI, Rather than an EAR/RDA***

For several nutrients, there were insufficient data for setting an EAR/RDA and therefore an AI was set. A major limiting factor of the AI is the inability to assess inadequacy of nutrient intakes. As discussed in the background section, the % DV for vitamin A,

vitamin C, calcium, and iron is required to be declared in the Nutrition Facts label because of public health concerns relative to inadequate intake of these nutrients at the time of implementing NLEA. While vitamin A, vitamin C and iron were assigned an EAR/RDA, calcium was assigned an AI which is approximately 25% higher than the 1968 RDA used for setting the DV in 1993. A number of the nutrients that were assigned an AI also lack reliable biomarkers of status (e.g., calcium and potassium). Therefore, it will be difficult to accurately identify, in its entirety, the micronutrients of concern required to be declared in the Nutrition Facts label.

### ***Macronutrients Assigned an Acceptable Macronutrient Distribution Range***

Because of the interrelatedness of the macronutrients, an AMDR (Acceptable Macronutrient Distribution Range) (e.g. percent of energy) was set for carbohydrate, fat and protein. An EAR/RDA was also set for carbohydrate and protein. The EAR/RDA for carbohydrate is based on the minimum amount of carbohydrate needed by the brain without relying on other energy sources (fat and protein). Therefore, the RDA for carbohydrate is much lower than what the U.S. population typically consumes and does not align with food-based guidelines (e.g., 2005 *Dietary Guidelines for Americans*). Like the AMDRs, the DVs for carbohydrate, fat and protein should have some level of interrelatedness, yet a single DV should be derived for each macronutrient. The process of identifying a specific DV from a range is not new. The FDA used the ESADDIs for several micronutrients and identified a specific value for setting the DV. Nonetheless, FDA will need to determine the best approach to identify a single DV for each macronutrient that represents a goal for all individuals 4 years and older and reflects the interrelatedness of the macronutrients in the context of the total diet.

### ***Defining Nutrients***

#### **Dietary Fiber**

The IOM DRI Macronutrient report identified three definitions of fiber: “dietary” fiber, “functional” fiber and “total” fiber (sum of “dietary” and “functional” fiber). These three definitions were developed by the DRI Panel on the Proposed Definition of Dietary Fiber. This panel acknowledged that changes to the currently available AOAC methods for dietary fiber would have to be changed to analytically distinguish between certain “dietary” and “functional” fibers (e.g., resistant starch). For compliance purposes, there must be reliable methods available for the isolation and quantification of individual nutrients declared in the Nutrition/ Supplement Facts labels. Currently, FDA relies on certain AOAC methods for isolating and quantifying dietary fiber in the Nutrition Facts label. Therefore, based on currently available AOAC methods, it is not possible to accurately isolate and quantify “dietary” and “functional” fiber for labeling purposes.

#### **Total Carbohydrate**

FDA relies on appropriate analytical methods (e.g., AOAC methods) for identifying and quantifying the mandatory and voluntary nutrients. Currently in the Nutrition Facts label, “total carbohydrate” represents various forms of carbohydrate including sugars, starch, and fiber. The RDA and AMDR for carbohydrate are specifically for sugars and starch, while an AI was set for “total” fiber. Therefore, there is not a DRI that represents all carbohydrates (“total carbohydrate”).

## **Application of the DRIs in Setting the DVs**

### ***For Assessment, Planning or Neither?***

The application of the DRIs is based, in part, on whether they are intended to be used for dietary “planning” or “assessment” of nutrient intake. With respect to nutrition labeling, the direct use of the RDA has been the development of the DVs. The percent DVs were not intended to be used in assessing nutrient intake of individuals or populations. The goal of dietary planning is to plan over the long term diets that are nutritionally adequate such that the probability of nutrient inadequacy or excess is acceptably low. NLEA stated that nutrition labeling must “be conveyed to the public in a manner which enables the public to readily observe and comprehend such information and to understand its relative significance in context of a total daily diet.” While the DVs do not represent dietary goals for individuals, their intended use is to provide an overall population reference value on the food label for the consumer. Based on consumer studies, the two most reported uses identified by FDA were: 1) to evaluate nutrition characteristics of single products and, 2) to assist in making choices between products. Thus, the DVs have not been used by the consumer in planning nutritionally adequate diets and have primarily been used to assist in making choices about certain food products. In setting the DVs, the FDA will need to evaluate the most appropriate use of the DVs by consumers.

### ***Use the EAR or the RDA?***

There has been much discussion via journal articles and symposia at professional society meetings as to which DRI to use in setting the DVs. The IOM DRI report on Applications in Dietary Planning discusses the RDIs and the Nutrition Facts label in the chapter on planning for individuals and states that the RDAs may be used as targets for planning nutrient intakes that result in acceptably low probability of inadequacy for the individual. The IOM DRI report on Guiding Principles for Nutrition Labeling and Fortification, however, recommended the EAR for setting a DV, because the best estimate of an individual’s requirement is the EAR for his/her age-gender group. Thus, while both reports agree that the percent DVs are intended to be used by individuals, these two IOM reports are suggesting different DRIs to be used in setting the DVs.

## **CONCLUDING STATEMENTS**

The members of the Federal DRI Steering Committee appreciate this opportunity to provide background information on the application of DRIs in U.S. government initiatives for the *Development of DRIs, 1994-2004: Lessons Learned and New Challenges* workshop. Additional details on a broad range of Federal programs and initiatives are included in Appendices A and B. Members of the Steering Committee can be available for consultation with prospective speakers and discussants if there are further questions.

**Appendix A. Examples of U.S. Government Applications of DRIs Categorized by IOM Generic Uses**

**Appendix B. Examples of U.S. Government Application of DRIs**

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**Appendix A**

**Examples of U.S. Government Application of DRIs  
Categorized by IOM Generic Uses**

Note: This chart reports how Federal agencies self-report their incorporation of DRIs into some of the programs they oversee. Some programs / activities fit into more than one category.

This chart is illustrative of Federal programs / activities; it is not comprehensive. For more details on specific programs, refer to Appendix B.

<b>ASSESSING or PLANNING*</b>	<b>GROUPS or INDIVIDUALS</b>	<b>PROGRAM / ACTIVITY / INITIATIVE</b>	<b>RESPONSIBLE AGENCY</b>
Assessing	Groups	Assessing the nutrient intake of population groups: <ul style="list-style-type: none"> <li>• Total intakes (foods + supplements) and relative contribution to total intakes;</li> <li>• Prevalence of inadequate intake;</li> <li>• Intake distribution patterns</li> <li>• Benchmarks for assessment of health status.</li> </ul> Healthy People 2010 Initiative - setting/tracking national nutrition objectives	HHS/CDC/NCHS HHS/NIH/ODS USDA/ARS USDA/ERS USDA/FNS
		U.S. National Food Supply (NFS) - historical data on the nutrient content of the US food supply	USDA/CNPP
		Food Additives - ULs for the review of GRAS notifications and food additive petitions	HHS/FDA
	Individuals	MyPyramid Tracker (MPT) - an interactive , web-based, dietary assessment tool	USDA/CNPP
Assessing	Groups and Individuals	Healthy Eating Index – a tool for assessing diet quality of groups and individuals	USDA/CNPP

Planning	Individuals	Thrifty Food Plan - basis for the Food Stamp Program allotment	USDA/CNPP
	Groups & Individuals	MyPyramid food guidance system	USDA/CNPP
Assessing & Planning	Groups & Individuals	Nutrition Education Initiatives	USDA & HHS
	Groups	Human Nutrition Research Programs - Intramural/ Extramural: <ul style="list-style-type: none"> <li>• Designing intervention diets that are nutritionally adequate (planning)</li> <li>• Evaluating the nutritional adequacy and safety of diets reported by study participants (assessing)</li> </ul>	DOD HHS/NIH USDA/ARS USDA/CSREES
	Groups & Individuals	Dietary Guidelines for Americans - Federal nutrition policy <ul style="list-style-type: none"> <li>• Assessing population intakes;</li> <li>• Developing dietary recommendations for individuals and groups (planning)</li> </ul>	HHS/ODPHP USDA/CNPP
		Nutrition assistance programs: <ul style="list-style-type: none"> <li>• Child and Adult Care Program (CACFP)</li> <li>• Summer Food Service Program (SFSP)</li> </ul>	USDA/FNS
		National School Lunch and School Breakfast Programs <ul style="list-style-type: none"> <li>• Menu standards (groups)</li> <li>• Education of components (individuals)</li> </ul>	USDA/FNS
		WIC - Women, Infants, and Children's Supplemental Nutrition Program: <ul style="list-style-type: none"> <li>• Supplemental food package (groups)</li> <li>• Educational component (individuals)</li> </ul>	USDA/FNS

\*Dietary assessment: compares usual nutrient intakes with estimated nutrient requirements and examines the probability of inadequate or excessive intake. Group assessment determines the percentage of individuals in a group that have a usual nutrient intake below his/her requirement.

Dietary planning: aims for the consumption of diets that have acceptably low probabilities of inadequate or excessive nutrient intakes.

**Key to Federal Agency Acronyms:**

**DOD – Department of Defense**

**HHS - U.S. Department of Health and Human Services**

CDC - Centers for Disease Control and Prevention

NCHS - National Center for Health Statistics

FDA - Food and Drug Administration

NIH - National Institutes of Health

ODS - Office of Dietary Supplements

ODPHP - Office of Disease Prevention and Health Promotion

**USDA - U. S. Department of Agriculture**

ARS - Agricultural Research Service

CNPP - Center for Nutrition Policy and Promotion

CSREES - Cooperative State Research, Education, and Extension Service

ERS - Economic Research Service

FNS - Food and Nutrition Service

Examples of U.S. Government Application of DRIs

Note: This table provides illustrative examples of federal program/activities but is not comprehensive.

Program	Federal Agency	Program Purpose	Relevance of DRIs	Process for Using DRIs	Challenges of Using DRIs
<b>POLICY and EDUCATION</b>					
Dietary Guidelines for Americans	HHS Office of Disease Prevention and Health Promotion (ODPHP) and USDA Center for Nutrition Policy and Promotion (CNPP)	The <i>Dietary Guidelines for Americans</i> (DGAs) provides science-based advice to promote health and to reduce risk for major chronic disease through diet and physical activity. The recommendations in the DGAs are for Americans over 2 years of age. The scientific basis for the DGA recommendations is the scientific report of the Dietary Guidelines Advisory Committee (DGAC).	The DGAC relied on the DRI reports as a primary resource in developing their recommendations.	The 2005 DGAC used the DRIs as a basis for their recommendations. The DGAC translated DRI values into food-based recommendations. DGA recommendations for qualified food group intakes were based in part on MyPyramid and DASH eating plans, which were designed to meet DRIs.	<p>One major challenge in using the DRI values is how a value could be interpreted for use. For example, the AI is 1500 mg and the UL is 2300 mg for sodium. In general, guidance on nutrient intakes is not to consume less than the UL, but to meet the AI. There was much debate among the scientific community on how the sodium values should be used.</p> <p>Another major challenge was the length of time between the beginning and end of the DRI process. For nutrient recommendations that were derived in the beginning of the process, such as calcium and vitamin D, there was much debate whether the values reflected the most current science. Additionally, concerns were raised regarding uniform strength of evidence across the DRIs, e.g., the level of evidence used to develop the vitamin E RDA.</p>
Healthy People 2010 Initiative	HHS Office of Disease Prevention and Health Promotion (ODPHP)	Healthy People 2010 sets national goals and objectives for improving health that provide a vehicle for motivating multi-level actions and monitoring progress over a decade.	The Nutrition and Overweight focus area and Maternal, Infant, and Child Health focus areas include objectives for nutrient intakes. These include: folic acid for women (#16-16a), saturated fat intake (#19-8), total fat intake (#19-9), sodium intake (#19-10), and calcium intake (#19-11).	The objective for calcium intake was based on the DRI recommendations for adequate daily intakes of calcium. The folic acid intake objective was based, in part, on the DRI Recommended Dietary Allowance for women capable of becoming pregnant. The DRI reports for the other nutrients and physical activity were not available at the time of target-setting. The Healthy People 2010	An overall challenge was the lack of availability of DRI values for all the nutrient intake objectives. For the calcium objective, approximated mean calcium requirements for the population were defined as 77% of the DRI recommendations for AIs of calcium.

Program	Federal Agency	Program Purpose	Relevance of DRIs	Process for Using DRIs	Challenges of Using DRIs
Thrifty Food Plan	USDA Center for Nutrition Policy and Promotion (CNPP)	<p>The USDA Food Plans provide the cost of preparing healthy meals at home at four expenditure levels: Thrifty, Low-Cost, Moderate, and Liberal Plans. Each expenditure level is calculated for various age and gender groups.</p> <p>The lowest expenditure level, the Thrifty Food Plan is used to update the Food Stamp allotment. All four plans are used in estimating the Cost of Raising a Child, an annual CNPP publication used by States in setting child support guidelines and foster care payments. The Low-Cost Plan is used by States to determine the portion of a bankruptee's income to allocate to necessary food expense. The Department of Defense uses the value of the Moderate-Cost and Liberal Food Plans to set the Basic Allowance for Subsistence rates for all enlistees, while many divorce courts use the value of the USDA food plans to set alimony payments.</p>	The Food Plans are created so that they meet the RDAs for the various age-gender groups.	<p>nutrient intake objectives have been finalized and progress will be measured based on the targets set in 2000. The more recent DRI reports will likely be considered when objectives for 2020 are set.</p> <p>The Food Plans use a mathematical optimization model to generate a diet that both meets the RDAs, the DGAs, and MyPyramid food-group intake recommendations for each age-sex group, while simultaneously deviating as little as possible from the diet that individuals report eating. The diet must also meet certain cost constraints. The RDAs, Pyramid recommendations, and costs are all constraints in the model, while the optimization function minimizes the "distance" between the average American diet and a healthy diet.</p>	The DRIs are set one nutrient at a time with no consideration that they will be combined into a diet comprised of foods available in the U.S. food supply. Creating food plans that meet all the RDAs, AIs, AMDRs and remain under the UL for sodium is very difficult. The RDA for vitamin E is particularly difficult to meet.

<p>MyPyramid food guidance system</p>	<p>USDA Center for Nutrition Policy and Promotion (CNPP)</p>	<p>MyPyramid was developed to help consumers interpret the DGAs for Americans. MyPyramid translates nutrition recommendations (the DGAs and the DRIs) into the kinds and amounts of food needed each day. MyPyramid food intake patterns provide recommendations for consumption from each of the following food groups: fruits, meat and beans, milk, whole grain, enriched grains, dark green vegetables, orange vegetables, legumes, starchy vegetables, and other vegetables.</p>	<p>The MyPyramid food intake patterns, which identify amounts to consume from each food group and subgroup at a variety of energy levels, were updated to meet current nutritional standards—the 2005 DGAs and the DRIs for vitamins, minerals, macronutrients, and electrolytes.</p> <p>Since food intake patterns are recommendations for individuals, RDAs and AIs were used to set the nutrient goals for patterns at each calorie level to meet the specific needs of individuals in each age and gender group. Acceptable intake ranges for macronutrients (AMDRs) were also used. Amounts of a nutrient in excess of the RDAs or AIs were considered acceptable as long as they did not surpass the ULs.</p> <p>Appropriate calorie levels for the food intake patterns were determined for age/gender groups using EER equations provided in the DRI macronutrient report. The resulting calorie levels ranged from 1,000 to 3,200 calories per day and food intake patterns were developed in 200-calorie increments within this range.</p> <p>The sodium standard was based on the recommendation of the Dietary Guideline 2005</p>	<p>To determine nutritional goals for food intake patterns at each calorie level, the energy needs of a sedentary person of reference height and weight within each age/gender group were first calculated with EER equations. Nutritional goals for each pattern were then assigned based on the nutrient needs of age/gender groups whose energy needs fell at that energy level.</p> <p>A nutrient profile for each food group and subgroup was calculated from the weighted average of the nutrient content of foods in each, based on the food consumption of Americans (NHANES 99-00). Based on the nutrient profiles and the recommended intake from each food group and subgroup, the nutrient content of each pattern was determined and compared to the nutritional goals. Recommended intake levels were modified iteratively to meet the nutritional goals.</p>	<p>The sodium content of diets is closely linked to calorie level. The food intake patterns at lower calorie levels resulted in sodium levels less than the UL. However, at calorie levels of 2800 calories and above, the amount of sodium in the patterns exceeded the UL.</p> <p>Meeting the RDA for vitamin E using foods commonly consumed by Americans was extremely difficult, especially in lower calorie patterns.</p> <p>Meeting the AI for potassium using foods commonly consumed by Americans was also extremely difficult, especially in lower calorie patterns. The food intake patterns include increases in potassium content over current consumption but still provide less than 100% of the AI for potassium in all intake patterns below 2600 calories.</p> <p>It was necessary to modify estimates of total fiber content of each food intake pattern from that calculated from dietary fiber. The DRI recommendations are based on "total fiber", including compounds such as inulin and oligofructose that are not included as part of dietary fiber in the ARS food composition database.</p> <p>The IOM panel has recommended that saturated fatty acid and cholesterol consumption to be kept as low as possible. To meet the need for a quantified standard, CNPP used the DG recommendation to keep consumption of saturated fat to less than 10 percent of calorie and cholesterol to less than 300 mg/day.</p> <p>It is extremely difficult to meet to develop food intake patterns that meet all RDAs and AIs within calorie limits using foods commonly eaten by</p>
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<p>Americans, even in their most nutrient dense forms. DRIs are set independently and do not consider how each can be met as part of a total diet.</p>				<p>Development of menus for low-income families that are consistent with the 2005 DGAs while keeping cost considerations in mind is a challenge. Meeting potassium and sodium recommendations is difficult.</p> <p>FNS programs include low-income, low literacy participants. Developing and tailoring messages and conveying MyPyramid concepts to this population is challenging.</p> <p>There is a significant cost to revising and reprinting materials to be consistent with the 2005 DGAs and MyPyramid. Reprinting materials and trying to have adequate stocks available for distribution in the period that immediately precedes the release of the DGAs and MyPyramid represents a challenge.</p>
		<p>committee--a level less than the UL (2300 mg).</p> <p>The nutrient goal for total fiber was set at 14 gms/1000 calories in each intake pattern. CNPP added 2.5 gms of dietary fiber per 1000 calories to each intake pattern to account for the inulin and oligofructose contained in foods. These compounds are not included as part of dietary fiber in the ARS food composition database. According to the DRI report, American diets may provide on average 2.6 gms/day inulin and 2.5 gms/day oligofructose, considered to be part of "total fiber," or about 5.1 gms/2000 calories more fiber than is reported as dietary fiber.</p>		<p>The DRIs are used in the development of the DGAs and federal programs, including all consumer materials, must be consistent with them. With the release of 2005 DGAs in January and MyPyramid in April, FNS will begin revising existing nutrition education materials and developing new ones that are consistent with these guidelines. Meetings have been held with representatives from all FNS programs to discuss developing key messages based on the 2005 DGAs that would be used consistently across all programs. FNS also provides leadership in getting our partners to update their nutrition education materials to be consistent with the 2005 DGAs. The Agency also develops and transmits guidance to State and local cooperators.</p>
				<p>The DRI are used for updating and revising the DGAs and the Food Guidance System (MyPyramid). FNS nutrition education messages must be consistent with the DGAs. One of the FNS, Healthier US Corporate Priority Plan tasks requires that FNS draft key nutrition education messages based on 2005 DGAs for implementation in all FNS nutrition assistance programs. FNS provides leadership in developing nutrition education guidance for our programs. The Food Stamp Nutrition Education Plan Guidance for FY 2006 incorporates</p>
				<p>Federal nutrition assistance programs that are administered by the Food and Nutrition Service (FNS) represent a significant opportunity to reach program participants with science-based behaviorally focused nutrition education and promotion strategies. These programs reach 1 in 5 Americans. The nutrition education provided to FNS participants is primarily based on changing lifestyle behaviors to meet the DGAs. The Agency spends over \$ 500 million annually on nutrition education. Most of these funds are provided to State and local partners as an integral funding</p>
			<p>USDA, Food and Nutrition Service (FNS) and HHS Agencies</p>	
<p>Nutrition Education Initiatives</p>				

<p>Expanded Food and Nutrition Education Program (EFNEP); and Cooperative Extension</p>	<p>USDA Cooperative State Research, Education and Extension Service (CSREES)</p>	<p>component of some of the FNS nutrition assistance programs. HHS agencies have similar communication / education goals and initiatives.</p>	<p>the 2005 DGAs as the basis for nutritional standards and educational messaging for the Food Stamp Program.</p>	<p>Changes in the DRIs, the DGAs, and the Federal food guidance system are incorporated in revising and developing new education programs, materials and messages and in the assessments of the effectiveness of education programs.</p>	<p>The greater the discrepancy between the DRIs and actual intakes, the more difficult it becomes to meet the DRIs. Because there are many discrepancies between the DRIs and actual intakes for the population in general and for specific subpopulations and because there are many related health problems, it is a challenge to know where to focus educational programs. Understanding the implications of not meeting the various DRIs is also a challenge.</p>
<p>Expanded Food and Nutrition Education Program (EFNEP); and Cooperative Extension</p>	<p>USDA Cooperative State Research, Education and Extension Service (CSREES)</p>	<p>The CSREES' Expanded Food and Nutrition Education Program (EFNEP) is a unique program that currently operates in all 50 states and in American Samoa, Guam, Micronesia, Northern Marianas, Puerto Rico, and the U.S. Virgin Islands. It is designed to assist limited-resource audiences in acquiring the knowledge, skills, attitudes, and changed behavior necessary for nutritionally sound diets, and to contribute to their personal development and the improvement of the total family diet and nutritional well-being.</p> <p>CSREES, in partnership with the Cooperative Extension System (CES), delivers community-based nutrition education programs that help individuals, families, and communities make informed choices about food and lifestyles that support their physiological health, economic, and social well-being. Four broad program areas—food security, food safety, dietary guidance, and health—are the foundation of the nutrition education programs.</p>	<p>The nutrition education programs of EFNEP, CES and 4-H are based on the DRI, the DGAs, and the MyPyramid food guidance system. While many of the educational programs use the DRI as they are reflected in the DGAs, and the food guidance system, some educational programs, depending on the needs of the audience, focus on specific nutrients and food components (e.g., iron, calcium, fiber, fats and calories). The DRIs, the DGAs, and the food guidance system are used both in the development and the evaluation of nutrition education programs.</p>	<p>The greater the discrepancy between the DRIs and actual intakes, the more difficult it becomes to meet the DRIs. Because there are many discrepancies between the DRIs and actual intakes for the population in general and for specific subpopulations and because there are many related health problems, it is a challenge to know where to focus educational programs. Understanding the implications of not meeting the various DRIs is also a challenge.</p>	<p>The greater the discrepancy between the DRIs and actual intakes, the more difficult it becomes to meet the DRIs. Because there are many discrepancies between the DRIs and actual intakes for the population in general and for specific subpopulations and because there are many related health problems, it is a challenge to know where to focus educational programs. Understanding the implications of not meeting the various DRIs is also a challenge.</p>

<p>Older Americans Act Nutrition Program (OAA)</p> <p>-Title III (Grants for State and Community Programs, includes Congregate and Home Delivered Nutrition Services)</p> <p>-Title VI (Grants for Native Americans, includes Congregate and Home Delivered Nutrition Services)</p>	<p>HHS Administration on Aging (AoA)</p>	<p>The OAA provides grants to States, Territories and Tribes to support the delivery of nutrition services (meals, nutrition education and nutrition counseling in OAA Nutrition Programs) to help older Americans remain healthy and active in the community and prevent more costly interventions and care. In Fiscal Year (FY) 2003 through Title III, approximately, 106 million congregate meals were served to 1.8 million older adults by 4,400 local nutrition service providers (NSPs); approximately, 143 million home delivered meals were served to 1 million home bound older adults by 3,900 NSPs. In FY 2003 through Title VI, approximately, 1.7 million congregate meals were served to 57,337 older Native Americans and approximately 2.2 million home delivered meals were served to 40,532 older home bound Native Americans by 236 Tribal Organizations (TOs).</p>	<p>The OAA requires that NSPs serve meals that comply with the DGAs and provide 33% of the RDAs if one meal is served, 67% of the RDAs if two meals are served and 100% of the RDAs if three meals are served. Under Title III, it is the responsibility of State Unit on Aging (SUAs) to develop policies and procedures to implement the requirements of the OAA and ensure compliance with its standards. Under Title VI, the OAA requires that TOs be substantially in compliance with Title III provisions.</p>	<p>The AoA has a cooperative agreement with the National Resource Center on Nutrition, Physical Activity and Aging (Center) at Florida International University. The Center:</p> <ul style="list-style-type: none"> <li>• compiled the RDAs, AIs, ULs and the DGAs as they relate to older adults and posted these on its website;</li> <li>• held two Issue Panels [comprised of nutrition researchers, nutrition implementers, and representatives of the Aging Network (representatives of states, area agencies on aging, local nutrition service providers, and tribal organizations)] to develop recommendations for implementation;</li> <li>• compiled and posted the First Issue Panel Report on its website and is finalizing and posting the Second Issue Panel Report; it includes targeted nutrient recommendations;</li> <li>• is compiling and posting Frequently Asked Questions about the RDAs and DGAs;</li> <li>• developed a "Best Practices" Toolkit for implementing the OAA requirements which includes a menu planning chapter incorporating the RDAs, as well as a chapter on health promotion/disease prevention incorporating the RDAs; and</li> <li>• is revising appropriate chapters of "Best Practices" Toolkit to incorporate the new RDAs and DGAs and will post these on its website.</li> </ul> <p>The AoA is working with an internal HHS Working Group to develop materials (based on the new DGAs) specific to the older adult population (consumer materials</p>	<p>Incorporating the new DRIs into the OAA Nutrition Programs will present challenges. Within the DRIs, the RDA levels for a number of nutrients have increased for individuals over age 70. The OAA requires that meals be planned to meet these levels rather than the EARs. It will be difficult to plan meals that meet some of the RDAs (calcium, vitamin D, vitamin E, sodium, etc.). The IOM recommended planning approach includes a survey of the population to determine usual intake and to plan meals accordingly. Given current funding constraints at federal, state, tribal and local levels, it is unlikely that such a survey at any of these levels will occur. Given the nutritional risk profile of the participants (over age 70, low income, minority, functionally impaired, multiple chronic conditions) and the fact that the single meal served provides over 50% of their usual daily food intake, the meals must be nutrient dense as well as meet cultural, health, and religious requirements. The responsibility for implementation rests with SUAs and TOs which results in variable implementation. About 40% of SUAs have no nutrition expertise and there is limited expertise at other levels. Guidance needs to be practical and accurate. Training and technical assistance remains a challenge at all levels.</p> <p>Meal production is challenging, particularly in relation to the use of processed foods which are often cheaper to use but are higher in sodium and may be less nutrient dense. Overall, the food industry will be challenged to reformulate products with lower sodium and</p>
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<p>higher nutrient density. Choice, culturally familiar foods, and food quality affect program participation. The DRIs affect dietary modification for special needs. Some programs use simplified, off-the-shelf nutrient analysis software. The software programs are being updated to incorporate the new DRI changes. Overall, use of computerized menu analysis is limited in the Aging Network. The DRI health promotion/disease prevention potential may be not realized due to the challenges.</p>	<p>and technical assistance implementation materials). These materials will be pilot tested by the Center. The AoA and the Center has and will continue to provide training and technical presentations to all levels of the Aging Network regarding the DRIs and the DGAs. The AoA plans to issue guidance to the Aging Network regarding recommended State implementation strategies.</p>	<p>By Law, NSLP and SBP meals must be consistent with the principles of the <i>Dietary Guidelines for Americans</i> and provide 1/3 of the RDA at lunch and 1/4 of the RDA at breakfast. When averaged over a week, all participating schools are required to provide NSLP and SBP meals that meet grade-group specific regulatory requirements for a set of nutrients that serve as proxies for providing the legislatively required RDA levels for all nutrients. The current program nutrient requirements include numeric targets for the following eight items: <i>calories, percent of calories from total fat, percent of calories from saturated fat, protein, calcium, iron, vitamin A and vitamin C.</i></p>	<p>The National School Lunch Program (NSLP) and School Breakfast Program (SBP) provide reimbursements to school food authorities that enable provision of free or low cost nutritious meals to students at approximately 100,000 and 80,000 public and private schools, respectively, in the U.S.</p>	<p>USDA Food and Nutrition Service (FNS)</p>
<p>Incorporating the new DRIs into the NSLP and SBP will present some challenges. Within the new DRIs, the RDA levels for a number of nutrients have been increased in certain age groups, particularly adolescents. In addition, for nutrients with the highest levels of inadequacy, the IOM-recommended population planning approach may suggest targeting usual 24-hour intake at levels that exceed the RDA. This may translate into a need for school meals that have a greater nutrient density; these meals must be planned, prepared and presented in a way that is appealing to students but not administratively or financially burdensome to school food service staff. In addition, the NSLP and SBP serve a highly diverse population nationwide. Meals are planned to meet the nutrient needs of a group; however, flexibility to meet nutrient needs and cultural food preferences of particular sub-groups or individuals must be allowed.</p>	<p>In follow-up to completion of the decade-long update to the RDAs encompassed in the IOM Dietary Reference Intakes, and their incorporation into the 2005 <i>Dietary Guidelines for Americans</i>, the USDA Food and Nutrition Service chartered a work group to develop options and recommendations for updating the school meal pattern requirements and the school nutrient standards for NSLP and SBP reimbursable meals.</p> <p>The School Meals Nutrition Work Group is reviewing the DRIs, the DGAs, historical records on development of the existing school meal patterns and nutrient standards, and published data on the food intake and percent inadequacy (using the IOM Interpretation and Uses Subcommittee-recommended methods) for specific nutrients among school-aged children. Consideration is being given to how best to use the DRIs in establishing minimum standards for meal reimbursement and to set targets for training and technical assistance. FNS is also planning for additional analyses, including</p>	<p>The School Meals Nutrition Work Group is reviewing the DRIs, the DGAs, historical records on development of the existing school meal patterns and nutrient standards, and published data on the food intake and percent inadequacy (using the IOM Interpretation and Uses Subcommittee-recommended methods) for specific nutrients among school-aged children. Consideration is being given to how best to use the DRIs in establishing minimum standards for meal reimbursement and to set targets for training and technical assistance. FNS is also planning for additional analyses, including</p>	<p>To simplify State and local planning and monitoring, USDA currently uses a subset of nutrients to serve</p>	<p>To simplify State and local planning and monitoring, USDA currently uses a subset of nutrients to serve</p>

<p>WIC – The Special Supplemental Nutrition Program for Women, Infants and Children</p>	<p>USDA Food and Nutrition Service (FNS)</p>	<p>WIC provides supplemental foods, nutrition education and breastfeeding support, and referrals to health and social services to low income nutritionally at-risk pregnant, breastfeeding and postpartum, and infants and children up to their fifth birthday.</p>	<p>The DRIs and DGAs serve as the basis for determining the nutritional achievement and inadequacies of the WIC target populations. They also provide the basis for nutrition education and periodic reviews and updating of the food packages provided by the Program. In addition, the WIC program is large enough (serving about 8 million women, infants and children per month at a cost of approximately \$5 billion per year) that standards for WIC foods can influence the food marketplace. For example, many breakfast cereals are formulated to meet the</p>	<p>modeling to determine a set of nutrients that can serve as a reasonable proxy for overall achievement of the legislative RDA-based requirements while also reducing the expected percent inadequate for nutrients where inadequacy levels are highest. Sample menus will also be developed to demonstrate how school menus can meet the new DRIs.</p>	<p>as proxy indicators of overall achievement of the RDA-base targets. Due to limitations in availability of composition data on the large number of food products that are specially formulated for use in school meals, the current proxy nutrients are limited to nutrients available from the Nutrition Facts panel. One challenge is to update program rules to adopt a new set of simple proxies that serve as reasonable indicators of overall local program nutrient achievement.</p> <p>Finally, the changes in recommended intake levels will require collaboration with various industries related to school food service operations. For example, software programs that are currently used by school food service directors, State agencies, and FNS must be updated to reflect the new DRI-RDA (or AI) values.</p>
			<p>The DRIs and DGAs serve as the basis for determining the nutritional achievement and inadequacies of the WIC target populations. They also provide the basis for nutrition education and periodic reviews and updating of the food packages provided by the Program. In addition, the WIC program is large enough (serving about 8 million women, infants and children per month at a cost of approximately \$5 billion per year) that standards for WIC foods can influence the food marketplace. For example, many breakfast cereals are formulated to meet the</p>	<p>USDA/FNS is in the process of updating the WIC food packages to reflect changes in the demographic of the target population and the recently completed updates to the DRIs and Dietary Guidelines for Americans. In September 2003, FNS contracted with the Institute of Medicine to review the nutritional needs of the WIC target populations and other factors, and make cost-neutral recommendations for updating the WIC food packages. The IOM report including these recommendations was published on April 27, 2005. Certain aspects of WIC nutrition education will be adjusted in consideration of the changes in the food packages. Assessments of the impacts resulting from the food package changes will use the</p>	<p>Application of the DRIs to the WIC food packages is the largest use to date in a nutrition assistance program.</p> <ul style="list-style-type: none"> <li>• The lack of EAR and RDA values for certain nutrients complicates interpretation of the data used to support policy decisions. For example, the percent inadequate cannot be determined if there is only an AI, so the percent inadequate cannot be compared across all nutrients.</li> <li>• Since the end points used to determine the DRIs differ in severity it is difficult to assess the relative emphasis that should be placed on nutrients with comparable degrees of DRI-assessed inadequacy.</li> <li>• The DRIs tend to be oriented towards chronic disease prevention. In considering the</li> </ul>

Child and Adult Care Program (CACFP) and the Summer Food Service Program (SFSP)	USDA Food and Nutrition Service (FNS)	Nutrition assistance programs such as CACFP and SFSP are administered by the USDA. The Agency also reimburses After School Snacks.	Similar to the National School Lunch Program and the School Breakfast Program, there are meal pattern requirements for the SFSP and the CACFP. The meal pattern requirements are expected to assist menu planners in providing nutritious meals that are consistent with the DGAs.	The DRIs and the 2005 DGAs could help inform meal component recommendations to meet the meal pattern requirements.	Challenges in using the DRIs in these programs are similar to those for NSLP and SBP, the CACFP and SFSP environments are often less well regimented than schools, requiring added flexibility. It will be a challenge to plan near-total diet standards and targets that are practical and acceptable to program participants and are not administratively or financially burdensome to Program sponsors. CACFP includes an Adult Day Care component that includes service to disabled adults who may fall outside the DRI focus of healthy individuals. Sponsors will need to be educated on how to meet meal pattern requirements and achieve nutrient group targets by choosing meal components that are nutritious, have variety, and consistent with the DGAs.	nutritional needs of the woman and infant and toddler in the period from 12 months prior to a birth to 2 years following, the more immediate nutritional needs for successful pregnancy and birth outcome, lactation and/or postpartum rehabilitation of the mother, and growth and health of the infant/toddler are paramount. <ul style="list-style-type: none"> <li>The DRIs are most useful when taken along with the more food-base Dietary Guidelines for Americans, however the DGAs do not apply to children under the age of 24 months.</li> </ul>
current WIC requirements for iron fortification.	DRIs, DGAs and other measures (e.g., participation).	nutritional needs of the woman and infant and toddler in the period from 12 months prior to a birth to 2 years following, the more immediate nutritional needs for successful pregnancy and birth outcome, lactation and/or postpartum rehabilitation of the mother, and growth and health of the infant/toddler are paramount. <ul style="list-style-type: none"> <li>The DRIs are most useful when taken along with the more food-base Dietary Guidelines for Americans, however the DGAs do not apply to children under the age of 24 months.</li> </ul>	The DRIs and the 2005 DGAs could help inform meal component recommendations to meet the meal pattern requirements.	Challenges in using the DRIs in these programs are similar to those for NSLP and SBP, the CACFP and SFSP environments are often less well regimented than schools, requiring added flexibility. It will be a challenge to plan near-total diet standards and targets that are practical and acceptable to program participants and are not administratively or financially burdensome to Program sponsors. CACFP includes an Adult Day Care component that includes service to disabled adults who may fall outside the DRI focus of healthy individuals. Sponsors will need to be educated on how to meet meal pattern requirements and achieve nutrient group targets by choosing meal components that are nutritious, have variety, and consistent with the DGAs.	nutritional needs of the woman and infant and toddler in the period from 12 months prior to a birth to 2 years following, the more immediate nutritional needs for successful pregnancy and birth outcome, lactation and/or postpartum rehabilitation of the mother, and growth and health of the infant/toddler are paramount. <ul style="list-style-type: none"> <li>The DRIs are most useful when taken along with the more food-base Dietary Guidelines for Americans, however the DGAs do not apply to children under the age of 24 months.</li> </ul>	

**FOOD SUPPLY MANAGEMENT / FOOD REGULATION**

Daily Values (DV's) for the Nutrition Facts Label (NFL) and	HHS Food and Drug Administration (FDA)	Percent daily values (DV's) are provided in the NSL/SFL and provide information to the consumer on the caloric and nutritional content of conventional foods and	The Nutrition Labeling and Education Act (NLEA) requires that certain foods bear nutrition labeling that includes the content of certain nutrients and food	Now that the first round of the DRI review process is completed, the FDA will begin the process of modernizing the NFL/SFL including the DV's. An Advanced Notice of Proposed Rulemaking (ANPR) will	DRIs were not set for sugars, cholesterol, trans fat and saturated fat, which are currently required to provide the weight amount in the NFL. FDA will not be able to rely on the DRI reports in setting DV's for
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<p>Supplement Facts Label (SFL), health claims and nutrient content claims</p>	<p>supplements. The purpose of the NFL is to help assist consumers in maintaining healthy dietary practices. DVs serve as the reference value for setting levels for nutrient content claims (e.g., an <i>excellent source</i> is 20% of the DV per serving) that are used in food labeling. Furthermore, DVs are used for determining which foods may bear a health claim when the substance of the claim is a nutrient that has a DV.</p>	<p>components. In addition to a weight amount, two types of reference values are presented: Reference Daily Intakes (RDIs) and Daily Reference Values (DRVs) that are collectively presented as the DVs. Since the implementation of NLEA, the FDA has primarily used the RDAs set by the National Academy of Sciences (NAS). Many of the DVs are based on the 1968 RDAs.</p>	<p>be printed in the Federal Register to seek public comment on specific questions being asked by the FDA. Once public comments are considered, a proposed rule will be drafted, followed by a final rule.</p>	<p>these four nutrients. Thus, FDA may need to rely on other approaches or authoritative sources or not provide a DV for each of these nutrients as is currently the situation for <i>trans</i> fat and sugars.</p> <p>A major limiting factor of the AI is the inability to assess inadequacy of nutrient intakes. The % DV for vitamin A, vitamin C, calcium, and iron is required to be declared in the NFL because of public health concerns relative to inadequate intake of these nutrients at the time of implementing NLEA. A number of the nutrients that were assigned an AI also lack reliable biomarkers of status (e.g., calcium and potassium). Therefore, it will be difficult to accurately identify, in its entirety, the micronutrients of concern required to be declared in the NFL.</p> <p>Because of the interrelatedness of the macronutrients, an AMDR (percent of energy) was set for carbohydrate, fat and protein. FDA will need to determine the best approach to identify a single DV for each macronutrient that represents a goal for all individuals 4 years and older and reflects the interrelatedness of the macronutrients in the context of the total diet.</p> <p>Three definitions of fiber were identified: "dietary" fiber, "functional" fiber and "total" fiber (sum of "dietary" and "functional" fiber). Based on currently available AOAC methods, it is not possible to accurately isolate and quantify "dietary" and "functional" fiber for labeling purposes.</p> <p>Currently in the NFL, "total carbohydrate" represents various forms of carbohydrate including</p>
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					sugars, starch, and fiber. The RDA and AMDR for carbohydrate are specifically for sugars and starch, while an AI was set for "total" fiber. Therefore, there is not a DRI that represents all carbohydrates ("total carbohydrate").
Food Additives	HHS Food and Drug Administration (FDA)	A substance that will be added to food is subject to premarket approval by FDA unless its use is generally recognized as safe (GRAS) by qualified experts or unless the use of the substance is otherwise excluded from the definition of a food additive.	There must be evidence that the substance is safe under the conditions of its intended use. FDA has defined "safe" (21 CFR 170.3(i)) as a reasonable certainty in the minds of competent scientists that the substance is not harmful under its intended conditions of use.	If applicable, the ULs could be used in the review of GRAS notices and food additive petitions submitted to the FDA.	There are no identified challenges at this time.

### ASSESSMENT

MyPyramid Tracker, an interactive tool	USDA Center for Nutrition Policy and Promotion (CNPP)	MyPyramid Tracker (MPT) is an interactive assessment tool. MPT translates the principles of the 2005 <i>Dietary Guidelines for Americans</i> and nutrition standards from the IOM reports. Users can track their dietary intake, physical activity, energy balance, and assessment results for up to 365 days.	The nutrient assessment component of MPT analyzes an individual's nutrient intake, based on recorded food intake. DRIs are provided as a reference standard. MPT also provides an estimate for the individual's daily caloric need, based on age, gender, weight, height, and physical activity levels, using the methodology suggested in the IOM energy and macronutrient report.	MPT analyzes and generates an overall nutrient evaluation by comparing the amounts of food consumed to current nutritional guidance. The nutrient standards are RDAs, AIs, and AMDRs. The ULs are used as the reference standard for sodium intake for each day of physical activity information, MPT generates an overall score for the types and duration of activities performed. The tracker also calculates the energy balance by subtracting the person's energy expended during physical activities from energy intake.	The IOM confidence of nutrient adequacy approach had been implemented in an earlier version of MPT. CNPP found that users were frequently confused when their estimated usual nutrient intakes exceeded recommendations (RDAs or AIs) but the assessment results indicated that intakes were predicted to be inadequate because of the low reliability of the estimate of usual intake. This method of assessment has been removed from MPT.
Healthy Eating Index	USDA Center for Nutrition Policy and Promotion (CNPP)	The purpose of the Healthy Eating Index (HEI) is to assess and monitor the dietary quality of Americans. The HEI assesses diet quality in terms of compliance with the Dietary Guidelines. The HEI components represent various aspects of diet quality.	The DRIs are the underlying basis of the standards used in the scoring system of the HEI. Some components measure conformance to recommended amounts of the food groups found in MyPyramid. Others assess	The components of the HEI that measure excess intake, such as fat and sodium, use the ULs or AMDRs. Those that measure nutrient adequacy, use the RDAs and AIs indirectly through the food-based recommendations, found in MyPyramid, which are set to meet the RDAs and AIs.	Few people have intakes below the UL for sodium so deciding how to score sodium intake was a challenge.  IOM recommended that saturated fat intake be "as low as possible," but did not provide a quantified standard that could be used in dietary

<p>Estimating the Prevalence of Nutrient Inadequacies</p>	<p>USDA Economic Research Service (ERS)</p>	<p>The Nutrition and Health Characteristics of Low-Income Persons (NHCLIP) and Assessing Nutrient Intakes of High-Needs Subgroups (ANIHS) studies were designed to estimate the prevalence of nutrient inadequacies for food assistance participants, low-income individuals and other vulnerable groups.</p>	<p>ERS conducts research on nutrient intakes in order to understand the influence of food assistance programs, nutrition knowledge, as well as household and individual characteristics. The DRIs, together with IOM's recommendations for nutrient intake assessment methodology, represent the recommended approach to intake adequacy assessment and identifying appropriate target groups for nutrition intervention.</p>	<p>Abt Associates conducted the NHCLIP. Abt used the NHANES III to assess nutrient intakes for food stamp participants, WIC participants, low-income children and low-income older adults. The nutrient intake assessments were part of a larger project including analyses of healthy index scores, biochemical indicators, dietary patterns and other health-related behaviors.</p> <p>The analysis used EARs for vitamin C, zinc, vitamin A, and the AI for calcium. The study used the probability approach to estimate risk of inadequate iron intake for females age 9-51, and the EAR for iron for all other subgroups. The study used earlier standards to</p>	<p>saturated fat and sodium intakes and discretionary calories from solid fat, alcohol, and added sugar.</p>	<p>assessment. In the absence of an IOM standard, the DGA recommend that less than 10% of caloric intake come from saturated fat, a level higher than that founding the MyPyramid and DASH (Dietary Approaches to Stop Hypertension) food patterns designed to meet the nutrient needs of almost everyone.</p> <p>A similar problem is posed by the 25% of total calories from added sugar "maximal intake" recommended by the IOM. CNPP has found that it is not possible to plan nutritionally adequate diets that have as many as 25% of calories coming from sugar. The HEI does not use the IOM standard for sugar.</p> <p>For assessments such as those done using the HEI, it would be desirable to create food-based standards that represent diets that would meet the EARs. Currently, we cannot do this because not all nutrients of concern, such as calcium and potassium, have EARs.</p>
				<p>The major challenge facing the NHCLIP was the need to estimate intra-individual variances using CSFII data and to incorporate these estimates into usual intake estimates from the NHANES III. This required custom programming with the assistance of Alicia Carrquiry of Iowa State and her former graduate student Kevin Dodd, now at NCI. This will not be needed once the NHANES includes a sufficient sample with two days of intake data, but could be needed for analysis of other dietary intake studies that don't include a sufficient two-day subsample. It might be worth adding a feature to Iowa State's usual intake estimation software to make this easier for researchers to do independently.</p>		

<p>examine energy, total fat and saturated fat (as a percent of calories), cholesterol, sodium, and fiber, because the IOM's recommendations were not available for these dietary components at the time the study was conducted.</p> <p>Abt used intra-individual variance estimates from the CSFII because the NHANES subsample with two days of intake data was determined to be too small and non-random to use for this purpose.</p> <p>Mathematica Policy Research, Inc. (MPR) conducted the ANIHNS. The ANIHNS used data from CSFII 1994-96, 1998 to assess nutrient intakes for food stamp participants, WIC participants, school lunch participants, low-income individuals, overweight individuals, adolescent girls, and older adults.</p> <p>The analysis used EARs for vitamin C, zinc, vitamin A, vitamin E, magnesium, folate, protein and carbohydrates. The analysis used AIs for fiber and calcium, AMDRs for total fat, protein, and carbohydrates as a percent of calories, the UL for sodium, and the EER (Estimated Energy Requirement) for total energy intake. The study used the probability approach to estimate risk of inadequate iron intake for all individuals. The study applied a separate EAR for vitamin C for smokers.</p>	<p>The major challenge for the ANIHNS was interpreting some results that were inconsistent with clinical data. For example, vitamin E showed extremely high levels of inadequacy; for some subgroups, the prevalence was 100%, and it was the only nutrient with a high prevalence of inadequacy among young children. However, clinical data on vitamin E inadequacy suggest otherwise. Data from NHANES III show that, although a majority of age and gender subgroups had a large proportion with usual intakes below the EAR, less than 5 percent had low plasma vitamin E levels.</p> <p>The results for vitamin E may also suggest additional research is needed to support the DRIs established for vitamin E. Other possible reasons for the very high estimate of nutrient inadequacy in light of a low prevalence of clinical inadequacy include the difficulty in providing accurate information on the types and amounts of oils and fats added during cooking and potential issues related to nutrient databases.</p> <p>The estimated risk of inadequate iron intake was lower than the prevalence of biochemical indicators suggesting iron deficiency. This problem was discussed in the IOM volume covering iron, but not considered a serious discrepancy.</p> <p>Another problem was applying DRIs that did not match available food composition data. The DRIs for folate are expressed as Dietary Folate Equivalents to reflect the finding that folic acid added in fortification is more completely absorbed than food folate. The food composition databases used to</p>

<p>calculate nutrient intakes in the CSFII did not provide this breakdown. Thus, estimates of inadequacy for folate in the ANIHNS may be biased upward.</p>					<p>The DRIs apply to diets actually consumed by people, but not necessarily to the food supply. However, they are used to evaluate the food supply. Additional guidance on assessing the nutrient adequacy of the food supply may be helpful.</p>
<p>Nutrient Content of the U.S. National Food Supply</p>	<p>USDA Center for Nutrition Policy and Promotion (CNPP)</p>	<p>The National Food Supply presents historical data on the foods and nutrients available for consumption in the U.S. The data and trends are used for monitoring the potential of the food supply to meet nutritional needs of the population; for examining ecological relationships between food supplies, diet, and health; and for examining trends in food and nutrient availability. Food supply nutrient estimates reflect Federal enrichment and fortification standards and technology advances in the food industry and contribute to the Federal dietary guidance system. As such, these data are of interest to agricultural policymakers, economists, nutrition researchers, and nutrition and public health educators.</p>	<p>The nutrient content of the U.S. food supply is evaluated using DRIs, when EARs are lacking. The food supply changes in response to dietary recommendations and revisions through enrichment of grains, fortification of foods, and the production of a variety of nutritious foods.</p>	<p>Nutrient content of the U.S. food supply represents the foods available for consumption by the U.S. population, thus the EARs are used. In instances where EARs do not exist, AIs are used as the standard. The nutrient content of the food supply is calculated by using data on the amount of food available for consumption from USDA's Economic Research Service and information on the nutrient composition of foods. Estimates of per capita consumption for each commodity are multiplied by the amount of food energy and each of 28 nutrients and dietary components in the edible portion of the food. Results for each nutrient from all foods are totaled and converted to amount per capita per day. Food supply levels include some waste factors, but do not take into consideration waste at the farm gate, at loading docks, or at home. Therefore, the levels of most nutrients available in the U.S. food supply must exceed recommended intakes to ensure that sufficient nutrients are available to the whole population.</p>	<p>The DRIs apply to diets actually consumed by people, but not necessarily to the food supply. However, they are used to evaluate the food supply. Additional guidance on assessing the nutrient adequacy of the food supply may be helpful.</p>
<p>Division of Nutrition, Physical Activity, and Obesity (DNPAO)</p>	<p>HHS Centers for Disease Control and Prevention (CDC)</p>	<p>One of DNPAO's goals is to improve those aspects of dietary quality most related to population burden of chronic disease and unhealthy child development.</p>	<p>The DRIs, taken individually and in conjunction, provide a benchmark estimate of how dietary intake aligns with nutritional requirements.</p>	<p>DNPAO is attempting to set priorities for nutrients of concern and references the DRIs in the process of priority setting.</p> <p>The DRIs are used as the basis for assessing and reporting dietary and supplement intakes of participants in surveys of dietary intake.</p>	<p>EAR/RDA (only AIs) values are not available for some nutrients and age groups. This shortcoming hampers the ability to make consistent comparisons across nutrients and is particularly problematic when the point of an analysis is to set priorities for action. Also, definitive statements about dietary status are difficult due to the varying basis for the DRIs (deficiency prevention,</p>

International Micro-nutrient Malnutrition Prevention and Control Program (IMPaCt)	HHS /CDC National Center for Disease Prevention and Health Promotion (NCCDPHP) DNPAO	IMPaCt assists countries to assess the burden of vitamin and mineral deficiencies through national surveys, to implement monitoring systems to track vitamin and mineral deficiency interventions -- especially food fortification and supplementation programs -- and to achieve widespread fortification of flour and other food staples to help eliminate vitamin and mineral deficiencies.	The DRIs provide the baseline to interpret nutrient adequacy from dietary intake and thus the need for potential fortification or supplementation.	The DRIs are used as the basis for dietary assessment and for quantifying the nutrient fortification levels of flours, salt, and other food vehicles and for home fortificants and supplements for pregnant women and children under 5 years of age.	health promotion, chronic disease prevention, and for some nutrients differences in the basis across population subgroups).  The lack of international standards and differences between the DRIs and equivalent values from other countries can lead to difficulty when trying to determine fortification levels. A lack of RDAs and EARs for infants is a problem because the AI cannot be used to estimate the proportion of a group with inadequate intakes. More information is needed on bioavailability and bioconversion of nutrients from both individual foods and whole diets.  Application of UL to populations is problematic- should no one's intake ever be above the UL?
Nutritional Biomarkers Branch	HHS/ CDC National Center for Environmental Health (NCEH)	To assess the nutritional status of Americans.	DRIs provide a basis to interpret biochemical status as it relates to dietary intake in the National Health and Nutrition Examination Survey (NHANES). Including the examination of high and low levels of intake.	The DRIs are used to interpret how biochemical levels vary with dietary intake. The DRIs are being used for the upcoming nutrition report which will report biochemical values from the recent NHANES.	It can be difficult to compare biochemical to dietary levels due to differences in bioavailability and bioconversion.

**RESEARCH**

Extramural Human Nutrition Research Programs	USDA Cooperative State Research, Education and Extension Service (CSREES)	CSREES supports research that contributes to our understanding of the need for and function of nutrients in the body, appropriate dietary practices throughout the life cycle, and the factors that effect nutritional needs and dietary practices such as gender, race, and ethnicity. The agency also supports research on factors effecting consumers' attitudes and behavior toward food and research to develop effective ways of improving dietary	CSREES' nutrition research programs focus on gaps in knowledge related to nutrients and diet. The gaps would be identified as those nutrients or food components for which it has been difficult to establish DRIs or DGAs. For example, one Multistate Research Fund project is focused on the needs for and functions of omega-3 fatty acids.	The research needs identified by DRI and Dietary Guidelines Advisory Committees are used as justification for requesting funding for both formula-funded and competitive projects.	Because there are so many gaps in knowledge, so many promising new areas of research and relatively little funding, priority setting is a challenge.
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<p>Intramural Human Nutrition Research Program</p>	<p>USDA Agricultural Research Service (ARS)</p>	<p>behavior. CSREES' research projects are supported through a formula and a competitive award process. Hatch Act funds are distributed according to a statutory formula to the State Agricultural Experiment Stations (SAES's) which are under the direction of land grant colleges and universities. The National Research Initiative (NRI) competitively awards investigator-initiated proposals in two nutrition areas: Bioactive Food Components for Optimal Health which includes funding for nutrients for which there are serious gaps in knowledge; and Human Nutrition and Obesity which focuses on the behavioral and environmental aspects of obesity prevention. The latter program invites applications for integrated research, education and extension projects. Most projects are expected to be multidisciplinary.</p>	<p>The mission of the ARS Human Nutrition Program is to define the role of food and its components in optimizing health throughout the life cycle for all Americans by conducting high national priority research.</p> <p>Some of the work is unique, including the "What We Eat in America/ NHANES dietary survey and the National Nutrient Databank. Most of the research program is comprised of long-term, hypothesis-driven studies that contribute to the scientific basis for development of the DRIs and DGAs, health promotion, prevention of obesity and chronic diseases, and elucidation of physiologic bases for nutrient requirements at all stages of the lifecycle.</p>	<p>ARS nutrition research has as one of its main components to increase the scientific basis for dietary guidance for health promotion and disease prevention. A high percentage of projects address improving the accuracy of the DRIs and Dietary Guidelines.</p>	<p>Research needs identified by DRI and Dietary Guidelines Advisory Committees are used by the National Program Leaders to prioritize research projects that are conducted by program scientists.</p>	<p>Research studies: Application of the DRIs to determine the prevalence of nutritional inadequacy in small groups is problematic, i.e. groups comprised of about 100 or less people.</p>
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Acronyms for Federal Agencies:

- U.S. Department of Health and Human Services (HHS)
- Administration on Aging (AOA)
- Centers for Disease Control and Prevention (CDC)
- Food and Drug Administration (FDA)
- Office of Disease Prevention and Health Promotion (ODPHP)
- National Institutes of Health (NIH)
  
- U. S. Department of Agriculture (USDA)
- Agricultural Research Service (ARS)
- Cooperative State Research, Education, and Extension Service (CSREES)
- Center for Nutrition Policy and Promotion (CNPP)
- Economic Research Service (ERS)
- Food and Nutrition Service (FNS)