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Introduction

Most people in the United States have difficulty remembering a time when they could not check the food label for the calorie or fat content of a food. At least a generation of young people does not realize that packaged food ever existed without nutrition labeling. Americans and Canadians have long been assisted in making informed food choices through regulations that control food labeling. In the United States, there have been three eras of nutrition labeling during which different reference values were used on the label: from 1941 to 1972, Minimum Daily Requirements were used; from 1973 to 1993, U.S. Recommended Daily Allowances (US RDAs) were used; and since 1993, Daily Values (DVs) have been used. The Nutrition Facts box that currently appears on virtually all food labels includes the DV and is a critical tool for consumers to use in making informed food choices. In January 2003 the Canadian government published new food labeling regulations that manufacturers can begin to implement immediately (Canada, 2003). With these new labeling regulations, Canadians will join Americans in receiving additional assistance in food selection through consistent, controlled Nutrition Facts information on food labels.

It has never been more important for consumers to make healthy food choices. Diet-related chronic diseases are a leading cause of preventable deaths in the United States and Canada (DHHS, 2001). In fact, because of the sharp rise in obesity and the decline in cigarette smoking, some public health researchers predict that if current trends continue, obesity will soon surpass smoking as the primary preventable cause of death (Allison et al., 1999b; Manson

and Bassuk, 2003). The current Nutrition Facts box that appears on food labels was conceived as an important public health tool to reduce diet-related disease. Since 1941 nutrition labeling in the United States has reflected the current scientific knowledge on the relationship between diet and health. For example, the changes reflected in nutrition labeling regulations promulgated by the Food and Drug Administration (FDA) in 1973 required that both positive and negative aspects of the nutrient content of food appear on the label to emphasize the relationship between diet and health (Hutt, 1981). The Nutrition Facts box and the related nutrition information on the label continued this effort to encourage healthier food choices. To achieve this health goal, the 1993 version of nutrition labeling included a new tool—the percent Daily Value (% DV)—that enables consumers to rapidly and efficiently understand how a particular food fits in the context of a healthy diet (FDA, 1993a).

The science underlying the % DVs in the Nutrition Facts box in the United States and Canada is not the most current. As explained further in Chapter 2, in the United States the majority of the nutrient reference values are based on the 1968 Recommended Dietary Allowances (RDAs) (NRC, 1968); for the reference values for which there were no RDAs at the time, FDA developed Daily Reference Values, which were based on the then current scientific information on reduction in risk of chronic diseases (FDA, 1993c). The new Canadian label values are based on the 1983 Recommended Nutrient Intakes (RNIs) (Canada, 1983b). In the United States and Canada, the Institute of Medicine's (IOM) Dietary Reference Intakes (DRIs), which have replaced the former RDAs and RNIs as quantitative estimates of required nutrient intakes, were developed to be used as reference values for planning and assessing diets and for many other purposes, including serving as the basis for nutrition labeling (IOM, 1997). The DRIs include the RDA and three additional reference values—the Estimated Average Requirement, the Adequate Intake, and the Tolerable Upper Intake Level (UL)—that need to be considered when establishing the basis for reference values for nutrition labeling. To enable consumers to use the nutrition label in making informed dietary choices, the science underlying the Nutrition Facts box must be up-to-date. Thus the U.S. Department of Health and Human Services' FDA, the U.S. Department of Agriculture's Food Safety and Inspection Service, and Health Canada asked IOM to undertake a study of the use of the DRIs in nutrition labeling and fortification.

COMMITTEE CHARGE AND STUDY PROCESS

Committee Charge

Following the National Academies committee process, the Committee on Use of Dietary Reference Intakes in Nutrition Labeling was appointed. The committee was to assess the objectives, rationale, and recommendations for the methodology to select reference values for labeling the nutritive value of food based on the DRIs and for the discretionary fortification of food, including meat and poultry products. The committee was to identify general guiding principles for use in setting reference values for nutrients on the food label, recognizing that the approach may need to be modified for special situations or for physiological needs related to each nutrient. These modifications were to be outlined and their rationale described. As a result of identifying approaches to use the DRIs as the basis for food label reference values, the committee was to determine principles for discretionary fortification and the suitability of using reference values for the food label for discretionary nutrient additions. In its consideration of nutrition labeling reference values, the committee was to take into consideration:

- the development of food label reference values and discretionary fortification practices in the United States and Canada;
- the purpose of reference values on food labels, specifically that consumers are expected to use the reference values to compare different food products and to determine the relative contributions of a food product to an overall health-promoting diet;
- the scientific basis for principles to be used to guide the selection of values for different nutrients, possibly using examples from various classes of nutrients;
- whether the resulting reference value for nutrition labeling should be a single set of reference values or if different sets of values for various life stage and gender groups are needed; and
- how reference values should be expressed.

In its determination of principles for discretionary fortification, the committee was to consider the 1980 FDA fortification policy (21 C.F.R. 104.20) and, given the new DRI concept of ULs, whether the discretionary addition of nutrients to food when based on labeling reference values alone may have the potential to increase risk due to overconsumption. This was to be done with special attention to vulnerable population groups, such as children for whom the RDA

for adults meets or exceeds the UL for children (as is the case for vitamin A, zinc, niacin, and folate) or young women who may become pregnant (and thus have a lower UL for vitamin A). The committee was also to consider the extent to which the discretionary addition of nutrients to food when based on labeling reference values alone may have the potential to increase risk due to overconsumption. The committee was not to address the format of the Nutrition Facts box, labeling claims, or fortification practices other than in relation to discretionary fortification.

After its review of these items the committee was to produce a report that provided the rationale and recommendations for the selection of reference values for nutrition labeling based on the DRIs. The report was to include a description of the purpose of reference values in nutrition labeling and to identify guiding principles for the selection of reference values for different nutrients. Based on the development of the reference value approach for nutrition labeling, the committee was to provide guiding principles for the discretionary fortification of food, including meat and poultry products.

Study Process

The committee met six times between March 2002 and April 2003 to consider its scope of work, review scientific evidence, and develop its recommendations and guiding principles. At these meetings the committee focused its analysis on the history of nutrition labeling and fortification, current labeling and fortification policies, the existing DRIs, and the limited information on consumer use of nutrition labeling. It held two open workshops to gather information from invited experts, government scientists, representatives of the food industry, and related groups on issues related to the nutrition labeling of food and dietary supplements and discretionary fortification.

During the committee process the Canadian government issued several consultation documents on the development of new policies on food fortification (Health Canada, 2002) and published new regulations for food labeling (Canada, 2003). Also during this time IOM released a report on the DRIs for macronutrients (IOM, 2002a) and a report on using the DRIs in dietary planning (IOM, 2003). The committee included these documents in its deliberations. A report on DRIs for electrolytes and water was not sufficiently finalized to be included in the committee's deliberations. The committee was cognizant of the timing of its recommendations while

the DRI reports were continuing to be published, and it developed the principles in this report not only to reflect published DRI reference values, but also to provide guidance on approaches that can be used as the science base evolves and new DRIs are established. This report addresses the aspects of nutrition labeling of food and dietary supplements that are currently included in laws regarding nutrition labeling in the United States and Canada. The committee includes a discussion of dietary supplement labeling because the same scientific principles apply to the derivation of the DRIs for conventional food and for dietary supplements. Consideration of the discretionary fortification of food focused on the DRIs, with special attention to the ULs in regard to vulnerable population groups.

REPORT ORGANIZATION

The first four chapters in this report include the committee's task, overviews of nutrition labeling and fortification in the United States and Canada, and a brief review of the history and concepts of the DRIs. It is within this context that the committee undertook its task of providing guidance on the best approach to develop reference standards for nutrition labeling of conventional food and supplements and for discretionary fortification based on the DRIs. Chapters 5 through 8 present the committee's findings and recommended guiding principles, recommendations for data support and research, and supporting references. Appendix A provides brief biosketches of the committee members. Appendixes B and C, respectively, include illustrative examples of application of a population-weighted approach as discussed in Chapter 5 and reference tables. Appendix D provides the agendas of the two information-gathering workshops convened by the committee.