

[W2-2]

Establishing DRIs for carbohydrates in the US and Canada

Joanne R. Lupton, PhD
Texas A&M University College Station, TX, USA

The major findings in the macronutrient report for carbohydrates are: (1) the establishment of an RDA for carbohydrate of 130 g/day (for individuals 1 and over); (2) a recommendation that "added sugars" not be more than 25% of energy intake; (3) the establishment of an acceptable macronutrient distribution range (AMDR) for carbohydrate intake and (4) the decision not to have a UL based on glycemic index or glycemic load. This is the first time that there has been an RDA for carbohydrate and the basis for the RDA was the amount of glucose needed by the brain. The studies used to support the recommendation were measurements of arterial venous differences across the brain in humans. The AMDR for carbohydrates is 45-65% of Kcals. The high end was established because of concerns over hypertriglyceridemia and also that when carbohydrate intake is very high, fat or protein intake may be too low. The low end of the range was established based on the difficulty to meet the AI for fiber, and also concerns that if carbohydrate intake is too low, fat intake may be too high. The recommendation that "added sugars" not be more than 25% of total Kcals was based on dietary intake data comparing ranges of "added sugars" intake with intake of micronutrients. Results showed that at the 25% level of "added sugar" intake, there was a drop off in the intake of certain micronutrients. Glycemic index and glycemic response are discussed in some detail in the report. Although a number of studies show a potential relationship between glycemic load and the incidence of certain diseases (e.g. relative risk of type 2 diabetes) the committee noted that insufficient data currently exist to make a recommendation with respect to glycemic index, load or response.

The major findings for total fiber are: (1) a definition for fiber; (2) an AI for total fiber; and (3) no UL for total fiber. The definition is: Dietary fiber consists of nondigestible carbohydrates and lignin that are intrinsic and intact in plants. Functional fiber consists of isolated, nondigestible carbohydrates that have beneficial physiological effects in humans. Total fiber is the sum of dietary fiber and functional fiber. With dietary fiber, the plant cells and their three-dimensional interrelationship remain largely intact. Dietary fiber is only from plants, and dietary fiber sources contain other macronutrients. With functional fiber, it may be isolated, extracted or synthesized. It can be of animal origin and it has to show a beneficial physiological effect in humans.

The adequate intake (AI) was based on the total literature for fiber but specifically concentrating on the relationship of fiber intake to coronary heart disease. In particular, three prospective studies (the Health Professionals follow-up study; the Nurses' health study and the Finnish Men study) all show decreased relative risk of CHD with high fiber intake. Collectively, these studies showed that 14 g/1000 Kcals was in the protective range. These findings were then used to determine the AI for each age and both sexes based on energy intake data for the specific categories. No UL was set for dietary fiber as the available data did not support one. It was noted, however, that the potential exists for a UL for functional fibers, once it is established which fibers fit the functional fiber definition.