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Diet Quality of Americans in 2001-02 and 2007-08 as Measured by the Healthy Eating Index-2010

Nutrition Insight 51

The Healthy Eating Index-2010 (HEI-2010) is a tool designed to measure compliance with the key, diet-related recommendations of the 2010 *Dietary Guidelines for Americans* (U.S. Department of Agriculture and U.S. Department of Health and Human Services, 2010). The HEI-2010 has 12 components: Total Fruit; Whole Fruit (forms other than juice); Total Vegetables; Greens and Beans (dark-green vegetables and beans and peas); Whole Grains; Dairy (all milk products and soy beverages); Total Protein Foods; Seafood and Plant Proteins; Fatty Acids (ratio of poly- and monounsaturated fat to saturated fat); Refined Grains; Sodium; and Empty Calories (all calories from solid fats and added sugars plus calories from alcohol beyond a moderate level). For most components, higher intakes result in higher scores; however, for Refined Grains, Sodium, and Empty Calories, lower intake levels result in higher scores because lower intakes are more beneficial.

The HEI-2010 assesses dietary intakes on the basis of density rather than the absolute amounts of foods consumed; thus, the HEI-2010 assesses the quality of the mix of foods rather than the quantity. Details on the development of the HEI-2010, including its components and scoring system, are available elsewhere (Guenther, et al., 2013).

The purpose of this *Nutrition Insight* is to assess the diet quality of Americans, age 2 years and older, at two points in time, 2001-02 and 2007-08, using the HEI-2010. Scores can range from 0-5, 0-10, or 0-20, depending on the component, and the maximum total score is 100. To aid in interpretation, the component and total scores are presented both as an absolute number and as a percentage of the maximum possible score.

METHODS

HEI-2010 scores were estimated using 1 day of dietary intake data provided by 9,033 participants in the National Health and Nutrition Examination Survey, 2001-02, and 8,529 participants in 2007-08 (Centers for Disease Control and Prevention, National Center for Health Statistics, 2012). Children under the age of 2 years were excluded because the Dietary Guidelines for Americans do not specifically apply to them, and breast-fed and formula-fed children were excluded because food-group intake data for them are incomplete.

Intakes of energy, fatty acids, sodium, and alcohol were calculated using the Food and Nutrient Database for Dietary Studies, versions 1.0 and 4.1 (USDA Agricultural Research Service, Food Surveys Research Group, 2012a). Food group intakes for 2001-02 were calculated using the MyPyramid Equivalents Database, version 1.0 (USDA Agricultural Research Service, Food Surveys Research Group, 2012b) and the Center for Nutrition Policy and Promotion (CNPP) 2001-02 fruit database. Food group intakes for 2007-08 were calculated using the MyPyramid Equivalents Database, version 2.0, CNPP's addendum to that database (Koegel and Kuczynski, 2011), and the CNPP 2003-04 fruit database. Average daily, long-term ("usual") intakes of the various HEI-2010 components were estimated using the population ratio method; for example, for dietary components expressed relative to energy, the total amount of a dietary component consumed by the population was divided by the population's total energy intake (SUDAAN, version 9.0.1, RATIO procedure), and component and total scores were then calculated. Sampling weights that account for the survey sample design, nonresponse, and day of week were applied.

RESULTS

In both 2001-02 and 2007-08, HEI-2010 scores were below the maximum possible score for all components, except for Total Protein Foods (see table). In 2007-2008, scores for Greens and Beans, Whole Grains, Fatty Acids, Sodium, and Empty Calories were below 50 percent of their maximums. Scores for the remaining components were also substantially below their maximums (57 percent to 72 percent) in most cases.

The diet quality of Americans, as assessed by the HEI-2010, did not change between 2001-02 and 2007-08, with three exceptions. Scores declined for Sodium and increased for Whole Fruit and Empty Calories ($P < 0.05$). Thus, on a per calorie basis, mean intakes of sodium and whole fruit increased, whereas mean intake of empty calories decreased. (Further examination of the data indicated that absolute intake of empty calories decreased and absolute intake of whole fruit increased; however, the change in sodium density was due to a slight decrease in energy intake with no corresponding change in absolute sodium intake (data not shown)). No significant change was seen for the remaining HEI-2010 component scores or in the total score.

Table. Estimated mean Healthy Eating Index-2010 component and total scores, expressed as absolute scores and as a percent of the maximum, United States, 2001-02 and 2007-08¹

Component (maximum score)	2001-02 Score (CI) ²	2001-02 %	2007-08 Score (CI)	2007-08 %
Total Fruit (5)	3.1 (2.9,3.3)	62	3.2 (2.9,3.5)	64
Whole Fruit (5)	3.4 (3.2,3.7)	68	4.1* (3.7,4.6)	82
Total Vegetables (5)	3.2 (3.1,3.4)	64	3.3 (3.2,3.5)	66
Greens and Beans (5)	1.9 (1.7, 2.0)	38	1.9 (1.6,2.1)	38
Whole Grains (10)	2.1 (2.0,2.2)	21	2.0 (1.8,2.2)	20
Dairy (10)	6.3 (6.0,6.5)	63	6.1 (5.8,6.4)	61
Total Protein Foods (5)	5.0 (5.0,5.0)	100	5.0 (5.0,5.0)	100
Seafood and Plant Proteins (5)	3.4 (3.1,3.6)	68	3.6 (3.3,3.9)	72
Fatty Acids (10)	4.1 (3.9,4.3)	41	4.0 (3.8, 4.2)	40
Refined Grains (10)	5.7 (5.4,6.0)	57	5.7 (5.4,5.9)	57
Sodium (10)	5.1 (4.9,5.3)	51	4.3* (4.1,4.6)	43
Empty Calories (20)	8.6 (8.0,9.3)	43	10.2* (9.5,10.9)	51
Total Score (100)	51.9 (50.1,53.7)	52	53.5 (51.0,55.9)	53

¹ Excludes children under 2 years of age and breast-fed children.

² 95 percent confidence interval.

* Significantly different from 2001-02 (p<0.05).

CONCLUSIONS

The diet quality of Americans is far from optimal and, according to the HEI-2010 total score, did not improve overall between 2001-02 and 2007-08. HEI-2010 scores can be improved by increasing intake of fruits; vegetables, especially dark-green vegetables and peas and beans; and fat-free or low-fat milk; substituting whole-grain for refined-grain products and seafood for some meat and poultry; choosing more nutrient-dense forms of foods, that is, foods low in solid fats and free of added sugars; and reducing sodium intake. Such changes would provide substantial health benefits for Americans. Supporting these changes will require comprehensive approaches that engage every segment of society (i.e., individuals, families, schools, industry, government, and nongovernmental organizations) and reshape the environment so that the healthy choices become the easy, accessible, and desirable choices for everyone (U.S. Department of Agriculture and U.S. Department of Health and Human Services, 2010).

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