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# Diet Quality of Low-Income and Higher Income Americans in 2003-04 as Measured by the Healthy Eating Index-2005

## Nutrition Insight 42

The quality of diets consumed by Americans in 2003-04 was determined using the Healthy Eating Index-2005 (HEI-2005), a tool designed to measure diet quality in terms of compliance with the key, diet-related recommendations of the 2005 Dietary Guidelines for Americans (U.S. Department of Health and Human Services & U.S. Department of Agriculture, 2005). The HEI-2005 has 12 components: Total Fruit; Whole Fruit (forms other than juice); Total Vegetables; Dark Green and Orange Vegetables and Legumes (dry peas and beans)\*; Total Grains; Whole Grains; Milk (all milk products and soy beverages); Meat and Beans\* (meat, poultry, fish, eggs, soybean products other than beverages, nuts, and seeds); Oils (nonhydrogenated vegetable oils and oils in fish, nuts, and seeds); Saturated Fat; Sodium; and Calories from Solid Fats, Alcoholic beverages, and Added Sugars (SoFAAS).

For most components, higher intakes result in higher scores. Note, however, that for three components, Saturated Fat, Sodium, and Calories from SoFAAS, *lower* intake levels result in higher scores because lower intakes are more desirable. The HEI-2005 assesses dietary intakes on a per calorie basis rather than on the basis of absolute amounts of foods consumed; thus, the HEI-2005 assesses the quality of the relative proportions of foods consumed rather than the quantity of foods consumed (Guenther, Reedy, & Krebs-Smith, 2008; Guenther, Reedy, Krebs-Smith, & Reeve, 2008). This report provides HEI-2005 scores for the total U.S. population estimated from the National Health and Nutrition Examination Survey (NHANES), conducted in 2003-04.

### Methods

The HEI-2005 scores were estimated using 1 day of dietary intake data provided by 8,272 participants in NHANES 2003-04. Sampling weights that account for the survey sample design, nonresponse, and day of the week were used. For the total population (age 2 years and older), “low-income” was defined as having a family income of less than 130 percent of the Federal poverty level, the income criterion for food stamp eligibility. For children age 2 to 18 years old, “low-income” was defined as having a family income less than 185 percent of the Federal poverty level, consistent with eligibility for the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) and for free or reduced-price school meals.

\*Legumes are counted in the Meat and Beans component if a diet otherwise does not meet the Meat and Beans standard.

Long-term intakes of the various dietary components assessed by the HEI-2005 were estimated using the population ratio method; that is, the total amount of each dietary component consumed by the population was divided by the population’s total energy intake (SUDAAN, version 10.0, proc ratio procedure), and the HEI scores were then calculated. Differences in estimated scores between income levels were considered to be significant when the probability that the true scores were actually the same for both groups was less than .05.

### Results and Discussion

In 2003-04, HEI-2005 component scores for the U.S. population ages 2 and older were below the maximum possible score for every component, except for Total Grains and Meat and Beans; the total score was 57.5 out of a possible 100 (see table 1). Scores were particularly low (less than half the maximum score) for Dark Green and Orange Vegetables and Legumes, Whole Grains, Sodium, and Calories from SoFAAS.

Although the average HEI-2005 total scores of the low-income and higher income populations were not significantly different (56.5 and 57.8, respectively), important differences were found in several component scores. People in low-income families had significantly lower component scores for Total Vegetables, Dark Green and Orange Vegetables and Legumes, and Whole Grains than did higher income families. People in low-income families, compared with their counterparts, however, had a significantly higher component score for Sodium, which indicates lower intakes of sodium and, thus, greater compliance with the dietary guideline. However, HEI-2005 component scores at both income levels were below the maximum for all components except Total Grains and, for higher income people, Meat and Beans.

There also was no significant difference in total HEI-2005 scores for children ages 2 to 18 years old by family income level (56.4 for children in low-income families; 55.4 for children in higher income families). The only significant difference between children in the two groups was that low-income children had a higher score for Total Vegetables. This may reflect low-income children’s greater participation in the National School Lunch Program. However, for both income groups of children, HEI-2005 component scores were below their maximums for all components except Total Grains.

**Table 1. Estimated mean Healthy Eating Index-2005 total and component scores, all and low-income populations, United States, 2003-04**

Component (maximum score)	Age 2 and older All incomes (n=8,272) Score (CI) <sup>1</sup>	Age 2 and older Low income <sup>2</sup> (n=3,293) Score (CI)	Age 2 and older Higher income (n=4,979) Score (CI)	Age 2-18 years Low income <sup>3</sup> (n=2,148) Score (CI)	Age 2-18 years Higher income (n=1,405) Score (CI)
Total Fruit (5)	2.9 (2.6, 3.1)	2.9 (2.5, 3.2)	2.9 (2.5, 3.2)	3.3 (2.9, 3.7)	3.1 (2.8, 3.4)
Whole Fruit (5)	3.1 (2.8, 3.5)	2.8 (2.4, 3.2)	3.2 (2.8, 3.7)	2.7 (2.2, 3.2)	2.8 (2.3, 3.3)
Total Vegetables (5)	3.2 (3.2, 3.3)	3.0 (2.9, 3.2)*	3.3 (3.2, 3.4)*	2.5 (2.4, 2.6)*	2.2 (2.1, 2.4)*
Dark Green and Orange Vegetables and Legumes (5)	1.2 (1.1, 1.3)	1.0 (0.9, 1.1)*	1.2 (1.1, 1.4)*	0.6 (0.5, 0.8)	0.6 (0.4, 0.7)
Total Grains (5)	5.0 (5.0, 5.0)	5.0 (5.0, 5.0)	5.0 (5.0, 5.0)	5.0 (5.0, 5.0)	5.0 (5.0, 5.0)
Whole Grains (5)	0.9 (0.8, 1.0)	0.8 (0.7, 0.9)*	0.9 (0.9, 1.0)*	0.7 (0.6, 0.9)	0.7 (0.7, 0.8)
Milk (10)	6.2 (5.9, 6.6)	6.3 (5.9, 6.7)	6.2 (5.8, 6.7)	8.4 (7.8, 8.9)	8.5 (7.9, 9.1)
Meat and Beans (10)	10.0 (10.0, 10.0)	9.9 (9.4, 10.0)	10.0 (10.0, 10.0)	8.4 (7.8, 8.9)	8.1 (7.6, 8.7)
Oils (10)	7.3 (7.0, 7.6)	7.1 (6.6, 7.6)	7.4 (7.0, 7.8)	6.8 (6.2, 7.5)	6.8 (6.4, 7.1)
Saturated Fat (10)	5.9 (5.6, 6.1)	5.9 (5.5, 6.3)	5.8 (5.5, 6.1)	4.9 (4.2, 5.6)	5.6 (5.0, 6.1)
Sodium (10)	4.0 (3.8, 4.1)	4.4 (4.2, 4.7)*	3.8 (3.6, 4.0)*	4.6 (4.3, 4.9)	4.2 (3.9, 4.5)
Calories from Solid Fats, Alcoholic beverages, and Added Sugars (20)	7.8 (7.3, 8.4)	7.4 (6.6, 8.2)	8.0 (7.5, 8.5)	8.3 (7.5, 9.1)	7.8 (6.9, 8.7)
Total HEI-2005 score (100)	57.5 (56.0, 59.0)	56.5 (54.3, 58.8)	57.8 (56.2, 59.4)	56.4 (53.9, 58.9)	55.4 (52.6, 58.2)

<sup>1</sup>95% confidence interval.

<sup>2</sup>Household income <130% of the Federal poverty level.

<sup>3</sup>Household income <185% of the Federal poverty level.

\* Significant difference between income levels (p<0.05).

Source of data: National Health and Nutrition Examination Survey, 2003-04.

Detailed information on the quality of diets of the low-income population in 2001-02, including HEI-2005 scores, is available in three reports found at <http://www.fns.usda.gov/oane/menu/Published/recentreleases.htm>.

## Conclusions

All Americans, regardless of income level, could benefit from dietary improvement. To improve their HEI-2005 scores, Americans need to increase their intake of fruits, vegetables, whole grains, and fat-free or low-fat milk; choose more nutrient-dense forms of foods—that is, foods low in solid fats and free of added sugars; and lower their intake of sodium and saturated fats. Such changes would provide substantial health benefits for many Americans. Further research is needed to determine how other sociodemographic characteristics, such as age, gender, race/ethnicity, and education level, relate to diet quality.

## References

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