

Changing Dietary Habits and Improving the Healthiness of Diets in the United States

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Physicians like challenges, and it is time to embrace a difficult one. Lifestyle choices of poor diet, physical inactivity, sleep deprivation, and medication nonadherence



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have adverse health consequences; however, **clinical trials have demonstrated that when improved choices are introduced, patients have an opportunity to experience reversal of adverse consequences.**^{1,2} Although this knowledge has advanced clinical care, merely educating patients about the proven effectiveness of lifestyle changes is not enough to help patients change their behaviors. Physicians and other health care professionals must find the best way to translate research findings into actionable messages, help patients set achievable goals, monitor progress, and manage relapses. These are significant, challenging tasks to accomplish in an office visit, particularly for the fundamental lifestyle factor of diet.

Getting people to eat right is not a simple task. Physicians do not control the purse strings of choice. Even with the best education and intensive training, physicians struggle to influence the lifestyles of their patients and produce long-term change. Habits often change slowly, and rational discussions of the harm poor habits create may not be an effective motivator for long-term change.

In this issue of *JAMA*, Rehm and colleagues³ report on how well individuals in the United States follow the current recommendations of a healthy diet. The authors did not address caloric consumption, the key driver of obesity, but chose to focus on energy-adjusted mean consumption of food groups and the proportion of individuals in the United States meeting targets of the American Heart Association (AHA) diet.

The analysis was derived from 24-hour dietary recalls collected from a nationally representative sample of 33 932 US adults who participated in 1 of 7 National Health and Nutrition Examination Survey cycles from 1999-2012. The present analysis highlights 2 of the many strengths of this method.⁴ First, data can be mined to answer questions that had not been posed at the time of data collection. Second, using trained interviewers, data can be collected from all persons, even those who cannot read, write, or perform basic math.

Using a sophisticated scoring system to analyze dietary records, the analysis placed a numeric value of 1 to 10 for each of the 5 primary dietary metrics of the AHA 2020 Strategic Goals.⁵ One point in each category was assigned for consuming (1) 0.45 c/d of fruit and vegetables, (2) 0.3-oz equivalents/d of whole grains, (3) 0.1 oz/d of fish and shellfish, (4) 1 fl oz/d less

of sugar-sweetened beverages than the maximum daily allowance of 16 fl oz/d, and (5) 300 mg/d less of sodium than the maximum daily allowance of 4500 mg/d. The sum of the 5 scales (0-50 possible points) defined the relative healthiness of the diet.

Based on the AHA goals, the authors placed participants into 3 adherence categories: poor (<40% adherence; score of <20), intermediate (40%-79.9% adherence; score of 20-39.9), and ideal (\geq 80% adherence; score of \geq 40-50). Comparing data from 2003-2004 with data from 2011-2012, the authors report that the estimated percentage of US adults with poor diets declined from 56% to 46%; those with intermediate diets increased from 44% to 53%; and those with ideal diets remained relatively unchanged from 1% to 2%.

They delved further in their analyses of diet, including intake of 3 additional secondary dietary metric goals of AHA 2020 (nuts, seeds, and legumes; processed meat; and saturated fat) and examined how intake of numerous food groups varied among different demographic subgroups. Much of the data are presented in the online supplement for the article, and discussion in this Editorial will be limited to a few key points.

Before presenting these points, 2 important assumptions of this analysis should be noted. **The equal weighting of the 5 goals in the primary diet composite score creates several biases because some goals concern weekly and not daily intake.** For example, it would be nearly impossible for an individual to achieve an ideal diet score if he or she did not consume fish or shellfish during the 24-hour dietary intake that was recalled, yet the person might achieve the goal if a longer period of intake was recorded. To reduce this bias, the authors scored only data collected from 2003 onward, when 2 nonconsecutive 24-hour dietary intake recalls were collected from each participant. Second, whether each of the AHA metric targets confer equal health benefits cannot be determined because the goals were derived from the current dietary recommendations, which emphasize patterns of food intake rather than macronutrient composition.

The report card presented by Rehm and colleagues³ for improvements in the dietary intake for individuals in the United States shows that progress has been steady, but slow. Looking at the overall prevalence of poor diet from 2003 to 2011, both sexes showed significant reductions in adherence to a poor diet (women: 54% to 42% vs men: 58% to 49%). Despite robust and significant reductions in the numbers of non-Hispanic white adults consuming a poor diet (54% to 43%), the smaller reductions observed among

both non-Hispanic black adults (65% to 58%) and Mexican American adults (66% to 59%) did not reach statistical significance.

Stratifying subgroups by highest level of education achieved showed encouraging trends of improvements across all 4 categories of formal education, but still underscored that poor diets are more prevalent among those with lower levels of education. Improvements in prevalence of poor diet were 63% to 58% for those with less than a high school degree, 63% to 53% for those with a high school degree or equivalent, 57% to 47% for those with some college, and 42% to 33% for those with a college degree. As expected, stratifying subgroups by income showed significantly poorer scores among those with lower levels of income. Participants with incomes of more than 3 times the ratio of family income to the federal poverty level had reductions in having a poor diet from 51% to 36%. However, those with less than 1.3 times the ratio of family income to the federal poverty level had reductions in having a poor diet of only 68% to 61%.

The small improvements in diet can be primarily attributed to changes in 2 of the 5 AHA metric goals: reduction in consumption of sugar-sweetened beverages and increases in whole grains. A nearly 50% reduction in consumption of sugar-sweetened beverages (decrease of 0.49 servings/d or 4 fl oz/d) and a nearly doubling for consumption of whole grains (from 0.56 servings/d to 1.00 servings/d) was observed from 1999 to 2011. These changes likely represent simple substitutions in which a healthier dietary choice is directly substituted for an unhealthy one.

The lower consumption of sugar-sweetened beverages is consistent with increased consumption of bottled water (4.5 million gal/y to 10 billion gal/y).⁶ The higher consumption of whole grains is consistent with the availability of whole grain alternatives in bread, pasta, rice, tortillas, and cereals. The overwhelming changes in these 2 behaviors was striking and was observed in all subcategories of persons (across all races, both sexes, all levels of education, all levels of income, and nearly all ages). The fact that there have not been parallel positive changes in the decreased consumption of high-sodium foods and processed meat deserves further investigation.

The remaining AHA metric goal of increasing consumption of fruits and vegetables is a more difficult behavior to change because it requires more than a simple substitution within a food category. If an individual maintains caloric balance, eating more fruits and vegetables means that he or she will eat less of some other food category.

Two interesting observations by Rehm et al³ deserve highlighting. Although there was no significant change during the study period for total consumption of fruits and vegetables, consumption of whole fruit increased from 0.59 servings/d to 0.74 servings/d (1 serving is approximately 1 c of fresh fruit). What drove this behavior change? The increase in fruit consumption parallels the increasing availability of inex-

pensive, imported seasonal fresh fruit (eg, raspberries, blackberries, blueberries, mangoes, pears, pineapples, melons, bananas, and grapes) from more than 15 countries; there was an increase in fruit imports from \$3.7 billion in 2000 to \$7.9 billion in 2011.⁷ How much of the significantly higher consumption of whole fruit by non-Hispanic white and non-Hispanic black adults, among the more educated, and those with higher incomes can be attributed to greater availability is speculation and whether improved intake across all socioeconomic groups could be achieved with broader availability remains to be seen.

For intake of vegetables, the only increase in consumption was for red and orange vegetables, in which significant increases were observed among non-Hispanic white adults, both sexes, college graduates, those in the 2 higher levels of income, and those aged 50 years or older. Whether these changes can be attributed to fresh-cut technology (eg, ready-to-eat peeled and cut carrots⁸) is uncertain.

The article by Rehm and colleagues³ is important and rich with data. But a number of limitations should be noted. Without information regarding how these food changes translate into changes in total calories consumed, it is impossible to know whether these modest improvements in dietary habits translate into decreased total energy intake and improved energy balance over time, both of which would be important in addressing the current epidemic of overweight and obesity. Despite the changes in intake for the entire US population, the findings reported by Rehm et al highlight how barriers of race, low income, and poor education can reduce adherence to a healthy diet. Developing successful approaches to overcome these barriers will take cooperative efforts on the part of clinicians, policy makers, the food industry, and food distributors.

New approaches are emerging, and it will be exciting to track their progress. For instance, a retired executive from a food store chain is addressing food distribution⁹ by operating a store that sells nearly out of date or unwanted foodstuffs at prices affordable to individuals with low levels of income. A food science graduate student has created a cookbook of affordable and tasty dishes to meet a food budget of \$4/d.¹⁰ Some cities are incorporating fresh fruits and vegetables into their food bank offerings (eg, San Antonio, Texas, distributes fresh fruits and vegetables donated by local farmers and supplements this with produce grown on its own 5-acre farm).¹¹

Achieving dietary changes remains a challenging task. The advice of clinicians may not provide lasting effects unless patients can incorporate meaningful dietary changes into a daily sustainable pattern. How to best accomplish this task is the goal. The article by Rehm et al³ provides a current dietary report card to help with this task. Even though there has been some improvement from 1999 to 2012, clinicians, patients, and the food industry all need to work together to meet the challenge of improving the healthiness of the US diet.

ARTICLE INFORMATION

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