RESEARCH
Monograph

Update of the Healthy Eating Index: HEI-2015

Susan M. Krebs-Smith, PhD, MPH; TusaRebecca E. Pannucci, PhD, MPH, RD; Amy F. Subar, PhD, MPH, RD; Sharon I. Kirkpatrick, PhD, MHSc, RD; Jennifer L. Lerman, MPH, RD, LDN; Janet A. Tooze, PhD, MPH; Magdalena M. Wilson, MPH; Jill Reedy, PhD, MPH, RD

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ABSTRACT

The Healthy Eating Index (HEI) is a measure for assessing whether a set of foods aligns with the Dietary Guidelines for Americans (DGA). An updated HEI is released to correspond to each new edition of the DGA, and this article introduces the latest version, which reflects the 2015-2020 DGA. The HEI-2015 components are the same as in the HEI-2010, except Saturated Fat and Added Sugars replace Empty Calories, with the result being 13 components. The 2015-2020 DGA include explicit recommendations to limit intakes of both Added Sugars and Saturated Fats to <10% of energy. HEI-2015 does not account for excessive energy from alcohol within a separate component, but continues to account for all energy from alcohol within total energy (the denominator for most components). All other components remain the same as for HEI-2010, except for a change in the allocation of legumes. Previous versions of the HEI accounted for legumes in either the two vegetable or the two protein foods components, whereas HEI-2015 counts legumes toward all four components. Weighting approaches are similar to those of previous versions, and scoring standards were maintained, refined, or developed to increase consistency across components; better ensure face validity; follow precedent; cover a range of intakes; and, when applicable, ensure the DGA level corresponds to a score >7 out of 10. HEI-2015 component scores can be examined collectively using radar graphs to reveal a pattern of diet quality and summed to represent overall diet quality.
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THE HEALTHY EATING INDEX (HEI)* IS A MEASURE for assessing dietary quality, specifically the degree to which a set of foods aligns with the Dietary Guidelines for Americans (DGA).[1] Since the 2005 version, the HEI has been density-based (eg, amounts per 1,000 kcal) rather than absolute amounts and relies on a common set of standards that are applicable across individuals and settings.[2,3] The HEI yields a total score, indicative of overall dietary quality, and separate component scores that can be examined collectively to reveal a pattern of quality regarding multiple dietary dimensions. The reliance of the HEI on densities allows the index to be applied to the diets of individuals and to various settings in the food supply chain.

There have been close to 300 publications using the HEI to evaluate food intakes, availability, distribution, and marketing.[4]

*This article considers only the Healthy Eating Index-2005 version onward.

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The index has been used to examine both prospective and cross-sectional associations between diet quality and health outcomes, such as risk for cardiovascular disease mortality.[5] It has also been used to describe diet quality in the US population,[6] as well as among population subgroups such as Mexican Americans,[7] children,[8,9] cancer survivors,[10,11] and the moderating effects of race on food security.[12] The HEI has also been used to evaluate diet quality of different levels of the food environment, including the US food supply,[13] restaurant menus,[14] grocery store circulars,[15] and federal food distribution programs.[16]

The DGA are updated every 5 years, leading to changes in emphasis and quantification as the evidence on healthy eating evolves over time. Likewise, an updated HEI, reflective of those changes, is released to correspond to each new edition of the DGA. The purpose of this article is to introduce the HEI-2015, designed to reflect the 2015-2020 DGA. The process and guiding principles used to update this latest version are the same as were described for the HEI-2010.[2] Figure 1 outlines the key features of the HEI and these guiding principles. The process used to evaluate the HEI-2015 has been examined in a separate report.[17]

COMPONENTS

The components of the HEI-2015 are listed in Table 1, and their correspondence to the key recommendations in the

Feature	Rationale
Assesses diet quality with regard to recommendations of the Dietary Guidelines for Americans	The Dietary Guidelines for Americans are the evidence-based foundation for nutrition policy of the US government
Assesses diet—foods and beverages and nutrients from them—and not supplement intake	Is consistent with fundamental premise of Dietary Guidelines for Americans to meet nutrient needs primarily from foods and beverages
Captures balance among food groups, including foods to encourage and foods to reduce	Reflects Dietary Guidelines for Americans Considers gaps between intakes and recommendations
Uncouples dietary quality from quantity, employing a density-based approach	Indicates appropriate mix of, or balance among, food groups Enables application to various levels, including groups of people, environments, food supply
Employs a least restrictive approach to setting standards for maximum scores by using the recommendations that are easiest to achieve among those that vary by age and sex	Results in highest possible scores, with potential error in the same direction for everyone Because very high scores for many components are rare among the US population, the score is optimized for sensitivity to improvement
Requires no single food or commodity to be indispensable to a perfect score	Accommodates a variety of eating patterns, reflecting cultural, ethnic, traditional and personal preferences and tolerances and food costs and availability
Guiding principles for updates of the HEI	
Principle	**Rationale**
Focus on key recommendations of the Dietary Guidelines for Americans, making only changes to the index that have a strong rationale	Stability of the HEI should reflect consistency of recommendations over time Unsubstantiated changes in the HEI may imply emergence of new evidence that does not exist
Limit the number of components	Each component should assess a critical aspect of diet quality
Avoid an unduly complex algorithm	The index should be transparent and straightforward to explain and apply

Figure 1. Key features of the Healthy Eating Index (HEI) and guiding principles for the updates.

2015-2020 DGA is shown in Figure 2.[18] The list of components is the same as in the HEI-2010, except that Saturated Fat and Added Sugars replace Empty Calories, resulting in 13 instead of 12 components (see Table 2).

Added Sugars and Saturated Fats

Each previous version of the HEI included a component intended to evaluate the extent to which diets fall within the limited allowance for solid fats, alcohol and added sugars, termed Calories from Solid Fats, Alcohol and Added Sugars (SoFAAS), in 2005 and Empty Calories in 2010. This concept was also included in the latest iteration of the DGA, referred to as "remaining calories".[1] However, quantified limits for added sugars and saturated fats defined in the 2015-2020 DGA suggested including them as separate components in the HEI-2015. Also, because carbohydrates and lipids are digested, absorbed, and metabolized differently,[19] treating them separately is appropriate. In effect, the inclusion of separate components suggests these are distinct aspects of the diet to be tracked, and both conditions should be met to optimize the overall score. Alcohol is also unique from these other components metabolically. How it is accounted for in the HEI-2015 is addressed below.

The inclusion of separate components for Added Sugars and Saturated Fats reflects the explicit key recommendation, in each case, to limit intakes to <10% of energy. That recommendation for Added Sugars was new with the 2015-2020 DGA, but for Saturated Fats has been a part of the DGA since 1990[20-24] and was reiterated in the most recent edition.[1] Saturated Fats was a component of the HEI-2005; it was replaced in HEI-2010 by the Fatty Acids component to address the explicit recommendation in the 2010 DGA to limit saturated fatty acids by replacing them with monounsaturated and polyunsaturated fatty acids.[24] The Fatty Acids component is retained in HEI-2015 to capture the extent to which the substitution of healthier for less healthy fatty acids occurs. In addition, the Saturated Fats component is being reintroduced from HEI-2005 to compensate for the loss of solid fats as sources of empty calories. The decision