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Continuity, Considerations, and Future Directions for the Healthy Eating Index-Toddlers-2020 (HEI-Toddlers-2020)

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Abstract

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The *Dietary Guidelines for Americans, 2020–2025* includes guidance for infants and toddlers aged birth to 24 months (B-24). To assess alignment with this new guidance, the Healthy Eating Index (HEI)-Toddlers-2020 was developed for toddlers 12 through 23 months old. This monograph focuses on the continuity, considerations, and future directions of this new index for toddlers in the context of evolving dietary guidance. There is considerable continuity between the HEI-Toddlers-2020 and previous versions of the HEI. The same process, guiding principles, and features (with caveats) are repeated in the new index. However, there are unique considerations for measurement, analysis, and interpretation for the HEI-Toddlers-2020 that this paper addresses, while identifying future directions for the HEI-Toddlers-2020. The continued evolution of dietary guidance for infants, toddlers, and young children will provide additional opportunities for index-based metrics: considering inclusion of multidimensional layers in dietary patterns, defining a healthy eating trajectory, bridging healthy eating across different life stages, and communicating the constructs of balance among dietary constituents.

Keywords

Healthy Eating Index; diet quality; dietary intake; diet indices; dietary patterns

Introduction

The *Dietary Guidelines for Americans (DGA), 2020–2025* now includes guidance for infants and toddlers aged birth to 24 months (B-24).[1] The assessment of adherence to this new guidance is the next logical step for the field of nutrition, for, “if you cannot measure it, you cannot improve it.” (Lord Kelvin).[2] Thus, the new guidance for infants and toddlers sparked the need to assess adherence to the new 2020–2025 DGA, and the Healthy Eating Index (HEI)-Toddlers-2020 was born (pun intended). When something changes, there can exist trepidation about how what has come before will co-exist with what is new. However, readers should be heartened with the knowledge that despite some unique considerations for a new index to assess diet quality for toddlers 12 through 23 months, there is a great deal of continuity that will feel familiar. Other papers have detailed the development process and evaluation metrics for the new HEI-Toddlers-2020.[3,4] Future directions for dietary assessment among the entire B-24 population are described elsewhere.[5] This monograph focuses on the continuity, considerations, and future directions of the HEI-Toddlers in the context of evolving dietary guidance.

Continuity

Continuity of development partners—As with previous versions of the HEI, the index for toddlers was developed through a joint partnership between researchers at the U.S. Department of Health and Human Services (HHS), National Cancer Institute (NCI), and the US Department of Agriculture (USDA) Center for Nutrition Policy and Promotion (CNPP) as a measure of overall diet quality, independent of quantity, that can be used to assess alignment with the DGA. The guiding principles and features of the HEI that have been used in the past to develop and update the index were employed in the development of the HEI-Toddlers-2020 and update of the HEI-2020.[3,6]

Continuity of guiding principles—A core guiding principle is to focus on the key recommendations of the DGA with the intention to only make changes to the index that have a strong rationale (Figure 1). Although the stability of the HEI is reflected in the consistency of recommendations over time, the B-24 emphasis in the recent 2020–2025 DGA supports the development of a new index to address the unique issues for this age group. Other guiding principles, including limiting the number of components and avoiding an unduly complex algorithm, remain constant to ensure that each component reflects a critical aspect of diet quality, and the index is transparent and straightforward. With the development of the HEI-Toddlers-2020, one new principle was introduced: allow for bridging of HEI components - the index should be flexible to support examination of a healthy eating trajectory across the lifespan. Even with this new principle and the development of a new index for toddlers, continuity in the features between the HEIs remain similar.

Continuity of features with caveats—The features of previous HEIs underpin the development of the HEI-Toddlers-2020, reasserting the theme of continuity between versions of the HEI. The features themselves (Figure 2) also illustrate how the index is constrained, by design, but allows for flexibility and refinement as needed with the expectation of evolution.

The first feature is to assess diet quality based on the recommendations of the DGA. Starting with the HEI-2005,[7] the defined scope captures “what” to eat for the maintenance and promotion of good health. The HEI-Toddlers-2020 remains true to this feature and is built on USDA Dietary Patterns that describe “what” to eat; however, it also allows for future iterations that may include the multidimensional layers that may mediate “what” is eaten, such as “when” (meal timing, dynamism), “where” (home, school, car), “why” (hunger, boredom, social setting), “with whom” (alone, with family), and “how” (using/watching screens, around a dinner table).[5,8,9] The relevance of these other contextual attributes is apparent for toddlers learning how to eat. This period is a critical time for implementation of responsive feeding practices that can have positive effects on child health and development as evidenced by the inclusion of information about responsive feeding practices in the 2020–2025 DGA.[1] However, research is needed to understand the optimal sequence of introduction of complementary foods that promotes healthy eating habits beginning in infancy and supports complementary feeding that meets nutrient requirements and supports lifelong healthy dietary patterns.

The multidimensionality and dynamism expected for toddlers is equally important across the lifespan, although less emphasis has been placed here with previous versions of the guidelines and hence the HEI for those ages 2 and older. Further integration of multidimensional layers in dietary patterns research among toddlers may lead to similar integration of multidimensionality and dynamism across the lifespan in future editions of the DGA. Guidance from other countries including Canada[10] and Brazil[11] have also recognized that “healthy eating is more than the food you eat” and “diet is more than intake of nutrients,” respectively. For example, Brazil recognizes that the “modes of eating,” including eating with family, friends, or colleagues influence health and well-being.[11] Although emerging guidance related to the context of eating may lead to new metrics, this first iteration of the HEI-Toddlers includes the “what” only.

In line with the second feature, like the HEI-2020, the new HEI-Toddlers-2020 also focuses on foods and beverages, not supplement intake. However, for infants (younger than 12 months) the 2020–2025 DGA recommend supplemental vitamin D soon after birth (2020–2025 DGAs – p.56).[1] Specific recommendations for key age groups may influence the development or use of other indices that account for supplement intake. For example, the Total Nutrient Index was recently developed and allows researchers to assess nutrient intakes from food, beverages and dietary supplements for adults.[12]

The third feature focuses on balance among food groups, including foods to encourage and foods to reduce. Defining that balance may continue to evolve to ensure optimal communication around core tenets of healthy eating. The HEI has always included constructs of adequacy (foods to encourage) and moderation (foods to reduce), but for B-24 this requires more nuance. For example, the current DGA defined a limit of less than 10% of energy from saturated fats for children and adults ages 2 and older, making Saturated Fats a moderation component. However, for infants and toddlers under 2 years, guidance does not restrict saturated fat, in part, to ensure adequate total fat intake. For B-24, saturated fats do not fit the traditional definition of a moderation component with a defined limit, yet to achieve the balance of the dietary patterns, no complementary food or dietary component can be limitless.[3] More research is needed to understand how best to understand the interplay among constructs such as adequacy and moderation in the context of toddlers' diets.

The fourth feature of the HEI highlights the use of a density approach which enables the index to be applied to different food environments and across various levels of the food system. With the development of a metric tailored to guidance for the unique developmental needs for a subset of the population, there is an inherent tension with the HEI's feature to allow for the application of a common metric. However, the density approach can be flexible if the research question is clear; an index can be tailored to specific and unique dietary recommendations, and can be applied to questions regarding the efficiency, sustainability, and resiliency of food systems.

The fifth feature to use the least restrictive approach to set standards for the maximum scores draws on a wide range of calories in the dietary patterns across sex and age groups. The HEI-Toddlers-2020 examines a narrower range of calories to inform a new index for a single year in the lifespan; a similar examination could be employed for other age groups or categorizations across the lifespan, if it were supported by the evidence.

The sixth and last feature notes the HEI-Toddlers-2020 requires no single food or commodity to be indispensable to a perfect score. It recognizes that there are many ways to eat a healthy diet of complementary foods. This allows for a variety of eating patterns, reflecting cultural, ethnic, traditional, and personal preferences, tolerances, food costs, and availability. The existing food grouping system employed in the framework of the USDA Dietary Patterns reflects the key tenants of a healthy dietary pattern, and indeed, there is general consistency across countries for some food groupings.[13] Additionally, there is a renewed commitment to apply a health equity lens to ensure inclusivity and cultural relevance throughout the guidance process.[14]

Continuity of components—The scoring standards for the HEI-Toddlers-2020 are based on the same 13 components that are used in the HEI-2020 for ages 2 and older. These components address constructs of adequacy and moderation and include Total Fruits, Whole Fruits, Total Vegetables, Greens and Beans, Whole Grains, Dairy, Total Protein Foods, Seafood and Plant Proteins, Fatty Acids, Refined Grains, Sodium, Added Sugars, and Saturated Fats. This continuity was intentional and allows for bridging between the HEI-Toddlers-2020 and HEI-2020 for ages 2 and older. If these two indices are used in conjunction, the design is flexible enough to measure healthy eating trajectories across the lifespan, reinforcing the lifespan perspective seen in the 2020–2025 DGA and 2020–2030 Strategic Plan for NIH Nutrition Research.[1,8] Details of the scoring standards for each component can be found in the HEI-Toddlers-2020 development paper.[3]

Considerations

Data collection—The HEI-Toddlers-2020 presents unique considerations for measurement, analysis, and interpretation. These considerations are layered on top of an already well-documented literature surrounding the challenges associated with dietary assessment.[15] For example, the data used to create the dietary patterns for toddlers comes from the What We Eat in America dietary interview component[16] of the National Health and Nutrition Examination Survey (NHANES).[17] Each food and beverage reported corresponds to foods and beverages in the USDA's Food and Nutrient Database for Dietary Studies (FNDDS).[18] The FNDDS food codes link to the USDA's Food Patterns Equivalents Database (FPED) that disaggregates each food code into ounce-equivalents (oz.-eq), cup equivalents (c-eq), teaspoon equivalents (tsp-eq), or grams of 37 distinct food pattern components used to model the DGA food pattern recommendations.[19] Dietary data is captured through two 24-hour recalls. The act of remembering foods consumed the previous day is challenging, but it can be more so when reporting for a toddler, as toddlers are often cared for by multiple proxy reporters throughout the day. Proxy reporters may include a "distant reporter", such that they are reporting intake for meals they were not present for and may struggle with accurate reporting. Additional research is needed to understand the measurement error related to layers of proxy reporting for this group.

Beyond reporting "what" is consumed, reporting "how much" is consumed can also be problematic. Portion size estimation for this age group is particularly difficult because of the small amounts of foods and beverages consumed by toddlers, as well as the factors associated with estimating actual consumption after quantifying leftovers found in places other than the plate (e.g., floor, hair, dog's mouth). Novel technologies, such as image capture, 3D food volume estimation,[20–22] and machine learning for food identification[23] may reduce error associated with dietary assessment and could potentially be applied to the assessment of toddler meals and other subpopulations of interest though the cost of these technologies remain high and respondent burden, particularly as it relates to proxy reporters still exists. Additional considerations and future directions for toddler dietary assessment is covered in a related commentary paper on B-24 dietary assessment.[5]

It is also important to acknowledge that NHANES dietary recalls are linked to food composition databases (noted above) generally intended for population surveillance of

average dietary intakes. New products and product reformulations are introduced to the market almost daily and it is unrealistic to expect national nutrition surveillance systems to keep pace with this change;[24,25] there is potential that nutrition policies, programs, and metrics are based on dated nutrient information.

Although the 2020–2025 DGA included dietary patterns for the second year of life, a dietary pattern could not be established for infants younger than 12 months. Part of the challenge is the consumption of human milk and the inadequate tools and databases available to measure the consumption amount of this important first food and describe its nutrient composition.[26] Efforts are underway to better understand how to assess the nutrient composition of human milk.[27–29] It deserves restating that the HEI-Toddlers-2020 is flexible for use among toddlers 12 through 23 months who are also consuming human milk and/or infant formula because the index is density-based, and a healthy dietary pattern should include a similar combination of nutrient-dense complementary foods and beverages whether human milk and/or infant formula is being consumed. However, additional consideration should be given for potential inferences regarding differences in component scores between subgroups, if the HEI-Toddler-2020 is being applied to a population with both consumers and non-consumers of human milk and/or infant formula as these calories and other dietary components may not be accounted for in the index.

Data Analysis—As previously mentioned, analyses to inform the 2020–2025 DGA and the evaluation of the HEI-Toddlers-2020 used data from NHANES.[4] As the sentinel source for national nutrition surveillance data in the U.S., NHANES is a rich and unmatched resource for the study of the B-24 subgroup. It is not without limitations that have been well-documented especially for this age group.[15,30]

Additional considerations were encountered during the development and evaluation of the HEI-Toddlers-2020. For example, in keeping with the principle that dietary guidelines are intended to be met over time rather than a single day,[31] usual intake estimates were used to guide the development and evaluation of the HEI-Toddlers-2020. Given the dramatic changes that occur in dietary patterns over a relatively short period of time (12 through 23 months), there is some uncertainty around whether “usual intake” is an applicable concept for toddlers. Additional methodological work is needed to examine this further.

The variables used in modelling also reflect the recognition there are rapid changes not only in dietary patterns, but also in body size and that these changes may not be linear. To allow for this flexibility, age was modeled as a cubic spline in initial evaluations of the index. An addition was the inclusion of weight-for-age-Z-score to account for differences in intake related to a toddler’s relative body size. These responsive accommodations to model specification underscore the continued evolution of the HEI and leave open the possibility of future refinements.

Data Use and Interpretation—The HEI-Toddlers-2020 is recommended for use with toddlers ages 12 through 23 months. However, in recognition that study groups may include this subgroup as part of larger age range (i.e., children 1–5 years), some guidance is provided to assist users in making decisions about the acceptable use of the HEI-

Toddlers-2020. First and foremost, the HEI is appropriate for the assessment of diet quality among populations where USDA Dietary Patterns exist. For this reason, it is not advised to use the HEI-Toddlers-2020 to assess dietary quality in those younger than 12 months, e.g., 6 through 11 months.[3] Conceptually it is possible to imagine an older infant, say 10 months old, who is consuming complementary foods and might have a varied diet that could be assessed with the index. However, the 2020–2025 DGA did not establish dietary patterns for infants younger than 12 months. There are also challenges with determining appropriate energy needs. Finally, cow's milk is not recommended or needed for infants under 12 months of age and thus the Dairy component score would not be applicable in this age group.

Generally, the HEI-Toddlers-2020 should be used for 12 through 23-month-old toddlers and the HEI-2020 should be used for ages 2 and older. However, a population may cross the boundary between the HEI-Toddlers-2020 and HEI-2020 and researchers may be faced with a decision based on what aspects of the HEI are most relevant to their study questions. Researchers in this situation could select the index most suited to address their question when estimating scores separately for toddlers 12 through 23 months and children aged 2 and older is not feasible (e.g., due to small sample size). In this example, using the same index allows comparison of all children within the group to each other, as they are all on the same scale. In these instances, it would be critical to note the components where the index deviates from guidance and caveat interpretations and comparisons to other studies and subgroups that use a different index.

Future Directions for HEI-Toddlers-2020

Bridging Between HEI-2020 and HEI-Toddlers-2020—In previous versions of the HEI, the concept of "bridging" has been negligible because dietary guidance is the same for all individuals aged 2 and older, scaled to a different amount based on age and sex categories, and physical activity level. However, with the latest version of the DGA (2020–2025), a boundary was created at 2-years-old, with differences in guidance depending on which side an individual falls relative to an (arguably) arbitrary point, around a transition process that is likely a continuum. This is the first time there have been two HEIs released, and additional considerations are needed to examine how the scores function across this transition time and what this means for nutrition surveillance. For some components there is consistency in how guidance is operationalized for the two indices and thus the questions related to bridging seem less consequential. However, for five components—Added Sugars, Sodium, Saturated Fats, Whole Grains, and Refined Grains–tension exists at the junction of the two indices, examples for Added Sugars and Saturated Fats are discussed below; for a detailed discussion please see accompanying articles on the development process and evaluation metrics for the new HEI-Toddlers-2020 [3,4].

The component Added Sugars illustrates this tension. Prior to age 2, the 2020–2025 DGA recommends that infants and toddlers "avoid foods and beverages with added sugars".[1] Panel (a) of Figure 3 shows HEI scores for toddlers aged 12 through 23 months; the solid line represents the component scores for the HEI-Toddlers-2020 and the dashed line shows component scores for the HEI-2020. In the radar plot, the outer edge of the radar represents

100% of the maximum score for that component. The center represents 0% of the maximum score for any component.[32] For the component Added Sugars, the score is lower for the HEI-Toddlers-2020 (44%) compared to HEI-2020 (89%) because the same diet, scored with the index for ages 2 and older allows for a small amount of added sugars, compared to a goal of no added sugars for toddlers.

Saturated Fats demonstrate this same tension, but the effect impacts scores in the opposite direction compared to Added Sugars. Prior to age 2, saturated fat intake is not directly limited, i.e., the current DGA acknowledges there is not room for unlimited saturated fat within these calorie ranges, but also does not imply that fat should be restricted in this age group, given fat is necessary for growth and brain development. Therefore, the component score Saturated Fats is higher for the HEI-Toddlers-2020 (72%) compared to HEI-2020 (35%) for the same diet: the index for ages 2 and older penalizes the score for exceeding the recommended limit of 10% total energy from saturated fats. Future research may clarify lower and upper bounds for Saturated Fats, focus further on the quality of fats, and/or provide context for age or developmental points relevant to fat that could thus lead to changes and refinements of the HEI-Toddlers-2020.

By design there is non-congruence between the two indices because guidance is different, but conceptually the indices are true to their respective dietary guidance. The individual component scores may show larger point differences than the total score when bridging from the HEI-Toddlers-2020 to HEI-2020, but again this reflects the dietary guidance they assess.

Additionally, it should be noted that 1 point on the HEI-Toddlers-2020 is not equivalent to 1 point on the HEI-2020. For example, 1 point of the Added Sugars component is the equivalent of 2% of total energy from added sugars (when intake is within the minimum-maximum standard range) in the HEI-2020, but only 1.3% of total energy from added sugars utilizing the HEI-Toddler-2020. This mathematical difference is expected because there is less capacity for expendable energy in the toddler diet, and the HEI-Toddlers-2020 is stricter about allotting points in this category. Alternatively, 5% of total energy from added sugars for an older child or an adult can be accommodated because of the higher range of total energy intake. However, that same 5% of total energy from added sugars in a toddler diet would likely displace energy from other necessary components because the total energy intake range for toddlers is so much smaller.

Multi-dimensional eating environments—As previously mentioned, the dietary intake of infants and toddlers is heavily influenced by how they are fed and the contextual attributes of eating. The inclusion of infants from birth through 11 months in dietary guidance may warrant further expansion from the focus on what to eat, to a framework that incorporates the multi-dimensional layers of eating (how much, with whom, where etc.). Inclusion of the multi-dimensional eating environment for infants could reasonably be expanded to toddlers, as both age groups are actively learning what and how to eat. This could also lead to further discussion regarding inclusion of new and different components in the HEI or pairing with other indices or metrics.

The multi-dimensionality of eating environments expands beyond the individual to include issues of food and nutrition security and food sustainability. The 2015 Dietary Guidelines Advisory Committee defined a sustainable diet as “a pattern of eating that promotes health and well-being and provides food security to the present population while sustaining human and natural resources for future generations”.[33] The evidence base that links food sustainability, and food security is growing.[34–36] Dietary guidance from other countries highlights the heightened need for metrics that may assess and link the relevance of dietary patterns and sustainability across the food system because “food choices have an impact on the environment”[10] and there is an “interdependence between healthy diets and the social and environmental sustainability of the food system”.[11]

Measuring diet across the lifespan—The lifespan framing of the new 2020–2025 DGA adds a fluidity to the HEI that was muted in previous iterations. The acknowledgement that earlier life stages influence later life stages is a welcome addition. However, the 2020–2025 DGA creates an implied boundary at 2-years-old. This is because previous DGA’s did not include recommended dietary patterns for younger individuals, and because of the differences in guidance around this boundary as dietary patterns are initiated and transitioned. Future iterations of the guidelines may have to wrestle with the additional implied boundaries around 6 months and 12 months. Although the lifespan approach theoretically positions age on a continuum, dietary guidelines are still determined for discrete age categories that can be studied in isolation, separating B-24 from other young children. This naturally raises questions around other boundary points, particularly at what age or cut point guidance differs. The scientific evidence base may continue to evolve and lead to further refinement for tailored recommendations within the B-24 age group, across the lifespan, and to other potential age groupings based on developmental milestones and other concepts about health over time.

Conclusions

Ultimately, the development of the HEI-Toddlers-2020 answers the call by the 2020 Dietary Guidelines Advisory Committee to “Develop a dietary pattern scoring system, such as the Healthy Eating Index (HEI), for infants and children from birth to age 24 months, considering findings from this report and future dietary guidance.”[37] Dietary guidance evolves and the index used to measure adherence should evolve with it. The HEI has a long and robust history of evolving to align with the state of the science. The development of the HEI-Toddlers-2020 is a clear example of this fact. In the future, opportunities for evolution include constructing models that include the varying multidimensional layers in dietary patterns, defining a healthy eating trajectory, bridging healthy eating across different life stages, and communicating the constructs of balance among dietary constituents. In anticipation of the evolving evidence base for dietary guidance across the lifespan, the discussions above illustrate the robustness and future opportunities for the evolution of index-based metrics.

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Research Snapshot

Research Question:

What considerations shaped the new Healthy Eating Index (HEI)-Toddlers-2020? What opportunities does the future hold for the evolution of the HEI-Toddlers-2020?

Key Findings:

Continuity between previous versions of the HEI and the new HEI-Toddlers-2020 anchored the development of the new index. Considerations unique to measurement, analysis, and interpretation for dietary patterns in toddlers spurred the development of the HEI-Toddlers-2020 and have identified future opportunities for evolution of index-based metrics.

Guiding principles for updates of the HEI	Rationale	Strengths	Considerations
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	Allows for continuity	How do we prepare for and anticipate necessary changes and evolution?
Limit the number of components	Each component should assess a critical aspect of diet quality	Allows for relatively simple, manageable index	What are differential considerations as the underlying constructs currently used to conceptualize total diet may evolve?
Avoid an unduly complex algorithm	The index should be transparent and straightforward to explain and apply	Allows for a standardized and relatively simple, manageable index	How might new modeling address known limitations (such as truncation, empirical models for specific health outcomes, etc.)?
Allow for bridging of components[a]	The index should be flexible to support examination of a healthy eating trajectory across the lifespan[1]	Allows for alignment with guidance across the lifespan	How does science best guide an (arguably) arbitrary point (2-years-old), around a transition process that is likely a continuum? What additional considerations, for example, interrelationships among dietary patterns, eating transitions and trajectories, growth and development, are needed to examine how the scores function among toddlers and young children? Is this the most appropriate (or only?) boundary to consider for the HEI or are there other lifestages that warrant additional considerations?

Figure 1. Strengths and Considerations of the Guiding Principles of the Healthy Eating Index (HEI)

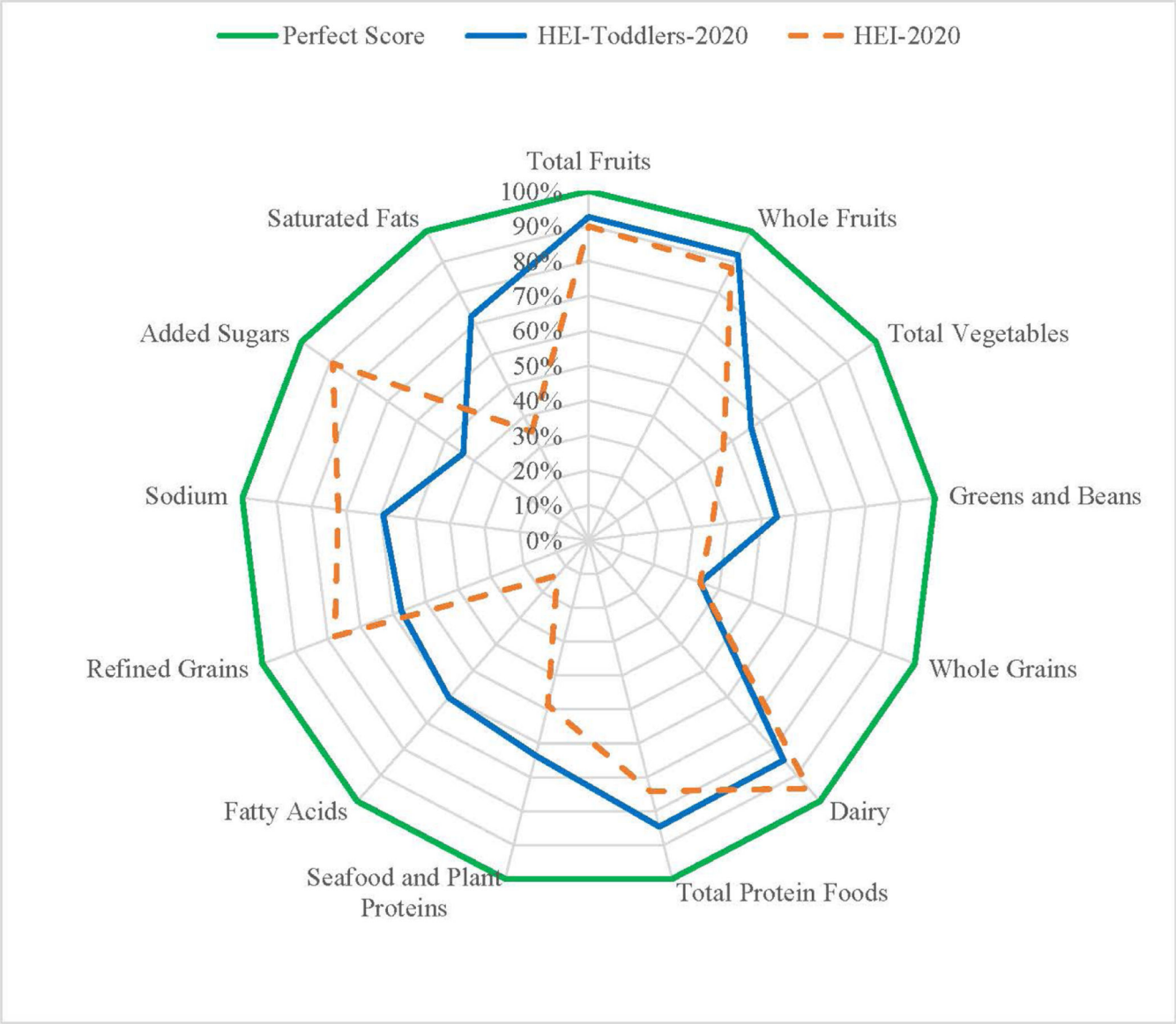
[a] Added to align with *Dietary Guidelines for Americans, 2020–2025*

Feature	Rationale	Strengths	Considerations
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	Allows for defined scope and purpose for HEI	How to best integrate multidimensionality and dynamism: • for the different contextual layers • across the levels of food system • at different life stages and across the life course?
Assesses diet—foods and beverages, and select nutrients—and not supplement intake For 12 through 23 months, diet refers to complementary foods and beverages (it does not include human milk or formulas). [a]	Is consistent with fundamental premise of Dietary Guidelines for Americans to meet nutrient needs primarily from foods and beverages For 12 through 23 months, this guidance refers to a healthy dietary pattern of age-appropriate foods and beverages that is intended for toddlers who no longer consume human milk or infant formula. However, because the index is density based and a healthy dietary pattern should include a similar combination of nutrient-dense complementary foods and beverages it can be applied even if toddlers are also consuming human milk or infant formula [1]	Focuses on actionable food-based guidance	How to incorporate additional nutrient-specific recommendations for specific life stages (birth to 12 months and vitamin D)?
Captures balance among food groups, including foods to encourage and foods to reduce and/or moderate	Reflects *Dietary Guidelines for Americans* Considers gaps between intakes and recommendations	Emphasizes balance and aligns with common recommendations related to “eat more” of this, “eat less” of that	How to include dietary constituents with nuanced and varying roles at specific life stages and across life course (for example, saturated fats)?
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	Applies to any mix of foods and allows for comparability across levels of the food supply	How can a metric be optimally designed for application across the food system?
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	Allows for standardized application and comparability across studies, populations, and age groups	How to acknowledge varying needs at specific life stages/across lifespan?
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	Allows for multiple ways to eat a healthy diet	How might underlying assumptions about existing guidance-based food groups and dietary components bias how we model sufficiency and excess, and communicate balance among food groups [see feature above]?

Figure 2. Strengths and Considerations of the Features of the Healthy Eating Index (HEI)

[a] Added to align with *Dietary Guidelines for Americans, 2020–2025*

(a) Scores for Toddlers 12 through 23 Months Old



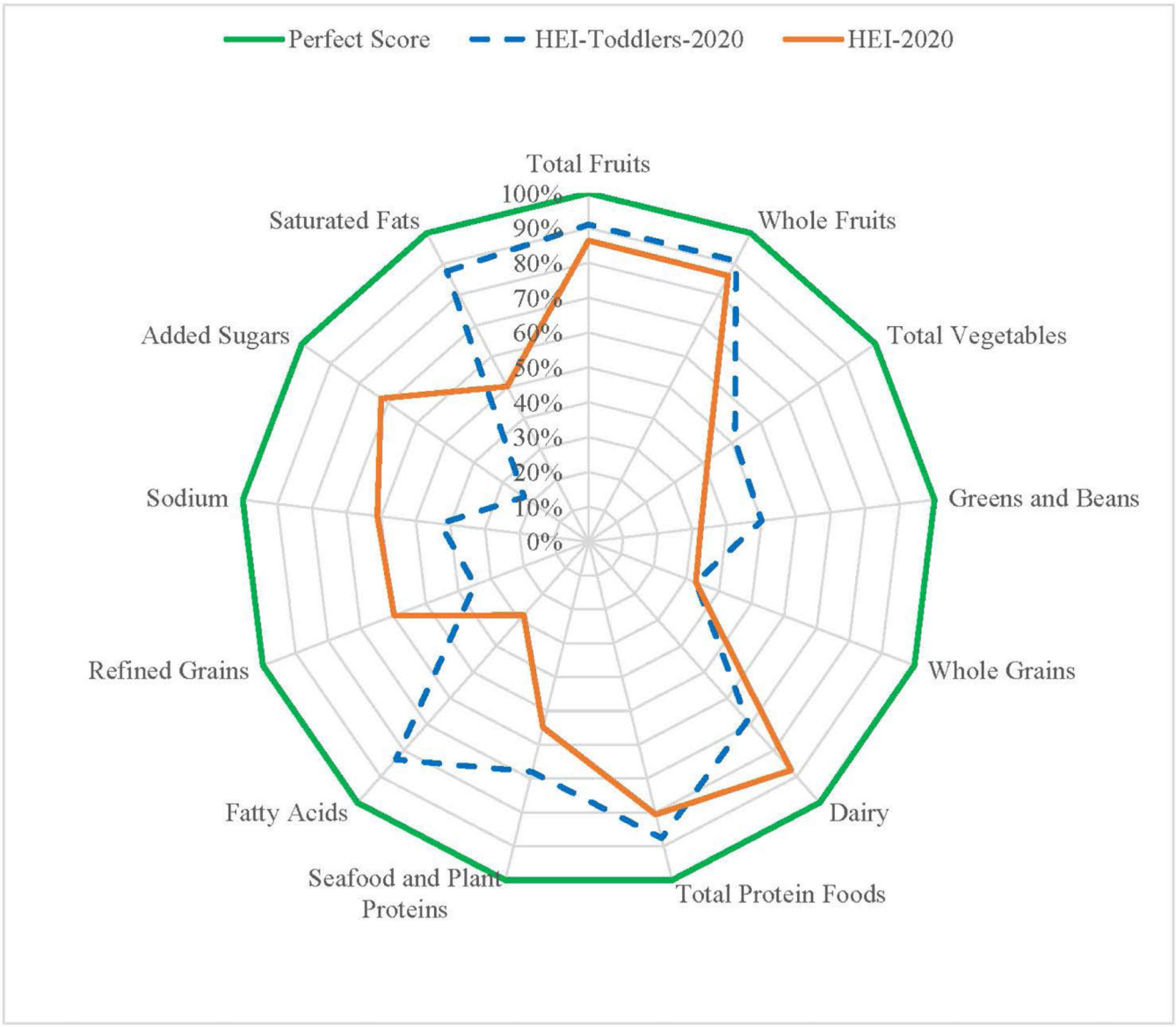


Figure 3.

Differences in Healthy Eating Index (HEI) radar plots by index used, NHANES 2011–2018. (a) HEI Scores of Toddlers 12 through 23 months old, scored with the HEI-Toddlers-2020 index and HEI-2020 index; (b) Children 24 through 59 months old scored with the HEI-Toddlers-2020 index and HEI-2020 index. On the radar plots, each component score is plotted as a percentage of its maximum points on 13 different axes for HEI-Toddlers-2020 and HEI-2020. The outer edge of the "wheel" (or end of the "spoke") represents 100% of the maximum score for that component; the center represents 0% of the maximum score for any component. Additional information on HEI visualization and radar plots can be found on the NCI website: https://epi.grants.cancer.gov/hei/interpret-visualize-hei-scores.html

Total Scores out of 100 points for (a) Toddlers 12 through 23 months: HEI-Toddlers-2020= 63.4 points; HEI-2020 = 60.9 points; and (b) Children 24 through 59 months old: HEI-2020 = 58.3 points; HEI-Toddlers-2020= 59.2 points.