

Evidence-Based Recommendations and Best Practices for Promoting Healthy Eating Behaviors in Children 2 to 8 Years

Guidelines for Researchers and Practitioners

Healthy
Eating
Research

Executive Summary | October 2021



Overview

Dietary recommendations are available about *what* to feed children ages 2 to 8 for optimal health, but relatively little guidance exists about *how* to feed those children. Because of the discrepancy between young children's recommended and actual dietary intakes, there is a clear need for such guidance. To address this gap, Healthy Eating Research convened a national panel of experts to develop evidence-based best practices and recommendations for promoting healthy nutrition and feeding patterns among children 2 to 8 years of age. This document presents the panel's recommendations for *how* to promote food acceptance and healthy appetites and growth among 2- to 8-year-olds, summarizes the supporting evidence, and identifies implementation considerations. For the full review of evidence and additional details, [*see the technical report*](#).

Introduction

Establishing healthy eating behaviors early in life is an important health promotion goal with long-lasting impacts. Childhood is a critical period for the development of eating behaviors and habits that last into adulthood and play a vital role in growth, development, overall health, and the prevention of obesity and other lifelong, diet-related chronic diseases.¹

Existing Guidance and Evidence Gaps

Eating behaviors are shaped by biological predispositions for taste preferences and learning in the diverse environments in which eating occurs.^{2,3} Although basic tastes (i.e., sweet, salty, sour, bitter, umami) are biologically determined, preferences for foods are learned and acquired through experiences shaped by caregiving.⁴⁻⁶ The home is the first fundamental eating environment in which a child's eating habits emerge. Children's early experiences with food are also shaped by interactions outside the home, such as those with other caregivers, in early care and education settings and eventually in school and after-school settings. All people who routinely care for and feed children play an important role in shaping their food preferences and eating behaviors.

The current dietary patterns of U.S. children, aged 2 to 8, do not align with the recommendations put forth in the 2020-2025 Dietary Guidelines for Americans (DGA).⁷ The DGAs are revised every five years and provide evidence-based recommendations about what foods and beverages to consume, and in what amounts, to promote health, prevent disease, and meet nutrient needs across the lifespan. While the DGAs focus on what foods and beverages should be eaten for optimal health, they have not provided science-based advice or detailed recommendations for *how* to feed children. Guidance on both *what* and *how* to feed children is needed for the development of healthy eating behaviors, food acceptance, and achieving a healthy weight.

Healthy Eating Research Report

To address this critical information gap, Healthy Eating Research convened a national panel of experts in 2020 to develop evidence-based best practices and recommendations for promoting healthy nutrition and feeding patterns among typically developing children 2 to 8 years of age. The 15 panel members represented diverse expertise in nutrition, pediatrics, psychology, child development, family medicine, and sociology. The panel reviewed findings from meta-analyses and narrative and systematic reviews published over the last decade, as well as individual research articles on special topics (e.g., diversity, equity, and inclusion; childcare and school-based interventions; parenting interventions). An expert-led consensus process was then used to develop recommendations for promoting healthy eating behaviors in 2- to 8-year-old children. The panel aimed to develop guidelines that take into consideration budgets, culture, and personal preferences.

This summary highlights the evidence reviewed in developing the recommendations, presents the recommendations on promoting acceptance of healthy foods and appetites to support healthy growth and weight in 2- to 8-year-old children, and identifies key information that can benefit health and childcare professionals working with families of children ages 2 to 8.

Caregivers' Role in Influencing Children's Eating Behaviors

Children's eating behaviors are influenced by factors at multiple levels, including the individual (e.g., child's biology, taste preferences, temperament), family (e.g., eating habits of parents and siblings, food available in the home, cultural backgrounds, food parenting practices), community (e.g., foods offered and meal practices in child care and school settings), and broader social context (e.g., income, culture, healthy food availability in the community, food and beverage marketing, policies).^{8,9} The evidence presented in the technical report primarily focuses on the caregivers' role in influencing children's eating behaviors in these multiple levels.

Family systems shape the dynamics of who is involved in caregiving of the child (e.g., spouse, grandparents) and the complexities of those interpersonal relationships and intergenerational differences. Financial security, and more specifically, available time and money, influence family systems including overall caregiving, foods available in the home, and food parenting practices. The styles and practices that parents and caregivers use to feed children reflect culture, values, attitudes, and beliefs related to child rearing that are shaped by parent and family characteristics, socio-cultural and economic factors, as well as the parent's perceptions of the child's behavior, body size and ideals for body size, health, and development. The manner in which caregivers determine the types and amounts of foods provided, how they model eating behaviors, and how they

guide children's eating is generally conceptualized as occurring through parenting styles, feeding styles, and food parenting practices, as defined below.

- **Parenting Styles:** A constellation of parental attitudes and beliefs toward child rearing, which create an emotional climate through which parental practices are expressed.¹⁰
- **Feeding Styles:** The broad approach that parents take to feed children, and the emotional climate in which feeding occurs.¹¹
- **Food Parenting Practices:** Specific goal-directed parent actions or behaviors designed to influence children's eating behaviors.¹²

Food parenting practices are thought to be relatively more amenable to change than parenting styles and therefore are often targets of interventions to improved children's eating habits. Food parenting practices are broadly described in three dimensions:

- **Structure:**¹³ The organization of a child's environment to facilitate children's competence to engage in healthy behaviors and avoid unhealthy behaviors, including creating meal- and snack-time routines, and providing consistency in the atmosphere and the amount/types of foods available.
- **Autonomy Support:**¹³ Supporting the child's developing psychological autonomy (e.g., giving choices; "Would you like carrots or beans?") and independence by supporting the child's self-feeding skills, engagement with food, choice and preferences, and nutritional knowledge.
- **Coercive Control:**¹³ Parental pressure, intrusiveness, and dominance in relation to children's feelings, thoughts, and behaviors.

Evidence suggests that food parenting practices reflecting coercive control are counterproductive to the development of healthful eating behaviors. Alternatively, practices providing structure and supporting autonomy are believed to promote and support healthful eating behaviors and discourage unhealthful eating behaviors.¹³

Recommendations and Supporting Evidence

The evidence-based recommendations are presented in two categories: 1) Promoting Food Acceptance and 2) Promoting Healthy Appetites and Growth. The recommendations were developed to influence the food parenting practices of parents and caregivers with the goal of providing the structure and autonomy support considered necessary for the development of healthy eating habits. In addition, the panel's recommendations also consider the child's overall developmental stage across several major domains (e.g., motor, cognitive, language, socio-emotional development) as eating behavior development is largely dependent upon overall child development. The panel recognizes that many families in the United States experience food insecurity or lack reliable access to healthy food in their communities, making it difficult to feed their children, and that additional resources and policies are needed for healthy food provision.

Promoting Food Acceptance

Food acceptance is a process that plays out over time as children accumulate positive experiences consuming foods.¹⁴ Positive experiences are thought to promote food acceptance by increasing familiarity and learned safety.¹⁵ Evidence indicates that encouraging children to try new foods and helping them learn to enjoy new foods is more effective than pressuring children to eat foods.^{6,16,17} Moreover, approaches to promote healthy food acceptance support structuring the food environment to provide children with abundant opportunities to learn about and have positive experiences with foods and to foster children's autonomy in making healthy decisions.

Repeated Exposure

The most effective strategy to promote food acceptance is repeated exposure. Robust experimental evidence indicates that repeated taste exposure increases intake and liking of new foods.¹⁸ The number of exposures required to produce acceptance among young children is thought to range between 5 to 15 exposures.¹⁹ Successful exposures to new foods can be done through small tastes and do not need to be full portions.²⁰⁻²² The effects of repeated exposure to promote food acceptance ultimately rests on children's willingness to try or taste foods.

Strategies for Promoting Food Acceptance

Repeated exposure alone may not work for all children. Strategies that create positive food experiences can support repeated exposure by increasing children's willingness to try new foods,^{23,24} and may be particularly helpful for children who exhibit food refusal or pickiness (characterized by consuming a limited type and amount of foods, unwillingness to try new foods, and rejecting foods based on certain sensory characteristics or textures), although evidence is limited.^{23,24} Additional strategies may also be needed for families with limited resources, for whom repeated exposure may not be feasible.

The following strategies may support efforts to provide repeated exposure to healthful foods by increasing children's willingness to try those foods.

- **Social Modeling** – Experimental studies show remarkably consistent effects of social modeling on children's willingness to try and like new foods.²⁵ Social modeling from peers may be more effective than from adults.²⁶⁻²⁸ Negative social modeling (e.g., dislike of foods) can negatively influence children's acceptance of foods.²⁹
- **Incentives or Rewards** – Providing either tangible (e.g., stickers) or intangible (e.g., praise) incentives or rewards has been shown to increase acceptance of new foods and is associated with higher fruit and vegetable intake, particularly among preschool-aged children.^{21,30-32} Providing foods as rewards is discouraged.^{30,33}
- **Associative Conditioning** – Associative conditioning strategies involve pairing repeated exposure with another positive experience such as an already liked flavor or rewarding experience.^{34,35} This strategy is most effective among bitter-sensitive children and those who are reluctant to taste new foods.
- **Sensory Exposure** – Engaging all of the senses may facilitate food acceptance and willingness to try new foods.^{36,37} Specific strategies include visual exposure to unfamiliar vegetables via picture books and visual, auditory, tactile, and olfactory exposure during playtime.³⁸⁻⁴⁰



Table 1. Recommendations for Promoting Acceptance of Healthful Foods

Provide children with abundant opportunities to learn about and have positive experiences with new foods by structuring the food environment and supporting children's autonomy.

<p>Structure the food environment to support food acceptance</p>	<ul style="list-style-type: none"> • Provide repeated exposure to new foods. This is the most simple and effective strategy shown to promote liking and intake of healthy new foods among young children.³¹ <ul style="list-style-type: none"> – Repeated exposure may be most effective during early childhood although recent studies suggest that it will also be helpful for school-aged children.¹⁵ – Children can require up to 15 exposures to accept new foods, but newer studies suggest that eight or fewer exposures can increase food and flavor acceptance.^{18,28} – Successful exposures to new foods can occur through small tastes (full portions need not be served/consumed). – Caregivers should continue to offer opportunities to try new foods even if a child has refused the item on several occasions. • Make healthy foods and beverages available to children throughout the day at planned meals and snacks. Children learn to like what is familiar and appealing to them.⁴¹
<p>Support children's autonomy in learning to accept healthful foods</p>	<ul style="list-style-type: none"> • Model for children how delicious new foods can be. Children are quicker to try new foods and show greater levels of acceptance when observing peers and adults eating and enjoying the same foods and beverages.²⁷ • Offer positive reinforcement, such as small non-food rewards (e.g., stickers) and verbal praise, for trying new foods. This may facilitate repeated exposure by encouraging children to try new foods.^{30,31} • Encourage children to learn about new foods by using all of their senses—looking, smelling, hearing, touching, and tasting. Tasting foods is most critical to learning to accept new foods, but non-tasting sensory exposures may increase willingness to try new foods.³⁶ • Pair new foods with familiar flavors. For example, providing vegetables with dips/dressing may encourage children to try new foods.^{34,35} • Include children in food preparation. This could include growing, choosing, preparing, and serving foods at home and school settings.^{17,42,43} • Get creative and offer foods in positive ways. For example, give new foods fun names (e.g., emerald dragon bites) and/or associate foods with familiar cartoon characters (e.g., “Dora the Explorer loves broccoli!”).⁴⁴



Promoting Healthy Appetites and Growth

Healthy diets are important for achieving optimal health and preventing excess weight gain in children. Studies on obesity prevention and treatment have identified effective food parenting practices for promoting children's healthy appetites and growth, including structuring food environments to promote healthy choices and supporting autonomy in appetite self-regulation.

Strategies to Promote Healthy Appetites and Growth

Although limited, the evidence suggests providing structure plays an important role in promoting healthy appetites. This includes making healthful foods available, establishing eating routines, offering child portion sizes, and eating meals together as a family.^{45,46} Evidence-based approaches that support children's autonomy include having family members and other caregivers act as role models of healthy eating, using praise and encouragement for healthy behaviors, being responsive to child hunger and fullness cues, and giving children choices.^{45,46} Observational research on food parenting practices for promoting healthy appetites generally supports these findings, although longitudinal studies and those involving diverse populations are limited.

Table 2. Recommendations for Promoting Healthy Appetites and Growth

Provide children with the support to make healthy choices and eat moderately by structuring the food environment and supporting children's autonomy to regulate appetite.

Structure the food environment to promote healthy appetites and prevent overeating and excessive intake of nutrient-poor foods	<ul style="list-style-type: none">• Have family meals as much as your schedule allows. Family meals support children's intake of healthful foods and provide opportunities to connect and communicate with children.⁴⁵⁻⁶³<ul style="list-style-type: none">– Create eating routines, such as shared meals, as much as the family schedule allows.– Plan healthy meals.– Model eating healthy foods.• Offer child-appropriate portion sizes.^{45,46,49-63}• Provide repeated exposure to new healthy foods.^{45,46,49-63}• Limit the amount of sugary drinks and snack foods in the home. The availability of sugary drinks and snack foods in the home and parents' consumption of these foods is closely linked with children's intake of these foods.^{45,46,49-63}<ul style="list-style-type: none">– Reserve sugary drinks and sweets for special occasions like family celebrations.– Make healthful foods more available and energy-dense nutrient poor foods less available in the home.• Limit eating out/take-out foods.^{45,46,49-63}
Support children's autonomy in regulating appetite	<ul style="list-style-type: none">• Have family members and other caregivers' model healthy eating.• Encourage fruit, vegetable, and water intake.^{45,46,49-63}• Be responsive to and respect child hunger and fullness cues.• Use praise and encouragement when making healthy choices.• Give children fixed choices—for example, would you prefer strawberries or grapes?
Avoid highly coercive and controlling food parenting practices	<ul style="list-style-type: none">• Avoid pressuring children to eat and being highly restrictive about specific foods. These practices can interfere with some children's self-regulation of intake.^{13,65,66}

Considerations and Limitations

These recommendations for promoting healthy eating behaviors and growth among children 2 to 8 years old are based on the best-available evidence; however, the following limitations are important to consider:

- Research on food-related parenting practices is primarily comprised of cohorts of predominantly white, well-resourced mothers of preschool-aged children. The panel sought studies with more diversity and emerging work includes other caregivers, such as fathers, but it is important to consider the potential limitations presented by a relatively homogeneous study population.
- The majority of literature is based on cohorts of children 3 to 5 years of age. Findings may not apply to younger or older children in this report's target age range, given the dramatic developmental changes that occur between ages 2 and 8 years, but the panel strived to translate the literature into broadly generalizable recommendations.

In addition, the panel's review primarily focused on healthy, typically developing children. The recommendations included in this report may not be appropriate for children with disabilities, sensory sensitivities, and high levels of food refusals. Care for children with complex medical problems, developmental differences, and eating or feeding disorders will often require additional supports guided by their health care provider.

Implementation Considerations for Guidelines

In order for parents and caregivers to effectively implement these recommendations, they need knowledge, time, and patience, as well as access to healthy foods. Importantly, they also need access to social, economic, and family support.

Children between the ages of 2 and 8 years spend a significant portion of their time outside the home, such as in child care or school settings, and with other caregivers. Ensuring the availability of healthy foods and strategies to promote food acceptance in these settings is important for the development of healthy eating patterns. Children and families also actively interact with health care providers and food and nutrition assistance programs (e.g., the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), the Child and Adult Care Food Program (CACFP), school meal programs (NSLP and SBP), highlighting the importance of aligning

organizational policies and practices, public policies, nutrition programs, and legislation with the recommendations. It is also important for service providers and program administrators to have the resources necessary to provide education and guidance on strategies to promote food acceptance and healthy appetites.

Families with low incomes face specific challenges in implementing feeding guidelines, mainly due to limited time and resources. Given the profound role income and family economics play in the development of healthy appetites and food acceptance of 2- to 8-year-olds, special considerations should be made when implementing these recommendations. The influence of family economics on food parenting emphasizes the need for policies that improve financial security and facilitate implementation.

The full technical report further discusses opportunities to leverage or modify policies, systems, and environmental solutions in settings where young children and families spend time, with the goal of supporting implementation of the recommendations in and outside the home and ultimately impacting child weight and diet quality.

Conclusion

The evidence-based recommendations produced by this expert panel are designed to help parents and caregivers promote healthy eating and growth among young children and represent the most comprehensive approach to date for *how* to feed young children to promote food acceptance and healthy appetites. Approaches that provide structure to children's food environments and behaviors while supporting their increasing needs for autonomy in eating have been shown to promote food acceptance and healthy appetites.

Socioecological and developmental frameworks highlight multiple levels of influence—child, caregiver, family, and broader socioeconomic and cultural contexts—on children's eating behaviors. For this reason, there is a great need for research that considers influences on children's eating across a broader range of ages and in more diverse populations. Additionally, policies, practices, and systems-level changes for promoting healthy eating behaviors are needed in a variety of settings where children and families spend time in order to achieve positive population-level influences on children's eating and overall health. Action is also needed to ensure that all children in the United States have consistent access to nutritious and affordable food.

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Suggested Citation

Fisher J, Lumeng J, Miller L, Smethers A, Lott M. Evidence-Based Recommendations and Best Practices for Promoting Healthy Eating Behaviors in Children 2 to 8 Years Executive Summary. Durham, NC: Healthy Eating Research; 2021. Available at: <https://healthyeatingresearch.org>.

Acknowledgements

The expert panel was supported by Healthy Eating Research (HER), a national program of the Robert Wood Johnson Foundation. HER and the authors thank the expert panel members for their engagement and contributions throughout the development of the recommendations. Mary Story, PhD, RD (Director, HER) provided guidance and counsel throughout the process, as well as editorial input and review. Lauren Dawson, MPH (Communications and Program Associate, HER) and Emily Callahan, MPH, RDN (EAC Health & Nutrition, LLC) provided editorial input and review of the technical report and executive summary. We would also like to thank Jamie Bussel, MPH (Robert Wood Johnson Foundation) for her guidance and counsel throughout the expert panel process.



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Healthy Eating Research



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Healthy Eating Research (HER) is a national program of the Robert Wood Johnson Foundation. Technical assistance and direction are provided by Duke University under the direction of Mary Story PhD, RD, program director, and Megan Lott, MPH, RDN, deputy director. HER supports research to identify, analyze, and evaluate environmental and policy strategies that can promote healthy eating among children and prevent childhood obesity. Special emphasis is given to research projects that benefit children and adolescents and their families, especially among lower-income and racial and ethnic minority population groups that are at highest risk for poor health and well-being and nutrition-related health disparities. For more information, visit www.healthyeatingresearch.org or follow HER on Twitter at @HERResearch or Instagram at @HealthyEatingResearch.

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