

Food and Beverage Marketing to Children and Adolescents: Limited Progress by 2012, Recommendations for the Future

Healthy Eating Research

Building evidence to prevent childhood obesity

Research Review, February 2013

Abstract

For decades, American children and adolescents have been surrounded by advertising and marketing for unhealthy foods and beverages. While the food and beverage industry, as well as local and national levels of government, have started to recognize the role that food and beverage marketing plays in driving the childhood obesity epidemic, American youths are still exposed to a disproportionate amount of marketing for unhealthy products across a variety of media. This research review summarizes the academic and industry literature on trends in food marketing to children and adolescents, as well as policy initiatives undertaken to address the contribution of marketing practices to the childhood obesity epidemic, from March 2011 to May 2012. This review finds that self-regulation by the food and beverage industry is not likely to reduce marketing of unhealthy foods to children and adolescents significantly. The review also finds that the food and beverage industry can exert significant influence on government efforts to reduce the marketing of unhealthy foods to children and adolescents.

Introduction

Despite some positive actions implemented by industry,^{1,2} government,³⁻⁶ and schools³⁻⁶ to improve young people's dietary choices and food environments between 2006 and 2012, in the United States, children and adolescents still grow up immersed in environments that promote primarily unhealthy foods and beverages.⁷⁻⁹

A healthy food and eating environment, whether it is at home, in fast-food establishments, restaurants, or schools, on television, or in the marketplace, would be one where young people have regular access to nutrient-rich foods, beverages, and meals that align with the 2010 *Dietary Guidelines for Americans*¹⁰ and support a healthful diet.¹¹ Unhealthy food and eating environments offer young people easy access to inexpensive and predominantly energy-dense (high-calorie), nutrient-poor foods, beverages, and meals that have excessive amounts of total calories, total fat, trans fat, added sugars, and sodium. Such environments also discourage



young people from consuming recommended levels of nutrient-rich food groups (including fruits, vegetables, whole grains, and low-fat dairy) and essential nutrients (such as calcium, potassium, and fiber).

Unhealthy food and beverage environments adversely affect the quality of children's and adolescents' diets and influence their future health. The marketing of energy-dense and nutrient-poor food and beverage products is linked to overweight and obesity,⁷ which remain unacceptably high among young people in the United States. In 2009-2010, 19.6 percent of boys and 17.1 percent of girls ages 12 to 19 were obese, and 34.6 percent of boys and 32.6 percent of



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girls were overweight or obese.¹² Obesity prevalence is especially high among Hispanic boys (26.5%) and African American girls (24.8%).¹³ Obesity and related chronic diseases disproportionately affect ethnically and racially diverse groups, including African Americans, Latinos, and American Indian/Alaska Native children and adolescents.¹⁴⁻¹⁷ Children and adolescents who are overweight or obese have an increased risk of developing chronic conditions, such as type 2 diabetes, cardiovascular diseases, and certain types of cancers.^{12,15,18}

Methodology

This review summarizes academic and industry research on evolving trends in food and beverage marketing to American children and adolescents between March 2011 and May 2012. It draws from many evidence sources including: published peer-reviewed journal articles and foundation reports, independent evaluations conducted by public health and consumer advocacy organizations, and media or news releases. It builds upon the findings discussed in the *Healthy Eating Research* brief and synthesis, released in October 2008¹⁹ and April 2011,²⁰ respectively, to examine the growing body of research related to food and beverage marketing to children and adolescents.

This review also highlights future research needs and policy options for the government at federal, state, and local levels to protect young people from unhealthy food and beverage marketing practices.

Key Research Results

- Although the industry has improved its self-regulatory program through the Children's Food and Beverage Advertising Initiative (CFBAI), there are remaining loopholes and significant gaps that allow food, beverage, and chain restaurant companies to market energy-dense and nutrient-poor foods and beverages to young people. Overall, industry has made "limited" to "moderate"¹ progress toward achieving the Institute of Medicine's (IOM's) recommendations to improve children's and adolescents' food marketing environments.
- Corporate lobbyists from the food and beverage industry sought to influence legislators and the public to halt the release of comprehensive voluntary marketing guidelines to improve the nutritional

quality of food and beverage products marketed to American children and adolescents. At the request of Congress, the guidelines were developed by the Interagency Working Group on Food Marketed to Children (IWG), comprised of representatives from the Centers for Disease Control and Prevention (CDC), Food and Drug Administration (FDA), Federal Trade Commission (FTC), and the U.S. Department of Agriculture (USDA).

- Research disputes the food industry's claims about some of the challenges in reformulating child-targeted products to improve their nutritional quality with emerging research showing that healthy products can be a profitable segment of the food business.
- Based on the CFBAI definition, measured media, such as television shows, are considered child-directed if the audience base includes more than 35 percent of children ages 12 or under. Research evaluating industry self-regulation has shown that this definition has produced uneven improvements to the landscape of television advertising, which still reaches millions of children and predominately features advertisements (ads) for unhealthy products.
- Many digital media channels, such as advergames, are dynamic and effective channels for food marketing to children and adolescents. Many public health experts suggest that certain digital media practices are inherently unfair, misleading, or deceptive, while other practices raise serious privacy concerns. While the CFBAI was revised in 2010 to include digital media marketing, independent research has found that CFBAI-participating companies use channels such as advergames to promote unhealthy products to children.
- Compared with White children and adolescents, African American and Latino children and adolescents, who experience higher rates of overweight, obesity, and diet-related chronic diseases such as type 2 diabetes, are exposed to higher levels of marketing for unhealthy food and beverage products.
- The use of popular characters on product packaging, which is outside the scope of the CFBAI, influences children's food preferences for unhealthy foods. Nutrition claims on packaging can discourage children from preferring healthy foods.

- The presence of competitive foods in schools where students are a captive audience is a marketing opportunity for the food and beverage industry, and research demonstrates the need for strong standards for foods sold in vending machines, à la carte lines, and school stores. The Healthy, Hunger-Free Kids Act of 2010 directed the USDA to align the nutrition standards for all foods and beverages sold in schools with current dietary guidelines. On February 1, 2013, the USDA released their proposed updates to the nutrition standards for competitive foods.
- Local policy interventions to improve children's food marketing environments have had mixed success.

Studies Supporting Key Research Results

Although the industry has improved its self-regulatory program through the Children's Food and Beverage Advertising Initiative (CFBAI), there are remaining loopholes and significant gaps that allow food, beverage, and chain restaurant companies to market energy-dense and nutrient-poor foods and beverages to young people. Overall, the industry has made "limited" to "moderate"¹ progress toward achieving the Institute of Medicine's (IOM's) recommendations to improve children's and adolescents' food marketing environments.

- In July 2011, the CFBAI adopted new category-specific uniform nutrition criteria that align with the 2010 *Dietary Guidelines for Americans*. These nutrition criteria are intended to guide companies' efforts to develop new products with less sodium, saturated fat, and added sugars, and fewer total calories. If the products of participating companies do not meet the uniform criteria, the CFBAI has promised that they will not be advertised after January 1, 2014.²¹
- In July 2011, 19 fast-food chain restaurants (including Burger King, Denny's, IHOP, Chili's, Friendly's, Chevy's, and El Pollo Loco) agreed to participate in the National Restaurant Association's *Kids Live Well Initiative* as concerns increased about the role of fast food in promoting childhood obesity.^{22,23} The McDonald's Corporation and Yum! Brands currently do not participate in this industry program.
- In March 2012, McDonald's Corporation pledged to include a nutrition or physical activity message in "100 of its national communications to kids"

and all Happy Meal advertising will include foods from "recommended food groups."^{24,25} While those nutritional criteria include healthier side dishes, such as apple slices and milk, the advertising still includes the promotion of unhealthy products, such as fried chicken nuggets and french fries.²⁵

- Researchers evaluated the progress made by the food industry toward specific recommendations to improve the food marketing environment for young people from December 2005 to January 2011. They found that food and beverage companies made "moderate" progress toward the IOM's recommendations on improving food marketing practices to promote a healthful diet to children and adolescents. Other industry sub-sectors, such as restaurants, industry trade associations, and media and entertainment companies, made only "limited progress" toward the IOM recommendations to improve the healthfulness of young peoples' diets.¹

Corporate lobbyists from the food and beverage industry sought to influence legislators and the public to halt the release of comprehensive voluntary marketing guidelines to improve the nutritional quality of food and beverage products marketed to American children and adolescents. At the request of Congress, the guidelines were developed by the Interagency Working Group on Food Marketed to Children (IWG), comprised of representatives from the Centers for Disease Control and Prevention (CDC), Food and Drug Administration (FDA), Federal Trade Commission (FTC), and the U.S. Department of Agriculture (USDA).

- In April of 2011, the IWG published a draft version of the voluntary guidelines, and called for public comment. In October 2011, the FTC Commissioner provided Congressional testimony indicating that the IWG received 29,000 public comments, including more than 28,000 comments that supported the IWG principles to significantly improve the nutritional profile of foods marketed to children and adolescents. Based on only the approximately 100 comments received from the food and beverage industry, the FTC recommended that the IWG principles should be narrowed by excluding food marketed at philanthropic activities, charitable events, community programs, and entertainment and sporting events. The FTC also recommended limiting the proposed IWG principles to children under age 12.²⁶

- In December 2011, after \$37 million in industry lobbying,²⁷ Congress requested a cost-benefit analysis of the proposed voluntary guidelines for marketing foods to children and adolescents.²⁸

Research disputes the food industry’s claims about some of the challenges in reformulating child-targeted products to improve their nutritional quality with emerging research showing that healthy products can be a profitable segment of the food business.

- While proponents of the CFBAI claim that product reformulation has been a successful outcome of the program,²⁹ a review of 84 popular brands of ready-to-eat breakfast cereals found that only one in four children’s cereals met the voluntary guidelines proposed by the IWG in 2010.³⁰
- An evaluation of the sales of 15 major food and beverage companies found that “better-for-you” products—defined by the researchers as no-, low-, and reduced-calorie items (e.g., flavored waters or diet sodas), yogurts, and whole-grain cereals—drove more than 70 percent of sales growth from 2007 to 2011.² Firms that had higher than average sales of “better-for-you” products showed a 50 percent growth in operating profit, compared with a little more than 20 percent growth for other companies that did not sell these products.² It is not clear from the study whether these “better-for-you” foods would meet the IWG’s voluntary nutritional guidelines.

Based on the CFBAI definition, measured media, such as television shows, are considered child-directed if the audience base includes more than 35 percent of children ages 12 or under. Research evaluating industry self-regulation has shown that this definition has produced uneven improvements to the landscape of television advertising, which still reaches millions of children and predominately features advertisements (ads) for unhealthy products.

- In 2009 children ages 2 to 5 saw an average of 10.9 food ads per day, while children ages 6 to 11 saw an average of 12.7 ads.³¹ Eighty-six percent of these ads were for food products high in saturated fat, sugar, and sodium.³¹
- A trend analysis of major food advertising categories between 2003 and 2009 showed that fast-food advertising to children increased by 21.1 percent

among children ages 2 to 5, and by 30.8 percent among children ages 6 to 11.³¹ From 2008 to 2010, children’s overall exposure to television advertising for full-calorie soda doubled,³² and during prime-time television programming such as *American Idol*, sugar-sweetened soft drinks constituted 70 percent of the brand appearances viewed by children.³³

Many digital media channels, such as advergames, are dynamic and effective channels for food marketing to children and adolescents. Many public health experts suggest that certain digital media practices are inherently unfair, misleading, or deceptive, while other practices raise serious privacy concerns. While the CFBAI was revised in 2010 to include digital media marketing, independent research has found that CFBAI-participating companies use channels such as advergames to promote unhealthy products to children.

- In 2010, the CFBAI was amended to include a variety of “new and emerging digital and social media platforms,” including company websites, advertising on third-party websites, video games, G-rated DVDs, and interactive games (e.g., advergames played online).²¹
- Food and beverage marketers are increasingly using Facebook, Twitter, YouTube, and other social media or online applications to foster ongoing engagement with young people that encourages them to interact with, befriend, and integrate brands into their personal identities and social worlds.³⁴ Because companies who use these strategies target young people in a way that may be inherently deceptive, such practices also raise serious privacy concerns.³⁵
- Fast-food, snack food, and soft drink companies routinely use five major digital marketing techniques to target children and adolescents. Several of these techniques are designed to tap into young peoples’ subconscious processes that circumvent rational decision-making.³⁶
 1. *Immersive techniques*, such as augmented reality, online gaming, and virtual environments, reduce young peoples’ conscious attention to marketing and foster impulsive behaviors.
 2. *Social media techniques* that monitor users’ online behaviors without notification, as well as viral brand promotion.

3. *Data collection and behavioral profiling* designed to deliver personalized marketing to young people without their knowledge or permission.
 4. *Location targeting and mobile marketing*, which follow young peoples' patterns of movement to link geographic location with influential point-of-purchase decisions for branded food and beverage products.
 5. *Neuromarketing techniques* that use neuroscience to develop digital marketing designed to trigger subconscious, emotional arousal to influence brand preferences and purchasing behaviors.
- Approximately 25 percent of American adolescents use their mobile phone to access the Internet or “go online,” and nearly three-quarters of adolescents belong to at least one social networking website.³⁶ Unhealthy food and beverage product brands, including Coca-Cola, Oreo, Red Bull, Skittles, and Pringles, comprise five of the top 10 most popular brands promoted on Facebook.³⁷ The Coca-Cola brand alone has more than 30 million “fans” on Facebook who are 10 times more likely to purchase Coca-Cola products and twice as likely to consume them compared with consumers who are not Facebook fans.³⁸
 - Smartphone applications, text messaging, and banner ads on mobile websites were the most common mobile strategies for sugar-sweetened beverage (SSB) marketers.³² Coca-Cola and Red Bull are major corporate brands marketed to young people through mobile channels. Red Bull offered 18 separate iPhone applications, and Coca-Cola offered 10 applications, including three advergames.³²
 - Online gaming is very popular with children and adolescents; more than 70 percent of 8-year-old children play video games on an average day.³⁹ Fast-food and beverage manufacturers⁴⁰ use online advergames because the playful environment builds positive brand associations for children and adolescents.⁴¹ On average, more than 2 million children and adolescents visited food company websites to access advergames every month in 2009, and children and adolescents spend 88 percent more time on food websites with advergames than those without.⁴²
 - One-half of child-targeted websites from companies participating in CFBAI included advergames promoting foods that companies had agreed were inappropriate for child-targeted marketing. In these advergames, candy was the most frequently promoted food category.⁴²
 - Under experimental conditions, children exposed to advergames featuring unhealthy foods consumed 55 percent more unhealthy snacks than those exposed to advergames with healthful foods.⁴² Advergames promote unhealthy cereals by convincing children that “the most nutritionally poor food items are the most valuable,” and without consequence.⁴³
- Compared with White children and adolescents, African American and Latino children and adolescents, who experience higher rates of overweight, obesity, and diet-related chronic diseases such as type 2 diabetes, are exposed to higher levels of marketing for unhealthy food and beverage products.**
- African American children and adolescents viewed 80 percent to 90 percent more television ads for sugary drinks and energy drinks compared with their White counterparts.³² Between 2008 and 2010, Latino children saw 49 percent more television ads and adolescents saw 99 percent more ads on Spanish-language television.³²
 - Compared with stores located in predominantly White neighborhoods, grocery and convenience stores located in predominantly African American neighborhoods were significantly more likely to promote child-targeted materials like cartoon characters for unhealthy products, such as cookies and crackers (48.1% versus 26.3%) and breakfast cereals (44.4% versus 25.0%).⁴⁴
 - African American high school students consumed SSBs three or more times per week and were almost three times more likely to consume sports drinks once or more per week compared with White students.⁴⁵ Between 2005 and 2008, African American youths ages 2 to 19 obtained 8.5 percent of their discretionary calories from SSBs, more than Mexican American (7.4%) and White (7.7%) youths.⁴⁶

The use of popular characters on product packaging, which is outside the scope of the CFBAI, influences children's food preferences for unhealthy foods. Nutrition claims on packaging can discourage children from preferring healthy foods.

- The CFBAI does not apply to product packaging, unless such products appear “in advertising primarily directed to children under 12,” and under all conditions, “this commitment also does not apply to the use of company-owned characters.”²¹
- A study of 80 children ages 4 to 6 found that exposure to a cereal box with a branded media character improved children's preference for the cereal. The effect of such characters on children's preferences was stronger when the same cereal was called “Sugar Bits” rather than “Healthy Bits.”⁴⁷
- A study of 306 parents of children ages 2 to 11 assessed their beliefs about the meaning of common front-of-package nutrition-related claims on children's cereals. The results found that the majority of parents misinterpreted the meaning of claims commonly used on children's cereals. Parents believed that cereals with claims were more nutritious, provided specific health-related benefits for their children, and increased their willingness to purchase the cereals.⁴⁸
- Nutrition claims on children's products can produce a “backlash effect,” leading children to choose less healthy products when exposed to on-package nutritional information.⁴⁹

The presence of competitive foods in schools where students are a captive audience is a marketing opportunity for the food and beverage industry, and research demonstrates the need for strong standards for foods sold in vending machines, à la carte lines, and school stores. The Healthy, Hunger-Free Kids Act of 2010 directed the USDA to align the nutrition standards for all foods and beverages sold in schools with current dietary guidelines. On February 1, 2013, the USDA released their proposed updates to the nutrition standards for competitive foods.

- A national survey found that during the 2009–10 school year, 60 percent of public elementary students were able to purchase competitive beverages (which range from bottled water to carbonated soda), a significant increase from 49 percent in 2006–07. The same survey found that the percentage of elementary students who had access only to healthful beverages

as recommended by the IOM (e.g., 1% milk, 100% juice, or water) rose over the same time period from 10 percent to 19 percent.⁵⁰

- Although a 2004 federal law required public elementary schools to have a wellness policy in place by the start of the 2006 school year that included guidelines for competitive foods and beverages, in 2009-10 only 55 percent of elementary schools had adopted a wellness policy.⁵⁰ Moreover, a national analysis found that during the 2009-10 school year, less than 5 percent of school policies on competitive foods had nutrition standards that met the 2010 *Dietary Guidelines for Americans*, as would be stipulated by the Healthy, Hunger-Free Kids Act of 2010.⁵¹
- A review of foods served in secondary school vending machines in the St. Paul-Minneapolis, Minn., area found that less than 5 percent met the IOM's nutritional criteria for competitive foods.⁵² A national health impact assessment that examined a scenario in which all school à la carte, vending, and snack bar items met the 2010 *Dietary Guidelines for Americans* found that: 1) student purchase of unhealthy foods, and their risk of diet-related disease, would diminish; 2) schools would not see a decline in revenues; and 3) such a policy would protect vulnerable populations of students most exposed to unhealthy eating environments.⁵³

Local policy interventions to improve children's food marketing environments have had mixed success.

- Researchers assessed the impact of an ordinance in Santa Clara County, Calif., that had established nutritional standards for children's meals served at fast-food chain restaurant when toy giveaways accompanied the meals. The study found that while affected restaurants had altered their marketing practices to promote healthier food and meal choices, these efforts did not improve the nutritional quality of children's meals offered at these restaurants.⁵⁴
- Policies to reduce students' consumption of sugary beverages in schools have had mixed success. One national study indicated that policies restricting the sale of some or all sugary beverages in middle schools did not affect students' intake.⁵⁵ A sugary beverage sales limit in Boston public schools, implemented as part of a larger district-wide effort to promote healthier foods and beverages, produced a significant reduction in high school students' sugary beverage consumption from 1.71 daily servings to 1.38 daily servings.⁵⁶

Conclusions

The rates of childhood overweight and obesity remain at unacceptably high levels with little change since 2007-08, especially among children and adolescents from communities of color. An examination of research and policy trends shows that the main response has been industry self-regulation, which has not substantially improved children's and adolescents' food marketing environment between 2006 and 2012. Public health experts and child protection advocates are exploring a variety of interventions to address this public health crisis.

Research analyzing traditional and new media indicates that industry self-regulation through the CFBAI is unlikely to be effective at protecting children because there are significant loopholes that allow continued marketing of unhealthy products. For example, current audience composition criteria allow companies such as Coca-Cola to expose millions of children to extensive product placement on prime-time television shows such as *American Idol* because the show is considered family programming.³³ Food marketers also exploit this loophole with child-targeted content online as well, such as advergames.⁴²

Policy Implications

- The CFBAI has developed a uniform set of nutrition criteria to be used by all participating food companies in 2014.²¹ All food and beverage manufacturers could further strengthen self-regulatory efforts by adhering to the drafted media and nutrition voluntary guidelines published by the IWG. The food industry also could adopt uniform global pledges instead of the current country-by-country self-regulatory regime, which consists of multiple sets of pledges that do not apply to the majority of nations.⁵⁷
- In May 2012, the IOM released a new report on accelerating progress in preventing obesity that reinforced the need for industry to implement comprehensive common voluntary standards to reduce the marketing of unhealthy foods and beverages to children and adolescents ages 2 to 17. The standards cover a broad range of marketing and advertising practices, including digital marketing, licensed characters, and toy premiums. If the voluntary marketing standards are not adopted by 2014 by a majority of companies, the IOM has recommended that the government should set mandatory nutrition standards and ensure they are implemented.⁵⁸
- Although food marketing has been identified as part of the unhealthy environments children inhabit,⁷ advocates have been concerned whether the First Amendment to the U.S. Constitution that protects the freedom of speech allows for government regulation. Recently, scholars have argued that government regulation of food marketing to children and adolescents would withstand this challenge because children and adolescents are cognitively defenseless against marketing messages, making the messages “inherently misleading.”⁵⁹ Scholars also have argued that contemporary characteristics of child-targeted food marketing do not warrant the protections afforded by the “commercial speech doctrine.”⁶⁰ For example, food marketing to children uses emotional rather than rational appeals to young people, and as such is designed to be misleading and should not receive protection.
- The food and beverage industry should support and implement the findings of the Federal Trade Commission's follow-up report⁶¹ on industry marketing expenditures. All companies marketing to children, including media firms, should participate in industry self-regulatory initiatives, and the industry should strengthen the CFBAI by adopting uniform nutrition criteria for foods marketed to children based on the 2010 *Dietary Guidelines for Americans*.⁶¹ The IWG, or some other independent group, should be able to evaluate the effectiveness of industry's voluntary actions for marketing products to children ages 17 and younger.
- The National Collaborative on Childhood Obesity Research (NCCOR), a public-private partnership including the Centers for Disease Control and Prevention (CDC), the National Institutes of Health (NIH), the Robert Wood Johnson Foundation (RWJF), and the U.S. Department of Agriculture (USDA), is a potential mechanism for developing a strategic research agenda to examine both the potentially beneficial and detrimental effects of industry marketing practices on children's and adolescents' diet, food and eating environments, and health.³ There are many opportunities for legislative,⁶² legal,⁶³⁻⁶⁵ and regulatory⁶⁶ actions to further protect children and adolescents from unhealthy food marketing.

Future Research Needs

Ongoing research is needed in these areas:

- Examine how media and marketing can be used to positively influence children's and adolescents' diet and health,^{3,67} especially to inform a national social marketing campaign for healthy eating.⁵⁸
- Understand how marketing affects young peoples' cognitive and psychological processes.⁶⁸
- Identify the novel strategies beyond television advertising that the food industry uses to engage children and adolescents, including venues such as socially interactive digital media, mobile devices, advergames, and apps, as well as techniques that include viral, peer-to-peer, and other social marketing practices.
- Continue to build the research base on food and beverage marketing to African American and Latino children and adolescents, and initiate new research to understand the nature and extent of the industry's targeting of all segmented audiences, especially Asian/Pacific Islander and American Indian youths.
- Monitor and evaluate the implementation and effectiveness of the CFBAI's consistent criteria for industry self-regulatory pledges made across various food categories as well as the effectiveness of other industry self-regulatory programs, such as those carried out by the National Restaurant Association, Hyatt Hotels, McDonald's, Darden Restaurants, and others that emerge.
- Identify healthy food marketing practices (including varied product formulation, pricing, promotion, and placement) in full-service grocery stores, corner stores and bodegas, restaurants, public vending outlets and services and concessions, machines in communities, parks, hospitals, and other organizational settings. This evidence base will provide additional valuable guidance for manufacturers, retailers, advocates, and public officials.
- Document the effectiveness of policies intended to protect children and adolescents from unhealthy food and beverage marketing practices.

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About Healthy Eating Research

Healthy Eating Research is a national program of the Robert Wood Johnson Foundation. Technical assistance and direction are provided by the University of Minnesota School of Public Health under the direction of Mary Story, PhD, RD, program director, and Karen M. Kaphingst, MPH, deputy director. The Healthy Eating Research program 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 ages 3 to 18 and their families, especially in lower-income and racial and ethnic populations at highest risk for obesity.

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