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KIDS' SAFE & HEALTHFUL FOODS PROJECT

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Healthier Nutrition Standards Benefit Kids

A health impact assessment of the Child and Adult Care Food Program's updated rules for meals and snacks

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Advisory Committee

The report benefited from the insight and expertise of an external advisory committee that met during the health impact assessment (HIA) to provide a diverse range of experiences and perspectives on CACFP. The committee members offered guidance and feedback on the methods and recommendations but were not decision-makers; the Kids' Safe and Healthful Foods Project had final authority and responsibility for the HIA process, findings, and recommendations.

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- Gail Birch, founder and retired CEO, Providers Choice.
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Overview

Each day across the United States, more than 4 million children, many from low-income families, receive meals and snacks through the U.S. Department of Agriculture's (USDA) Child and Adult Care Food Program (CACFP).[1] The program, which began as the Child Care Food Program in 1968, provides funding for these foods, in the form of reimbursements, to a variety of child care, after-school, and adult day care institutions that serve young children, older adults, and chronically disabled people. Through CACFP, the USDA aims to ensure that all of these vulnerable populations have daily access to nutritious foods.

As part of the Healthy, Hunger-Free Kids Act of 2010, Congress directed the USDA to review and update CACFP nutrition standards to align more closely with the 2010 Dietary Guidelines for Americans (DGAs).[2] In early 2015, based on science-based recommendations from the National Academies of Sciences, Engineering, and Medicine's Health and Medicine Division (formerly the Institute of Medicine), the USDA proposed several adjustments to CACFP standards to better meet children's nutritional needs without increasing costs.

Shortly after these updates were proposed, the Kids' Safe and Healthful Foods Project—a collaboration between The Pew Charitable Trusts and the Robert Wood Johnson Foundation—launched a health impact assessment (HIA) to analyze how the proposed CACFP rule—the first significant update to the program's standards in nearly 50 years—might affect the overall health of children up to age 5 who are served by CACFP in centers and family child care homes.

HIAs bring together research, health expertise, and stakeholder input to identify the potential and often-overlooked effects on public health of proposed laws, regulations, projects, policies, and programs. For this assessment, the HIA team examined peer-reviewed literature as well as reports and publications outside of academic journals on CACFP meals and snacks, the health disparities among CACFP-enrolled children, nutrition-related health outcomes, and policy interventions that could improve children's overall consumption of healthy foods. In addition, the HIA team constructed and analyzed hypothetical menus and examined potential costs based on the various foods providers may choose to meet the new standards. The team also gathered input from stakeholders, including providers, parents, state agency personnel, sponsors—organizations that oversee family child care homes and centers and report to the state on their behalf—and others in the CACFP community. The HIA did not address external factors, such as children's exercise behaviors and eating patterns outside of CACFP, which are largely driven by parents' food choices as well as economic and neighborhood contexts.

In April 2016, as the HIA was underway, the USDA finalized its updated CACFP standards to require that meals and snacks include a greater variety of fruit and vegetables, more whole grains, and less added sugar and saturated fat. The department also outlined a number of best practices to help early care and education (ECE) providers build on the standards and to highlight areas where centers and homes may take additional steps to improve the nutritional quality of the foods they serve. The final rule reflects most of the changes that were in the proposal and that were addressed by the HIA. Providers must comply with the rule's provisions by Oct. 1, 2017.

The HIA team considered seven research questions:

1. How would the USDA's proposed changes affect the nutritional quality of food served in ECE settings that adhere to CACFP standards (CACFP and non-CACFP participants)?
2. How would the changes affect dietary consumption for children in ECE settings that follow CACFP nutrition standards (CACFP and non-CACFP participants)?

3. How would changes in children's dietary consumption affect health outcomes for children in settings that follow CACFP nutrition standards (CACFP and non-CACFP enrollees, particularly the most vulnerable groups of children, such as racial or ethnic minorities and those living in food deserts, that is, areas with little or no access to quality foods)?
4. How would changes in dietary consumption affect the attitudes toward healthy foods of children, families, and ECE provider administrators and staff?
5. How would changes to the standards affect providers' costs and fiscal stability?
6. How would changes to the standards affect food-related costs for CACFP settings and in turn affect participation in the meal program?
7. How would the changes to the nutrition standards affect food distribution costs and other food system mechanisms?[3]

Based on the proposed rule, the HIA team concluded that some of the final rule's provisions—such as requirements for whole grains, fruits, and vegetables—will maximize positive health effects on the children served by CACFP, while others, including those related to milk, will be neutral. What is less clear is how the changes in provider costs and participation will affect children's health. For children from low-income families in particular, enrollment in CACFP can mitigate various risk factors, such as being overweight or obese, anemic, and food insecure, so if providers leave the program because of higher costs or other changes associated with the proposed rule, fewer children will reap those benefits.

The key findings from the HIA process are:

- **The new rule should improve the nutritional quality of CACFP-funded meals and snacks, increasing children's intake of whole grains and vegetables, decreasing their consumption of grain-based desserts, and having a positive overall impact on their health.** The final rule standards separate fruits and vegetables into individual meal components and allow providers the flexibility to serve two vegetables at lunch and supper. Additionally, at least one grain serving a day must be whole grain-rich and providers cannot be reimbursed for serving grain-based desserts. These shifts toward increased whole grains and vegetables may result in greater consumption of commonly underconsumed nutrients, such as vitamins D and E, and reduced consumption of commonly overconsumed nutrients, such as saturated fats and added sugars. The resulting improved nutritional quality could lower CACFP-enrolled children's risk of being overweight or obese, and the increased consumption of healthier foods could influence children's overall diet, including in settings outside of ECE, which could maximize health benefits.
- **Nutrition education, training, and technical assistance, along with increased service of nutrient-dense meals and snacks at ECE settings, may positively affect providers', parents', and children's attitudes toward healthy foods.** However, improved attitudes toward nutritious foods—particularly among parents whose behaviors may be influenced by social and economic factors—are not always predictive of improvements in diet quality or consumption.
- **Changes to the nutrition standards may result in small to moderate provider cost increases depending on the foods selected, which could lead to a decrease in provider participation in the program.** However, the extent of cost increases will vary based on provider choices and available resources, which are often dictated by the size, type, and location of each setting, as well as on the price and quality of foods they currently serve.

- **All children under the care of a provider following CACFP standards, even those whose meals may not be eligible for reimbursement, would probably benefit from the nutritional updates.** The impact that changes to CACFP meal standards have on non-CACFP providers serving food to children will be dictated in part by whether and how each state's ECE licensing regulations link to the CACFP guidelines.

The HIA recommends that providers incorporate best practices into their menus and that Congress, the USDA, state agencies, providers, and sponsors adopt policies and practices to improve the nutrition and overall health of CACFP-enrolled children.

- **Consider additional strategies—such as increasing vegetable serving sizes and limiting added sugars, salt, and fat in fruit and vegetable dishes—to improve consumption of nutrient-dense foods.** Although these approaches were not included as part of the proposed rule, they were supported by the HIA's research and input from stakeholders.
- **Encourage providers to adopt a phased-in implementation timeline, extend for up to three years the current one-year transition period during which providers are not penalized for minor errors, and provide training and technical assistance** to support adoption and sustainability of the rule and to help providers comply with program requirements.
- **Conduct a review of CACFP's reimbursement rates and eligibility requirements** to identify areas that may hinder the program's effectiveness and ability to maximize health impacts.

As the CACFP community moves closer to implementation of the final nutrition standards and as the program expands, ongoing study of the broader ECE field would provide useful information about the reach of CACFP standards to non-CACFP settings and would help to compare the types of foods the latter group of providers are serving with what the law requires.

This report examines the HIA findings in depth and looks at how they relate to the final rule, with added suggestions to support providers during implementation.

CACFP history and the proposed nutrition standards

Establishing healthy dietary habits during the preschool years helps children achieve and maintain a healthy weight and reduce the risk of obesity and other chronic diseases later in life. Research shows that, on average, infants and toddlers do not consume the recommended amounts of foods most important to their nutrition and development, such as fruits and vegetables.

Of the 20 million U.S. children under the age of 5, 12.5 million (61 percent) spend time in some type of regular care arrangement each week,[4] so the federal Child and Adult Care Food Program, which ensures that nutritious foods and beverages are served to young children nationwide, plays a major role in the daily food and nutrient intake of these infants and children. In fact, many states require ECE providers to meet or exceed CACFP nutritional standards as part of their licensure requirements, even if they do not participate in CACFP. (See the "Effects on state early care licensing regulations" section for more information.)

CACFP, established by Congress in 1968, subsidizes the meals and snacks that meet federal nutrition standards provided by participating independent centers, family child care homes, after-school care programs, emergency shelters, and adult day care homes.[5] As of October 2016, CACFP funded meals and snacks for more than 4 million children as part of daily child care.[6]

This report focuses on two CACFP settings—centers and family child care homes—that serve children up to age 5.

CACFP Guidelines for Child Nutrition Have Evolved Over Nearly 5 Decades

Federal early care and education healthy food milestones:

- 1968—An amendment to the National School Lunch Act (Pub. L. No. 90-302) establishes the Special Food Service Program for Children as a three-year pilot project; meal components are established.[*]
- 1996—The Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (Pub. L. No. 104-193) mandates changes to the number of meals eligible for reimbursement.[†]
- 1997—The USDA commissions the Early Childhood and Child Care Study to assess benchmarks for nutrient standards for CACFP meals and snacks. Nutrition requirements link to the 1995 DGAs and the 1989 Institute of Medicine (IOM) report "Diet and Health: Implications for Reducing Chronic Disease."[‡]
- 2011—Healthy, Hunger-Free Kids Act of 2010 provisions for fluid milk and fluid milk substitutions become effective.[§]
- 2015—The USDA releases proposed rule to update CACFP nutrition standards to comply with the Healthy, Hunger-Free Kids Act of 2010 and to align more closely to the 2010 DGAs.[||]
- 2016—Final rule released in April.[#]
- 2017—Providers must be in compliance with the rule by Oct. 1, although in May, the USDA established a one-year transition period to help providers implement the new standards.[**]

* Institute of Medicine, "Child and Adult Care Food Program: Aligning Dietary Guidance for All" (Nov. 4, 2010), http://www.nationalacademies.org/hmd/Reports/2010/Child-and-Adult-Care-Food-Program-Aligning-Dietary-Guidance-for-All.aspx.

† Ibid.

‡ Ibid.

§ U.S. Department of Agriculture, "Revised: Child Nutrition Reauthorization 2010 Nutrition Requirements for Fluid Milk and Fluid Milk Substitutions in the Child and Adult Care Food Program, Q&As," accessed Jan. 27, 2017, https://www.fns.usda.gov/cacfp-21-2011-revised-child-nutrition-reauthorization-2010-nutrition-requirements-fluid-milk-and.

|| Proclamation No. 10, 80 Fed. Reg. RIN 0584-AE18 (Jan. 15, 2015), 7 CFR Parts 210, 215, 220, and 226, https://www.gpo.gov/fdsys/pkg/FR-2015-01-15/pdf/2015-00446.pdf.

Proclamation No. 79, 81 Fed. Reg. RIN 0584-AE18 (April 26, 2016), 7 CFR Parts 210, 215, 220, 226, https://www.federalregister.gov/articles/2016/04/25/2016-09412/child-and-adult-care-food-program-meal-pattern-revisions-related-to-the-healthy-hunger-free-kids-act.

** Ibid.

CACFP program participation and eligibility

A variety of institutions that are licensed to provide child care services participate in CACFP. They include public and private nonprofit centers, Head Start programs, after-school care centers, and for-profit centers that serve lower-income children.[7]


Courtesy of Neighborhood House Association

Enrollee profile

According to a study published in 2013, CACFP-enrolled children come from families with lower incomes and tend to live in poorer communities, on average, than the U.S. child population as a whole: The average neighborhood poverty rate among enrollees was 22.7 percent, compared with 12.2 percent nationally.[8] Furthermore, CACFP-enrolled children are more likely to be Hispanic or black and to have single, less-educated mothers as the head of the household, compared with the national population of children.[9]

Eligibility

CACFP targets benefits to children most in need by reimbursing centers according to three categories: free, reduced price, and full price. Children from households with incomes at or below 130 percent of poverty are eligible for free meals; those from families between 130 and 185 percent of poverty are eligible for reduced price meals; and children from families above 185 percent of poverty pay full price for their meals.[10] Institutions must determine each enrolled child's eligibility for free and reduced-price meals.[11]

CACFP provides reimbursement for meals and snacks to licensed, registered, or approved family child care homes, but the reimbursement structure varies by how a site qualifies. Family child care home providers whose incomes fall at or below 185 percent of the federal poverty threshold or whose homes are in low-income areas in which at least half the children served come from families in that same income range are considered to be Tier 1 and receive the maximum reimbursement for all meals and snacks served. Providers who do not meet the Tier 1 criteria can qualify for the lower Tier 2 reimbursement and may work with their sponsors to seek higher reimbursement for meals and snacks served to children in their care whose families meet the Tier 1 income requirements.

In fiscal year 2016, an average of more than 4 million children—about 7.8 percent of U.S. children under age 13—participated in CACFP each day in 170,601 child care homes and centers.[12] Approximately 85.3 percent of child care homes qualified as Tier 1 in 2014.[13] Table 1 compares participation levels of homes and centers in fiscal 2014 to 2016. Overall, average daily participation increased each year with a steady trend toward more children enrolled in centers but fewer in child care homes.

Table 1

CACFP Child Enrollment Has Risen Steadily Among Centers but Declined for Homes

Number of settings and average daily attendance by type, FY 2014-16

Fiscal year	Homes		Centers	
	Number of homes	Average daily attendance	Number of centers	Average daily attendance
2016	107,832	752,737	62,769	3,414,846
2015	113,847	777,667	64,211	3,277,506
2014	117,172	776,274	58,656	2,941,355

Sources: U.S. Department of Agriculture, "Program Information Report: U.S. Summary, FY 2016-FY 2017" (October 2016), https://www.fns.usda.gov/sites/default/files/datastatistics/keydata-october-2016.pdf; U.S. Department of Agriculture, "Program Information Report: U.S. Summary, FY 2015-FY 2016" (December 2015), https://www.fns.usda.gov/sites/default/files/datastatistics/keydata-december-2015.pdf; U.S. Department of Agriculture, "Program Information Report: U.S. Summary, FY 2016-FY 2017" (October 2016), https://www.fns.usda.gov/sites/default/files/datastatistics/keydata-october-2016.pdf; U.S. Department of Agriculture, "Program Information Report: U.S. Summary, FY 2014-FY 2015" (October 2014), https://www.fns.usda.gov/sites/default/files/datastatistics/Keydata-October-2014.pdf

Program costs

The total cost of CACFP was $3.5 billion in 2016, with most of the funding, $3.2 billion, directed toward reimbursements for food served.[14] Although programmatic costs have gone up, when adjusted for inflation, this rise has not caused dramatic increases overall. (For expanded data tables, see supplemental Appendix A, which can be downloaded from the report webpage.)

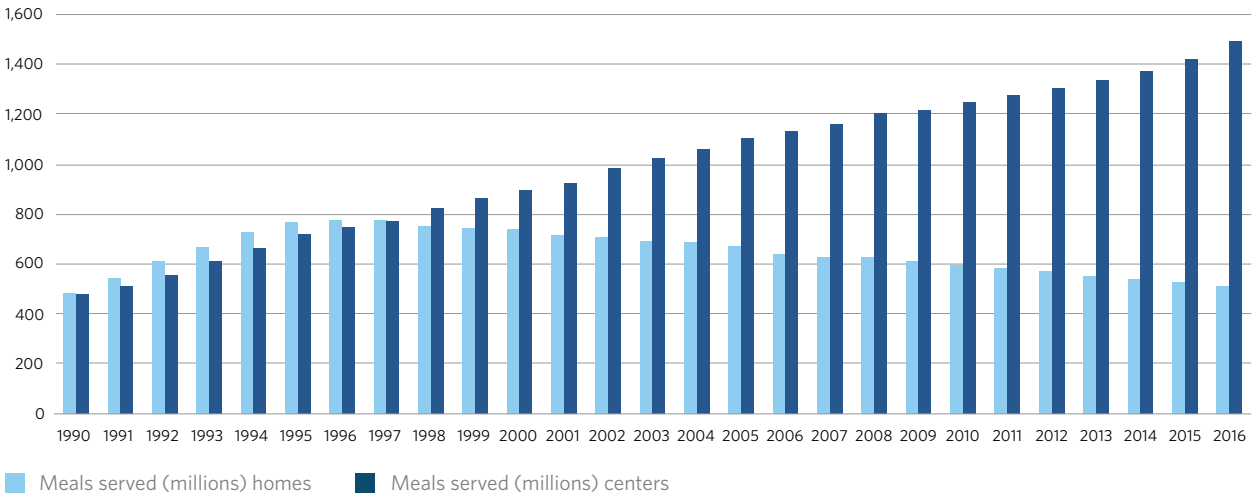
Meals served in CACFP

Approximately 2 billion meals were served to children in licensed care homes (512 million) and centers (1.5 billion) in 2016.[15] Since 1997, meals served in homes have been on the decline while those in centers have risen steadily. (See Figure 1.)

Figure 1

Food Service in Child Care Homes Has Declined Since 1997

Meals in CACFP homes and centers, 1990-2016



Notes: Data for 2016 are preliminary and as of Jan. 6, 2017. For expanded data tables, see supplemental Appendix A, which can be downloaded from the report webpage.

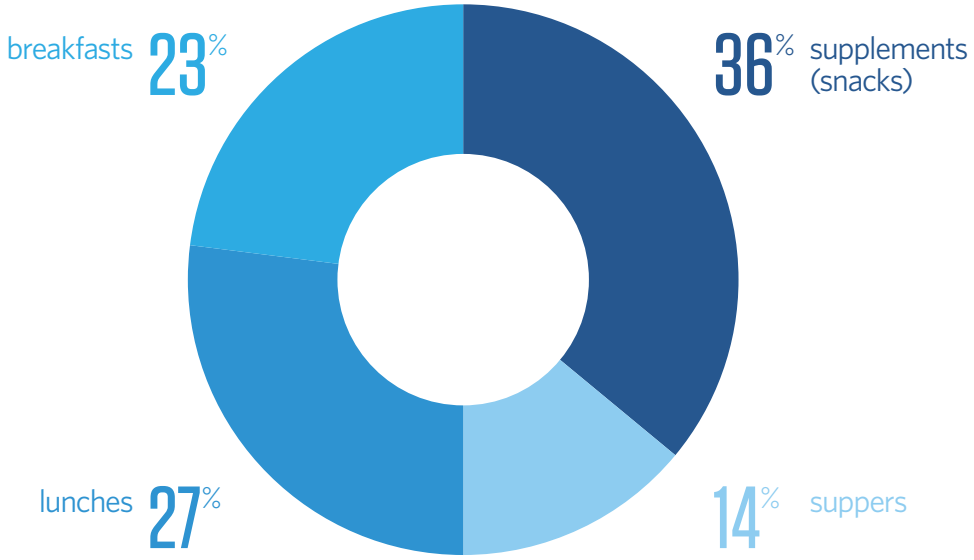
Source: U.S. Department of Agriculture, "Child and Adult Care Food Program: Data as of January 6, 2017," accessed Jan. 31, 2017, https://www.fns.usda.gov/sites/default/files/pd/ccsummar.pdf

On average, 22.8 percent of foods served in CACFP settings are breakfasts, 27.3 percent are lunches, 13.9 percent are suppers, and 36 percent are supplements (snacks).[16] (See Figure 2.) This analysis did not include suppers. CACFP standards set requirements for meal components rather than for nutrients. To be reimbursable, lunches and suppers must include all five food components: fluid milk, meat or meat alternates, vegetables, fruits, and grains; breakfasts must include three of the components—fluid milk; vegetables, fruits, or portions of both; and grains—and snacks must include any two of the five.

Figure 2

Most of the Foods Served in CACFP Settings Are Snacks

Percent of meals served in centers and homes by type, FY 2016



Source: U.S. Department of Agriculture, "Program Information Report: U.S. Summary, FY 2016-FY 2017" (October 2016), https://www.fns.usda.gov/sites/default/files/datastatistics/keydata-october-2016.pdf

CACFP proposed rule on nutrition standards

Before the proposed rule, CACFP nutrition standards were based in part on guidance from the 1989 report "Diet and Health: Implications for Reducing Chronic Disease" and the 1989 "Recommended Dietary Allowances."[17] The Healthy, Hunger-Free Kids Act of 2010 required the USDA's Food and Nutrition Service to review the CACFP meal patterns and make them more consistent with the 2010 DGAs,[18] current and relevant nutrition science, and appropriate authoritative scientific recommendations. In response, the Food and Nutrition Service commissioned the IOM to review the CACFP meal standards and provide recommendations to align with the most recent DGAs and improve the nutritional quality of the foods served in program settings. In November 2010, the IOM issued its findings and recommendations in the "Child and Adult Care Food Program: Aligning Dietary Guidance for All."[19]

In early 2015, the USDA crafted a set of revisions to the CACFP standards, based on the IOM's recommendations, to better serve the nutritional needs of children while maintaining costs within current reimbursement levels.[20] Optional best practices to improve meals' nutritional value beyond the proposed requirements were also included for providers wishing to do more.

Update to the CACFP proposed rule

In April 2016, the USDA finalized its strengthened CACFP nutrition standards for food and beverages served to young children in child care and adults in day care settings. The final rule, "Child and Adult Care Food Program: Meal Pattern Revisions Related to the Healthy, Hunger-Free Kids Act of 2010" (7 CFR Parts 210, 215, 220, and 226), marks the first major revision to the standards since the program's inception in 1968. Most of the final rule requirements are the same as those in the proposed rule with some minor modifications as shown in Table 2.

This HIA analyzed the potential health impacts of the initial proposed changes and provides recommendations for successful implementation. The final rule was effective in June 2016 and providers must be compliant by October 2017.

Table 2

CACFP Nutrition Standards

Specific changes examined by the HIA

Topic*	Pre-revision standards†	Proposed rule requirements	Final rule requirements	Final rule recommended best practices
Whole grains‡	All grains may be whole or enriched and/or fortified. No specific requirement to provide whole grain.	Requires that at least one grain serving per day be whole grain-rich.	Same as proposed rule.	Provide at least two servings of whole grain-rich grains per day.
Fruits and vegetables	Combines the fruit and vegetables into one meal component and allows sites to serve only fruit to satisfy the requirement.	Separates fruits and vegetables into individual meal components at lunch, supper, and snack; breakfast requirements for fruit and vegetable serving sizes do not change.	Same as proposed rule, with the flexibility to serve two vegetables at lunch or supper.	Make at least one of the two required components of a snack a vegetable or a fruit. Serve a variety of fruits and choose whole fruits (fresh, canned, dried, or frozen) more often than juice. Provide at least one serving each of dark green, red and orange vegetables, beans and peas (legumes), starchy vegetables, and other types per week.
Grain-based desserts	Allows grain-based desserts, such as cakes, pies, and cookies to be reimbursed as a grain component.	Prohibits reimbursement of grain-based desserts.	Same as proposed rule.	

Continued on next page

Topic*	Pre-revision standards†	Proposed rule requirements	Final rule requirements	Final rule recommended best practices
Ready-to-eat breakfast cereals§	Ready-to-eat breakfast cereals may be whole grain or enriched with no sugar limitations.	All breakfast cereals must meet Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) requirements that include, for example, no more than 6 grams of sugar per dry ounce.	Eliminates the full WIC requirements for breakfast cereals but requires that all breakfast cereals contain no more than 6 grams of sugar per dry ounce (e.g., no more than 21.2 grams of sucrose and other sugars per 100 grams of dry cereal).	
Fluid milk	Fluid milk‖ is required as a reimbursable meal component.	Requires only unflavored whole milk for children ages 1-2; low-fat or fat-free milk for children 2 and older; and that any flavored milk served to children ages 2-5 be fat-free.	Same as proposed rule, with the caveat that flavored milk be prohibited for children 2-5. Low-fat milk may be served to a 1-year-old instead of whole milk in cases of medical or special dietary needs.	Serve only unflavored milk to all participants, but when it is served to children 6 and older ensure that it contains no more than 22 grams of sugar per 8 fluid ounces.
Meat or meat alternate	No reimbursement for service of meat or a meat alternate for breakfast or snack.	Allows an optional meat or meat alternate to be served at breakfast of up to half of the required grains and allows tofu to be counted as a meat alternate.	Allows an optional meat or meat alternate to be served in place of the entire grains requirement at breakfast a maximum of three times per week.	Serve only lean meats, nuts, and legumes. Limit serving processed meats to no more than one serving per week. Serve only natural cheeses and choose those that are low or reduced fat.
Frying of foods	On-site frying of foods is permitted	Prohibits facilities from frying foods (i.e., cooking in added fat or oil) as an on-site preparation method.	Same as proposed rule, with the clarification that deep-fat frying (i.e., cooking by submerging food in hot oil or other fat) is prohibited. On-site sauteing, pan-frying, and stir-frying are allowable.	Limit serving purchased pre-fried foods to no more than one serving per week.

* See complete analyses in the "Effects on nutritional quality of foods served" section of this report. The proposed rule also includes other modifications that are not addressed by this HIA. Juice, for example, while much discussed in research and in the stakeholder interviews, was not part of the core analysis for the HIA team because the USDA's proposal to limit juice was offered as a best practice and not a requirement. Specifically, stakeholders applauded the elimination of juice from infant meals but expressed some concerns about the juice allowances for older children. The juice standards are touched on in the "HIA findings and the final CACFP rule" section.

† Pre-revision standards are those standards that were in place before the proposed rule's release. They are effective until the final regulation goes into effect in October 2017.

‡ In the final rule, the USDA defines whole-grain and whole grain-rich foods this way: "Foods that qualify as whole grain-rich are foods that contain a blend of whole grain meal and/or whole grain flour and enriched meal and/or enriched flour of which at least 50 percent is whole grain and the remaining grains in the food, if any, are enriched; or foods that contain 100 percent whole grain." This definition can be found at https://www.regulations.gov/document?D=FNS-2011-0029-4303.

§ The USDA's "Child and Adult Care Food Program Crediting Handbook" defines breakfast cereals as those that are "cold dry cereal" or "hot cooked cereal." The handbook can be accessed at http://www.fns.usda.gov/sites/default/files/CACFP_creditinghandbook.pdf.

‖ Although before the rule change, regulations did not specify fat content and/or flavoring, USDA memo CACFP 21-2011 REVISED Sept. 15, 2011 advised state agencies that milk served in CACFP to children 2 and older must be low-fat or fat-free, in accordance with the most recent Dietary Guidelines for Americans.

Sources: Proclamation No. 10, 80 Fed. Reg. RIN 0584-AE18 (Jan. 15, 2015), 7 CFR Parts 210, 215, 220, and 226, https://www.gpo.gov/fdsys/pkg/FR-2015-01-15/pdf/2015-00446.pdf; Proclamation No. 79, 81, Fed. Reg., RIN 0584-AE18 (April 25, 2016), 7 CFR Parts 210, 215, 220, and 226, https://www.gpo.gov/fdsys/pkg/FR-2016-04-25/pdf/2016-09412.pdf

Breastfeeding Practices and the Proposed Rule

The proposed rule modified reimbursement criteria for breastfeeding, allowing reimbursement for infant meals when the mother breastfeeds her baby on site; the final rule included this revision. This change was not addressed in detail by the HIA because it does not pertain directly to meals served by CACFP providers.

Overall, stakeholders largely supported this change because many providers promote breastfeeding and offer a private space for mothers. Although limited evidence is available to determine whether this change will contribute positively to infants' overall nutrition, data do show that efforts to improve the quality and frequency of on-site breastfeeding tend to be effective.*

Regulatory revisions made in 2014, combined with peer- and client-centered counseling, were shown to increase breastfeeding initiation and delay the introduction of solid foods.† Researchers, state agency officials, sponsors, and providers were in agreement that breastfeeding has many benefits for infants' overall health and brain development.

Mothers who were breastfeeding or who had breastfed indicated that the proposed change would be positive. One said that breastfeeding provides bonding time and saves mothers from having to pump at work. In addition, a few home providers appreciated the potential financial benefit from this change and said that marketing their businesses as breastfeeding-friendly provides a competitive advantage when parents are searching for child care.

In interviews, sponsors and providers identified two challenges related to mothers' work that could reduce the use of this provision: If the child care home or center is located far from the mother's job, or if her other daytime responsibilities do not allow enough flexibility, she may not have time for on-site breastfeeding.

* Marilyn Batan, Ruowei Li, and Kellie Scanlon, "Association of Child Care Providers Breastfeeding Support With Breastfeeding Duration at 6 Months," *Maternal Child Health Journal* 17, no. 4 (2013): 708–13, http://dx.doi.org/10.1007/s10995-012-1050-7; Sara B. Fein, Bidisha Mandal, and Brian E. Roe, "Success of Strategies for Combining Employment and Breastfeeding," *Pediatrics* 122, Supp. 2 (2008): S56–62, http://dx.doi.org/10.1542/peds.2008-1315g.

† Mary Ann Chiasson et al., "Changing WIC Changes What Children Eat," *Obesity* 21, no. 7 (2013): 1423–29, http://dx.doi.org/10.1002/oby.20295. WIC is a federal nutrition program that provides grants to states to support a variety of activities to support low-income pregnant, breastfeeding, and nonbreastfeeding postpartum women, as well as infants and children experiencing nutritional risk.

The HIA approach

HIAs identify the potential health effects of a proposed policy, project, plan, or program to inform policymakers, those affected by the decision, and others with an interest in the outcome, and to offer practical options for maximizing health benefits while minimizing health risks.

HIAs broadly consider environmental, social, and economic factors related to health and evaluate the potential impacts on the health and well-being of the community, including the full range of potential positive and negative effects. They employ a variety of data methods, including qualitative and quantitative analysis and input from stakeholders, to identify health concerns and opportunities related to the proposal and to determine how these impacts may be distributed among the population. HIAs pay particular attention to the effects on at-risk groups, such as seniors, children, and low-income families, which experience more health-related obstacles than does the general population, based on race and ethnicity; religion; socio-economic status; gender; mental health; cognitive, sensory, or physical disability; sexual orientation or gender identity; or geographical location.[21] Finally, HIAs provide pragmatic, evidence-based recommendations about how to reduce risks, promote benefits, and monitor the health effects of the implemented decision.[22]

An HIA is conducted in six steps, which are briefly described below.[23] Engaging stakeholders—including those who may be affected; policymakers; and others with an interest in the outcome—is essential to conducting an HIA and occurs throughout the steps.

The HIA Process*

Step 1: Screening. The HIA team and stakeholders determine whether an HIA is needed, can be accomplished in a timely manner, and would add value to the decision-making process.

Step 2: Scoping. The HIA team and stakeholders identify the potential health effects that will be considered and develop a plan for completing the assessment, including specifying their respective roles and responsibilities.

Step 3: Assessment. The HIA team evaluates the proposed project, program, policy, or plan and identifies its most likely health effects using a range of data sources, analytical methods, and stakeholder input to answer the research questions developed during scoping.

Step 4: Recommendations. The team and stakeholders develop practical solutions that can be implemented within the political, economic, or technical limitations of the project or policy to minimize identified health risks and to maximize potential health benefits.

Step 5: Reporting. The team disseminates the HIA report, which describe its process, findings, and recommendations to a wide range of stakeholders.

Continued on next page

Step 6: Monitoring and evaluation. The team and stakeholders evaluate the HIA according to accepted standards of practice. Then, to inform future work, they propose a plan for monitoring and measuring the HIA's impact on decision-making and the effects of the implemented decision on health.

* Rajiv Bhatia et al., "Minimum Elements and Practice Standards for Health Impact Assessment, Version 3" (2014), https://sophia.wildapricot.org/resources/Documents/HIA-Practice-Standards-September-2014.pdf; National Research Council, *Improving Health in the United States: The Role of Health Impact Assessment* (Washington: National Academies Press, 2011), 5, http://www.nap.edu/catalog.php?record_id=13229

Research questions and scope

This assessment focused on aspects of the proposed rule that affect children in ECE settings. The HIA team developed the initial scope of the assessment by comparing the proposed rule with pre-revision standards and generating a map of potential pathways through which changes to the nutrition standards could affect health. (See Figure S.1 in the companion "CACFP Health Impact Assessment Methodological Supplement," which can be downloaded from the report webpage.) This exercise helped the team develop the original set of research questions that are listed in the overview, above.

Assessment approach

The HIA team used a mixed-methods approach to address the research questions, including a systematic review of literature that investigated pre-revision meal standards and the populations most likely to be served, child care in general, and children's health; an analysis of three hypothetical menus; and the collection and examination of qualitative data from stakeholders.

For more detail about the assessment approach and the process through which the HIA team projected the health effects of the proposed changes, please see the methodological supplement. The empirical literature largely drove the approach for predicting health effects with the stakeholder input and menu analyses supporting the findings.

Literature review

The research team conducted a systematic literature review using search terms aligned with the HIA scope and questions. The goal was to summarize the current knowledge base regarding the nutritional quality of foods served in CACFP, children's food consumption, and nutrition-related health outcomes and disparities among CACFP-eligible children. The methodological supplement includes a list of specific search terms with criteria for whether to consider an article and a description of the process used to score the quality of the research.

Quantitative data: Hypothetical menus and cost calculations

Hypothetical menus

The HIA team developed a set of hypothetical weekly CACFP menus, including meals, snacks, and drinks, which reflected the components and overall nutritional quality of meals under three scenarios: CACFP practices before the proposed rule ("pre-revision"), with the proposed requirements ("proposed"), and with the best practices included in the proposed rule ("best practices"). (For the menus and corresponding rationales, see supplemental Appendix B, which can be downloaded from the report webpage.)

Because no national surveillance data are available to demonstrate what constitutes a "typical" CACFP meal and stakeholders consistently noted the diversity of meals being served, the menus were not representative of all foods served by CACFP providers. Rather, they provide examples of how meal quality might change with updated standards.

The team examined menus using the USDA's Center for Nutrition Policy and Promotion's Healthy Eating Index (HEI), which measures diet quality and how closely eating patterns align to the DGAs. The HEI assesses diet quality based on adequacy (dietary components to increase) and moderation (dietary components to decrease).

Further, the team calculated the associated nutrient changes across menu scenarios using 2011-12 National Health and Nutrition Examination dietary recall data, the most recent available. However, the HIA does not include a statistical analysis of changes in nutrients between the scenarios because of a lack of representative data on pre-revision meals and inconsistencies between data sets: The scenarios reflect only partial days because CACFP limits reimbursement to a maximum number of meals during care, while the recall data cover full days. No quantitative conclusions could be drawn from the menu analysis, but providing HEI scores for the proposed changes helps to demonstrate their possible impacts. (See the methodological supplement, which can be downloaded from the report webpage, for additional detail on methods.)

Cost simulation

The HIA estimated the proposed rule's potential cost impacts on providers using cost-evaluation data from the IOM report as a baseline and relevant literature to form assumptions about provider practices. Prices were adjusted according to the USDA's most recent Quarterly Food-at-Home Price Database.[24]

Qualitative data: Stakeholder perspectives

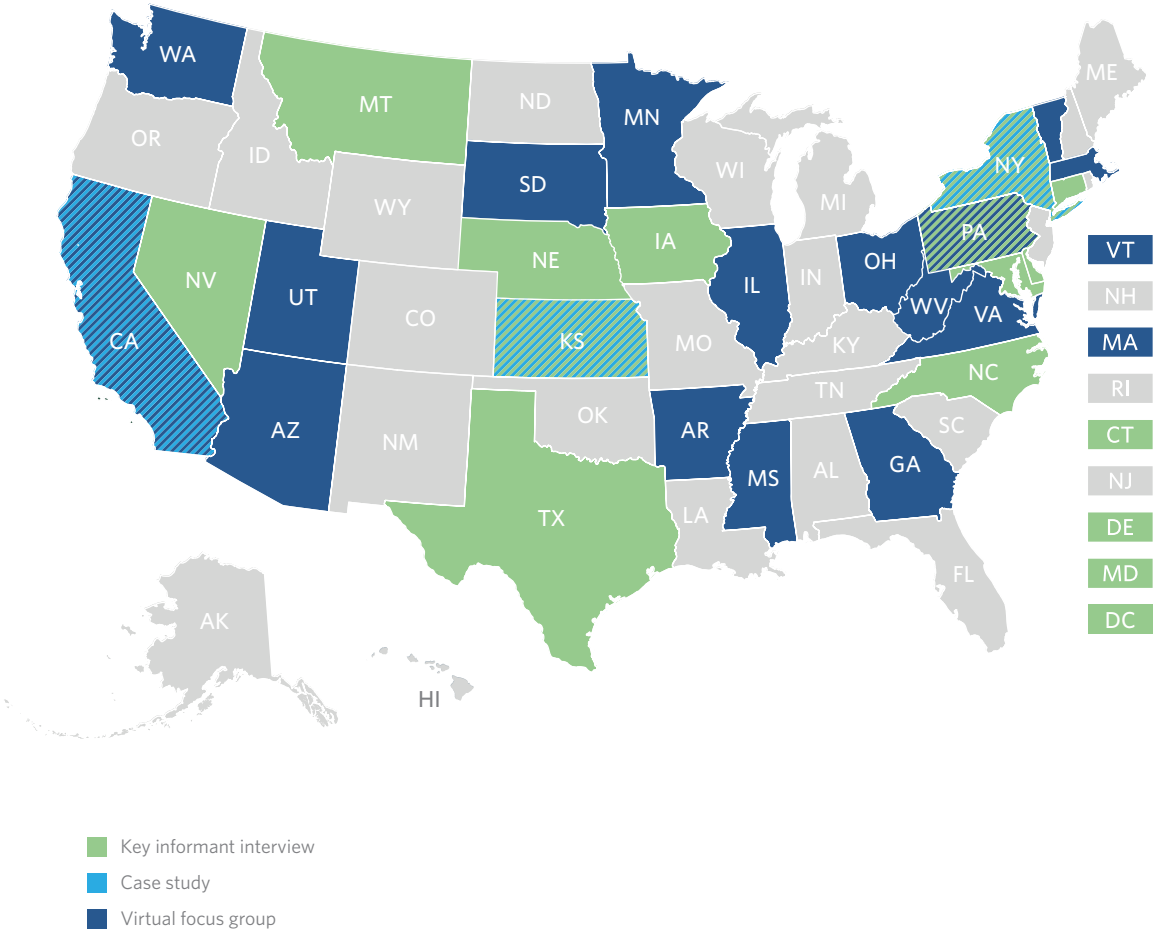
From October 2015 through January 2016, the HIA team collected stakeholder perspectives on the proposed changes using informant interviews, focus groups, and three case study visits at Opportunities for Chenango Inc. in Norwich, New York; Neighborhood House Association in San Diego; and Kristin's Daycare in Lenexa, Kansas. In total, the team gathered feedback from more than 130 individuals, including CACFP sponsors; provider staff, such as administrators, teachers, and food service personnel; parents; state agency staff; and research and policy organizations. The Johns Hopkins Bloomberg School of Public Health Institutional Review Board approved all qualitative data collection procedures. (See the methodological supplement, which can be downloaded from the report webpage, for additional detail on methods.)

Figure 3 illustrates these engagement efforts across the U.S. by data collection method.

Figure 3

Stakeholders Across U.S. Provided Input for This Study

Distribution of interviews, case studies, and focus groups



Note: Participating stakeholders in the various engagement efforts included providers, sponsors, experts, researchers, agency staff, and/or parents of children enrolled in CACFP.

Review of state ECE licensure laws

Accurately assessing the strength and distribution of the effects—referred to collectively here as "magnitude of impact"—that a policy, project, or program will have on a given population is critical for generating evidence-based recommendations that maximize positive health outcomes. The HIA team conducted a qualitative assessment—through a review of state ECE licensure laws and their ties to CACFP as the nutritional standard of choice—to determine the magnitude of impact the proposed rule could have on non-CACFP settings (centers and homes) across the country. The HIA measured the magnitude of impact on settings and states, rather than on children, because data on the number of kids in non-CACFP programs that serve food are limited.

Key Concepts Used in This Study

Food served is a proxy for food consumed

Identifying valid, reliable, and cost-effective methods for documenting dietary intake is difficult; the best measure, direct observation, is time-consuming and costly. Thus, no nationally representative study of consumption in CACFP is available. As a result, researchers often use "amount served" as a proxy for consumption, although the ratio of food consumed to food served could differ based on several factors, including a child's age and preferences. The HIA team reviewed trends and themes from smaller studies—some used actual consumption while others conducted nutrition analyses of foods served—to understand the diet patterns and food intake of children in CACFP.*

Dietary Reference Intakes

Dietary Reference Intakes (DRIs) are benchmark nutrient consumption values developed by the IOM and intended to provide a scientific evidence base for the development of nutrition guidelines in the U.S. and Canada. The DRIs were developed in the mid-1990s and replaced the Recommended Dietary Allowance in the United States and the Recommended Nutrient Intake in Canada.† These values are specified by age, gender, activity level, and life stage, including the nutritional requirements for pregnancy and lactation; cover more than 40 nutrients; and incorporate measures related to adequate intake and excessive levels for each nutrient.

Nutrient-dense foods

The DGAs define nutrient-dense as "a characteristic of foods and beverages that provide vitamins, minerals, and other substances that contribute to adequate nutrient intakes or may have positive health effects, with little or no solid fats and added sugars, refined starches, and sodium. All vegetables, fruits, whole grains, seafood, eggs, beans and peas, unsalted nuts and seeds, fat-free and low-fat dairy products, and lean meats and poultry—when prepared with little or no added solid fats, sugars, refined starches, and sodium—are nutrient-dense foods."‡

Low-nutrient, high-calorie foods

Also known as "empty calories," these foods get their calories from added sugars and solid fats, some of which contain saturated fats that are detrimental to health. Empty calories come from foods that are considered high energy-dense foods. Energy density, the amount of energy or calories per gram of food, is one way to identify foods that provide unnecessary calories in a child's diet. High energy-dense foods yield more empty calories than their low energy-dense counterparts and are often processed with "a high concentration of calories per bite," more fat, and lower water content.§

Continued on next page

* Clifton Gray et al., "Fruits and Vegetables Taken Can Serve as a Proxy Measure for Amounts Eaten in a School Lunch," *Journal of the Academy of Nutrition and Dietetics* 107, no. 6 (2007): 1019–23, http://dx.doi.org/10.1016/j.jada.2007.03.001; Theresa A. Nicklas et al., "Characterizing Lunch Meals Served and Consumed by Preschool Children in Head Start," *Public Health Nutrition* 16, no. 12 (2013): 2169–77, http://dx.doi.org/10.1017/S1368980013001377; Jennifer O. Fisher, Barbara J. Rolls, and Leann L. Birch, "Children's Bite Size and Intake of an Entrée Are Greater With Large Portions Than With Age-Appropriate or Self-Selected Portions," *American Journal of Clinical Nutrition* 77, no. 5 (2003): 1164–70; Jennifer O. Fisher et al., "Portion Size Effects on Daily Energy Intake in Low-Income Hispanic and African American Children and Their Mothers," *American Journal of Clinical Nutrition* 86, no. 6 (2007): 1709-1716, PubMed: 18065590; Jennifer O. Fisher et al., "Effects of Portion Size and Energy Density on Young Children's Intake at a Meal," *American Journal of Clinical Nutrition* 86, no. 1 (2007): 174–79, PubMed: 17616778; Debbie A. Lown et al., "Effect of Variable Energy Served on 24-Hour Energy Intake in 16 Preschools, Chicago, Illinois, 2007," *Preventing Chronic Disease* 8, no. 3 (2011): A58, http://www.cdc.gov/pcd/issues/2011/may/10_0145.htm; Marlene B. Schwartz et al., "Testing Variations on Family-Style Feeding to Increase Whole Fruit and Vegetable Consumption Among Preschoolers in Child Care," *Childhood Obesity* 11, no. 5 (2015): 499–505, http://dx.doi.org/10.1089/chi.2015.0038.

† National Academies of Sciences, Engineering, and Medicine, "Dietary Reference Intakes Tables and Application," http://www.nationalacademies.org/hmd/Activities/Nutrition/SummaryDRIs/DRI-Tables.aspx.

‡ U.S. Department of Health and Human Services and U.S. Department of Agriculture, "Dietary Guidelines for Americans, 2015-2020: Executive Summary," https://health.gov/dietaryguidelines/2015/resources/DGA_Executive-Summary.pdf.

§ North Carolina State University and North Carolina A&T State University Cooperative Extension, "Energy Dense Foods," accessed May 19, 2016, https://rutherford.ces.ncsu.edu/family-and-consumer-article.

Effects on nutritional quality of foods served

Research consistently shows that American children ages 1 to 3 fall short of the recommended consumption of vegetables and whole grains, and exceed the recommended intake for added sugars, saturated fats, and sodium.[25] Further, children from families below 185 percent of the federal poverty threshold consume significantly fewer fruits, whole grains, seafood, and nuts than those from higher-income households.[26] Inadequate consumption of these foods results in insufficient intake of associated nutrients, such as fiber, potassium, vitamin D, and vitamin E. In particular, African-American children from families with incomes under 185 percent of the poverty threshold consume more sodium and higher amounts of protein, fatty acids, and vitamin E on average than similarly low-income children from every other ethnic group.[27] For a detailed chart of children's food consumption and associated nutrients by ethnic and racial and income groups, see supplemental Appendix C, which can be downloaded from the report webpage.

The foods that children eat while in ECE settings play an important role in shaping the nutritional quality of their diets.[28] The Academy of Nutrition and Dietetics recommends that foods and beverages served in ECE homes and centers cover a proportional share of children's daily nutrient requirements, with part- and full-time programs satisfying at least a third and a half to two-thirds of those needs, respectively.[29] The HIA first examined these existing deficiencies in infants' and young children's diets and how the proposed rule might address them by improving the foods served in CACFP. It went on to consider how those changes could affect the health of children who spend time in settings that follow CACFP nutritional standards.

Two of the HIA research questions guided this portion of the study:

- How would the changes affect the nutritional quality of food served at ECE settings that follow CACFP nutrition standards (CACFP participants and others)?
- How would the changes affect dietary consumption for children in ECE settings that follow CACFP nutrition standards (CACFP participants and others)?

The HIA sought to answer questions with a particular focus on four key indicators for children's health:

- Nutritional quality of foods served to children.
- Consumption of certain foods, including fruits, vegetables, whole grains, grain-based desserts, milk, and meat.
- Consumption of commonly underconsumed nutrients, such as vitamins D and E.
- Consumption of commonly overconsumed macronutrients, such as saturated fat, sodium, and sugar.

The HIA found that, collectively, the proposed rule's revisions could have beneficial effects on the health of children in CACFP settings:

- **A positive impact on the nutritional quality of foods served.** The changes to the nutritional standards are expected to improve the quality of foods, in turn providing greater health benefits to the children reached. The case studies demonstrate that CACFP providers that already follow the new standards have observed such improvements. (See, for example, "Case Study Promising Practices: Neighborhood House Association" on Page 21.)
- **Mixed effects on consumption across food groups.** The proposed rule is likely to increase children's intake of some foods and to decrease or hold steady others:
  - Greater access and exposure to various options, appropriate portion sizes, and more nutrition education could increase consumption of vegetables, in particular.
  - Children already eat more fruits than vegetables, so fruit consumption would probably not change.
  - The daily whole-grain requirement would probably increase consumption.
  - Eliminating reimbursement for grain-based desserts would probably decrease service and intake of those foods.
  - The proposed requirements for reduced-fat milk and the provision to allow meat at breakfast would probably not result in any consumption changes.
- **A probable increase in intake of underconsumed nutrients.** The projected increase in certain food groups, such as whole grains and vegetables, would probably boost consumption of beneficial nutrients, which could in turn have a positive effect on children's health.
- **An overall decrease in consumption of commonly overconsumed macronutrients.** The projected increased compliance with the lower-fat milk requirement and a possible decline in empty calories as a result of limits on grain-based desserts and high-sugar cereals could decrease intake of saturated fats and added sugar. However, changes to sodium consumption are less certain. Overall, such a decline in commonly overconsumed macronutrients could benefit children's health.

- **A positive impact on children's overall diets.** Implementation of the proposed rule provides an opportunity for ECE environments that follow CACFP to expose children to a greater variety of foods and shape healthy eating habits. Stakeholders affirmed that improved access to and awareness of healthy foods also have the potential to affect children's nutrition beyond the ECE setting by positively influencing what parents serve at home, which is consistent with evidence from the literature.[30] Although updated standards can promote better diets, external factors such as physical activity and meals served outside of CACFP also influence the extent to which these changes benefit children's health.

Nutritional quality of foods served in CACFP

The HIA found that improving the nutritional value of meals and snacks served by CACFP-participating providers could lead to an increase in the overall quality of children's diets. By implementing the updated standards, providers can expose children to a larger variety of foods and encourage lifelong healthy eating habits. Research has shown that raising the nutritional value of foods in ECE settings could also result in small improvements in overall diet quality, but not without parental involvement and buy-in.[31] Nearly all parents and several providers discussed the importance of quality nutrition at ECE settings as a part of the overall diet. Many parents noted that the foods in CACFP were often healthier than what they have at home, drawing attention to the importance of these care-provided meals in filling the gaps in children's nutrition that are due to high food costs, especially for fruits and vegetables. (See the "Effects on child health inequities, risks, and outcomes" section for additional discussion on barriers to accessing healthy foods.)

However, providers repeatedly expressed that it is difficult to predict how nutritional gains in ECE settings may affect children's overall diets because of external factors, particularly the foods children eat at home. Unfortunately, the proposed rule does not provide guidance on additional levers for improving health such as encouraging children to eat the foods offered in ECE settings, incorporating or tracking eating habits outside of CACFP, or promoting physical activity.

> "I definitely took a cue from the school, and instead of asking my daughter what she wants to eat for dinner, I just put healthy foods on the table."
>
> —Parent

Case Study Promising Practices: Kristin's Daycare

Lenexa, Kansas
Family child care home
Suburban

Kristin's Daycare is a private, for-profit, licensed family child care home that can provide care for up to 10 children, or 12 if schools are closed due to snow or teacher workdays; the additional two children must be 5 or older. Lenexa is a suburb of Kansas City and has a population of 52,490, of which 80.6 percent identifies as non-Hispanic white, approximately 7 percent as Hispanic or Latino, and about 6 percent African-American.*

Lenexa is located near a variety of grocery stores, farmers' markets, and other resources that afford Kristin's Daycare easy access to high-quality foods, such as fresh fruits and vegetables.

Owner Kristin Malara began operating in 2004 as a licensed CACFP provider through Day Care Connection, a nonprofit, full-service support agency for more than 700 family child care home providers in the Johnson County area. She chose to join CACFP to improve access to healthy foods for families in her city. Over the past decade, she has cared for more than 30 children—most of whom have been white and from English-speaking households, but she also has reached families from diverse ethnic and cultural backgrounds, such as South Asian, Chinese, Polish, Dutch, and New Zealander.

A typical lunch at Kristin's Daycare† includes a variety of options, such as broccoli, beans, chicken, whole-grain bread, fresh fruit, and milk. Malara gives parents a detailed, printed description of the foods their children eat each day. In interviews, parents said this feedback helps them better understand their child's preferences and instills confidence to experiment with similar items at home. They also shared that hectic schedules often prevent them from cooking healthy dinners, emphasized their reliance on ECE settings to serve nutritious meals, and expressed appreciation that their children are consuming the recommended daily amounts of fruits and vegetables.

Sample menu

- **Breakfast:** whole-grain oat cereal, plum slices, and 1 percent milk.
- **Lunch:** meatballs, mozzarella cheese, cannellini beans, bow-tie pasta, zucchini-cauliflower-carrot mix, fresh papaya, and 1 percent milk.
- **Snack:** butter crackers and purple grapes.

* Census Bureau, "QuickFacts: Lenexa City, Kansas," accessed Jan. 31, 2017, http://www.census.gov/quickfacts/table/PST045216/2039350,00.

† Stakeholders recommended this site to the HIA team as operating at or above the CACFP pre-revision requirements. No nutrient analysis was conducted on the sample menu to determine parity with the proposed rule and best practices. The menu represents the foods that would be served to children 2 and older.

> We want parents to look to us as a role model and understand this is what healthy eating looks like and I can do this at home."
>
> —Provider food service director

Generally speaking, CACFP participation is associated with improvements in the overall nutritional quality of foods served to children in ECE settings compared with nonparticipation.[32] Research shows that interventions to improve children's fruit and vegetable consumption, especially those that offer larger servings of vegetables and provide fruits and vegetables together, have been successful at changing preferences and increasing acceptance and consumption.[33]

In addition, studies have found positive effects of policy interventions to boost whole-grain intake, such as changes made to the WIC food package in early 2009 to align the program more closely to the 2005 DGAs.[34] A study of nearly 3,000 caregivers and children in California demonstrated that six months after the WIC changes, consumption of whole grains increased by 17.3 percentage points.[35] This post-intervention increase suggests that similar changes in CACFP may yield long-term positive behavioral changes. Additionally, research from a racially and ethnically diverse preschool in Connecticut demonstrated a significant increase in fiber intake when half of the grains in daily meals included whole grains or were whole grain-rich, as recommended by the IOM.[36]

However, many CACFP sites continue to serve flavored milk or inadequate amounts of plain milk, insufficient quantities of whole grains, and excessive portions of sweetened grain-based desserts.[37] The HIA examined the proposed changes to the program's guidance on breastfeeding and for four food groups: whole grains, fruits and vegetables, milk, and meat.

Case Study Promising Practices: Neighborhood House Association

San Diego
Early Head Start and Head Start, non-Head Start centers food vendor
Urban

Since 1914, Neighborhood House Association (NHA) in San Diego has been committed to "changing the quality of life for [families and children] in need" and has grown to offer a broad array of programs, including CACFP.*

San Diego's population is nearly 1.4 million, with the plurality represented as non-Hispanic white (45.1 percent), followed by Hispanics or Latinos (28.8 percent).† As of fiscal 2014-15, 62 percent of the children in NHA's Early Head Start and Head Start programs were Hispanic, 12 percent were African-American, 16 percent white, and 6 percent Asian.‡

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Today, NHA's nutrition services program prepares food from scratch at a central kitchen and serves more than 6,000 meals a day at more than 50 locations. The nutritional value of its meals exceeds CACFP's pre-revision standards and, in some cases, goes further than the proposed rule.

NHA has received nationwide recognition for its meal services, including a Let's Move! Child Care award from first lady Michelle Obama.

History of menu shift

Before 2008, most food served by NHA was prepackaged. This heat-and-serve model allowed little room for creativity and made less nutrient-dense foods a frequent part of the children's daily diets.

NHA leadership recognized that a change would be necessary if the program was going to remain committed to "providing food that [would] give each child the largest dose of nutrients in every bite of food."[§] Market research and a thorough cost analysis revealed a strategy to make the vision a reality. The food service operation was overhauled in 2008, and since then, NHA's central kitchen has been staffed by professionals with higher educational degrees, culinary training, and other skills and certifications who create recipes and cook most of the food from scratch. The program also welcomes and incorporates feedback from children, teachers, and parents to ensure that its five-week cycle of menus—a series that includes different food each day and then repeats—remains fresh, healthy, and delicious.

Impacts of serving nutritional meals and snacks

A recent study compared the pre- and post-change average macro- and micronutrient levels and vegetable variety for breakfast, lunch, and snacks across NHA's five weeks of menus.

Overall, the analysis found that "made-from-scratch menus showed significant improvements in fat profile, with increases in essential fatty acids and significant decreases in trans-fat and percentage calories from saturated fats." NHA's new menus had more protein, dietary fiber, and vitamin C, as well as other beneficial components, and included greater variety in its menu service.[‖]

Continued on next page

Sample menu[#]

- **Breakfast:** granola blueberry yogurt parfait and 1 percent milk.
- **Lunch:** rotini alla Bolognese, Caesar salad, banana, and 1 percent milk.
- **Snack:** southwestern black bean dip with tortilla chips.

* Neighborhood House Association, "Neighborhood House Association History," accessed July 7, 2016, http://www.neighborhoodhouse.org/about-us/neighborhood-house-association-history/#sthash.gqh8twHn.dpbs.

† U.S. Census Bureau, "QuickFacts: San Diego City, California," accessed Feb. 9, 2016, http://www.census.gov/quickfacts/table/PST045216/0666000,00.

‡ Neighborhood House Association, "Fiscal Year 2014-2015 Annual Report" (2016), accessed June 15, 2016, http://www.neighborhoodhouse.org/wp-content/uploads/2012/03/ANNUAL-REPORT-COMBINED-FINAL.pdf.

§ Neighborhood House Association, "Nutrition Services," accessed Feb. 9, 2016, http://www.neighborhoodhouse.org/nha-programs/nutrition-services/#sthash.0uCjiGnq.dpbs.

|| Virginia Gray et al., "Validating the Made-From-Scratch Versus Traditional Style Approach for Improving the Nutritional Quality of Heart Start Menus," *Childhood Obesity and Nutrition* 7, no. 6 (2015): 355–66, http://dx.doi.org/10.1177/1941406415611475.

\# Stakeholders recommended this site to the HIA team as operating at or above the pre-revision CACFP requirements. No nutrient analysis was conducted on the sample menu to determine parity with the proposed rule and best practices. The menu represents the foods that would be served to children 2 and up.

In interviews and focus groups, providers, sponsors, and state and federal agency officials generally agreed that adding a variety of fruits and vegetables; introducing whole grains; limiting added sugars in grains, milk, and yogurt; and reducing fried foods, as the USDA proposed, would improve the quality of foods served in CACFP and deliver a healthier diet for children. Providers and sponsors affirmed that at sites that were already meeting or exceeding the proposed rule's standards, the nutritional quality of food had increased; they specifically mentioned an increase in fruits and vegetables and a decrease in added sugars.

Stakeholders said that changes designed to reduce added sugars and increase whole grains would probably have the most positive impact on children's health. Providers described a number of potential benefits, including stable energy levels, improved mental well-being, better dental health, decreased risk of becoming overweight and obese, and stronger immune systems, and parents said the improvements could also improve their children's behavior and readiness to learn.

Some stakeholders expressed concerns that "picky eaters" may not eat enough of the nutritious foods, which could be detrimental to their health, but sponsors said that continuously encouraging providers and engaging with parents would eventually lead to uptake. (See the "Effect on stakeholder attitudes toward nutrient-dense foods" section for more information.)

Stakeholders, especially sponsors, noted the importance of a clear implementation process for the proposed changes. Provider education and training related to product identification, selection, and purchasing were a few of the areas highlighted to ensure successful rollout of the updated standards. (See the "Policy recommendations" section for more information.)

> "[My daughter used to eat] chicken nuggets and carrots, then I started hearing [words like] hummus and curry come out of her mouth, and that made me feel really good that she was being encouraged to try it … even if she didn't like it."
>
> —Parent

Children's consumption of CACFP meals and snacks

Whole grains

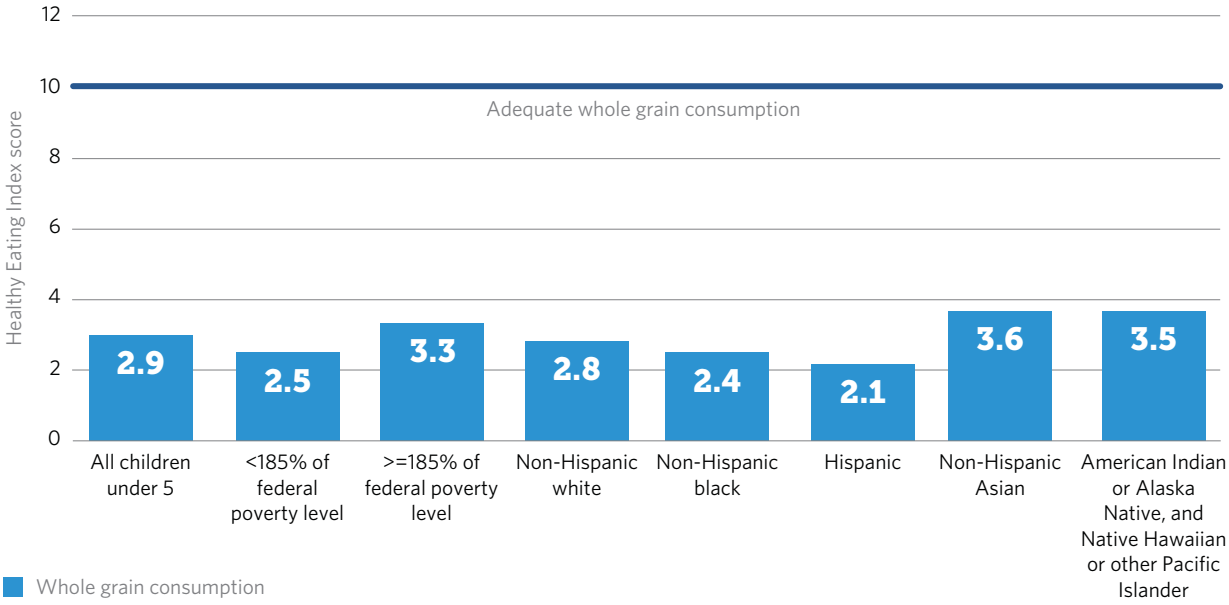
The proposed rule would require that at least one grain serving a day be whole grain-rich. This change is likely to have a positive impact on children's whole-grain intake by making whole-grain foods more available, which in turn could improve the consumption of dietary fiber and other nutrients. Stakeholders believed that eating more whole grains in ECE settings would put more fiber in children's diets, promote better digestion, and deliver necessary vitamins and minerals.

The literature indicates that across all income and racial and ethnic groups, consumption of whole grains by children under 5 is substantially below DGAs recommended levels. (See Figure 4.) Moreover, evidence shows children's elevated intake of refined grains and inadequate levels of whole grains through age 5.[38] Research on ECE settings—including those participating in CACFP—identified several factors that may lead to low levels of consumption. Providers regularly served refined grains, struggled to properly identify whole grains, and had low compliance with state whole-grain requirements.[39] This consistent lack of consumption leaves children deficient in fiber and other nutrients that come from whole grains.[40]

Figure 4

Young Children Do Not Eat Enough Whole Grains

Consumption to age 5, 2011-12



Notes: For expanded data tables and information on the ranges that overlap or fall outside of the 95 percent confidence interval, see supplemental Appendix C, which can be downloaded from the report webpage. Adequate intake of whole grains (using Healthy Eating Index scores) is based on the 2010 Dietary Guidelines for Americans..

Sources: U.S. Department of Agriculture, Center for Nutrition Policy and Promotion, "Healthy Eating Index," accessed May 2, 2016, http://www.cnpp.usda.gov/healthyeatingindex; Pew analysis of data from the Centers for Disease Control and Prevention, National Center for Health Statistics, "What We Eat in America, NHANES 2011-2012," accessed Sept. 9, 2015, http://wwwn.cdc.gov/Nchs/Nhanes/Search/DataPage.aspx?Component=Dietary&CycleBeginYear=2011

The menu scenarios for this change show that meals:

- **Pre-revision:** Included items such as white bread, white tortillas, fruit muffins, enriched spaghetti noodles, and crackers.
- **Proposed rule:** Replaced one serving of refined grain with one of whole grain, resulting in daily changes, such as replacing white bread with whole-wheat, fruit muffins with whole-grain options, and cheese sandwich crackers with whole-grain bagels.
- **Best practices:** Incorporated a second daily serving of whole grains by replacing white tortillas and enriched spaghetti noodles with whole-grain versions.

The changes from the pre-revision scenario to the proposed scenario shifted the HEI score from 0.8 out of 10, indicating poor intake of whole-grain foods, to 6.2 out of 10, which would far surpass the average intake for children ages 2 to 17 (HEI score of 2.5 out of 10).[41]

The best practices scenario achieved the maximum HEI score of 10, meaning that incorporating it into CACFP meals could help enrolled children meet DGAs recommendations for whole-grain intake. Best practices for whole grains in CACFP could be a potent lever for addressing low intake and reducing the disparity in overall diet quality between children above and below 185 percent of federal poverty.

However, the proposed change in the whole-grain component of the CACFP standards presents several challenges. Providers noted difficulties with identifying whole-grain foods and limited access to whole grain-based products in remote and low-income areas. Whole-grain products are also often more expensive than their enriched-grain counterparts, which adds a particularly significant barrier for low-income providers.

Grain-based desserts and ready-to-eat breakfast cereals

Research demonstrates that sugary cereals and grain-based desserts are served in most child care centers, including some that participate in CACFP, and are regularly consumed by toddlers and preschoolers.[42] Grain-based desserts, also referred to as sweet grains, include such items as cookies, muffins, and doughnuts. The proposed rule would prohibit reimbursement of grain-based desserts and requires that all breakfast cereals meet WIC requirements. The proposed rule's focus on reducing the service of grain-based desserts supports DGAs recommendations to limit the average daily intake of added sugars to less than 10 percent of total calories. Because grain-based desserts contribute a range of nutrients to the diet, connecting specific nutrition outcomes to changes in service and consumption of these foods can be difficult. However, the proposed rule may result in less added sugars and saturated fats in foods that are regularly served in ECE settings.

Providers, researchers, and state agency officials generally agreed with the change. However, parents and sponsors had mixed opinions, with some supporting it and others recommending that the USDA restrict the monthly number of grain-based desserts for which a provider could be reimbursed or limit the reimbursement to once a week to enable treats for special occasions. Although the proposed rule's elimination of reimbursements for grain-based desserts is likely to cause providers to serve them less often, some providers might choose to continue offering these foods even as an out-of-pocket expense. The HIA, however, did not examine this possibility in detail.

A survey of licensed providers in California and a sample of 60 home-based providers in Washington state found that 21 to 24 percent of cereals served were high in added sugar.[43] However, CACFP centers were more likely than non-CACFP centers to limit sweets and sweet snacks.[44]

State licensing also appears to be an effective lever to decrease sweet grains. At least one study found that Delaware's Head Start programs were almost seven times as likely as other child care centers to report consistent compliance with the state's limits on sweet grains.[45]

The menu scenario analysis for this change found that meals:

- **Pre-revision:** Included a chocolate chip cookie as a snack one day.
- **Proposed rule and best practices:** Removed the chocolate chip cookie and replaced it with fresh fruit.

Challenges to implementing limits on grain-based desserts will probably be related to changing attitudes about what constitutes a snack. Providers and sponsors will need education to help understand the impact of excessive added sugars in the diets of young children as well as training and technical assistance on preparation and service of healthier alternatives.

Fruits and vegetables

The proposed rule separates fruits and vegetables into individual meal components at lunch, supper, and snack; breakfast requirements for fruit and vegetable serving sizes do not change. Overall, the total fruit and total vegetable HEI scores increased incrementally with each scenario change. However, because children already eat more fruits than vegetables, the proposed rule could increase the frequency of service and of children's exposure to vegetables.[46]

Hero Images/Getty Images

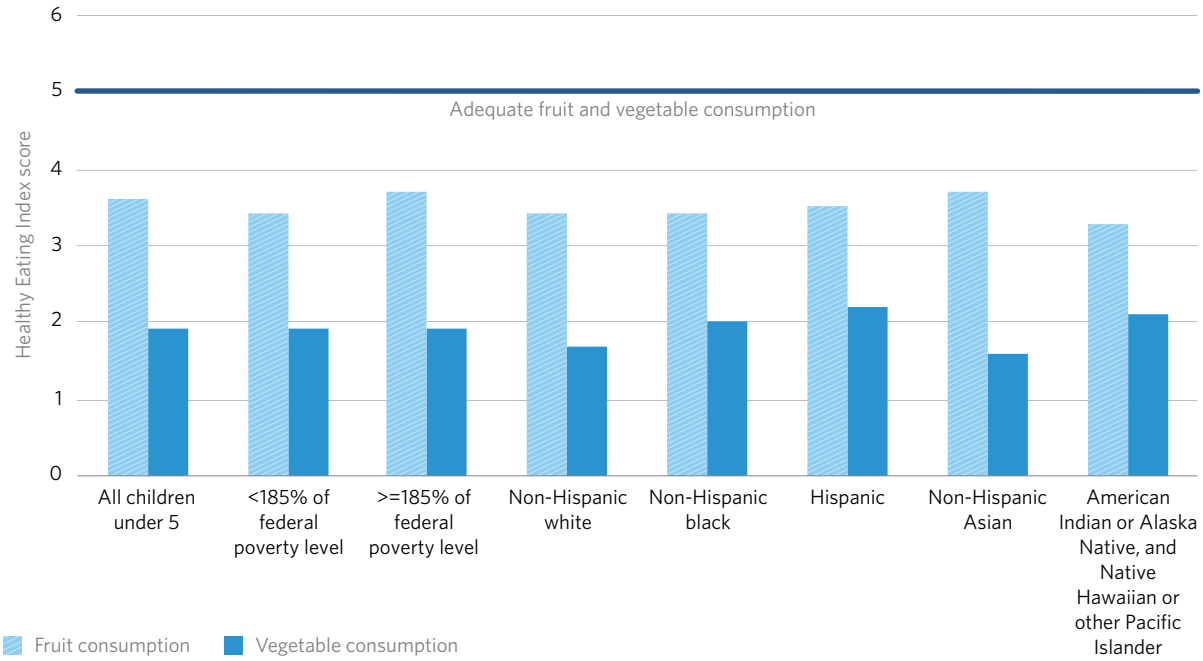
Young children eat far fewer fruits and vegetables on a weekly basis than the DGAs recommend.[47] Between ages 1 and 3, children's consumption of fruits is at recommended levels, but it begins to decline as they get older. In the case of vegetables, intake is typically below recommended levels at age 1 and often remains low into adulthood.[48] As shown in Figure 5, across all income and racial and ethnic groups, children under 5 typically eat more fruit than vegetables. Hispanic children in this age bracket include more vegetables in their diet, on average, than any other group but still consume far less than the DGAs recommend. On a given day, about 30 percent of 3-year-olds do not eat a vegetable, and among those who do, white potatoes, mainly fried, are the most common.[49] Less than 15 percent eat a dark green or red/orange vegetable each day.[50] Similarly, children's intake of fruits and vegetables while in child care is below recommended levels.[51]

Evidence suggests that CACFP participation is associated with increased fruit and vegetable consumption among preschool-age children from low-income families.[52] In addition, studies show that changes in variety, portion size, and exposure, as well as recipe modification and nutrition education, are promising strategies to further increase intake.[53]

Figure 5

Young Children Eat More Fruit Than Vegetables, but Not Enough of Either

Consumption to age 5 by race and family income, 2011-12



Notes: For expanded data tables and information on the ranges that overlap or fall outside of the 95 percent confidence interval, see supplemental Appendix C, which can be downloaded from the report webpage. Adequate intake of fruits and vegetables (using Healthy Eating Index scores) is based on the 2010 Dietary Guidelines for Americans. The Healthy Eating Index standard for maximum score for fruits is 0.8 cup per 1,000 calories, and the standard for maximum score for vegetables is 1.1 cups per 1,000 calories.

Sources: U.S. Department of Agriculture, Center for Nutrition Policy and Promotion, "Healthy Eating Index," accessed May 2, 2016, http://www.cnpp.usda.gov/healthyeatingindex; Pew analysis of data from the Centers for Disease Control and Prevention, National Center for Health Statistics, "What We Eat in America, NHANES 2011-2012," accessed Sept. 9, 2015, http://wwwn.cdc.gov/Nchs/Nhanes/Search/DataPage.aspx?Component=Dietary&CycleBeginYear=2011

The menu scenario analysis for this change found that meals:

- **Pre-revision:** Included apple slices and a banana as two lunch menu items. Snack time featured a chocolate chip cookie as a grain-based dessert; on other days, cheese slices and pretzels were included.
- **Proposed rule:** Removed the banana lunch option and replaced it with celery sticks. Offered strawberries in place of the chocolate chip cookie for one snack and, on other days, added fruit at snack to replace pretzels.
- **Best practices:** Included mandarin oranges and orange slices as replacements for cheese slices and pretzels, respectively.

All of the hypothetical menus could be improved by eliminating items such as mixed fruit in light syrup, which may have added sugars. They also all included some vegetables that meet the proposed best practice guidance of including dark green and red/orange vegetables and legumes, and because they were the same in this regard, the

best practice menu offered no measurable change in nutritional quality. For full menus and scenario analysis, see supplemental Appendices B and D, which can be downloaded from the report webpage.

According to stakeholders, the proposed rule presents a rich opportunity to develop children's palates by exposing them to new types of fruits and vegetables, including unfamiliar and culturally diverse offerings. However, some sponsors and providers said they would prefer the flexibility to serve two vegetables at meals instead of a fruit and a vegetable. The USDA's final rule included this option.

Sasta Fotu/EyeEm/Getty Images

Milk

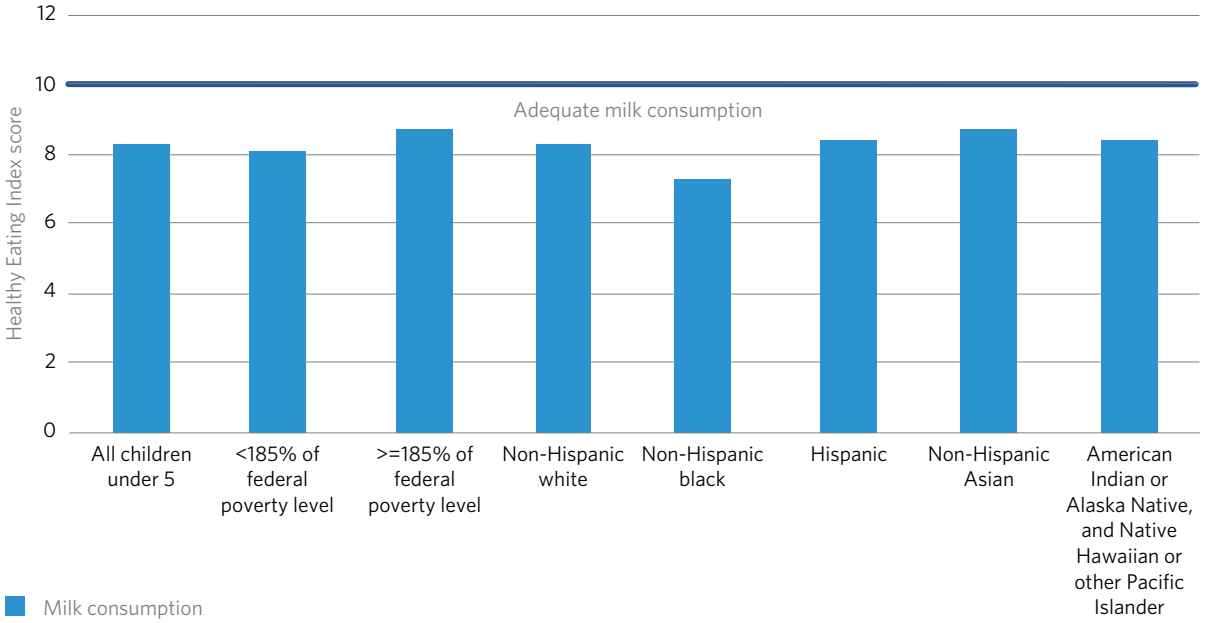
The proposed rule requires only unflavored whole milk for children to age 1; low-fat or fat-free milk for children 2 and older; and that any flavored milk be fat-free. Policy changes to increase low-fat milk consumption have been effective for other food programs, such as WIC. Eighteen months after WIC removed whole milk from the nutrition guidelines for children older than 2, whole milk consumption decreased in that population and lower-fat milk intake increased. Offering low-fat milk as the default option may have made it easier for WIC recipients to adopt this change.[54]

Dairy intake for children ages 1 to 3 typically meets recommended amounts, but consumption decreases with age, falling below recommended levels by age 4.[55] Based on the HEI analysis, most children under 5 across all income levels and ethnic groups still fall slightly short of consuming adequate amounts of dairy, with African-American children consuming the least. (See Figure 6.) Studies found that for children from low-income families, enrollment in an ECE setting with CACFP participation was associated with increased consumption of milk and a greater likelihood of meeting recommendations for milk intake, compared with sites that did not participate in CACFP.[56] However, the amounts and type of milk served to infants and toddlers vary considerably across sites.

Figure 6

Most Young Children Drink Almost Enough Milk

Consumption to age 5 by race and family income, 2011-12



Notes: For expanded data tables and information on the ranges that overlap or fall outside of the 95 percent confidence interval, see supplemental Appendix C, which can be downloaded from the report webpage. Adequate intake of milk (using Healthy Eating Index scores) is based on the 2010 Dietary Guidelines for Americans. The Healthy Eating Index standard for maximum score for dairy is 1.3 cup per 1,000 calories.

Sources: U.S. Department of Agriculture, Center for Nutrition Policy and Promotion, "Healthy Eating Index," accessed May 2, 2016, http://www.cnpp.usda.gov/healthyeatingindex; Pew analysis of data from the Centers for Disease Control and Prevention, National Center for Health Statistics, "What We Eat in America, NHANES 2011-2012," accessed Sept. 9, 2015, http://wwwn.cdc.gov/Nchs/Nhanes/Search/DataPage.aspx?Component=Dietary&CycleBeginYear=2011

The HIA's scenario analyses found that because the proposed rule makes no substantive change to the amount of milk served, it would result in no change to overall fluid ounces consumed. The menu scenario analyses for this change found that meals:

- **Pre-revision:** Included the service of 1 percent white milk or 1 percent chocolate milk and that most providers rarely serve whole milk to children 2 or older.
- **Proposed rule:** Either continued to include 1 percent white milk or shifted to skim flavored milk.
- **Best practices:** Switched to 1 percent white milk.

Providers who still serve whole or reduced-fat milk may observe changes in consumption based on how quickly a child's palate adjusts to the lower-fat milk. Providers that already serve low-fat or fat-free milk for children 2 and older will not need to change their practice and will see no change in consumption. Recent USDA guidance requiring service of low-fat or fat-free milk has yielded high rates of provider compliance, and in interviews, providers said that serving lower-fat milk was already common at most CACFP sites.[57]

The menu scenarios did not examine other dairy products, particularly yogurt and cheese, which could contribute to consumption of added sugars and fats and for which the proposed rule includes revisions.

Stakeholders agreed that milk is an important component in children's diets, but despite clear scientific evidence and dietary guidance recommending low-fat and fat-free milk intake, controversy persists among providers about the type of milk that is best for children. Concerns about how low-fat or fat-free milk will suit children's palates drives the conversation toward flavored milk, but the added sugar content of fat-free flavored milk and its long-term influence on flavor preferences makes that option potentially problematic as well, especially in light of childhood obesity risk. The challenge will be to sustain efforts long enough for children who have not been exposed to low-fat or fat-free milk to develop a liking for it over other milk options. The HIA did not analyze the research on flavored milk because it is not addressed in the proposed rule; however, the USDA's final rule prohibits serving flavored milk to children 5 and younger.

Meat or meat alternates

The proposed rule allows an optional meat or meat alternate to be served at breakfast instead of up to half of the required grains and allows tofu to be counted as a meat alternate. Research suggests that the changes in CACFP regulations are not likely to result in greater or less consumption of meat or meat alternates or to change the quality or fat content of meat. Although interventions such as the Nutrition and Physical Activity Self-Assessment for Child Care have been successful in reducing the service of high-fat meat in ECE settings, the CACFP rule does not include the components of that effort and which would be most likely to yield the same outcome.[58]

Meat and meat alternates are good sources of protein, which is also derived from foods made from seafood, eggs, beans and peas, nuts and seeds, and processed soy. On average, protein consumption from these foods by children under 5 across all racial and ethnic and family income groups is fairly close to recommended levels, with African-American children in that age bracket consuming the most protein daily.[59] (For expanded data tables, see supplemental Appendix C, which can be downloaded from the report webpage.)

However, certain types of protein and the various fats they contain may be cause for concern. Research shows that providers consistently served and children regularly consumed high-fat meats and that CACFP-participating centers were less likely than nonparticipants to be compliant with state-imposed limits on processed meats.[60]

In interviews and focus groups, opinions were mixed on whether the allowance of meat or meat alternates at breakfast would be beneficial. Some providers supported the proposed rule because they said the partial substitution for grains could be more satisfying for children's appetites. However, some providers thought that the serving size of the meat component would not provide children with enough food at breakfast, leaving them hungrier and less attentive. The USDA's final rule allows meat or meat alternates to be substituted for the entire grains component at breakfast.

The impact of the change would probably differ substantially across settings given the significant variation in foods served by providers and the flexibility the standards allow for protein options, such as tofu, which many providers were enthusiastic about.

The menu scenario analyses for this change found that meals:

- **Pre-revision:** Included ground beef, canned tuna, chicken strips, cheese, cottage cheese, and strawberry yogurt as meat and meat alternates.
- **Proposed rule:** Did not add meat or meat alternates for breakfast in lieu of grains or include tofu as a replacement to any of the options above.
- **Best practices:**
  - Replaced high-fat meats at snack with leaner ones—some prepared in new ways—or other components and swapped yogurt, cheese slices, and cheese crackers during snack time for healthier fruits or whole grains.
  - Replaced the 80 to 84 percent lean ground beef served in pasta sauce or with a tortilla with 90 to 94 percent lean or ground chicken, and replaced fried chicken strips with baked or broiled ones at lunch.

The slight tweaks in the best practices scenario improved the HEI scores and highlighted opportunities for nutritional quality improvements. In addition to lean meats, the best practice recommendations suggest nuts and legumes, which contribute protein but are calculated as separate items in the HEI score component table, as preferred meat alternates to better balance children's diets in ECE settings.

Because the proposed rule makes only minor changes to types of meat and meat alternates allowed, providers anticipate no significant challenges associated with implementing this revision.

Commonly underconsumed nutrients

As noted above, inadequate consumption of certain food groups leads to deficiencies in key nutrients. On average, children 1 to 5 across race and income groups tend to be deficient in fiber, potassium, and vitamin D. (For expanded data tables, see supplemental Appendix C, which can be downloaded from the report webpage.) Research demonstrates that CACFP child care centers and homes that follow the program's pre-revision standards do not always serve foods that provide adequate amounts of key nutrients; many offer foods that lack fiber, vitamin E, and other critical nutrients.[61]

The updated rule may help to resolve this issue with respect to certain nutrients, but the available evidence is not sufficient to confirm that it will address the problem for all underconsumed nutrients. Interventions aimed at improving nutrition, such as boosting consumption of fruits and vegetables and whole grains, have been successful in increasing intake of fiber and other nutrients including thiamin, folate, and vitamins A and C.[62] Because the proposed rule emphasizes whole grains and fruits and vegetables, it could yield similar results. In addition, some providers may experience small to moderate cost increases, which could present barriers to improving nutrition. (See the "Effects on provider costs, fiscal stability, and CACFP participation" section for more information.)

Across the hypothetical menus, beneficial differences were evident for some nutrients, but most showed no change; the scenario analysis did find that the USDA's recommended best practices could have a meaningful effect on children's intake of commonly underconsumed nutrients:

- **Proposed rule:** Increased fiber and water intake with minor gains for other commonly underconsumed nutrients, such as vitamin E and potassium.
- **Best practices:** Further increased consumption of vitamin E and potassium by adding more variety of nutrient-rich foods, particularly fruits and vegetables.

Although they offer substantial additional benefits, the best practice revisions may prove challenging for many providers as discussed in the "Effects on provider costs, fiscal stability, and CACFP participation" section.

Commonly overconsumed macronutrients

Meals in ECE settings, including those meeting the pre-revision CACFP guidance, frequently contain excess amounts of commonly overconsumed macronutrients, including saturated fat, sodium, and added sugar.[63] Some interventions have been successful in decreasing consumption of saturated fat, added sugar, and sodium.[64]

Sodium

Children's intake of sodium is typically higher than recommended.[65] (See Figure 7.) Sodium is found in foods from almost all categories, including commercially processed and prepared items commonly found in ECE setting menus, such as pizza, burgers, sandwiches, tacos, and soups. High sodium consumption begins with children as young as 1.[66] Pre-revision CACFP standards do not require that foods be low in sodium.[67]

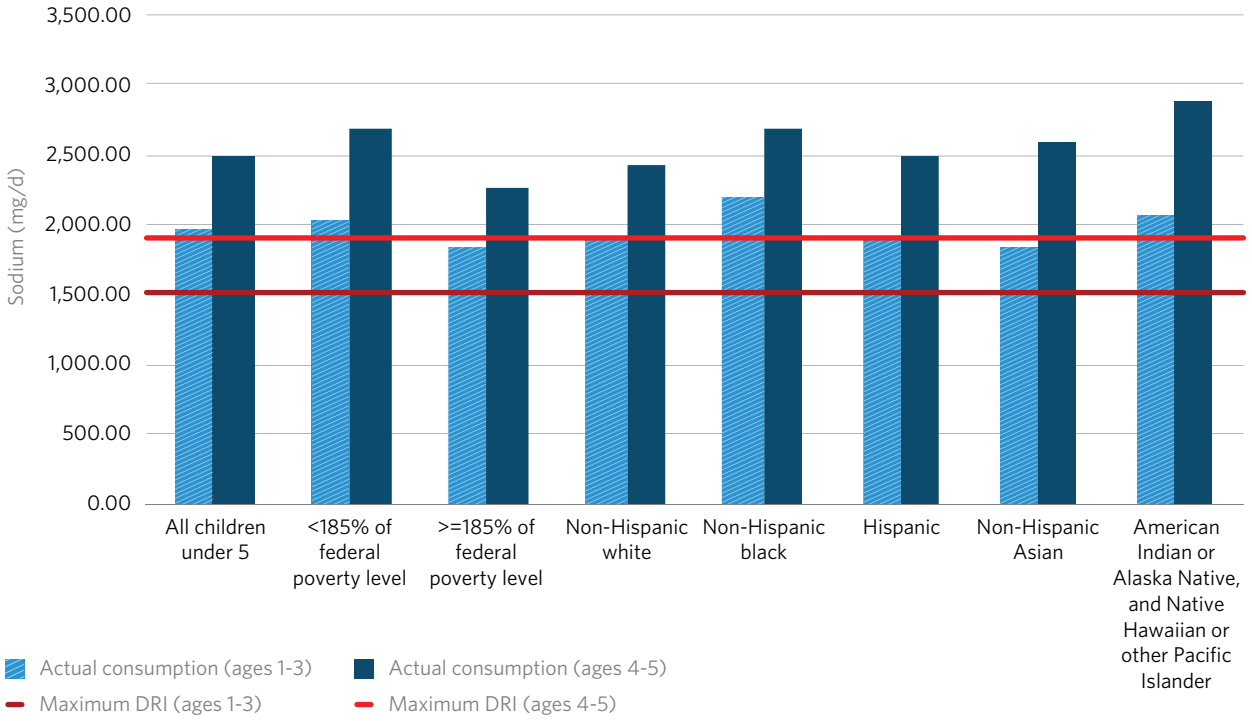
Because CACFP standards set requirements for meal components rather than for nutrients, the proposed rule's precise effects on sodium are uncertain. However based on the hypothetical menus, the HIA infers that sodium levels as a percentage of the DRI could decrease marginally with the proposed changes. For example, instances in the menu scenarios when fruit was substituted for grain-based desserts (e.g., strawberries replacing a chocolate chip cookie at snack) demonstrated such improvements. Moreover, shifts from refined grains to whole grain-rich products (e.g., whole-grain tortilla replacing a refined grain or plain tortilla at snack) also supported the inference of declines in sodium intake. For example, the Neighborhood House Association documented a decrease in sodium levels at breakfast after changing from enriched bread and cereal items to whole grain-rich varieties.[68]

Research demonstrates that made-from-scratch cooking can also reduce sodium.[69] However, the proposed rule does not dictate how providers should prepare the foods they serve. Figure 8 shows that within CACFP settings, children's sodium intake is generally within maximum recommended daily levels. This suggests that reducing their overall sodium consumption depends primarily on educating parents about the importance of serving healthier food outside the ECE setting.

Figure 7

Young Children Eat Too Much Sodium

Consumption to age 5 by race and family income, 2012



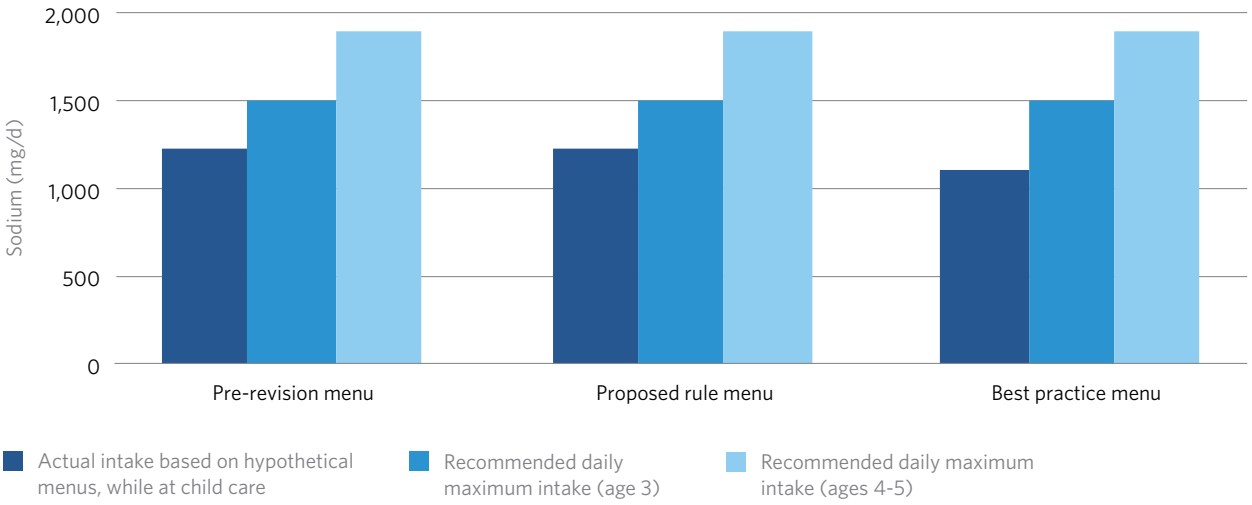
Notes: For expanded data tables and information on the ranges that overlap or fall outside of the 95 percent confidence interval, see supplemental Appendix C, which can be downloaded from the report webpage. Children's maximum sodium intake is based on the Dietary Reference Intakes, http://www.nationalacademies.org/hmd/Activities/Nutrition/SummaryDRIs/DRI-Tables.aspx.

Sources: U.S. Department of Agriculture, Center for Nutrition Policy and Promotion, "Healthy Eating Index," accessed May 2, 2016, http://www.cnpp.usda.gov/healthyeatingindex; Pew analysis of data from the Centers for Disease Control and Prevention, National Center for Health Statistics, "What We Eat in America, NHANES 2011-2012," accessed Sept. 9, 2015, http://wwwn.cdc.gov/Nchs/Nhanes/Search/DataPage.aspx?Component=Dietary&CycleBeginYear=2011

Figure 8

Sodium Intake in CACFP Is Near Daily Recommended Levels

Projected consumption among children ages 3-5 by CACFP menu scenario



Notes: For expanded data tables for the consumption of sodium, see Supplemental Appendix C, and for the menu scenario analysis, see supplemental Appendix D, both of which can be downloaded from the report webpage. Children's maximum sodium intake is based on the Dietary Reference Intakes.

Sources: U.S. Department of Agriculture, Center for Nutrition Policy and Promotion, "Healthy Eating Index," accessed May 2, 2016, http://www.cnpp.usda.gov/healthyeatingindex; National Academies of Sciences, Engineering, and Medicine, "Dietary Reference Intakes Tables and Application," accessed Oct. 27, 2016, http://www.nationalacademies.org/hmd/Activities/Nutrition/SummaryDRIs/DRI-Tables.aspx

Saturated fats

Saturated fats are typically solid at room temperature; occur naturally in many foods, such as meat and dairy products; and are commonly found in baked goods and fried foods. The DGAs recommend that saturated fats make up less than 10 percent of daily calories and be replaced with unsaturated fats whenever possible.[70]

Two requirements in the proposed rule may directly affect saturated fat intake. The proposed rule prohibits facilities from frying foods (i.e., cooking in added fat or oil) on site. It also requires that children over 2 get low-fat or fat-free milk and that flavored milk served to older children be fat-free. Overall, the HIA found that these changes could decrease children's intake of saturated fat, though the benefits of the milk revisions may be limited. Additional requirements such as eliminating the reimbursement for grain-based desserts and best practices not addressed here could further support a reduction in saturated fats.

Milk

Outside of ECE settings, though, low-income children may be more likely to consume higher-fat milk, so a switch to lower-fat milk in CACFP could decrease saturated fat intake and be more consistent with the DGAs recommendations; however, the impact of this change would be limited to sites that still serve 2 percent or whole milk.[71]

Parents interviewed for this project had mixed opinions on the types of milk children should consume. Providers more consistently favored requiring low-fat or fat-free milk, with many already shifting to such products.

On-site frying

Restricting the on-site frying of foods also may curb saturated fats in children's diets. Research shows that nutritional interventions that lowered the energy density of foods and beverages served in ECE settings, such as by decreasing the fat content of milk, helped moderate children's energy intake better than efforts that did not include such changes.[72] Overall, stakeholders were supportive of the reduction in fried foods that could result from this change. Many believe that it could lower the consumption of fats and ultimately reduce the risk of being overweight or obese, and lead to healthier lifestyles into adulthood.

With respect to fried foods, sponsors did not think the proposed change would affect most providers because on-site frying is not widely practiced. They added that the provision of pre-fried foods and foods fried off site may remain common if the final rule did not exclude them from reimbursement. The USDA's final rule prohibits on-site frying, and the final rule's best practice—limiting purchased pre-fried foods to one serving per week—may help reduce these stakeholder concerns.

Stakeholders said the proposed change related to on-site frying was ambiguous and could pose implementation challenges. They urged the USDA to clarify its definition of frying in the final rule—which it did—and suggested specifying "deep-fat frying" so providers could continue cooking in small amounts of oil, such as in stir-frying and sauteing.

Overall, the shift from whole milk to low-fat or fat-free milk for older children and the reduction in fried foods should reduce children's consumption of saturated fats.

Sugars

Added sugar intake, as a percentage of calories, is particularly high among children: Those ages 4 to 8 consume 50 percent more than the DGAs recommend.[73] The proposed and final rule provisions, noted above, prohibit reimbursement of grain-based desserts as a meal component and set sugar limits on ready-to-eat breakfast cereals. These changes would probably have the greatest impact on sugar intake, but other revisions and best practice recommendations not addressed here could further reduce added sugars. The HIA also did not address options on sugar limits in milk and yogurt that the USDA asked stakeholders to weigh in on during its federal rule-making process.

Stakeholders generally supported reducing sugary cereals and grain-based desserts, and some noted that fewer grain-based desserts could create opportunities for providers to serve more fruits and vegetables. The menu scenario analysis did not evaluate added sugars because they are not identifiable on food labels.

Stakeholders, particularly sponsors, expressed concern that the requirement for grain-based desserts would be challenging for some child care home sites. First, serving cookies or cupcakes on special occasions may be viewed as a treat by these providers, one that they could resist reducing. Further, some engage in activities such as baking with the children as part of a hands-on educational experience. However, the proposal would not prohibit serving a grain-based dessert; it just would not reimburse for them. Providers will need to be educated on menu adaptation and identification of replacement items.

Although increasing nutrient-dense foods improves children's diets, research shows that menu modifications intended to reduce energy-dense foods, such as by increasing fruits and vegetables and lowering sugar and fat, reduced energy intake and overall calorie consumption.[74] Many anti-hunger advocacy organizations view such caloric reductions as a negative change for children at risk for food insecurity.

Effects on child health inequities, risks, and outcomes

In a 2012 survey, parents reported their children's general health status, ranging from excellent to poor. For children to age 4, 1.4 percent of respondents rated their children's health as fair or poor, and nearly 86 percent said it was excellent or very good.[75] However, within these overall encouraging figures, discrepancies emerged. White children and those from families with higher incomes were seen by parents as having better health and were less likely to experience chronic disease than Native American/Alaskan Native, African-American, and Hispanic children and those from lower-income families. Similarly, almost 5 percent of parents in families with incomes under 100 percent of federal poverty reported that their children were in fair to poor health, compared with only 1 percent of those in families above 200 percent of poverty.[76]

Young children, especially those from certain demographic groups or lower-income families, face a number of nutrition-related health risks. Because CACFP serves lower-income children, changing the program's standards to improve the nutritional quality may mitigate some of these risks. The CACFP-eligible population also may have risk factors for other chronic diseases, such as asthma and attention deficit (hyperactivity) disorder, that are not discussed here.

The HIA examined the extent of and factors contributing to young children's risk for certain chronic nutrition-related illnesses and then considered how the proposed rule could help reduce these risks and associated health inequities for children who spend time in settings that follow CACFP nutritional standards.

The following research question guided this section of the study:

- How will changes in children's dietary consumption affect health outcomes for children in ECE settings that follow CACFP nutrition standards?

The HIA sought to answer the question with a particular focus on three key indicators for the health of children, particularly those from the most vulnerable groups:

- Risk of being overweight and obese.
- Risk of anemia or iron deficiency.
- Food insecurity.

In general, the HIA found that the proposed rule could benefit children older than a year at risk for some but not all of the chronic health problems studied. Specifically:

- **Children's risk of being overweight or obese may decrease.** Provisions such as a reduction in the consumption of commonly overconsumed nutrients (sugars and saturated fats) should result in a corresponding decrease in caloric intake and therefore, weight gain. However, several mediating variables and behaviors outside of CACFP, such as physical activity, general eating habits, and parental food choices, also affect the level of risk, and because these factors were not examined in this study, a definitive effect cannot be projected.

- **The proposed rule will probably have no impact on iron deficiency and anemia.** Because it makes only modest changes to the amount of iron offered in meals and snacks, the evidence was insufficient to project the impact of those modifications. And since the impact of the change is unknown, so is the effect on the risk of anemia and iron deficiency. However, this analysis predicts that low-income African-American children under 5, who are at more risk of anemia than their peers of other races and ethnicities, will still be vulnerable.
- **The proposed rule's effect on the risk of food insecurity is uncertain.** Data show that enrollment in CACFP decreases this risk. However, if the final rule causes a drop in participation among providers—which is difficult to predict—children could lose the benefits of the program and be at greater risk. (See the "Effects on provider costs, fiscal stability, and CACFP participation" section for more details.) Multiple external factors, such as poverty, access to healthy foods, transportation, and food costs, influence food insecurity, which makes predicting the impact of the proposed rule difficult.

Health outcomes for children in settings that follow CACFP nutrition standards

Weight and obesity

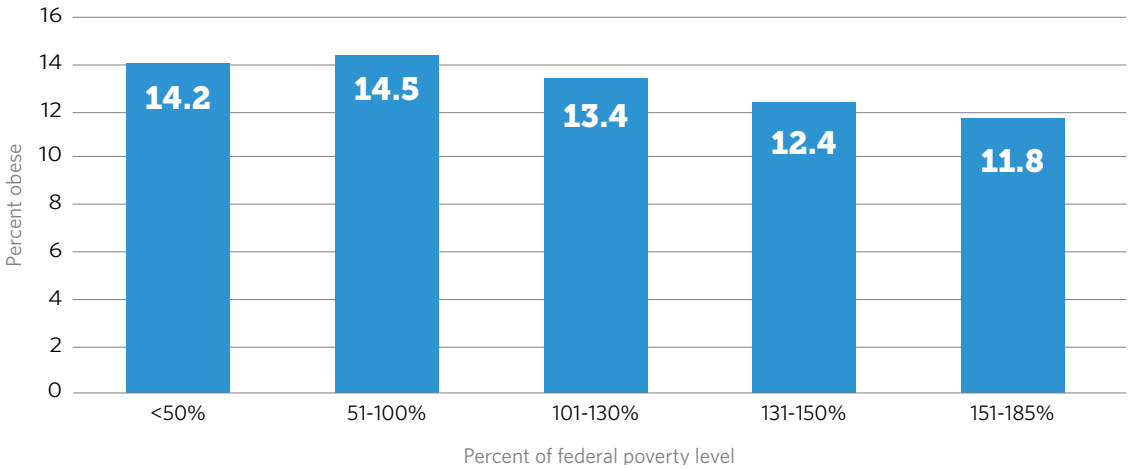
Preventing obesity early can affect a child through adulthood. Nationwide, the prevalence of obesity among children ages 2 to 5 has declined from 13.9 percent in 2003-04 to 8.9 percent in 2011-14.[77] Despite this progress, children served by CACFP continue to have higher rates of obesity than does the broader population.[78] (See Figure 9.)

A study of more than 7,700 children found that a third of those who were overweight in kindergarten were obese by eighth grade: When the children entered kindergarten, 12.4 percent were obese and another 14.9 percent were overweight; by eighth grade, 20.8 percent were obese and 17 percent were overweight. Overweight 5-year-olds were four times as likely as healthy-weight children to become obese over the nine-year study period.[79]

Figure 9

Obesity Most Prevalent Among the Lowest-Income Children

Rates for 2- to 4-year-olds by family income level, 2011



Source: Centers for Disease Control and Prevention, "Prevalence of Obesity Among Low-Income Children Aged 2 Through 4 Years, Pediatric Nutrition Surveillance System (PedNSS), 2011," accessed Sept. 18, 2015 (no longer archived by CDC)

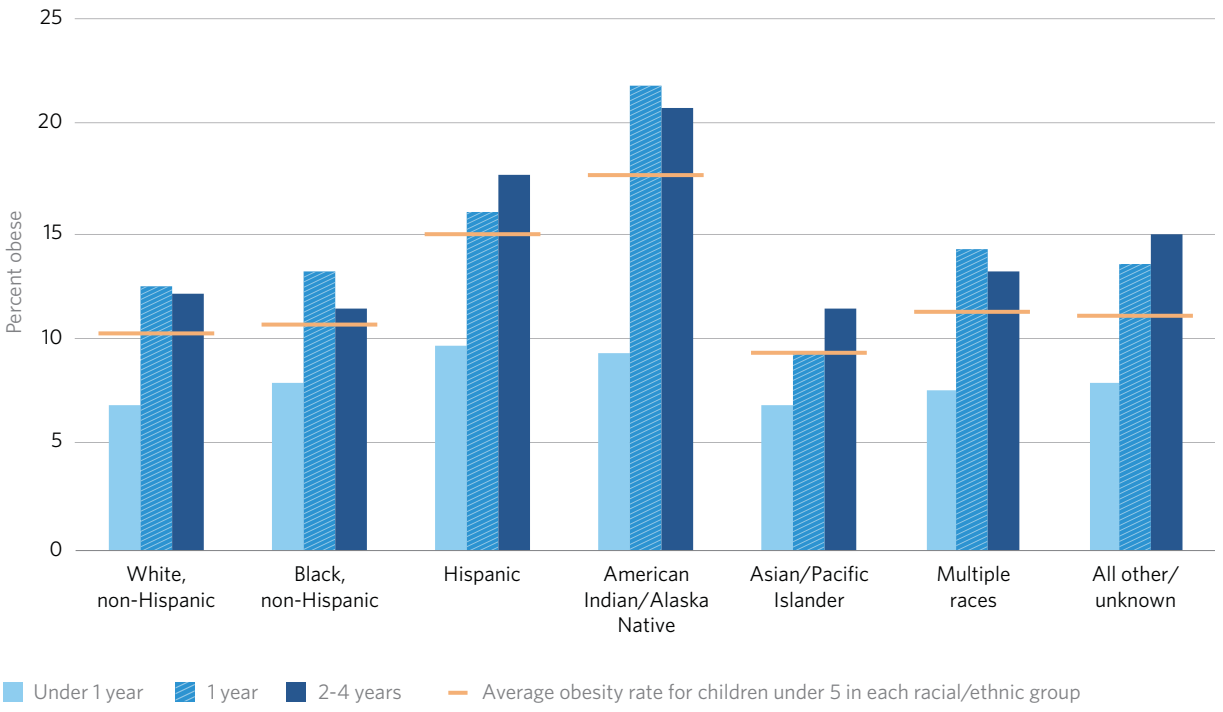
In 2011, low-income 2- to 4-year-old Hispanic children had an 18.7 percent obesity rate compared with 12.75 percent for non-Hispanic white children and 11.85 percent for black children.[80] Among American Indian/Native Alaskan children, 25 percent of 2- to 5-year olds were obese and 45 percent were overweight in fiscal 2008.[81] (See Figure 10.)

Caloric consumption is one part of this story. Although, on average, U.S. children ages 2 to 8 consume calories at roughly recommended levels (1,000 to 1,400 calories for 2- and 3-year-olds, and 1,200 to 1,800 for 4- to 8-year-olds), most still exceed recommended daily amounts of refined grains, solid fats, and added sugars.[82] Obesity is higher among low-income children in large part because their diets tend to have excess calories and poor nutritional content.[83] Multiple factors influence children's eating behaviors, among them sources of food such as schools and ECE settings. Although the evidence is mixed regarding the impact of ECE on weight, studies have generally found that CACFP enrollment benefits children's weight status.[84]

Figure 10

Childhood Obesity Is Most Prevalent Among Low-Income American Indians/Alaska Natives

Rates for poor children 5 and younger by race and ethnicity, 2011



Note: For expanded data tables and information on the ranges that overlap or fall outside of the 95 percent confidence interval, see supplemental Appendix E, which can be downloaded from the report webpage.

Sources: Liping Pan et al., "Trends in State/Territorial Obesity Prevalence by Race/Ethnicity Among U.S. Low-Income, Preschool-Aged Children," Pediatric Obesity 11, no. 5 (2015): 397–402, http://dx.doi.org/10.1111/ijpo.12078; Centers for Disease Control and Prevention, "Growth Indicators by Race/Ethnicity and Age, 2011," Pediatric Nutrition Surveillance System, accessed May 11, 2016 (no longer archived by CDC)

The proposed rule addresses several protective measures against obesity and being overweight, including breastfeeding, low consumption of sugar-sweetened beverages, and increased intake of fruit.[85] However, interventions designed to address obesity in young children have demonstrated mixed results. WIC nutrition updates, for example, are one effective way to reduce the prevalence of obesity, but a range of external factors, such as physical activity, may also influence outcomes.[86]

Some providers who already changed their menus said they observed a reduction in the weight of some children, but they and other experts agreed that predicting a direct effect based on menu changes alone is difficult without controlling for other variables such as physical activity and diet patterns outside of CACFP. This was confirmed by the menu analysis, which did find a reduction in calories per serving between the pre-revision and proposed rule and best practice menus but was not sufficiently robust to account for the many variables that influence a child's weight and so could not predict a change in obesity levels.

Overall, the proposed rule could reduce the risk of being obese or overweight among CACFP-enrolled children, with the potential to provide the greatest benefit to high-risk groups.[87]

Anemia and iron deficiency

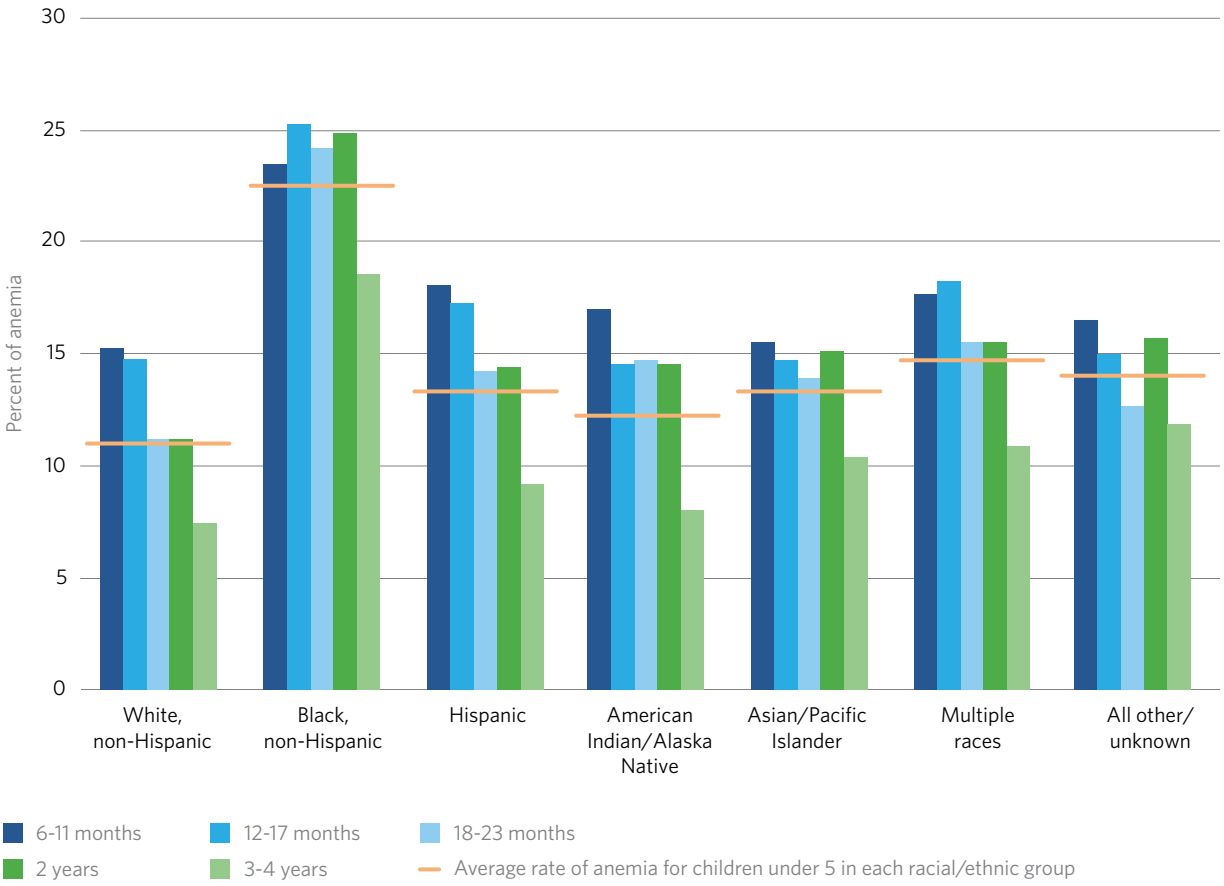
Iron deficiency and anemia are a combined clinical health indicator with known negative cognitive, behavioral, and health consequences.[88] Findings suggest that children who suffer from malnourishment are at greater risk for anemia and iron deficiency.[89] Although the proposed rule does not alter iron content directly, it aligns the cereal standard with WIC's guidance and adds cereals to infant snacks, both of which could provide children with additional iron, with the caveat that serving sizes are small and cereal is not served daily.

The anemia rate among low-income children under 5 is 14.4 percent.[90] African-American children are more likely than those of other races and ethnicities to be anemic.[91] (See Figure 11.) They are also more likely than their white peers to live in households facing economic hardship and in economically segregated communities with lower access to grocery stores, to experience hunger and food insecurity, and to develop other diet-related health conditions.[92]

Figure 11

Anemia Is Most Prevalent Among Low-Income African-American Children

Rates for 2- to 4-year-olds by family income level, 2011



Note: For expanded data tables, see supplemental Appendix E, which can be downloaded from the report webpage.

Sources: Massachusetts Department of Public Health, "2011 Pediatric Data Report" (January 2015), http://www.mass.gov/eohhs/docs/dph/wic/reports/pednss-report-11.pdf; Centers for Disease Control and Preventions, "Anemia by Race/Ethnicity and Age, 2011," Pediatric Nutrition Surveillance System, accessed May 11, 2016 (no longer archived by CDC)

Despite the general potential of the changes to cereal standards in particular to increase iron intake, the menu analysis did not find substantial differences in the amount of iron consumed across the scenarios. Further, the HIA advisory committee had mixed opinions on the potential complexities that could arise in implementing the full package of WIC cereal standards. It suggested, for example, that some providers could have trouble finding compliant cereals if their states did not have approved WIC lists. Advisers recommended that the USDA, state agencies, and sponsors collaborate on resource development and communication to help providers identify cereals that meet the standard.

Ultimately, however, the USDA's final rule did not include the full WIC cereal requirement for iron, which both mitigates the concerns raised and potentially lessens the benefits to children's nutrition.

Food insecurity

In 2014, the national food insecurity rate for children under 18 was 20.9 percent; rates vary by state, from 27.4 percent in Mississippi to 11.4 percent in North Dakota.[93] (See Figure 12.) Although the estimated percentage of food insecure households declined from 2014 to 2015 (14.0 percent and 12.7 percent, respectively), the prevalence of food insecurity is still greater than it was in 2007, before the Great Recession.[94] One of the key risk factors for food insecurity is poverty, and nationwide 21 percent of children are poor, and about double that qualify as low income. Poverty rates are much higher still among children of color under 3: Around 71 percent of black and 66 percent of Hispanic children are poor, compared with 35 percent of white children.[95]

Another important variable influencing food insecurity is living in a food desert, defined as more than 10 miles from a supermarket in rural areas and more than a mile in urban areas.[96] Tribal and rural children are at the highest risk of living in food deserts because of geographic, cultural, and socio-economic barriers.[97] Many of the same neighborhoods also struggle with high rates of unemployment and poverty, further exacerbating the risk of food insecurity.[98] Further, research shows that vulnerable communities tend to live in counties with underlying health and socio-economic characteristics that indicate an increased risk of poor child nutrition and related negative health outcomes.[99]

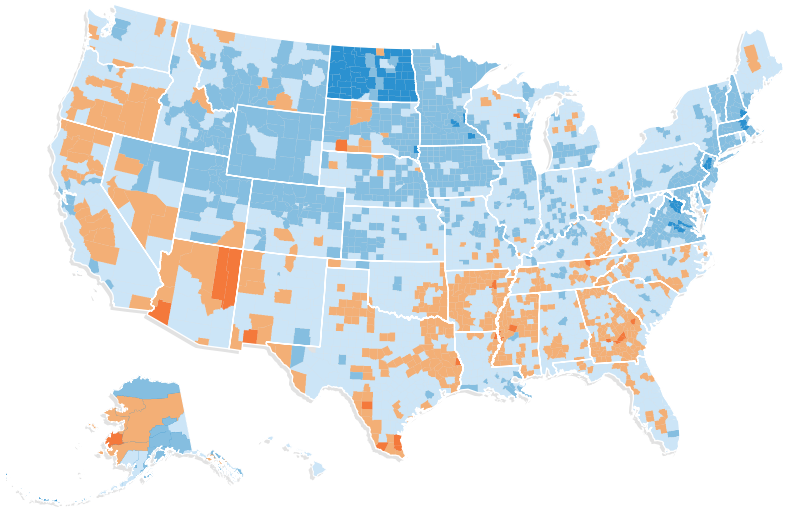
A review of the literature indicates that food insecurity can lead to a number of poor health and behavioral outcomes.[100] The diets of food insecure children were consistently deficient in fruit, dairy, vitamin B-6, and iron, compared with those of food secure children. However, food insecurity may affect children's consumption among diverse ethnic groups differently based on the typical diets of those populations.[101]

> "I work with a lot of rural providers and small communities. We did run into accessibility issues, but it has gotten a lot better. [Grocers] are working very hard with providers. Each one is different, so it's a matter of getting to know the grocer and figuring out what you can work on together as a team."
>
> —Sponsor

Figure 12

Child Poverty, Food Insecurity Tend to Align Across the U.S.

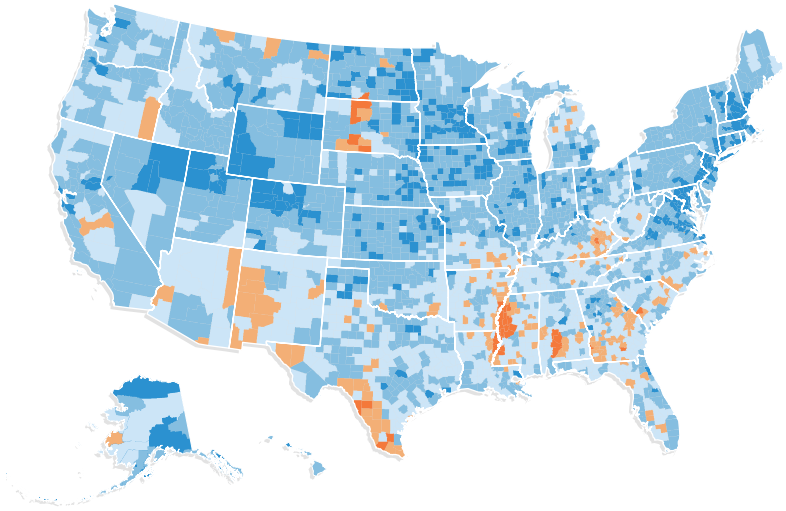
Rates of child food insecurity by county, 2014



- 6.2%–13.6%
- 13.6%–20.9%
- 20.9%–28.3%
- 28.3%–35.6%
- 35.6%–43%

Source: Feeding America, "Map the Meal Gap 2015," http://www.feedingamerica.org/hunger-in-america/our-research/map-the-meal-gap/2013/map-the-meal-gap-2013-exec-summ.pdf

Rates of child poverty by county, 2010



- 2.7%–14.4%
- 14.4%–26.1%
- 26.1%–37.7%
- 37.7%–49.4%
- 49.4%–61%

Source: U.S. Department of Agriculture, Economic Research Service, "Food Environment Atlas" (2015), http://www.ers.usda.gov/data-products/food-environment-atlas/data-access-and-documentation-downloads.aspx

Notes: Rates are for county residents 18 and under. Within a given county, rates may vary by neighborhood.

According to Feeding America's "Map the Meal Gap 2016," most food insecure U.S. children live in households with incomes at or below 185 percent of the federal poverty threshold: $44,955 for a family of four in 2014.[102] These children would be eligible for free or reduced-price meals in CACFP-participating homes and centers, and enrollment numbers indicate that the program serves a large number of children living in areas of persistent poverty, which is defined as a county with childhood poverty rates of 20 percent or more over the past 30 years and is a strong risk factor for food insecurity.[103] A study published in 2013 showed that 4-year-olds participating in CACFP centers are more likely than those in non-CACFP settings to have experienced food insecurity by age 2.[104]

Stakeholders suggested that CACFP is critical not only for providing nutritious foods to children living in food deserts or where access to affordable transportation is limited—another risk factor for food insecurity—but also for assisting at-risk families beyond the ECE setting. For instance, providers often help families locate affordable healthy foods in their communities and connect them with local resources, such as food banks and pantries, farmers markets, and produce stands. Similarly, sponsors frequently support grocers, act as a liaison between providers and grocers, and partner with community gardens.

Providers also discussed a range of food access challenges that they would need to overcome to meet the proposed CACFP meal standards. For example, those located in rural and remote areas and in food deserts described the difficulty of finding healthy foods in small stores with limited supplies and highlighted that identifying and locating whole-grain products and specialty foods for children with allergies or dietary restrictions could pose some of the biggest problems. Several anticipated additional travel time, sometimes to multiple stores, to find the variety of foods that would be required to meet the proposed rule. Sponsors agreed that provider location, availability of grocery stores and food vendors, and access to transportation were among the most significant barriers providers would face in accessing required foods for the proposed standards.

Overall, studies suggest CACFP meets children's basic needs for nutritious meals and snacks which may help to reduce some families' financial burden and their risk of household food insecurity, compared with those whose children are in settings that do not serve food or are under parental care.[105] As a result, other than improving nutritional quality of foods served in CACFP settings, the proposed rule is unlikely to significantly reduce food insecurity among enrolled children. Further, should provider participation decline, for example due to higher costs (see the "Effects on provider costs, fiscal stability, and CACFP participation" section), it could potentially increase children's food insecurity by cutting program access.

Regardless of the proposed rule's effects, the program already is probably not reaching all children who could benefit.[106] One study suggested that in 2010 as many as 2.6 million eligible children from rural households were not enrolled.[107] Further, research indicates that in urban areas, eligibility rules may exclude some low-income communities within affluent urban neighborhoods.[108] Further research in this area is needed to understand the extent to which CACFP is reaching food insecure regions.

Case Study Promising Practices: Opportunities for Chenango Inc.

Norwich, New York
Early Head Start and Head Start, family child care homes sponsor
Rural

Opportunities for Chenango Inc. (OFC) is a private, nonprofit community action agency that offers a range of services across Chenango County, New York, including Early Head Start and Head Start, WIC, and housing and energy assistance programs. OFC has participated in CACFP for nearly 30 years and operates six Early Head Start and Head Start sites across the county, serving nearly 100 in Early Head Start and approximately 200 children in Head Start. In addition, OFC serves as a CACFP sponsor for 30 home-based providers caring for about 430 children.[*] Chenango County is in a rural area and has a population of roughly 50,000, and more than a quarter of its children under 5 lived in poverty in 2012.[†]

Ninety-four percent of children in the OFC Early Head Start and Head Start programs are white, and the programs serve primarily English-speaking households; however, some staff noted that a growing number of racially and ethnically diverse families are moving into the county.

Staff and parents at OFC described a range of challenges that families face in accessing healthy, affordable foods in their rural location. Annual community assessments have identified poverty and transportation as two of the most significant barriers. Food insecurity is a daily reality for parents. Access to grocery stores is limited by long distances, forcing families to rely on local convenience or dollar stores for the bulk of their food shopping. In addition, a local food bank recently closed because of funding problems, eliminating an important food resource for the community. And although fresh produce is fairly affordable and accessible in the area during the growing season, food service managers described the difficulties in acquiring a variety of fresh produce in winter and noted that produce in the stores is sometimes moldy because it has traveled far or sat for too long on the shelves. OFC administrators, who oversee multiple CACFP centers and home-based providers, highlighted that specialized products, such as those for children with dietary restrictions, can be particularly difficult to access or afford.

To address these challenges and leverage community assets, OFC works with local partners and obtained grant funding to equip the families it serves with the knowledge, skills, and tools to make healthy, affordable meals. For example, OFC hosted a food canning class in partnership with the Cornell Cooperative Extension of Chenango County, the county Farm Bureau, and the local Venison Donation Coalition. After completing the training, families were given a pressure cooker and glass jars so that they could continue the practice at home. OFC also hosts slow-cooker classes and provides participants with a new slow cooker, recipe booklet, and ingredients for one full meal.

Continued on next page

When parents requested more information on gardening, OFC again partnered with the cooperative extension to offer education on how to grow produce using 5-gallon buckets. After the trainings, family advocates and family support providers work one-on-one with families to reinforce the lessons and ensure that families continue to use these tools at home.

Such strategies, although not required under CACFP's proposed rule, could be used to help counter the lack of access to healthy foods in food deserts and reduce the risk of food insecurity. However, the effectiveness of these approaches may vary based on provider resources, community needs, and other factors.

* Opportunities for Chenango Inc. administrative team, pers. comm.

† Opportunities for Chenango Inc., "Head Start Program: 2014-2015 Head Start Family Survey" (unpublished report, received December 2016).

Effect on stakeholder attitudes toward nutrient-dense foods

Food aversions, allergies, costs, and cultural norms are among the factors that can shape people's attitudes toward nutrient-dense foods. Research indicates that children's diet-related health outcomes can improve when they consume nutrient-dense foods and that multiple supports across individual, social, physical, and macro-level contexts are needed to encourage this behavior.[109]

CACFP provides a key context within which healthy eating behaviors can be established, and parents and providers serve a role in nurturing positive attitudes in children and one another. For some providers, revising menus to meet the updated nutrition standards will require them to serve foods that may be unfamiliar to them or to some parents and children.

The HIA assessed adults' and children's perceptions of nutrient-dense foods and considered how the proposed changes could influence attitudes toward more healthful offerings in the program.

The following research question guided this portion of the study:

- How will changes in dietary consumption affect children's, families', and provider administrators' and staff attitudes toward nutrient-dense foods?

The HIA sought to answer the question with a particular focus on three key indicators of children's health:

- Providers' positive attitudes toward nutrition.
- Children's positive attitudes toward nutrition.
- Parents' positive attitudes toward nutrition.

Overall, the HIA's findings suggest that if the proposed rule is implemented, positive attitudes toward nutrient-dense foods among providers and children in CACFP may increase, generally, but the likely impact on parental attitudes is unclear. Specifically the rule may have the following effects:

- **Providers' positive attitudes toward nutrient-dense foods may increase.** However, their opinions and input are not the only determining factors in what children eat. Therefore, the potential increase in providers' positive attitudes is not necessarily predictive of improvements in children's health.
- **Children's positive attitudes toward nutrient-dense foods may increase.** However, those sentiments will not necessarily translate into healthy food choices. Children's consumption behavior is affected by food and beverage availability in the home, peer behavior, and other external factors. Therefore, the health impact on children is uncertain, even if positive attitudes toward healthy food increase.
- **Parents' attitudes toward nutrient-dense foods probably will be mixed.** Several social and economic factors influence parents' feeling about healthy foods. Stakeholders indicated that parental attitudes and behaviors are often shaped by those of their children and their CACFP providers, which suggests that the updated standards could have a constructive impact. However, even with positive attitudes toward nutrient-dense foods, parents may not have access to those foods or role modeling skills necessary to increase consumption outside the ECE setting. Thus, the health effects on children remain uncertain.

This section draws from the lessons learned at the case study sites to identify strategies—particularly nutrition education, training and technical assistance, and expansion of nutrient-dense offerings—that can positively affect providers', parents', and children's attitudes toward healthy foods.

Factors influencing attitudes toward nutrient-dense foods

Some research has found that children often prefer less healthful foods, such as salty and sweet snacks, to more nutritious choices, with fruits and vegetables being the least favorite.[110] However, children also adapt when presented with healthier options. Studies have shown that nutrition education may improve preschoolers' understanding of healthy foods and alter their food preferences.[111] Overall, stakeholders who participated in this HIA agreed that proper education, engagement, and attitudes on the part of providers can positively shape children's attitudes toward nutrient-dense foods.

Parental behaviors can have an especially strong influence on young children's consumption of fruits, vegetables, and nutrient-poor foods.[112] Like children, adults' perceptions of diet quality are influenced by multiple factors.[113] According to the literature, parents, in general, reported being concerned about what their children eat in the ECE environment and at home. They also wanted to develop healthy eating habits in their children and to identify strategies to improve communication about food and eating behaviors.[114]

Tools to Facilitate Positive Attitudes

Training, education, and support

The literature demonstrates that ECE providers generally have positive attitudes toward nutrition policies and regulations and want to improve child health.[*] However, implementation of such policies is inconsistent across settings, and knowledge gaps exist among provider types and staff, including teachers, administrators, and food service operators.[†] Researchers, experts, and officials interviewed for this HIA emphasized the importance of training (in food preparation, shopping, etc.) to promote positive attitudes toward serving nutritious foods. Interventions for providers, including nutrition education programs, may result in improved knowledge and communication with parents, as well as a higher likelihood of using nutrition lesson plans to educate students.[‡] Stakeholders felt that state agencies and sponsors could facilitate positive attitudes by providing such resources and technical assistance. However, interviewees also noted that providers may still face some barriers to implementation, including the cost of healthy foods and staff turnover.

Training and education can also support a shift in parents' knowledge about and attitudes toward nutrition. For example, a study of non-CACFP parents who packed their children's lunches showed that most parents thought those meals were healthful when in fact 70 percent failed to provide adequate servings of fruits and vegetables and nearly half had more than the recommended amount of energy from fat.[§] The 2008 Feeding Infants and Toddlers Study also demonstrated that only 30 percent of preschoolers met the American Academy of Pediatrics' recommendations for five daily servings of fruits and vegetables, despite parents believing their children ate enough of those foods.[‖] Nutrition education materials improved parents' nutrition knowledge and the accuracy of their self-reported healthy eating behaviors.[#]

Skillful communication

Sponsors explained that although proper education and modeling of food choices are important, the way the new rule is presented to providers will be critical to shifting attitudes and ultimately affect the program's success. Perceived difficulties with implementing changes can often be more powerful than the actual challenges. For example, if providers consider the proposed standards to be directives, they may view new regulations negatively. On the other hand, if the rule is presented as a collaborative effort to create something positive and beneficial for children, providers are more likely to embrace it.

Providers noted that regular communication with ECE staff about the nature of and rationale for menu changes associated with the new standards would help them understand the importance of nutritious foods for children's health and development. Additionally, stakeholders suggested that providers can keep staff invested by soliciting their input and buy-in before adjusting menus and continuing to collect staff feedback during implementation.

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Role modeling

Sponsors and providers noted that positive staff attitudes benefit children's adoption of new foods. Modeling consumption and enjoyment of foods is an important method to encourage children to try new offerings, and stakeholders recognized that children may need to try new foods many times before they embrace the changes.

Teachers and food service workers described how they learned the importance of eating and trying new foods (even those they dislike) in front of children during mealtime as a way to not only demonstrate healthy eating choices but also improve their own eating habits.

Family-style meal service

Many parents and providers said that family-style service, which CACFP encourages, had an impact on their children's willingness to try new foods and, ultimately, on their health. When meals are served family-style, teachers and peers play a role in encouraging children to understand their internal hunger and satiety cues.[**]

Family-style service allows children to serve themselves from common platters of food with the assistance of supervising adults. A sufficient amount of prepared food is placed on each table to provide the full required portions of each component, and during the course of the meal, supervising adults actively encourage children to serve themselves adequate quantities.

Teachers at one site described how a switch from a cafeteria-style service with individually wrapped items, to family style, allowed them to spend more time sitting and talking with children, and parents appreciated that family-style service allows children to choose what they eat. Although children's attitudes toward nutrient-dense foods can be positively influenced through communication with adults, research shows that most adult communication with children at mealtimes tends to focus on getting children to eat rather than discussing preferences or attitudes toward the foods.[††] Some parents said this type of meal structure has influenced family eating habits at home.

Others, particularly home-based providers who run a program without staff, agreed that family-style service has benefits but said it is challenging to implement with only one person responsible for meal service and caretaking.

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Mealtime activities and classroom lessons

Parents described the importance of the family-style mealtime as a learning opportunity and a chance to help nurture children's positive attitudes toward healthy foods. When children are part of the preparation process and understand where the foods they eat come from, they are more excited about trying them.[‡‡] A few parents described how family-style service can be a learning opportunity, especially when paired with resources and curricula such as the USDA's MyPlate program. Several providers reported involving children in mealtime activities by assigning helpers to bring meals or snacks to the table or to post the daily menu on a MyPlate chart, and parents described how children enjoy setting the table and eating with their friends. Sponsors said that programs beyond CACFP, such as Let's Move! Child Care or the USDA's Grow It, Try It, Like It! nutrition education kit, could help providers learn how to introduce new foods and improve children's attitudes toward them.[§§]

Other tools that providers use include planting gardens and creating lesson plans that tie the foods on the menus to those growing in the garden.

> "We used the Let's Move! program to teach the children about proper nutrition [and] eating more grains and vegetables. The toddlers took that home and began asking parents for fruits and vegetables based on what they experienced."
>
> —Sponsor

* Alison Tovar et al., "An Assessment of Nutrition Practices and Attitudes in Family Child-Care Homes: Implications for Policy Implementation," *Preventing Chronic Disease* 12 (2015): http://dx.doi.org/10.5888/pcd12.140587; Altarum Institute, "Challenges and Opportunities Related to Implementation of Child Care Nutrition and Physical Activity Policies in Delaware," accessed Jan. 5, 2016, http://altarum.org/our-work/challenges-and-opportunities-related-to-implementation-of-child-care-nutrition-and-physical-activity.

† Ana C. Lindsay et al., "Latino Family Childcare Providers' Beliefs, Attitudes, and Practices Related to Promotion of Healthy Behaviors Among Preschool Children: A Qualitative Study," *Journal of Obesity* 2015 (2015), http://dx.doi.org/10.1155/2015/409742; Carmen Byker, "A Report Addressing Development of Montana Physical Activity and Nutrition Guidelines for Early Childhood Programs," prepared for Best Beginnings Advisory Council Health Committee (August 2013); Danielle Lyons, "A Head Start on Health: The Benefits and Challenges of Implementing Wellness Policies in Los Angeles Head Start Preschools" (senior comprehensive project, Occidental College, 2014); Shreela V. Sharma et al., "Nutrition-Related Knowledge, Attitudes, and Dietary Behaviors Among Head Start Teachers in Texas: A Cross-Sectional Study," *Journal of the Academy of Nutrition and Dietetics* 113, no. 4 (2013): 558–62, http://dx.doi.org/10.1016/j.jand.2013.01.003.

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‡ Abbey Alkon et al., "Nutrition and Physical Activity Randomized Control Trial in Child Care Centers Improves Knowledge, Policies, and Children's Body Mass Index," *BMC Public Health* 14, no. 215 (2014): 1–13, http://dx.doi.org/10.1186/1471-2458-14-215; Stefanie Van Stan, Laura Lessard, and Kate Dupont Phillips, "The Impact of a Statewide Training to Increase Child Care Providers' Knowledge of Nutrition and Physical Activity Rules in Delaware," *Childhood Obesity* 9, no. 1 (2013): 43–50, http://dx.doi.org/10.1089/chi.2012.0057; Holly F. Huye et al., "Evaluation of the Color Me Healthy Program in Influencing Nutrition and Physical Activity in Mississippi Preschool Child Care Facilities," *Journal of Child Nutrition & Management* 38, no. 2 (2014); Darra Ballance and Nancy Webb, "For the Mouths of Babes: Nutrition Literacy Outreach to a Child Care Center," *Journal of Consumer Health on the Internet* 19, no. 1 (2015): 1–12, http://dx.doi.org/10.1080/15398285.2015.998054; Shreela V. Sharma et al., "Effectiveness of the Lunch Is in the Bag Program on Communication Between the Parent, Child and Child-Care Provider Around Fruits, Vegetables and Whole Grain Goods: A Group-Randomized Controlled Trial," *Preventive Medicine* 81 (2015): 1–8, http://dx.doi.org/10.1016/j.ypmed.2015.07.005; Jakub Kakietek et al., "Compliance With New York City's Beverage Regulations and Beverage Consumption Among Children in Early Child Care Centers," *Preventing Chronic Disease* 11, no. E180 (2014), http://dx.doi.org/10.5888/pcd11.130430.

§ Nicole Larson et al., "What Role Can Child-Care Settings Play in Obesity Prevention? A Review of the Evidence and Call for Research Efforts," *Journal of the American Dietetic Association* 111, no. 9 (2011): 1343–62, http://dx.doi.org/10.1016/j.jada.2011.06.007.

|| Ronette R. Briefel, Denise M. Deming, and Kathleen C. Reidy, "Parents' Perceptions and Adherence to Children's Diet and Activity Recommendations: The 2008 Feeding Infants and Toddlers Study," *Preventing Chronic Disease* 12, no. E159 (2015): http://dx.doi.org/10.5888/pcd12.150110.

Jamie S. Dollahite et al., "A Randomized Controlled Trial of a Community-Based Nutrition Education Program for Low-Income Parents," *Journal of Nutrition Education and Behavior* 46, no. 2 (2014): 102–9, http://dx.doi.org/10.1016/j.jneb.2013.09.004.

** Institute of Medicine, *Early Childhood Obesity Prevention Policies* (Washington: The National Academies Press, 2011), 98–101, http://www.nationalacademies.org/hmd/Reports/2011/Early-Childhood-Obesity-Prevention-Policies.aspx; Rachel E. Blaine et al., "Child Care Provider Adherence to Infant and Toddler Feeding Recommendations: Findings From the Baby Nutrition and Physical Activity Self-Assessment for Child Care (Baby NAP SACC) Study," *Childhood Obesity* 11, no. 3 (2015): 304–13, http://dx.doi.org/10.1089/chi.2014.0099.

†† Samantha A. Ramsay et al., "'Are You Done?' Child Care Providers' Verbal Communication at Mealtimes That Reinforce or Hinder Children's Internal Cues of Hunger and Satiation," *Journal of Nutrition Education and Behavior* 42, no. 4 (2010): 265–70, http://dx.doi.org/10.1016/j.jneb.2009.07.002.

‡‡ Derek Hersch et al., "The Impact of Cooking Classes on Food-Related Preferences, Attitudes, and Behaviors of School-Aged Children: A Systematic Review of the Evidence, 2003–2014," *Preventing Chronic Disease* 11, no. E193 (2014): 1–10, http://dx.doi.org/10.5888/pcd11.140267.

§§ Let's Move, "Child Care Providers," accessed Dec. 15, 2016, https://letsmove.obamawhitehouse.archives.gov/child-care-providers; U.S. Department of Agriculture, "Grow It, Try It, Like It! Nutrition Education Kit Featuring MyPlate," accessed Dec. 15, 2016, http://www.fns.usda.gov/tn/grow-it-try-it-it.

Leon Harris/Cultura/Getty Images

Providers and children can affect parents' attitudes

In interviews, many providers noted that parents are often pleasantly surprised to learn about the healthy and diverse foods their children eat in ECE settings.

> "It's really nice that she gets to try some new things that we don't even offer at our house. And when I do see that she's tried it here, we try to integrate it into our meals [at home]."
>
> —Parent

At the case study sites, providers described how some parents were initially anxious about higher nutritional standards and associated menu changes because they feared their children would dislike and not eat the food, which could cause them to go hungry. But some of those attitudes changed as parents recognized the nutritional benefits of the new menus and understood that their children were adapting to the changes.

Providers suggested that surveying parents about the types of foods served at home and children's preferences could help address concerns before menu changes go into effect and serve as an ongoing educational tool to engage with families about health and nutrition. ECE sites can also cultivate parents' positive attitudes by inviting them to taste the foods served to their children. Interviewed researchers emphasized that the USDA, state agencies, and sponsors can support providers' efforts by creating informational materials about healthy foods targeted to parents.

In some cases, children also can influence parents' attitudes toward healthy foods. For example, in one study, Hispanic parents revealed that what their children ate in an ECE setting influenced the eating habits in their homes.[115] In interviews, several providers and parents shared that a "snowball effect" takes place when items from ECE menus and recipe books are integrated into their family meals; in fact, one parent said her 7-year-old son, a previous CACFP attendee, now prefers to cook at home rather than picking up fast food.

> "[CACFP] has changed my eating habits as a parent. … I want in on her little club."
>
> —Parent

Conversely, some stakeholders believed that children have little influence in their homes and that competing priorities may prevent parents from changing to healthier food selections.

Participation in CACFP advances providers' knowledge and understanding of nutrition, healthy foods, and appropriate portion sizes, and providers welcome this training.[116] Further, CACFP and Head Start participation increase the likelihood that providers will use positive feeding behaviors, such as sitting with children at meals, offering fruits and vegetables, and limiting the service of fast foods.[117]

Some sponsors said children enjoy the nutritious foods served in CACFP and ask their parents to serve them at home as a further lever to support healthy eating habits outside of ECE settings. Although some parents may face barriers related to access to and cost of healthy foods, children in CACFP still have the opportunity to be exposed to and develop positive attitudes toward nutrient-dense offerings. Researchers and experts shared that children may be more willing to try new foods when introduced to them at a young age and suggested that repeat exposure to healthy options through CACFP could reinforce positive attitudes toward these foods.

The proposed rule presents an opportunity to positively influence parents' attitudes toward nutrient-dense foods. However, the extent to which the changes shape their attitudes is unknown given external factors.

Case Study Promising Practice: Neighborhood House Association

When NHA was considering its menu transformation, organizational leaders decided not to phase in changes but instead to make them all at once. For some teachers and parents, it happened too quickly, and many expressed initial concerns that children would go hungry because they would not eat the new foods. Rather than reverting back to the original menu, NHA staff used these conversations as learning opportunities to strengthen communication and provide education about the value of the changes. Teachers were trained in how to positively model attitudes about the food for children, even when doing so was outside their own comfort zones, and NHA began surveying parents to learn about children's food preferences.

In this case, NHA learned that early communication and buy-in with staff and parents would have facilitated a smoother transition. However, by responding to the initial feedback, NHA was able to improve its meal service process, and ongoing dialogue continues to be an important component to successful menu planning.

An array of influences, such as the types of food an ECE center serves, when they are served, and what they are called affect eating behaviors.[118] These external factors may also affect children's attitudes and overall consumption of nutrient-dense foods.

Although providers recognize that policy, training, and incentives can support improved nutrition, they also identify multiple barriers to implementation such as cost, limited training opportunities, bureaucracy, and a lack of healthy eating behaviors in children's homes.[119] They also expressed concern about classroom management if children did not eat the new foods and remained hungry throughout the day. These issues could negatively affect providers' attitudes toward the proposed standards and nutrient-dense foods. Some sponsors noted that providers sometimes had preconceived notions about children's food preferences, which could influence the approach providers take to encouraging children to eat healthier foods.

The proposed rule's influence beyond the ECE setting could be maximized by a greater commitment from parents to the promotion of healthy foods. However, parents' numerous obligations, time constraints, financial limitations, and competing priorities may limit their ability to make the necessary commitment.

Overall, while training, education, communication, and interventions may be steppingstones to positive attitudes, the evidence is insufficient to identify the mechanisms most likely to result in increased service of healthier foods.

Effects on provider costs, fiscal stability, and CACFP participation

Meals and snacks served through CACFP offer inconsistent nutritional quality, with some providers meeting only baseline requirements and others offering food options at or above the USDA's proposed best practices.[120] Given this wide range, provider food and labor costs also differ. Furthermore, participation in CACFP is tied to financial considerations as well, namely perceived cost versus benefit of being in the program.

With both the proposed and final rules, the USDA made public its regulatory impact analyses, which demonstrated that the updated nutrition standards should be cost-neutral for providers. This should, in turn, mitigate possible negative effects such as participation decline.[121] The USDA analysis predicts that the new standards will result in a small decrease in food costs and a minor temporary increase in labor and administrative costs, with "no meaningful net change in cost as a result of the rule."[122] Because reimbursement rates are set by Congress, any increase in reimbursement to support changes that may raise costs, such as adoption of the USDA's recommended best practices, would require congressional action.

The HIA conducted a cost simulation to understand how the proposed rule could affect providers, given their range of existing menu practices. It went on to consider how the nutrition standard changes could influence program participation.

The following research questions guided this piece of the study:

- How will changes to the standards affect providers' costs and fiscal stability?
- How will changes to the standards affect food-related costs for CACFP settings and in turn affect participation in the meal program?

The HIA sought to answer the questions with a particular focus on two key indicators of program availability and sustainability, and their potential effects on children's health:

- Provider costs.
- Provider participation.

Overall, the HIA's findings differ somewhat from the USDA's analysis and suggest that if implemented, the proposed rule could increase provider costs and decrease participation. Specifically:

- **Provider costs will probably increase slightly depending on the foods each provider is currently serving.** The required daily whole-grain or whole grain-rich serving requirement would be likely to raise costs, but the shift from whole to low-fat milk could offset some of those increases. Providers who replace grain-based desserts with fruits and vegetables rather than with less-expensive items, such as refined grain crackers, will experience the largest cost increases.
- **Provider participation may decline moderately if participants believe that the associated costs and administrative tasks outweigh the program's financial benefits.** An individual providers' sense of what qualifies as overly burdensome may be the strongest deterrent to participation and could influence their decisions.
- **The effect that an increase in costs and/or a decrease in participation could have on children's health is uncertain.** However, if providers leave the program because of higher food costs, and children's access to the program erodes as a result, food insecurity could increase. (See the "Effects on child health inequities, risks, and outcomes" section for more details.)

A review of provider costs

ECE-setting food costs include direct expenses—the cost of the food—and indirect ones related to labor, such as food preparation and service. Based on state and regional research, CACFP and non-CACFP providers allocated between 4.6 and 12.2 percent of operating expenses for direct costs, and between 53.1 and 81.0 percent toward labor.[123] Most of these studies did not differentiate between overall labor costs and those related to food preparation and service. A study of nearly 150 providers in Massachusetts who participated in CACFP found that direct and indirect food-related costs made up 44.5 and 65.4 percent of centers' and home-based providers' total operating expenses, respectively. Approximately 44.4 percent of all food expenses could be attributable to staff labor.[124]

Direct costs

The 2010 IOM report that informed the proposed CACFP standards represents one of the most comprehensive studies on how changes in the nutritional quality of food in ECE can affect direct costs.[125] Reimbursement rates for CACFP, across all provider types, average $1.29 for breakfast (ranging from 29 cents to $2.66), $2.55 for lunch and supper (from 29 cents to $4.99), and 58 cents for snacks (from 7 cents to $1.37).[126] The ranges are based on differing levels of reimbursement according to the provider setting: center or Tier 1 or 2 family child care home.

The IOM estimated that the improvements necessary to align CACFP meal standards with the 2010 DGAs would increase the combined costs for breakfast, lunch, and a snack by an inflation-adjusted 39 cents per 1-year-old child per day and 73 cents per 2- to 4-year-old per day.[127] Because the IOM recommendations are more stringent than the proposed rule, its cost impact estimates are higher.[128]

Previous research suggests that overall food costs for ECE providers increase as the nutritional quality of meals served improves; and fruits, vegetables, and whole grains are on average more expensive per unit than grain-based desserts and fruit or vegetable juices.[129] Between 2008 and 2009, a study in Washington state examined the correlation between food expenditures and nutritional quality at 60 CACFP child care homes.[130] Food expenditures at these sites ranged from $1 to $4.26 per child per day, and each extra $1 spent per child added a daily 0.38 serving of whole grains and 0.54 serving of fresh fruits and vegetables.

To evaluate potential provider spending responses to the proposed rule, the HIA team conducted a cost simulation that drew its baseline estimations from the IOM report, adjusted prices to reflect the most recent data from the USDA Quarterly Food-at-Home Price Database,[131] and made the following assumptions regarding meal components and costs, as shown in Figure 13:

1. Pre-revision, all grains (breads, rolls, rice, pasta, and cereal), excluding those in snacks, were refined, and all were changed to whole grains under the proposed rule, with a cost increase of 15.6 percent.[132]
2. 85 percent of all pre-revision milk was whole fat and was converted to skim or 1 percent under the proposed rule, at an average cost decrease of 2.5 percent.[133]
3. Pre-revision, grain-based desserts with milk were served for snack once or twice a week.[134] The simulation presumed refined grain-based desserts are served at baseline as a snack component (along with milk) and two substitution scenarios are considered—refined grain-based crackers or fruits and vegetables—with a cost increase of up to 18.26 percent. The analysis confirms the USDA's estimate that the impact of these changes on overall provider costs would be minor—on the order of a few dollars per child per month.[135]

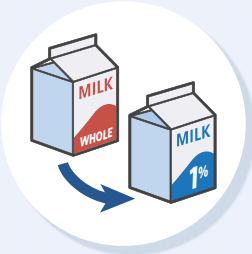
The HIA did not consider administrative needs, which vary across CACFP sites, as part of these estimates or explore the potential impact on families of nominal ECE cost increases associated with providers passing on food costs.

Figure 13

New Standards Likely to Raise Daily Costs by No More Than 26 Cents per Child Over 2

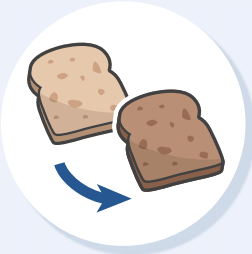
Implications of substitutions for CACFP and non-CACFP child care food prices

Cost changes under new requirements



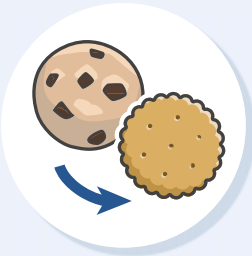
Milk:
Replace whole milk with 1% milk in all meals and snacks.

↓ $0.07 (0.5%)



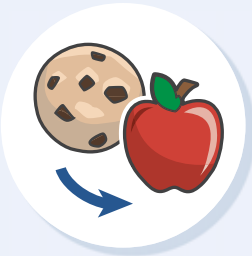
Breakfast and lunch:
Replace refined grains with whole grain/ whole-grain rich foods.

↑ $0.02 (1.47%)



Snack option 1:
Replace refined grain-based dessert with refined grain cracker.

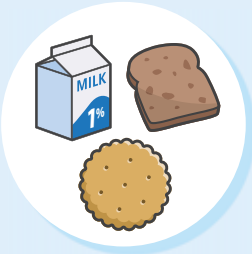
No change (0%)



Snack option 2:
Replace refined grain-based dessert with fruits and vegetables.

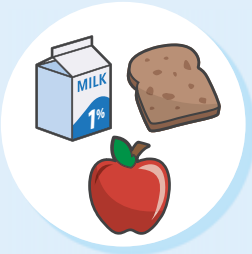
↑ $0.25 (18.27%)

Total daily per-child cost changes



Milk + breakfast and lunch + snack option 1

↑ $0.01 (0.97%)



Milk + breakfast and lunch + snack option 2

↑ $0.26 (19.23%)

Notes: Cost figures are in 2010 dollars. Preliminary 2017 calculations are available upon request. Cost change is a percentage of daily food costs per child. A positive amount denotes an increase in provider costs, and a negative figure indicates a decrease. The analysis assumes that pre-revision, providers serve fruits and vegetables at breakfast and lunch as a single component, and meat or meat alternates only as part of the lunch. The proposed rule changes to fruits and vegetables and meat or meat alternates are not expected to affect costs and so, although they were included in the overall calculations, they are not shown in the table. Costs could fluctuate should a provider choose to serve leaner meat options or substitute meat or meat alternatives for grain-based dessert snacks, but these hypotheticals were not factored into these cost estimates. This simulation also assumes that some non-CACFP providers may serve higher-fat milk. In a survey, 15 percent of providers

Continued on next page

reported serving 1 percent milk at meals, so such providers would not realize the savings associated with switching to lower-fat milk. Providers are required to select two of five options for snack service. For this example, milk and grains were selected.

The cost simulation for grains reflects the proposed best practice scenario for breakfast and lunch, in which providers replace all pre-revision refined grains with whole-grain or whole grain-rich options. Providers' costs could be further controlled if they instead adhere to the proposed rule's minimum requirement of one whole-grain or whole grain-rich serving a day. For the snack menu, refined grains serve as a proxy for grain-based desserts and the cost is assumed to remain constant.

Sources: University of Wisconsin Dairy Marketing and Risk Management Program, "Retail Prices of Dairy Products, FMMO Reduced Fat Milk Retail Price (by Major City)," accessed Aug. 19, 2016, http://future.aae.wisc.edu/data/annual_values/by_area/2060?tab=prices; University of Wisconsin Dairy Marketing and Risk Management Program, "Retail Prices of Dairy Products, FMMO Whole Milk Retail Price (by Major City)," accessed Aug. 19, 2016, http://future.aae.wisc.edu/data/annual_values/by_area/2059?tab=prices; U.S. Department of Agriculture, Economic Research Service, "Quarterly Food-at-Home Price Database," accessed May 16, 2016, http://www.ers.usda.gov/data-products/quarterly-food-at-home-price-database.aspx; U.S. Department of Agriculture, Economic Research Service, "Fruit and Vegetable Prices," accessed May 16, 2016, https://www.ers.usda.gov/data-products/fruit-and-vegetable-prices.aspx

Possible cost increases are dependent on a setting's starting point and the extent to which it must shift its menus to meet or exceed the proposed requirements. Substituting a grain-based dessert with a refined grain cracker minimizes the cost impact for providers, while replacing the sweet grain with a fruit or a vegetable would result in greater cost increases.

The menu scenario analysis shows that serving only lower-fat milk yields savings that offset more than a third of the cost increase associated with converting to whole grains or whole grain-rich offerings at breakfast and lunch. However, provisions for fluid milk (1 percent or skim requirement) and fluid milk substitutions became effective in 2011 as part of the Healthy, Hunger-Free Kids Act of 2010.[136] Therefore, CACFP providers should already have switched to lower-fat milk and may not experience as significant a cost savings as providers who are not CACFP participants but generally adhere to the program's standards and plan to make these changes when the final rule is issued.

These options could result in overall food cost changes of roughly 1 to 19 percent—or 1 to 26 cents—across a daily menu. Given that direct food costs for CACFP and non-CACFP sites are between 4.6 and 12.2 percent of operating expenses, this would translate to less than a 2 percent rise in providers' overall costs.[137] Further, the literature review revealed that small changes in overall ECE costs do not generally decrease demand for services,[138] so providers could probably pass the increase along to parents without experiencing a decrease in the number of children enrolled.

Evidence and stakeholder feedback suggest that the proposed rule is likely to be most significant for providers that rely heavily on the least expensive products, such as sweet grains. A study of CACFP providers in Connecticut found that on average, providers already met or exceeded the proposed requirements for all food groups except fruits and vegetables, which tend to be more costly, and that the most frequently served items were typically those that cost less, such as bread, grain-based desserts, ground beef, cheese, and canned fruit.[139]

In interviews, several providers said they already serve meals that meet the proposed requirements or best practices and so their costs should remain steady when the final rule is effective. However, they also reported facing cost increases when upgrading to healthier menus and cautioned that providers who are not yet at those levels could experience similar price hikes. For example, one center operator responsible for approximately 200 children estimated that her site's food bills increased $200 a week (or $1 per child per week) after she made menu changes comparable to those in the proposed rule and best practices. She described how buying fresh fruits and vegetables and sourcing food locally can be more expensive and said providers may need to be prepared to subsidize meals if reimbursement rates do not rise accordingly.

Indirect costs

Changes to CACFP requirements also may affect indirect costs such as labor and administration.[140] A few providers noted that labor costs would increase when they shift to preparing more foods from scratch, and one who had already implemented the proposed changes confirmed this view, noting that her food purchases decreased after the changes but preparation and labor costs rose. Another provider said costs are also associated with retraining staff to prepare food in different ways.

To support the learning curve that comes with new standards, stakeholders across CACFP will need to invest in staff training in areas related to meal planning, food procurement, and preparation.[141] To implement these changes successfully, some state agency officials noted that they would guide providers on using their dollars wisely, encourage group purchasing when possible, and share materials on how to prepare healthy, low-cost meals.

One study of administrative costs found that CACFP sponsors—who oversee much of the paperwork and other services such as training, compliance reviews, meal purchasing and delivery, and handling of reimbursements for home-based providers—already spend 5 percent more on average than they are reimbursed.[142] This suggests that existing reimbursement rates are not covering providers' current administrative costs.[143] Although reporting requirements will not change under the proposed rule, the revised standards may add administrative complexity that could require additional staff hours and increase costs for providers, sponsors, and state agencies. Data on administrative costs for center-based providers was not available for this study.

Stakeholders expressed differing opinions regarding the adequacy of existing funding and reimbursements for CACFP. A few Tier 1 home-based providers indicated that the current reimbursement is sufficient to cover the foods they purchase. However, several others said they are incurring substantial costs "out of their own pockets" for food because the reimbursements are inadequate. Sponsors noted that providing Tier 1 reimbursements for all providers would be beneficial. The steady decline in participation of home-based providers since tiering was implemented in 1997 could be interpreted as evidence that the current reimbursement rates do not meet program demands.

> "The disparity between the two tiers [for CACFP home providers] is outrageous. It should be one tier or at least more comparable. Providers can be across the street from one another and be in different tiers."
> —Sponsor

Access to healthy foods and costs

Availability of healthy foods has two components: physical access and affordability. A limited number or variety of stores within walking distance and constrained transit options are some of the physical access barriers. High costs of transportation and of locally available nutrient-dense foods are key affordability obstacles.[144]

Some providers and sponsors noted challenges related to the limited availability of fresh fruits and vegetables in the winter, the lack of variety of stores, and increased transportation costs if more travel becomes necessary to access the foods, such as whole-grain products, needed to meet the standards. Additionally, stakeholders suggested that difficulties could be exacerbated in rural settings, where vendors who can accommodate the

new changes are scarcer. A few providers said the responsiveness of food service companies and vendors to reformulate and offer new products to meet the new standards could be a significant factor in enabling providers to successfully make the proposed changes.

Home-based providers' unique challenges

In interviews and focus groups, stakeholders indicated that smaller home-based providers would face more significant cost challenges than other sites because of their limited budgets, flexibility, and negotiating power with vendors. Sponsors and providers said that such challenges could be mitigated through bulk food purchasing from big-box or online stores, using coupons or sales, accessing local food banks, shifting money from field trips or supplies, using frozen fruits and vegetables, and planting gardens. As an example, one home-based provider shared that she collaborates with seven peers in her area to purchase foods in bulk and trade foods from their gardens to help defray costs.

> "A lot of it comes down to budgeting. [Some] providers would be amazed to look at the unit price and realize that feeding fresh, whole foods is actually more economical. It takes time for sponsors to train them. We need to help people look at those unit costs."
> —Provider

Provider participation in CACFP

A recent survey of providers in low-income rural areas in the U.S. found that less than half of eligible sites participate in CACFP.[145] The literature indicates that participating providers are more likely than other sites to:

- Be located in higher-poverty areas (those with 19 percent or more of children living below federal poverty).
- Say reimbursement levels are adequate.
- Manage nonprofit programs or home-based child care.
- Provide care for extended hours.
- Hold at least a college degree.
- Work in a center that is connected to a broader ECE network or Head Start program.[146]

Providers described a range of benefits associated with being a CACFP participant. Nearly all highlighted the ways financial reimbursement improves their ability to serve nutritious foods and leverage other resources. Many also noted that the program saves families money, because they do not have to assume additional costs for food during ECE hours and helps ensure that all children receive nutritious meals, regardless of family income. Many providers also mentioned training opportunities, new skills, resources, educational opportunities, mentorship from state agencies and sponsors, and peer-learning.

Participation decreases when policies change

Many CACFP providers join the program for the array of benefits, so it is unsurprising that federal policy changes have been associated with declines in participation. In 1997, the program implemented a national tiered reimbursement structure intended to reach more low-income children and families by providing higher subsides

for those populations.[147] However, provider participation rates fell immediately after the change and have continued to decline.[148] Between 1997 and 1999, 8.1 percent (15,492 of 190,227) of all CACFP home providers left the program, of which 5,500 continued to operate a site, while the number of CACFP center-based providers rose by 11 percent. Of those home-based providers that left, between a third and half would have qualified for Tier 1; these providers were the most likely to serve a smaller number of children, operate for fewer hours a day and days a week, and offer fewer meals—all factors that would have influenced providers' total reimbursement regardless of tier.[149]

Still, Tier 2 providers frequently cited insufficient reimbursement and burdensome paperwork as reasons for leaving, giving some credence to the argument that providers may have exited the program because the lower Tier 2 reimbursement offered only marginal benefits.[150] Moreover, changes in reimbursement rates were also associated with increased provider fees, with Tier 2 sites charging about 50 cents more per hour of care than Tier 1 settings. This may, in turn, disproportionally affect low-income families that could be more sensitive to fluctuations in ECE fees, possibly forcing them to leave the program, which would result in their children no longer receiving the nutritional benefits. However, in general, demand for ECE is quite inelastic; cost alone is not the driving factor for participating in the program.[151]

Despite both the potential for slight cost increases and the evidence showing that policy changes can affect participation, sponsors and providers agreed that changes in participation because of the proposed rule would be minimal. Advisory committee members noted that training providers to understand price models for the foods in the cycle menus and to differentiate between the costs of self- and vendor-prepared meals can support provider retention.[152] Most providers said participation in CACFP benefits their business and sets them apart from non-CACFP providers, so any initial increase in costs may be outweighed by the overall value of participation.

In interviews, providers and sponsors said the proposed changes could pose challenges such as increased paperwork, greater regulatory complexity, and stricter enforcement with possible financial penalties. Additionally, some noted that the CACFP record-keeping process can be particularly difficult for providers with lower English literacy levels and described how those providers probably need to make the most changes to comply with the proposed rule.

Effects on state early care licensing regulations

Accurately assessing the strength and distribution of the effects—referred to collectively here as "magnitude of impact"—that a policy, project, or program will have on a given population is critical for generating evidence-based recommendations that maximize positive health outcomes. The proposed rule would affect CACFP providers in different ways depending on the nutritional quality of the foods that they already serve, while non-CACFP licensed providers who choose to serve food may also experience ripple effects from the changes.

This chapter details the HIA's approach to assessing the magnitude of the proposed rule's impact on state ECE licensing regulations, which could in turn affect the health of children in CACFP and non-CACFP sites. In addition, the section proposes directions for future research and policy work, and highlights the need to consider vulnerable populations that might be disproportionately affected by the proposed rule.

Establishing a baseline and characterizing magnitude of impact

The "Minimal Elements of Practice Standards for Health Impact Assessment" defines magnitude as "how widely the effects would be spread within a population or across a geographical area."[153] Magnitude may be considered as part of the final scope to determine "those impacts with the greatest potential significance" and help to understand the overall implication of the impact.[154] To assess the magnitude of impact, then, a baseline, or starting point, must be established upon which the effects can be projected.

To do this, the HIA team assessed state licensing regulations for family child care homes and centers to project the proposed rule's impact,[155] with the baseline set at the CACFP pre-revision standard. The updated standards will become effective automatically for CACFP participating providers, regardless of state licensing regulations, but for non-CACFP providers, whether state laws conform to CACFP standards will determine how the regulatory language changes once the rule goes into effect. In addition, to gauge the strength of impact, each state's nutritional standards were compared with the pre-revision CACFP standard.

Several intricacies in the ECE landscape shaped this study's approach to characterizing magnitude of impact, specifically:

1. **Some CACFP providers exceed the program's minimum nutritional requirements.** In light of available resources or state licensing law mandates, certain providers may choose to serve food that surpasses CACFP's nutritional standards. Although important, the assessment of the level at which each individual CACFP provider meets or exceeds program standards was beyond the scope and resources of this study.
2. **The proposed rule may affect both CACFP and non-CACFP providers.** ECE providers who do not participate in CACFP may still be required to follow the program's meal standards if they serve food and operate in a state with licensing requirements that adhere to CACFP standards. Therefore, to establish a baseline, this HIA needed to consider current nutritional requirements for CACFP and non-CACFP participants. A second layer of complexity lies in the divergent ways that various ECE settings are defined in each state and that state licensing laws link to CACFP nutritional standards across those settings. A third layer stems from the variable ways that states monitor and assess non-CACFP sites for compliance with state laws.
3. **The frequency with which ECE licensing laws are updated varies across states.** Establishing a firm baseline can be challenging because states' licensing laws change frequently and may be subject to updated guidance that is released separately from the regulation.
4. **Some measures related to children's diet quality are not governed by program standards or state regulations.** Certain indicators identified in this project are affected by factors outside of the project's scope. Measuring magnitude for indicators, such as attitudes toward nutrient-dense foods and risk of food insecurity, would require a baseline that considers all of these external factors. This information would not be found within state licensing regulations and would require an additional protocol that is too broad a task for one project.
5. **Data limitations prevent assigning numbers to ECE enrollees as a measure of magnitude.** No readily available data source provides the numbers of children that are enrolled in licensed ECE programs serving food.

Effect on state ECE licensing regulations

When the final CACFP nutrition standards take effect, state licensing regulations for center and home-based ECE providers who do not participate in CACFP will be affected in one of three ways, based on the structure, written language, and additional details of the regulatory document.

- **Regulations should automatically update** when the final rule takes effect if, for example, they:
  - Directly reference or link to pre-revision CACFP as the required nutritional standards, without embedding meal-specific guidance (i.e., for breakfast, lunch, or snack) in the regulatory text.
  - Reference or link to pre-revision CACFP standards and include meal-specific guidance within the regulatory text.
  - Cite the Code of Federal Regulations by reference, which means the updated CACFP meal pattern in the final rule will take precedence and replace the previous one, as long as there is no date included or referenced.
- **Regulations may automatically update** when the final rule takes effect if, for example, the language:
  - Indirectly references or links to CACFP as the required nutritional standard for ECE settings but uses ambiguous terms or phrases, such as "meet USDA standards," "Food and Nutrition Service, USDA," or "USDA requirements regarding food groups and serving sizes" that leave room for interpretation.
  - Says that the state or department or office must provide the update.
  - References CACFP standards but does not specify the pre-revision version and includes details, such as meal-specific guidance under older iterations of the standards, as part of the regulatory text or as an appendix.
  - References or links to the USDA or generically to a federal program and includes details of previous standards, such as meal-specific guidance from previous standards, within the text or as an appendix of the regulation.
  - Uses a permissive phrase, such as "may use" or "must be based on" in reference to CACFP.
  - Provides CACFP as one of the examples of nutrition standards and the other examples used are also CACFP-based nutrition standards.
- **Regulations should not automatically update** when the final rule takes effect if, for example, they:
  - Do not reference or link to CACFP as the required nutritional standard.
  - Do not reference or link to the USDA or CACFP and include details of CACFP standards (e.g., details within the regulatory text or as an appendix that mirror CACFP's meal-specific guidelines).
  - Cite the Code of Federal Regulations and a specific year, which would mean the state has designated that version of the CACFP standards.

Comparison of state regulations to pre-revision CACFP standards

As a second step, the HIA team identified specific nutritional standards within states' licensing regulations that exceed pre-revision CACFP guidance. The team addressed only nutritional standards that would be improved upon under the proposed rule.

State regulations received a point for each standard that surpassed pre-revision CACFP guidance and at least met the proposed rule standard. The HIA team reviewed the components in each state's regulations to determine whether they:

- Required a variety of fruits and vegetables.
- Required daily whole-grain or whole grain-rich servings.
- Restricted or limited grain-based desserts.
- Limited the frying of foods.
- Set requirements on milk (i.e., unflavored whole milk for 1- to 2-year-olds and/or low-fat or fat-free milk for 3- to 5-year-olds).
- Set limits on juice.

Using this system, the strength of state ECE nutrition standards relative to pre-revision CACFP guidance can be classified as either "falls below" or "exceeds," based on the points received, regardless of the individual state's linkage to CACFP. (See Table 3.)

Table 3

States' Nutritional Regulations Vary in Their Alignment With Pre-Revision CACFP Guidance

Center and home-based regulations across states fall into 2 categories

State regulation rating compared with pre-revision CACFP guidance	Number of states*
Falls below (no standards exceed pre-revision guidance)	Center-based regulations: 34
	Home-based regulations: 38
Exceeds (1 or more standards above pre-revision guidance)	Center-based regulations: 17
	Home-based regulations: 13

* District of Columbia licensing regulations were included in the analysis.

Strength and distribution of impact

After reviewing states' regulatory linkages to CACFP nutritional standards, the magnitude of impact was measured in terms of strength and distribution. Importantly this analysis considered only impact on regulation and does not imply any equivalent effect on providers.

The proposed rule's strength of impact on state early care licensing regulations will vary depending on:

- The type of setting (center or home) to which the regulation applies.
- The type of ECE provider (CACFP or non-CACFP).
- The state's regulatory language and whether it will be updated once the final CACFP rule is effective.
- The number of state standards that exceed pre-revision CACFP guidance.

The strength of impact categories are characterized as follows:

- No substantial.
- Low.
- Medium.
- High.

Table 4 shows how the proposed rule could affect state regulations and the distribution across provider and setting type. Regardless of a state's licensing regulations, CACFP providers will need to ensure that they meet the updated nutritional standards, but non-CACFP providers are not necessarily under the same obligation. Their required level of compliance depends largely on the specifics of their state's licensing regulations.

Importantly, these categories are inversely correlated with the rigor of existing state regulations. In other words, states with licensing regulations that already include strong nutrition standards will experience little or no impact from the CACFP changes, while states with weaker guidance that includes only some nutritional requirements will see a medium impact and need to make more changes in food service to be on par with CACFP. In most states, the impact will be high because licensing regulations do not exceed any of the pre-revision CACFP requirements. Providers in states with weaker regulations will probably incur the greatest cost increases because they will need to make the most improvements to their meals and snacks.

Table 4

Proposed Rule Would Affect Non-CACFP Providers Differently Depending on State Regulations

Strength and distribution of impact

Strength of impact	Distribution of impact	Description
No substantial impact	All CACFP and non-CACFP settings in 1 state (Mississippi).	Mississippi has the best licensing regulations in the country. They exceed all of the CACFP pre-revision standards measured in this analysis. When the final rule goes into effect, licensed providers that follow the state's regulations will feel no meaningful effect because the meals and snacks they serve are already at least on par with the new CACFP requirements.
Low impact	CACFP and non-CACFP centers in 1 state (Rhode Island).	Rhode Island boasts strong licensing regulations that exceed 3 of CACFP's pre-revision standards measured. When the final rule goes into effect, providers that comply with the state's requirements will need to make very few improvements to ensure the meals and snacks they serve meet CACFP standards.

Continued on next page

Strength of impact	Distribution of impact		Description
Medium impact	CACFP settings: · All in 11 states. · Centers in 4 states.	Non-CACFP settings: Licensing regulations should automatically update to final rule in: · All settings in 2 states. · Centers in 2 states. · Homes in 1 state.	These states have average regulations that exceed 1 to 2 of the CACFP pre-revision standards measured. When the final rule goes into effect, licensed providers that follow the state's regulations will need to make substantive changes to the meals and snacks they serve in order to meet CACFP requirements.
		Licensing regulations should not automatically, but may still, update to final rule in: · All settings in 8 states. · Centers in 3 states. · Homes in 1 state.	The impact on regulations is less clear for certain non-CACFP providers. Those that choose to follow the new CACFP standards may experience a medium impact, but they would not be required to do so based on state licensing requirements.
High impact	CACFP settings: · All in 33 states and the District of Columbia. · Homes in 5 states.	Non-CACFP settings: Licensing regulations should automatically update to final rule in: · All in 5 states and the District of Columbia. · Centers in 5 states. · Homes in 1 state.	These states' licensing regulations are below-average and do not meet or exceed any of the CACFP pre-revision standards measured. When the final rule goes into effect, licensed providers who follow these regulations will need to make improvements to all meal and snack components served.
		Licensing regulations should not automatically, but may still, update to final rule in: · All in 23 states. · Homes in 8 states.	The impact on regulations is less clear for certain non-CACFP providers. Those that choose to follow the new CACFP standards may experience a high impact, but they would not be required to do so based on state licensing requirements.

Note: Information on specific states is available upon request.

Disproportionate impact

The minimum elements and practice standards for HIA require the assessment to address health equity. One of the key values of this type of report is the identification of vulnerable populations that might be disproportionately affected by a policy decision and any changes in health inequities that could occur.[156] Existing differences in where CACFP providers operate, whom they serve, and the health risks their enrollees face all influence the magnitude of the impact the proposed rule would have on health factors and outcomes. (See the "Effects on child health inequities, risks, and outcomes" section for more details.)

Limitations of the HIA

The HIA confronted some challenges in identifying an ideal approach for establishing a baseline for impacts. Initial efforts focused on using information from the National Resource Center for Health and Safety in Child Care and Early Education's report "Achieving a State of Healthy Weight," which rates state licensing regulations for their adherence to obesity prevention best practices as determined by the American Academy of Pediatrics.[157] However, because of several methodological limitations, this HIA ultimately analyzed state regulations directly to better understand how the proposed rule would affect them.

Although the review of regulations provides a more accurate picture of the proposed rule's potential magnitude of impact, its value has limits. Further, state regulations cannot be used as the sole measure because they do not always translate into practice and because unlike CACFP, which regularly monitors programs, states may not subject nonparticipating providers to similarly rigorous oversight, meaning the licensure compliance rate is unknown. For example, one study found that six states conducted routine child care center inspections three or more times a year to assess compliance with licensing regulations; 16 states performed visits twice a year; and 29 states once per year. Meanwhile, inspections of home-based child care were much less frequent—from every six months to once in 10 years—with some states conducting assessments only if a complaint was filed.[158] In all these cases, the extent to which state inspections review the nutritional quality of foods is uncertain because licensing covers a range of areas.

In this HIA, determinations of the strength of impact of the proposed rule on non-CACFP providers are based solely on legislative language, which can be difficult to understand. Further, this analysis defined range of impact because measuring the exact meal service practices of every ECE site was impossible.

In addition, this HIA faced several other limitations related to magnitude of impact:

- This HIA confined its review of state ECE licensure standards to two types of settings: centers and home-based providers. In many states, group child care homes are the same as centers, but the HIA did not consider that in the overall assessment.
- In determining how state laws compare with current CACFP guidance, the HIA team did not review additional nutritional guidance or programs that are in place in some states and settings, such as policies related to sugar-sweetened beverages. Although not addressed here, such standards may benefit children's health.
- Some states offer exemptions from licensure requirements for certain settings.[159] For example, states may choose to approve centers and homes to operate for three or four hours per day without complying with licensing rules and regulations.[160] In addition, the USDA allows states flexibility to determine whether such providers can participate in CACFP. [161] These exceptions add a layer of complexity when identifying impact across non-CACFP providers.
- The HIA did not consider foods brought to the ECE site by parents. To do so would require additional multivariate analyses of state laws.

HIA findings and the final CACFP rule

This HIA evaluated the proposed CACFP rule before the USDA released the final rule—"Child and Adult Care Food Program: Meal Pattern Revisions Related to the Healthy, Hunger-Free Kids Act of 2010" (7 CFR Parts 210, 215, 220, and 226)—in April 2016. Fortunately, the findings of this assessment support many of the provisions in the final regulations that were also part of the proposed rule. For certain standards, the evidence was insufficient to determine the impact on health, so the HIA does not specifically address those areas.

In some cases, the HIA affirmed areas that were slightly modified from what was proposed because evidence demonstrated the potential to maximize positive health impacts for children in the program. Additionally, the final rule best practices—to be clarified through the USDA policy guidance—will further advance the benefits to health. Although no additional reimbursement is offered to providers who follow the best practices, those guidelines should support ECE sites as they build toward nutritional excellence. Each finding includes a description of the final rule requirement or best practice and how it aligns with the proposed rule studied by the HIA, according to seven categories:

- Same as proposed requirement.
- Shift from proposed best practice to final requirement.
- Same as proposed requirement with slight enhancement.
- Proposed options finalized based on public input.
- Same as proposed best practice.
- Same as proposed best practice with slight enhancement.
- Slight revision of proposed best practice.

Final rule requirements supported by the HIA findings

- **At least one whole-grain or whole grain-rich-serving is required each day (*same as proposed requirement*).** This change should make whole-grain foods more available in ECE settings, which should improve children's intake of whole grains, dietary fiber, and other nutrients.
- **Grain-based desserts served as a grains component will not be reimbursed (*same as proposed requirement*).** Grain-based desserts are offered frequently in ECE settings, so this requirement has the potential to decrease their service and consumption, which could in turn lower children's intake of added sugars.
- **Breakfast cereals must contain no more than 6 grams of sugar per dry ounce (*shift from proposed best practice to final requirement*).**
  Two studies found that providers serve high-sugar cereals in 20 to 26 percent of breakfasts and morning snacks, so this change could decrease children's consumption of empty calories.[162] The proposed rule required that breakfast cereals meet WIC nutritional standards (which include a limit of 6 grams of sugar, among other criteria) and also included the 6-gram sugar limit as a stand-alone best practice. In light of stakeholder feedback citing potential difficulties for providers in finding compliant cereals, the final rule provides greater flexibility, allowing providers to simply select from the WIC list of pre-approved cereals (which will necessarily meet the 6-gram sugar limit) or they can choose other cereals that fall under the limit.

- **Separate fruit and vegetable components are required for lunch, supper, and snack (*same as proposed requirement with slight enhancement*).**
  This is an improvement from the pre-revision standards, which treat these produce types as one food component, potentially allowing the service of more fruits and fewer vegetables. The USDA received mixed stakeholder feedback on the change (more than 1,270 comments in support and 2,320 generally opposed), but nearly 550 remarks encouraged the allowance of two vegetables to be served instead of a vegetable and a fruit, and identified suggestions to further strengthen the provision to ensure that vegetable consumption would not decline.[163] The final rule allows providers to serve two types of vegetables instead of a fruit and a vegetable during lunch and supper. This enhancement should support additional flexibility in menu planning and promote greater vegetable exposure and consumption.
- **Prohibit flavored milk for children ages 1 and 2 *(same as proposed requirement)*.**
  This HIA did not consider flavored milk in its nutritional analysis, but the team supports the USDA's final requirement because, like the grain-based dessert provision, this change should reduce the services of added sugars in CACFP settings.
- **Prohibit flavored milk for children ages 2 to 5 (*proposed options finalized based on public input*).**
  The USDA solicited stakeholder comments on flavored milk service options across different age groups (ages 2 to 4, and 5 and older). Again, though the HIA did not analyze flavored milk, the team supports this requirement based on the rationale above for milk requirements for children ages 1 and 2. The USDA also has included best practice guidance on flavored milk for children 6 and up (sugar limit of no more than 22 grams per 8 ounces), and the HIA team encourages additional studies on appropriate milk servings.

Best practices supported by the HIA findings

The USDA will provide future guidance to clarify the following best practices:

- **Provide at least two whole grain-rich servings per day (*same as proposed best practice*).**
  Adding a second daily serving of whole grains encourages greater consumption, which can increase children's intake of fiber and other nutrients.
- **Serve a fruit or vegetable for at least one of the two required snack components; offer a variety of fruits; and provide whole fruits (fresh, canned, dried, or frozen) more often than juice (*same as proposed best practice with slight enhancement*).**
  Increasing access, portion size, and nutrition education to support intake of fruits and vegetables may raise children's consumption. Parents were encouraged that the fruit or vegetable snack requirement would lead providers to put more thought into their snacks, but some members of the HIA's advisory committee worried that the best practice would still allow juice to be served. The final rule requirement that limits fruit or vegetable juice to one serving a day for children 1 and older alleviates this concern as well as stakeholder unease around the proposed rule's inclusion of 100 percent juice as a qualified fruit or vegetable meal component. The HIA findings indicate that this rule change and the best practice will enhance intake of underconsumed nutrients through greater consumption of whole vegetables and fruits.
- **Serve a variety of vegetables, including dark green, red/orange, legumes, starchy vegetables, and others each week (*same as proposed best practice with slight enhancement*).**
  The final rule best practices added beans, starchy vegetables, and others to the list of required vegetables. Such additions have the potential to increase consumption, and the HIA findings support this as an acceptable best practice that providers can adopt to increase variety and intake.

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- **Serve only lean meats, nuts, and legumes (*same as proposed best practice*).**
  Substituting lean protein sources for higher-fat meats could decrease intake of commonly overconsumed nutrients and increase consumption of commonly underconsumed nutrients.
- **Limit the service of purchased pre-fried foods to one serving per week (*slight revision of proposed best practice*).**
  In the final rule, on-site frying of foods is prohibited, and the USDA clarified the definition of "on-site frying" to be deep-fat frying. However, the new requirement leaves room for providers to purchase and serve off-site pre-fried foods. To address this, the proposed rule best practice, "avoid or limit the service of fried and pre-fried foods to no more than one serving per week" was slightly revised to "limit the service of purchased pre-fried foods to no more than one serving per week." The addition of this best practice should support the positive health outcomes associated with the on-site frying prohibition, though some stakeholders raised concerns that the regulatory language (a serving per week) could be confusing to providers because the program is tracked in daily terms.

Policy recommendations

The HIA provides administrative and operational recommendations to support the implementation of changes to the CACFP nutrition standards that would enhance health benefits and to minimize potential negative impacts to child health, provider costs, or program participation. The recommendations are structured around three themes: increasing consumption of nutrient-dense foods, promoting effective implementation and sustainability, and maximizing equitable health impacts, and are targeted to various actors, including the USDA, state agencies, sponsor organizations, and providers, which each play a role in ensuring strong program participation. If implemented, these changes would help CACFP capitalize on positive health outcomes for children, encourage existing providers to remain in the program, and motivate new participants to join.

Consider additional strategies to increase consumption of nutrient-dense foods

Beyond the new standards, the USDA, state agencies, and sponsors can take other steps to support providers in improving the nutritional quality of their foods.

- **Increase vegetable serving sizes.** Increased vegetable portion sizes may result in greater consumption. Although the USDA did not include this as a best practice in the final rule, the agency should consider increasing vegetable servings and providing additional reimbursements to support the improvement in future standard updates.
- **Limit the added sugar, salt, and fat in fruit and vegetable servings.** Providers should consider this additional enhancement to reduce consumption of commonly overconsumed nutrients. The USDA, state agencies, and sponsors should continue to offer technical assistance in the form of recipes, menus, and culinary training to help providers implement this recommendation.

Promote effective implementation and sustainability of the final rule

Providers were eligible to begin receiving reimbursements under the updated standards June 24, 2016, and are required to be in full compliance by Oct. 1, 2017. In addition, they have two years from that deadline to transition whole-grain component serving sizes to ounce equivalents. Training and technical assistance will be critically important leading up to implementation and should continue thereafter to ensure program compliance.

- **Continue to encourage providers to adopt a phased-in implementation timeline to support compliance.** In June 2016, the USDA provided guidance for early implementation of the new standards.[164] Over the past year, the department has taken advantage of this opportunity and "anticipates that most issues of non-compliance will result from child nutrition program operator's efforts to adhere to updated requirements."[165] Stakeholders suggested that phasing in implementation before Oct. 1, 2017, would be critical to the success of the new standards, and the literature review indicated that children would be more willing to try new foods that are incorporated into the classroom curriculum, modeled positively by teachers, and presented in a fun manner. Developing effective strategies for introducing new foods requires time and training for the provider. In addition, children typically need to taste a food between eight and 12 times before their palates adjust, and experts say introducing one new food at a time yields the best results.[166] The HIA team encourages state agencies and sponsors to continue working with providers that have not begun making updates, in order to troubleshoot difficulties early.
- **Consider extending the one-year "transition" period for minor implementation errors to up to three years.** The USDA released a transition memorandum in May 2017 detailing flexibilities afforded to CACFP providers during the first year of implementation. Providers who are making "good faith" efforts to adjust to the new requirements will not have financial penalties imposed or be subject to sanctions, such as program termination and disqualification, for minor errors related to meeting the updates. State agencies and sponsors will be required to provide technical assistance and training as a remedy for noncompliance in such cases.[167] Punitive action will still be taken in situations where a provider is missing one or more of the required meal components.

  In interviews, stakeholders said providers may view enforcement as punitive (e.g., strict review during site visits can result in loss of reimbursements), and suggested an appropriate grace period—during which providers would not be penalized for small implementation errors, such as meal count reporting (claiming snack reimbursement for three children, when only two children were served that day)—would be three years. In light of the USDA's memorandum, the HIA team agrees that a cooperative approach that encourages education, training, and flexibility has greater potential than punitive fines and disqualifications to yield

desired results, improve the nutritional quality of meals, and influence the overall health of millions of young children. The team also encourages the USDA to communicate closely with the states during the first year of implementation to understand how providers are adjusting to the new requirements and extend the one-year grace period as needed. In the National School Lunch Program, the incorporation of food service training programs, nutrition education, and flexible implementation guidance enabled 95 percent of schools to participate in the program and successfully meet the initial requirements for updated nutrition standards within three years.[168]

- **Generate educational materials and resources for diverse populations to support seamless adoption.** CACFP providers frequently represent diverse cultural and ethnic backgrounds. State agencies should support all providers by offering materials in Spanish and other major languages spoken in their states, such as Creole, Somali, Russian, and Mandarin, with translations and writing done by native speakers to ensure that cultural meaning and implications are preserved.[169]
- **Produce sample menus and recipe guides, including culturally relevant meals, before the implementation deadline.** Stakeholders, especially providers, noted the importance of available "turnkey" materials, such as cycle menus that can be adapted easily to meet the new standards. In addition to broad promotion of existing resources, such as the What's Cooking? USDA Mixing Bowl recipe database and the menu planning tools on the USDA's Team Nutrition Healthy Meals Resource System, sponsors and state agencies should consider creating a website that is accessible to all providers and includes a compendium of cycle menus featuring healthy, culturally diverse meals.[170]
- **Secure buy-in from teachers, staff, and administrators and communicate with parents about menu changes.** Providers who actively support positive attitudes toward nutrient-dense foods are more likely to have success encouraging children to eat and enjoy those foods. Sponsors and providers should consider strategies (e.g., taste-testing, garden projects, etc.) and resources (e.g., preplanned menu repositories like Rainbow in My Tummy, tracking tools such as Minute Menu, spreadsheets, and portable receipt scanners) to support that process.[171] Providers should also communicate with parents about changes to the foods being served, for example by sending menus and recipes home with children, inviting parents to taste-testing events, and including families in school garden projects.
- **Develop meal-planning resources that include nutrient-dense alternatives to grain-based desserts.** Stakeholders reiterated that the USDA needs to provide clear guidelines on what qualifies as a grain-based dessert. The agency has provided a definition in the final rule that is taken from its "Food Buying Guide for Child Nutrition Programs," a manual to support proper purchasing of the foods required to meet the CACFP standards.[172] As sponsors prepare to support provider efforts in this area, they should consider developing classes related to healthy cooking and proper identification of added sugars on ingredient labels. Moreover, providing suggestions for nutrient-dense alternatives, such as in the USDA's "Build a Healthy Plate With Fewer Added Sugars" nutrition and wellness tipsheet, will encourage providers to embrace healthier options for special occasions.[173]

- **Develop resources and tools to support providers' proper identification of whole grains and on-site frying.** To help eliminate potential barriers to implementation of the whole-grain requirements, the USDA should ensure that providers are educated on how to identify and select products and maintain compliance with new regulations. The USDA could make its online whole grains resource more dynamic—in the fashion of the Alliance for a Healthier Generation's "Smart Snacks" product calculator—to assist providers in identifying compliant products by brand name.[174] Furthermore, the USDA, state agencies, and sponsors should partner with external organizations, such as food producers, grocers, and food service management companies, to support training and technical assistance across specific areas.

  Additionally, providers will need support to properly identify how to transition from whole-grain servings to "ounce equivalents," a final rule requirement that must be implemented by Oct. 1, 2019.[175] The USDA should consider updating these changes in its "Food Buying Guide." The USDA, state agencies, and sponsors should also take steps—such as providing resources outlining recipes and types of foods that do or do not qualify—to ensure that providers fully understand the definition and application of on-site frying as stated in the final rule: "Deep-fat frying means cooking by submerging food in hot oil or other fat. Foods that are pre-fried, flash-fried, or par-fried by a commercial manufacturer may be served, but must be reheated by a method other than frying."[176]
- **Promote and support nutrition education for parents and ECE staff.** State agencies and sponsors can provide training, technical assistance, and education to help providers with parent and family engagement related to healthy food lifestyles, such as by providing written menus, nutrition policies, and interactive trainings (e.g., cooking demonstrations) and workshops for families.
- **Develop tools and trainings that support ECE businesses' general financial health.** As providers begin to adapt their menus to meet the new meal standards, state agencies and sponsors should train them on strategies to manage financial resources. State agencies and sponsors should provide training on developing and understanding financial statements and related reports and on what to do when expenditures consistently run higher than generated revenue.
- **Ensure that required forms and paperwork procedures are updated and that new inspection procedures are in place.** As providers anticipate updates to their menus, state agencies must begin to revamp administrative booklets and web resources to support the transition. The USDA should bolster this work by creating model forms and spreadsheet templates, such as those created for the National School Lunch Program that help providers receive certification for additional meal reimbursements and school districts determine whether they need to raise meal prices.[177] As these new procedures are put in place, state agencies will need to build in time to train sponsors on changes to required paperwork as well as expectations for monitoring and inspections. In turn, sponsors will need to train providers on specific requirements and ensure that software systems that track meal counts and components are up-to-date and understood by all parties.
- **Create opportunities for providers to lower costs.** The USDA, state agencies, and sponsors should identify opportunities to remove cost barriers for home-based providers, especially those receiving the lower Tier 2 rate, such as through bulk collaborative purchasing with other providers; negotiating prices with distributors and retailers; buying produce in season or from local farms, markets, or co-ops; and adding vegetarian options. Sponsors and state agencies could make subsidized memberships to warehouse or wholesale stores available to providers, and the USDA should explore strategies to support cooperative purchasing within counties, states, or regions to improve provider buying power.

The USDA, state agencies, and sponsors could provide trainings related to cost-effective procurement, menu planning, and how to write bid specifications and technical assistance such as creating cost-based sample menus that demonstrate how costs may be lowered or held neutral. Sponsors can offer trainings in grocery stores for home-based providers to demonstrate efficient and compliant shopping; seasonal produce guides for their states to indicate which foods are in season and most affordable each month; and workshops on strategies to maximize bulk purchases, such as by serving raw produce at the beginning of the week and cooked or pureed foods later.

Examine CACFP structure to maximize equitable health impacts

The USDA and policymakers should ensure that CACFP continues to advance equity for food-insecure populations by targeting nutrition-improvement efforts to communities where children are most at risk. As decision-makers consider these recommendations, they also should monitor the nutritional landscape to ensure that CACFP standards stay current with the latest science.

- **Evaluate barriers and incentives to program participation.** The USDA should consider conducting an evaluation of CACFP to track participation trends, determine why participants decide to leave or join, and better understand providers' concerns about implementing the updated standards. Moreover, depending on the results of the evaluation, the USDA may wish to reassess the program's eligibility structure to reduce unintended consequences, such as disadvantages and barriers to enrollment.
- **Consider an additional reimbursement for settings that provide nine or more hours of care.** The USDA should work with Congress to identify opportunities for additional reimbursements that can promote healthful foods and attract new providers, and for new sources of reimbursement funding. These efforts can support parents, especially those from low-income families who work long hours; their children, who tend to be in child care for longer than their more well-to-do peers; and providers who offer additional snacks or meals.[178] State agencies may also want to consider whether they can serve as an additional revenue source.
- **Use available resources to provide financial incentives, professional development, and technology.** CACFP has the potential to improve the food security of low-income families through the provision of nutritious meals and snacks.[179] To further support providers' efforts, the USDA should consider equipment and technology grants (e.g., small kitchen equipment assistance and menu software) and training, technical assistance, and education opportunities (e.g., scholarships to attend conferences and trainings, etc.) to professionalize providers and encourage their continued participation in the program. State agencies should consider utilizing their state administrative funds to support these areas.
- **Reduce administrative burdens.** The USDA and state agencies should minimize paperwork and administrative duties associated with the new rule by reviewing reporting requirements and supporting technology upgrades for sponsors and providers. Additionally, the USDA should evaluate whether the area eligibility test—the threshold at which home-based providers qualify for CACFP—could be modified to increase participation across low-income communities.
- **Explore opportunities to increase informational and organizational networks.** The USDA, state agencies, and sponsors should identify and create professional networking opportunities for CACFP providers to bolster program participation. Such resources may include training and technical assistance, educational materials, webinars, in-person trainings, and peer-to-peer mentoring.

- **Consider creating a program in which providers who have successfully implemented the final rule or best practices can mentor others.** The USDA and state agencies should consider incorporating a mentoring model similar to the Institute of Child Nutrition's Team Up for School Nutrition Success program for school meals, which pairs school nutrition professionals who want to maintain a healthy environment and bolster student participation with peer mentors and provides regional trainings and webinars.[180] Participants leave workshops with a plan for building healthy school environments with financial stability and strong student participation.

Policy-practice gap

States should consider surveying licensed providers or implementing monitoring and enforcement measures to understand whether their laws translate into practice. They also should be aware of the existing level of compliance, especially where licensing is tied to or exceeds CACFP nutritional standards, and provide training and technical assistance to licensees and regulators.

Requiring providers to submit a form with a simple check box each year to confirm they are meeting licensing requirements may not fully capture what is happening at ECE sites. Because the CACFP reimbursement model includes monitoring for compliance and participation, the program requires more intensive nutrition implementation and oversight training than most states do for non-CACFP providers. Although state agencies may not have access to the additional funds necessary to require site visits for licensure, states still need a mechanism for understanding the existing level of compliance. However, states must balance their approaches to ensure that they do not create burdensome requirements that drive providers out of the ECE field.

Conclusion

The Child and Adult Care Food Program plays a critical role as a federal nutrition safety net for low-income children and families who are at risk of food insecurity. Efforts to improve the nutritional quality of the foods and beverages that children consume when they are away from home can support that function and the health of generations to come.

Overall, this HIA found that the new CACFP standards would have a positive effect on the health of enrolled children. Ultimately, improved diets and eating habits have the potential to reduce the risk of diet-related conditions, such as Type 2 diabetes and obesity, for children in the short and long terms. In particular, the final updates related to increasing vegetable and whole-grain consumption and lowering sugar intake will have the most substantial effect on health.

The analysis indicates that CACFP providers will need additional support in key areas, such as identifying whole grains and acceptable alternatives to grain-based desserts. Training and educational materials will be important to helping providers phase in the new standards to ensure that children's palates have adequate time to adjust to changes.

Further, CACFP's meal standards have the potential to improve nutrition for children receiving care from providers who align with CACFP through state regulations, especially if states implement additional monitoring and enforcement measures. Further research on compliance with state laws would help the ECE community better understand the variety and nutritional quality of foods served in non-CACFP settings, with the potential to make CACFP the uniform nutritional standard for all state licensing laws.

Endnotes

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2 U.S. Department of Agriculture, "Hunger-Free Kids Act," news release, Dec. 16, 2010, https://www.fns.usda.gov/tags/hunger-free-kids-act.

3 The HIA team was unable to answer this research question because of the limited ability of CACFP to effect changes within the larger food distribution and delivery environment and inadequate resources to pursue additional investigation in this area.

4 Lynda Laughlin, "Who's Minding the Kids? Child Care Arrangements: Spring 2011" *Household Economic Studies,* Census Bureau (April 2013), http://www.census.gov/content/dam/Census/library/publications/2013/demo/p70-135.pdf.

5 U.S. Department of Agriculture, "Child and Adult Care Food Program: Why CACFP Is Important." Most children in CACFP are under age 13, but some older children may be served through at-risk after-school care or emergency shelters. CACFP also serves older adults and chronically impaired disabled persons.

6 U.S. Department of Agriculture, "Program Information Report: U.S. Summary, FY 2016-FY 2017" (October 2016), https://www.fns.usda.gov/sites/default/files/datastatistics/keydata-october-2016.pdf.

7 Head Start and Early Head Start programs are required through the Head Start Performance Standards (HSPS) to offer meals that meet USDA standards. Meals and snacks must align with CACFP standards if they are not participating in the National School Lunch and Breakfast programs. The HSPS were updated in September 2016 (the first comprehensive revision in over 40 years) and support Head Start's mission "to deliver comprehensive, high-quality individualized services to support children from low-income families." This link between Head Start and CACFP provides a vehicle to reach nearly 1 million children from families living at or below the poverty line with healthy meals and snacks at an early age. For more information about HSPS, see http://eclkc.ohs.acf.hhs.gov/policy/45-cfr-chap-xiii/1302-44-child-nutrition?language_content_entity=en.

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13 Food Research & Action Center, "Child & Adult Care Food Program: Participation Trends 2014" (February 2016), http://frac.org/wp-content/uploads/cacfp-participation-trends-2014.pdf.

14 U.S. Department of Agriculture, "Child and Adult Care Food Program: Data as of Jan. 6, 2017"; and U.S. Department of Agriculture, "Program Information Report: U.S. Summary, FY 2016-FY 2017."

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17 Institute of Medicine, "Child and Adult Care Food Program: Aligning Dietary Guidance for All" (Nov. 4, 2010), http://www.nationalacademies.org/hmd/Reports/2010/Child-and-Adult-Care-Food-Program-Aligning-Dietary-Guidance-for-All.aspx.

18 The Dietary Guidelines for Americans are recommendations of the U.S. departments of Agriculture and Health and Human Services for dietary intakes to reduce chronic diseases related to food consumption (e.g., heart disease, diabetes, obesity). They are updated every five years.

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21 Jonathan Heller et al., "Promoting Equity Through the Practice of Health Impact Assessment" (2013), PolicyLink, http://www.policylink.org/sites/default/files/PROMOTINGEQUITYHIA_FINAL.PDF.

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KIDS' SAFE & HEALTHFUL FOODS PROJECT

Robert Wood Johnson Foundation

THE PEW CHARITABLE TRUSTS

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Project website: healthyschoolfoodsnow.org

The Kids' Safe and Healthful Foods Project, a collaboration between The Pew Charitable Trusts and the Robert Wood Johnson Foundation, provides nonpartisan analysis and evidence-based recommendations to make sure that all foods and beverages sold in U.S. schools are safe and healthful.