Health Impact Assessment
National Nutrition Standards for Snack and a la Carte Foods and Beverages Sold in Schools
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Introduction

The foods and beverages available in schools have a significant impact on children’s diets and weight, with many students consuming more than half of their daily calories at school. In addition to meals, nearly all students can buy foods and beverages at school, often from multiple locations, including cafeteria a la carte lines, vending machines, and school stores. These snacks and drinks are technically called “competitive foods” because they compete with school meals for students’ spending; however, they are also referred to as “snack and a la carte foods and beverages” throughout this document.

Ensuring that schools sell nutritious foods is critical to improving children’s diets. This is one of the goals of the Healthy, Hunger-Free Kids Act (HHFKA), passed in 2010, which directs the U.S. Department of Agriculture (USDA) to update nutrition standards for all foods and beverages sold in schools during the school day by aligning them with the current dietary guidelines.

In an effort to inform USDA as it updates nutrition standards for foods and beverages that are sold outside of the school meal programs, and to better understand how standards might affect student health and school finances, the Kids’ Safe & Healthful Foods Project and the Health Impact Project, both collaborations of The Pew Charitable Trusts and the Robert Wood Johnson Foundation, worked with Upstream Public Health, a nonprofit research and policy organization, to conduct a health impact assessment (HIA).
Health Impact Assessment Background

An HIA is a prospective research tool that guides decision makers in considering the possible health impacts, and in some cases financial considerations, of proposals. HIAs recommend actions to minimize adverse consequences and optimize beneficial effects.

The goals of this HIA are to:

- **Synthesize** relevant data to assess potential health impacts as school districts implement USDA’s updated national standards for snack and a la carte foods and beverages sold in schools.
- **Inform national and state deliberation** regarding the potential costs and benefits related to national snack and a la carte food and beverage standards.
- **Identify potential health disparities and inequities** that could result from national snack and a la carte food and beverage standards.
- **Make recommendations** to USDA in order to maximize positive health outcomes and minimize potential health risks.

The research team followed the North American HIA Practice Standards Version 2 and the National Research Council Guidelines to develop each stage of this HIA. The most comprehensive literature review to date on competitive foods in schools, as well as original empirical analysis of school financial data was conducted for this HIA. The process also required extensive interviews and involvement of a wide array of experts and stakeholders from academia, industry, the public health community, and those individuals most affected at the ground level, such as teachers, students, and parents, in planning, researching, and peer reviewing the study.

Because USDA had not yet proposed updated standards at the time of this study, the HIA examines a scenario in which items would be required to meet the 2010 Dietary Guidelines for Americans (DGA).

See Figure ES.1 for a visual mapping that summarizes the research questions and outcomes examined in this HIA.

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**FIGURE ES.1** Summary of Snack and a la Carte Food and Beverage Health Determinant Pathway

<table>
<thead>
<tr>
<th>Policy</th>
<th>National nutrition standards for snack foods and beverages sold in schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>ES, MS, HS snack food and beverage availability</td>
<td></td>
</tr>
<tr>
<td>Access to healthy foods and beverages</td>
<td></td>
</tr>
<tr>
<td>Access to unhealthy foods and beverages</td>
<td></td>
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<tr>
<td>School snack foods meeting DGA</td>
<td></td>
</tr>
<tr>
<td>Purchase/consumption</td>
<td></td>
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<tr>
<td>A la carte sales</td>
<td></td>
</tr>
<tr>
<td>Vending sales</td>
<td></td>
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<tr>
<td>School store and snack bar sales</td>
<td></td>
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<tr>
<td>School services health outcomes from revenue</td>
<td></td>
</tr>
<tr>
<td>Diet and nutrition health outcomes</td>
<td></td>
</tr>
</tbody>
</table>

△ Change ↑ Increase ▼ Decrease

1 Fund-raisers are not included.
2 ES, MS, HS: Elementary school, middle school, high school
Key Questions and Findings

This HIA considers several key research questions related to school food services, diet and nutrition, and vulnerable populations (including low income and ethnic minority students).

Diet and Nutrition: The impact of updated nutrition standards for snack foods and beverages sold in schools on children’s school-based diets was the main issue considered in this study. The analysis considered two primary nutritional concerns: (1) the total intake of calories from items sold in schools and (2) the consumption of high-calorie, low-nutrient snack foods and beverages versus healthier options. Specific questions included:

- Will the updated standards affect the availability of snacks and drinks sold in schools, student purchases of these items, and student consumption?
- Will changes in student consumption of snacks sold in schools affect different chronic disease health outcomes?

Finding: Student access to, purchase of, and consumption of unhealthy foods and beverages, and subsequently their risk for disease, decreases.

Research indicates that many schools currently sell high-calorie, low-nutrient snack foods and beverages to students of all ages, who consume them instead of healthier options. The HIA found that the implementation of strong snack and a la carte food and beverage policies that meet the 2010 DGA will decrease students’ access to, purchase of, and consumption of unhealthy foods and beverages while also likely increasing their access to, purchase of, and consumption of healthier items at school. Even small changes to students’ school-based diets—like replacing a candy bar with an apple—may reduce their risk of tooth decay, obesity, and chronic illness through decreased calorie, fat, and sugar intake at school. Additionally, the data suggests that strong snack and a la carte food and beverage policies tend to increase participation in the school meal programs, thus the risk of not having enough to eat also may decrease as children purchase school meals in place of less filling snacks.

School Services and Impact on Revenue: The impact of updated nutrition standards for snack and a la carte foods and beverages on student health and school district revenue were of primary concern as food sales are an important component of school budgets. Specific questions included:

- Will updated nutrition standards affect students’ participation in the school meals program and school food service revenue?

The increase in child weight observed between 1988 and 2002 may have been prevented by an average reduction of 110–165 calories per day. This is the difference between providing an elementary school student a 150-calorie snack rather than a 250-calorie snack, as indicated by the child’s daily energy needs.

EXECUTIVE SUMMARY

• Will updated standards affect school-district or other types of revenue that pay for school services?
• If revenue changes occur, will they affect student health via changes to enrichment learning opportunities and school-supported physical activity?

Finding: Districts would likely not see a decline in revenue.

The HIA analysis found that, when schools and districts adopted strong nutrition standards for snack and a la carte foods and beverages, they generally did not experience a decrease in revenue overall. In most instances, school food service revenues increased due to higher participation in school meal programs. However, in some cases, school districts experienced initial declines in revenue when strengthening nutrition standards. The HIA concluded that, over time, the negative impact on revenue could be minimized—and in some cases reversed—by implementing a range of strategies. Limited data exists on the impact of snack food and beverage policies on fund-raising revenue for school groups, such as athletic teams and student government. More research is needed in this area in order to determine how such revenue changes might influence the provision of school services, such as physical activity and enrichment programming, and thus the related effect on students’ health.

Vulnerable Populations: A primary consideration of this analysis was how vulnerable populations—including students from lower-income families as well as those who are black or Hispanic—might be affected by USDA’s snack and a la carte food and beverage policy. These vulnerable populations are more likely to have limited or uncertain access to adequate food; to be overweight or obese; to suffer from type 2 diabetes, hypertension, and other chronic diseases; and to have untreated dental caries, all of which are associated with reduced quality of life, more frequent school absences, and longer-term health problem.

Finding: Vulnerable populations would benefit from stronger nutrition standards for snack foods and beverages sold in schools.

Updated nutrition standards that make healthier foods more available may have a particularly beneficial effect among vulnerable populations, who are at greater risk for nutrition-related health problems. Vulnerable populations also have higher risk of poor academic outcomes, such as lower test scores and higher dropout rates. Because a healthy diet is linked with improved school performance, stronger nutrition standards also may have a positive impact on academic indicators, especially among vulnerable populations. The HIA explored other vulnerable populations, such as children of Asian, Pacific Island, and American Indian descent, but data was too limited to draw conclusions.

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1 Effective strategies for reversing potential declines in revenue are discussed in Section 7.3 of the full report.
2 Hispanic is the term used throughout this HIA to refer to “a person of Mexican, Puerto Rican, Cuban, South or Central American, or other Spanish culture or origin, regardless of race,” as defined by the U.S. Office of Management and Budget. Other terms, such as Latino, may be used when citing specific literature findings.
3 About 15 percent of U.S. households are food insecure, defined by USDA as a household-level economic and social condition of limited or uncertain access to adequate food.
Policy Recommendations

The following policy recommendations are meant to inform USDA’s efforts to update nutrition standards for snack and a la carte foods and beverages sold in schools. The recommendations reflect the outcomes and the conclusions described above, are based upon the evidence summarized in this document, and are intended to maximize health benefits while minimizing risks. Although not the primary question considered in his HIA, the research reviewed indicates that the way schools implement improved nutrition standards through marketing, engaging students, and promoting school meals can play a significant role in how both students and the schools are impacted. Thus, in addition to the following policy recommendations to USDA, the full report highlights a range of promising practices for implementation.

Recommendation 1: USDA should establish nutrition standards for all foods sold regularly on school grounds outside of the school meal programs. These standards should include:

- a requirement that schools sell items from the Dietary Guidelines for Americans list of “foods to encourage;”
- age-appropriate calorie limits for items sold individually (snacks: 100 calories for elementary, 140 calories for middle, and 180 calories for high school students; entrée items: 300 calories for elementary and middle and 400 calories for high school students);
- a maximum of 35 percent of total calories from sugar;
- maximum limits for fats (no more than 35 percent of calories from total fat, 10 percent of calories from saturated fat, and less than or equal to 0.5 g of trans fat per serving); and
- incremental reductions in sodium, with a target time frame of 10 years, to achieve full alignment with the Dietary Guidelines for Americans.

Recommendation 2: USDA should establish nutrition standards for all beverages sold on school grounds. At a minimum, these standards should:

- limit beverages sold in elementary and middle schools to only water, low-fat and fat-free milk, and 100 percent fruit juice in appropriate portions, and
- establish calorie and serving size restrictions for all beverages sold in high schools so as to ensure calories obtained from sugar-sweetened beverages during the school day are minimal.

Recommendation 3: USDA should adopt policies and practices that ensure effective implementation of the standards. At a minimum, USDA should:

- provide technical assistance and training to schools and districts;
- provide clear guidance on how the terms infrequent, school day, and school campus as included in the Healthy, Hunger-Free Kids Act are to be addressed;
- ensure that nutrition standards are kept up to date with future iterations of the Dietary Guidelines for Americans; and
- collaborate with states and nongovernmental organizations to monitor the implementation of the standards.
Concluding Statement

This HIA explores the potential impacts of national nutrition standards for competitive foods or foods sold in schools individually as snacks, a la carte items, and beverages. Research included an extensive literature review, interviews, stakeholder discussions, and financial analysis. Overall, the results indicate that strong nutrition standards could have a significant positive impact on the health of students with potentially increased benefits to those populations that are most vulnerable. In addition, if implemented effectively at the district and school levels, the changes can be made with little to no negative financial impact and in fact may even result in improved financial outcomes for schools and districts. Thus, USDA should establish updated standards and adopt practices—as recommended by this report—that are most likely to maximize positive health impacts while assisting schools in effectively implementing the changes.
1.1 Introduction

In December 2010, the U.S. Congress passed and the President signed into law the Healthy, Hunger-Free Kids Act, setting the stage for a range of improvements in school meals and the school nutrition environment. One change outlined in Section 208 of the Act directs USDA to regulate all foods and beverages sold on the school campus throughout the school day. Foods sold outside of the school meal programs include venues such as vending machines, school stores, and a la carte lines, and what is sold varies greatly in schools across the country. A set of national nutrition standards for these foods could have a significant impact on the health of students and the financial health of schools across the United States.

Background on the Issue

USDA defines competitive foods as items sold at school outside of the school meal, including all reimbursable school meal programs—school lunch, school breakfast, and afterschool snack programs. These foods and beverages include a la carte sales during mealtimes and items sold throughout the school day in vending machines, food carts, school stores, and snack bars, or through fund-raisers. They are technically called competitive foods because these options compete with items offered in school meal programs for inclusion in a child’s daily diet. Whenever possible, this report avoids using this term as it has been found difficult to understand by the general public; rather, such items are referred to as “snack and a la carte foods and beverages.”

HIA Background

An HIA is a prospective research tool that is used to inform decision makers regarding the possible health impacts of proposals. HIAs recommend actions to minimize adverse consequences and optimize beneficial effects. The World Bank, International Finance Corporation, and a growing number of private companies...
voluntarily use HIAs as part of international lending standards and project planning studies because there is a strong business case for proactively identifying and addressing health effects in major investment decisions. The use of HIAs in the United States is increasing rapidly, driven in part by a growing body of data linking decisions made outside the health sector—in transportation, housing, and urban planning, for example—to rates of many diseases. A number of HIAs have addressed nutrition and school-related proposals, such as a farmers’ market, a physical education policy in California, Baltimore’s recent land use plan, Hawaii County’s agriculture plan, and the 2002 federal Farm Bill.

This HIA explores the potential health and financial effects USDA’s updated snack and a la carte food and beverage regulations could have on children and their schools. The Kids’ Safe and Healthful Foods Project and the Health Impact Project—both collaborations of The Pew Charitable Trusts and the Robert Wood Johnson Foundation—contracted Upstream Public Health, a nonprofit health policy advocacy organization experienced in HIA and nutrition policy, to conduct this HIA in anticipation of USDA releasing its proposed regulation in spring 2012.

### About this Report

This HIA summarizes the most current understanding regarding how a federal policy on snack and a la carte foods and beverages sold in schools would impact health. It provides science-based recommendations to inform new regulations that best improve health. The HIA is organized as follows:

#### Chapters

1. Introduces the subject matter
2. Describes the HIA research methods
3. Synthesizes the current conditions related to snack food and beverage policies and health outcomes
4. Summarizes how snack food and beverage policies could affect school services through revenue
5. Summarizes the evidence on how a national policy could impact diet- and nutrition-related health outcomes
6. Discusses the implications of the HIA’s findings and areas needing more research
7. Suggests policy recommendations for USDA and promising practices for states, school districts and schools to help improve the school food environment in support of a national snack food and beverage policy

#### Appendices

1. Provides reference information such as the 2010 DGA and the 2007 IOM recommendations for snack and a la carte foods and beverages sold in schools
2. Offers additional details on HIA research methods
3. Details policy classification results
4. Provides additional context to the current conditions chapter
5. Reviews how this HIA met practice standards
6. Provides details on the state policies reviewed for this HIA
7. Detailed list of works cited

### 1.2 HIA and National Policy

Health impact assessments are distinct from other assessment tools because they explore the root causes of health, known as health determinants, in order to understand the potential health consequences of a policy proposal. An HIA aims to ensure a careful consideration of any possible unintended consequences, benefits, and impacts of policies before they are adopted. An HIA’s purpose is to suggest feasible actions that can be implemented to maximize the benefits and minimize the harms of any decision.
This HIA focuses on health determinants in the broad school food environment. It is intended to connect existing research on the impact of policy and programs affecting children’s school nutrition and school services to upcoming national policy changes.1

Other types of health studies, such as health risk assessments and regulatory impact analyses, may accompany certain federal rule-making processes, but these differ from HIA. Health risk assessments typically provide only a narrow focus on the amount of risk people will incur if exposed to a potentially harmful substance. A regulatory impact analysis (RIA) is more commonly used by USDA and is mandated for major regulations by Executive Order 12,866.21 An RIA is completed by agency staff (or a contractor), and is required to provide a detailed and systematic appraisal of the potential impacts of a new regulation with the primary goal of completing a cost-benefit analysis for the rule, generally expressed in economic terms. An HIA offers several unique benefits beyond a health risk assessment or an RIA.

• It focuses on human health outcomes and incorporates input from a broad range of stakeholders, in this case school personnel, business leaders, and decision makers. This approach can improve the specificity of the analysis and ensure that people affected by a decision have an opportunity to provide active and constructive input.
• It has proven to be an effective tool for cross-sector collaboration. The relationships and the trust that are built among partners during the process increase the likelihood of routine consideration of issues around health in future policy proposals.
• It makes recommendations with the goal of maximizing predicted health benefits and minimizing any potential health risks.

This HIA adds a unique perspective to existing research on the school food environment by considering how updating national standards for snack and a la carte foods and beverages sold in schools could impact social, economic, and environmental factors in schools and, in turn, how these changes could influence children’s school-based dietary behaviors and nutrition-based health outcomes. One of the goals of this assessment (see Table 1.1) is to identify the costs and benefits resulting from national standards that might otherwise be overlooked.

The most common concern related to the issue at hand is how to balance children’s health with increasingly strained financial realities in schools. This report includes original research that sheds light on this important challenge and retroactively examines past impacts on school district revenue made by the implementation of nutrition standards and policies at the school, district, and state levels. It also makes recommendations on how USDA can strongly support children’s health while taking into account the practicalities of implementation.

1This report’s findings relate only to changes concerning snack foods and beverages sold in schools. These foods are just one part of the entire school food and nutrition environment. Studies indicate that comprehensive changes related to food and physical activity—including changes to foods offered, policies about fund-raisers, nutrition education, and increased physical education or opportunities to be physically active—are needed to change social norms and behaviors among schools and students.
States and local school districts have historically led the way in adopting policies to address nutrition standards for snack and a la carte foods and beverages sold in schools. In order to better inform the decision-making process for national standards, this report considered what potential changes in student consumption patterns, as well as changes in revenue for school districts, school organizations, and school food services, might mean for children's health. By extrapolating these findings from the state level, outcomes for similar standards implemented at the national level could then be predicted. This research serves as the foundation for recommendations to USDA regarding the development of national standards and for guidance to states and school districts on how to address the health and financial impacts of implementing such standards.

### 1.3 Children’s Dietary Health: Rationale for National Snack and a la Carte Food and Beverage Standards

Children's nutrition is a national priority for policy makers, public health advocates, and educators. In addition to supporting physical health, good nutrition contributes to student learning. In comparison to national recommendations, American children generally do not eat enough fruits, vegetables, whole grains, or calcium-rich foods, while they often overeat calories, added sugars, sodium, and saturated fats. Such dietary habits are taking a toll on children's health. The past three decades have been marked by a troubling trend of overweight and obesity prevalence rates more than tripling among children and adolescents. Overweight children and adolescents are at an increased risk of health problems, including cardiovascular disease, depression, high blood pressure, type 2 diabetes, breathing problems, sleep disorders, and high cholesterol. They may also experience increased bullying, which is related to poorer mental health and decreased physical activity. Overweight children are also more likely to become obese as adults.

As of 2008, the medical costs associated with obesity in the United States were conservatively estimated to be $147 billion per year, a near doubling from 1998 levels. Increasing concern about children's dietary health and the obesity crisis has focused researchers, government agencies, national associations and organizations, and First Lady Michelle Obama's Let's Move campaign on the school food environment,
emphasizing that more healthy foods and beverages need to be within children’s reach.40-49 A national competitive foods policy will enable schools to support healthier dietary behaviors in children.50,51

The School Food Environment

Various strategies addressing children’s diet, nutrition, and health converge in the school food environment. Schools are responsible for educating youth, which many argue extends to supporting children’s diet. Most children in the United States attend public schools.52 For “food insecure” children who don’t know from where their next meal will come, school food is an important meal source.53 Overall, children eat between one-quarter and one-half of their daily food at school and consume a substantial portion of calories there as well.54,55

The school food environment is defined as the school setting for students’ dietary intake, including when and where children obtain food and the types of options that are available. This environment consists of foods and beverages in school meals—including the breakfast and lunch programs, fund-raisers, hallway and lunchroom vending machines, lunchroom a la carte lines, snack and other food carts, and school stores. The environment also includes food items that are not for sale, such as classroom party foods, treats, and student rewards. Local wellness policies governing nutrition in schools affect the times when food is accessible, the variety of options available to students, and the social messages children receive about food.

A socioecological framework developed by Mary Story, R.D., Ph.D., of the University of Minnesota School of Public Health, and her colleagues reveals the connections between snack and a la carte food and beverage policies and other elements that shape students’ eating behavior at school.56 Figure 1.1 shows that a student’s eating behaviors are a result of a complex interaction of personal factors within social, physical, and macro level environments. For example, macrolevel eating environments include distant, strong forces, such as social norms about eating, food marketing, food prices, and, most relevant to this HIA, food-related policies. Though these factors are considered “upstream” from an individual’s daily eating behavior, they have a trickle-down effect that ultimately impacts health at the population level.57

Numerous factors interact to impact eating behaviors. A child’s decision to eat a carrot happens where he or she eats, in physical settings such as the home, school, neighborhood, and community eateries. A decision to eat a carrot depends on what is immediately available. If the school does not have carrots, that choice is gone.
A child’s choice can also be guided by friends’ opinions about carrots, a personal taste for carrots, or role-modeled behavior when teachers and parents think carrots are delicious.

The school district policy takes the first step in making sure carrots are available and supports children’s learning about foods. Social networks and personal food preferences are also important in shaping healthy eating behaviors when the child leaves school. Policies that change school food environments can shape, or be shaped by, social norms at school, among friends, and at home. The snack food and beverage policies this report examines target the school environment; however, it is important to note that policies at the macro level that influence food access in one physical environment may also affect other settings by changing the food culture.

### History of Snack and a la Carte Food and Beverage Standards and Policies

Snack foods and beverages have been a part of the school food environment since the inception of the National School Lunch Program (NSLP) in 1946. Historically, sales of these items have been used to fund school athletic and extracurricular programming, but beginning in the 1960s parents and doctors began to express concern due to their lack of nutritional value. Schools continued selling snack and a la carte foods and beverages as a way to fill gaps in school food services funds and to raise money for other activities as budgets were cut, until 1970, when the Child Nutrition Act of 1966 was amended to give the USDA Secretary the authority to regulate these items (see Figure 1.2). During the 1970s, organizations on both sides of the debate pressured Congress to rescind, and then restore, USDA’s authority, though in a more narrow capacity.

In 1979, USDA still had very limited authority over competitive foods, regulating only those defined as “foods of minimal nutritional value” (FMNV). The proposed regulation to limit where and when these foods were sold was challenged in court and issued in 1985.

### FIGURE 1.2 History of Snack and a la Carte Food and Beverage Regulations in Schools

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1946</td>
<td>National School Lunch Act: School lunches begin.</td>
</tr>
<tr>
<td>1966</td>
<td>Child Nutrition Act requires USDA to develop nutrition guidelines for NSLP.</td>
</tr>
<tr>
<td>1970</td>
<td>Child Nutrition Act is amended; USDA is granted authority to regulate snack foods and beverages sold in schools; no soft drinks or candy sales are allowed at lunch.</td>
</tr>
<tr>
<td>1972–1973</td>
<td>National Soft Drink Association introduces amendment to eliminate restrictions; USDA authority is rescinded.</td>
</tr>
<tr>
<td>1973</td>
<td>Hearings on vending machine competition with NSLP reveal loss of revenue to snack food and beverage sales and poor nutritional impact on children’s diets.</td>
</tr>
<tr>
<td>1973–1975</td>
<td>Bills to restore USDA authority fail; snack foods and beverages increase in schools.</td>
</tr>
<tr>
<td>1977</td>
<td>USDA authority to regulate snack foods and beverages is restored.</td>
</tr>
<tr>
<td>1979–1985</td>
<td>Amended rule establishes category for “foods of minimal nutritional value,” which is battled in court and issued in 1985.</td>
</tr>
<tr>
<td>2001</td>
<td>USDA report to Congress finds that snack foods and beverages are undermining nutrition from school meal programs.</td>
</tr>
<tr>
<td>2004</td>
<td>Reauthorization Act requires local school districts to establish wellness policies.</td>
</tr>
<tr>
<td>2006</td>
<td>Alliance for a Healthier Generation food and beverage standards are released.</td>
</tr>
<tr>
<td>2007</td>
<td>Institute of Medicine’s guidelines are released.</td>
</tr>
<tr>
<td>2010</td>
<td>Healthy, Hunger-Free Kids Act requires USDA to set standards for all foods sold in schools.</td>
</tr>
</tbody>
</table>

items could be sold was battled in court between the soft drink industry and USDA until 1985, when it was determined that FMNV sales, including soda, would only be prohibited in the cafeteria at lunchtime.\textsuperscript{45} FMNV items were defined as foods that provide less than 5 percent of the recommended daily allowance (RDA) for eight nutrients (protein, vitamins A and C, niacin, riboflavin, thiamin, calcium, and iron) and included such foods as soda water, water ices, chewing gum, and certain candies.\textsuperscript{66,67} Any foods providing at least 5 percent of one of these eight nutrients could be sold in schools free of nutrition requirements.

In contrast, school meals offered through the School Breakfast Program (SBP) and the NSLP are required by USDA to meet nutrition standards, providing up to one-third of the RDA of specific nutrients.\textsuperscript{68} In a 2001 letter to Congress, USDA expressed concern that snack foods and beverages may undermine the nutritional integrity of school meals, as many of them are low-nutrient food options providing added fat, sugars, and calories.\textsuperscript{69-76} Additionally, these foods discourage participation in school meal programs and send mixed messages to children who learn about nutrition in schools.\textsuperscript{77} As a result, the 2004 reauthorization of the Child Nutrition Act required school districts to develop nutrition standards for snack and a la carte foods and beverages as part of local wellness policies. Although many districts did put nutrition standards in place as required, they remained weak as of 2008.\textsuperscript{78-81}

In 2006, the Alliance for a Healthier Generation (Alliance)—a joint initiative of the American Heart Association and the William J. Clinton Foundation, the American Beverage Association, and several major beverage companies—announced a voluntary agreement to limit portion sizes and calorie content of all beverages sold to students during the regular and extended school day. In the same year, several major food manufacturers agreed to limit snack foods sold in schools to those meeting the nutrition guidelines set by the Alliance. The nutrition guidelines adopted under the agreement—based on the 2005 Dietary Guidelines for Americans as well as the American Heart Association’s Dietary Guidelines for Healthy Children—established restrictions for calories, total fat, saturated fat, trans fat, sugar, and sodium.\textsuperscript{82-84}

In 2007, the Committee on Nutrition Standards for Foods in Schools of the Institute of Medicine (IOM) applied the 2005 DGA to nutrition standards for single-item snack foods and beverages sold in schools. The final IOM report, \textit{Nutrition Standards for Foods in Schools: Leading the Way Toward Healthier Youth}, emphasizes that calories and nutrients consumed in school and during school-related activities contribute significantly to school-age children’s total dietary intake.\textsuperscript{85} The committee developed nutrient recommendations using the core principle that federally reimbursable school nutrition programs should be the primary source of foods and beverages offered at school.\textsuperscript{86} Thus, snack foods and beverages would be treated as stand-alone items, not as part of a whole meal pattern. Additionally, the committee intended for the standards to ensure all foods and beverages offered or sold on the school campus would contribute to an overall healthful eating environment.\textsuperscript{87} The IOM tailored the 2005 DGA for children’s overall dietary intake to snack foods and beverages, which allowed it to recommend specific limits on dietary fat, sugar, calories, and serving sizes for products sold during the school day (see Appendix 1).\textsuperscript{88}
1.4 Snack Foods and Beverages and the 2010 Healthy, Hunger-Free Kids Act

In 2010, Congress made historic improvements to the school food environment upon passage of the HHFKA, which required in section 208 for the Secretary of Agriculture to establish science-based nutrition standards for all foods sold in schools throughout the school day (see Figure 1.3). The intent of this legislation is to restrict access to the least-healthy foods being sold in schools and to align overall dietary intake with national dietary guidelines. In addition to establishing nutrition standards for such foods, the HHFKA requires the Secretary of Agriculture to define the terms school campus, infrequent and school day. Currently, USDA has no such operational definitions. The U.S. Department of Education has defined school day as “any day, including a partial day in which children are in attendance at school for instructional purposes, including children with and without disabilities.” However, this definition is used only with respect to disciplinary procedures. USDA will have to provide further guidance addressing the hours that determine the school day for states that do not already do so.

A variety of current state nutrition policies and local school districts define the school day time frame. For example, Tennessee’s school day starts 45 minutes before the first period and ends 30 minutes after the last period; Connecticut’s school day, on the other hand, begins with the arrival of the first child at school and ends after the last instructional period; and Texas’s school day starts with the first breakfast period and ends after the last instructional period.

The U.S. Secretary of Agriculture is required to establish “science-based nutrition standards for foods sold in schools other than foods provided under this Act (PL 111-296) and the Richard B. Russell National School Lunch Act (42 U.S.C. 1751 et seq.). The nutrition standards shall apply to all foods sold

i. outside the school meal programs;
ii. on the school campus; and
iii. at any time during the school day.

The secretary is required to establish standards that are consistent with the most recent DGA (2010) published under section 301 of the National Nutrition Monitoring and Related Research Act of 1990 (7 U.S.C. 5341), including the food groups to encourage with students and identified nutrients of concern. The secretary is also required to consider the following in drafting these guidelines:

i. authoritative scientific recommendations for nutrition standards;
ii. existing school nutrition standards, including voluntary standards for beverages and snack foods and state and local standards;
iii. the practical application of the nutrition standards; and
iv. special exemptions for school-sponsored fund-raisers (other than fund-raising through vending machines, school stores, snack bars, a la carte sales, and any other exclusions determined by the secretary), if the fund-raisers are approved by the school and are infrequent within the school.

The new standards are to take effect at the beginning of the school year that is not earlier than one year and not later than two years following the date on which the regulations are finalized. The Department of Agriculture and the Department of Health and Human Services are required to update the standards when a new edition of the Dietary Guidelines for Americans is released.

The research team followed the North American HIA Practice Standards Version 2 and the National Research Council Guidelines to develop each stage of this HIA. An HIA involves six key stages: screening, scoping, assessment, recommendations, reporting, and monitoring and evaluation. (see Figure 2.1)

**FIGURE 2.1** Steps in an HIA

1. **Screening** determines the need for and value of an HIA.
2. **Scoping** develops a plan and timeline for the HIA that defines research questions, health determinants, health outcomes, and vulnerable populations.
3. **Assessment** evaluates the direction and magnitude of potential health impacts using existing data, expertise, current conditions, and literature.
4. **Recommendations** identifies actions based on information in the assessment that will minimize adverse effects and optimize potential beneficial ones.
5. **Reporting** communicates the findings and recommendations.
6. **Monitoring and Evaluation** tracks changes in health indicators or implementation of HIA recommendations and evaluates the impacts of the HIA on the decision making process.

**SOURCES:**
3. P. Harris et al., *Health Impact Assessment: A Practical Guide* (Sydney, Australia: Centre for Health Equity Training, Research and Evaluation [CHETRE], Part of the UNSW Research Centre for Primary Health Care and Equity, UNSW, 2007).

This HIA used a diverse set of evidence and methodologies in the scoping and assessment stages, including integrated literature reviews, an analysis of state policies and their impacts, and interviews of key stakeholders (see Table 2.1). Following community-based research practices, this HIA also incorporated stakeholder perspectives in the scoping, assessment, recommendations, and reporting stages, described further in Appendix 2.
This chapter provides details on the scoping and assessment stages; details on all other stages can be found in Appendix 6.

### TABLE 2.1 | HIA Research and Assessment Methods

<table>
<thead>
<tr>
<th>Methods</th>
<th>Brief Description</th>
<th>Assessment Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Literature review</td>
<td>Integrated meta review of peer-reviewed empirical studies and available grey literature</td>
<td>Current conditions; assessment of impacts</td>
</tr>
<tr>
<td>Policy scenarios</td>
<td>Developed from Section 208 of HHFKA</td>
<td>Could not use</td>
</tr>
<tr>
<td>Secondary data</td>
<td>Summary of existing data and scan of existing state policies</td>
<td>Current conditions</td>
</tr>
<tr>
<td>Policy revenue analysis</td>
<td>Original empirical analysis; used secondary data to examine the relationship between state policy and food-related revenue</td>
<td>Assessment of impacts</td>
</tr>
<tr>
<td>Stakeholder input</td>
<td>Interviewed advisory committee and key informants</td>
<td>Applicability of other findings to specific groups; context for assessment of impacts</td>
</tr>
</tbody>
</table>

#### 2.1 HIA Scope: Origins of the Health Determinant Pathway and Research Questions

Scoping is a key stage of an HIA in which a plan and timeline are developed, and in which the scope of the health determinants to be studied during the assessment stage are narrowed and possible connections (or pathways) between proposed policy elements and predicted health outcomes are identified. The use of a health determinant pathway diagram, or logic model, typically guides this process and enables the subsequent development of research questions. Figure 2.2, which also appears in the executive summary, outlines the research team’s hypothesized connections between updating nutrition standards for snack and a la carte foods and beverages sold in schools and the resulting effects on the selection of items available to students.

As mentioned in the introduction, the Healthy, Hunger-Free Kids Act gave the Secretary of Agriculture authority to update nutrition standards for all foods sold in schools throughout the school day. Given that these are national standards, the study area of the HIA encompasses the 50 states and the District of Columbia. The HHFKA allows the Secretary...
of Agriculture to provide exemptions for infrequent fund-raisers, thus they were not included in the scope of this HIA.

The research team hypothesized that updating national nutrition standards for all foods sold in schools would likely affect the nutritional quality of foods and beverages offered in elementary, middle, and high schools. These changes could include both increased availability of healthier foods and beverages and decreased availability of less healthy options. The research team further hypothesized that such differences in product availability are likely to shift the purchasing patterns of students, and thus could impact revenue for school services as well as student health outcomes, including chronic disease risk and student learning.

Two central research questions emerged from this scoping (see Figure 2.3). First, will a national standard for snack foods and beverages impact (either positively or negatively) school district revenue and will those changes subsequently affect student health? Second, will the anticipated changes in diet and nutrition resulting from a national standard for snack foods and beverages sold in schools impact (either positively or negatively) children’s health? Within these two broad areas of inquiry, a more specific set of research questions was developed to guide the investigation of the links among policy, practices, health determinants, and health outcomes (see Appendix 2).

<table>
<thead>
<tr>
<th>FIGURE 2.3</th>
<th>Key Research Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>School Services</strong>—Will a national standard for snack and a la carte foods and beverages impact school district revenue and health?</td>
<td></td>
</tr>
<tr>
<td>• Will updated nutrition standards affect students’ participation in the school meal programs and school food service revenue?</td>
<td></td>
</tr>
<tr>
<td>• Will updated standards affect school-district or other types of revenue that pay for school services?</td>
<td></td>
</tr>
<tr>
<td>• If revenue changes occur, will they affect student health via changes to enrichment learning opportunities and school-supported physical activity?</td>
<td></td>
</tr>
<tr>
<td><strong>Diet and Nutrition</strong>—Will a national standard for snack and a la carte foods and beverages impact student diet and nutrition?</td>
<td></td>
</tr>
<tr>
<td>• Will the updated standards affect the availability of snacks and drinks sold in schools, student purchases of these items, and student consumption?</td>
<td></td>
</tr>
<tr>
<td>• Will changes in student consumption of snacks sold in schools affect different chronic disease health outcomes or risks of those outcomes?</td>
<td></td>
</tr>
</tbody>
</table>

Figure 2.4 offers a detailed visual mapping of the research questions and outcomes examined in this HIA. The expanded detailed pathways for the school services and diet and nutrition health determinants are presented in Chapters 4 and 5.
A health determinant pathway is a tool, similar to a logic model, often used in HIA practice. Initially, the health determinant pathway guides the development of research questions; later, it is used to map out possible connections between the proposed policy elements being examined and the predicted health outcomes. This figure is a summary diagram of the health determinant pathway used in this HIA.

1 Fund-raisers are not included.
2 ES, MS, HS: Elementary school, middle school, high school
3 NSLP: National School Lunch Program
4 Enterprise revenues, as defined in the LEA Finance survey, includes revenue from vending machine sales as well as funds from any activity for which a fee is charged to external users for goods or services, whether or not it is food and beverage based.
2.2 Assessment Methods

Integrated Literature Review

The research team used an integrated, structured literature review approach for health outcomes in both the school services and diet and nutrition health determinant pathways. Search terms specific to each pathway’s health outcomes and determinants were used in a subset of 10 electronic databases and through Google Scholar.96 A full description of the scoring process is included in Appendix 2, and a detailed listing of the literature review is in Appendix 7.

For a list of specific search terms and databases used for each health outcome, see Appendix 2.

To be included in this review, articles had to address at least one of the research questions, be published or released in English between 1999 and 2011, and cover a public school-based population in the United States. Both qualitative and quantitative literature were included. In addition, the team examined reference lists, review articles, database-generated related article lists, grey literature, and related author publication lists for additional eligible articles.

The research team used scoring criteria to help determine the quality of each piece of literature, taking into account the extent that bias was minimized.97,98 Team members reviewed more than 300 articles and scored and evaluated the weight of evidence to predict potential impacts based on the overall (1) quality of articles; (2) quantity of articles; and (3) consistency of findings within the literature.

Policy Scenarios

Because USDA had not proposed specific rules at the time of the analysis, the research team used the guidance in Section 208 of the HHFKA, the 2010 DGA, and the IOM’s 2007 report, Nutrition Standards for Foods in Schools: Leading the Way Toward Healthier Youth, to draft two plausible policy scenarios that may be put forth by USDA in its draft rule: (1) nutrition standards meet the principles of the 2010 DGA; (2) nutrition standards meet the 2007 IOM recommendations plus those from the Alliance for a Healthier Generation (see Appendix 2 for a more detailed description of policy scenarios). When the research team attempted to apply the two scenarios to the assessment model, however, they determined that the two scenarios were not dissimilar enough to account for age-based differences in nutrient needs and to evaluate the resulting potential differences in health impacts. Thus, the research team chose to discard the approach of using two policy scenarios and instead applied the basic principles of the 2010 DGA.

State Policy Measures

This HIA used the School Nutrition-Environment State Policy Classification System (SNESPCS) from the National Cancer Institute’s Classification of Laws Associated with School Students (CLASS) as the basis for identifying competitive food policies at the state level. CLASS scores state-level codified laws for nutrition in schools for elementary, middle, and high school age levels.99,100
The CLASS system for nutrition reflects statutory laws enacted by state legislatures and administrative laws promulgated by state administrative agencies. The research team chose CLASS because it is anchored both to the 2005 Dietary Guidelines for Americans and the 2007 IOM recommendations, is available by state for the longest time span (currently 2003–2008), and provides sufficient detail on the various elements of state policies. Using this data, the research team developed an overall categorical policy index ranging from 0 (no policy) to 3 (strong) to create the policy indicators for the analyses. For a description of how the research team converted the original CLASS scale to the 0-3 scale, see Appendix 3.

There are limitations to the CLASS system. First, it focuses only on statutory laws and resulting regulations; therefore, it will not capture nutrition policy stemming from school board or state department policies that have not been codified into law or did not require legislative action. Second, because state statutes and regulations often set a baseline policy, individual school districts’ wellness policies may be stricter, but will not be captured by this classification. Lastly, while an overall state ranking on snack and a la carte food and beverage policy can be developed from CLASS data, it was not designed specifically, nor are there set rules, for calculating ranking measures across the individual policy domains scored within CLASS.

### TABLE 2.2 Policy Analysis Outcome Measures

<table>
<thead>
<tr>
<th>Measures</th>
<th>Definition</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enterprise revenue¹</td>
<td>Includes vending machine revenues but also funds from any activity for which a fee is charged to external users for goods or services, whether or not it is food and beverage based.</td>
<td>This is dependent upon food and beverage and other types of enterprise revenue.</td>
</tr>
<tr>
<td>Food service revenue</td>
<td>This includes revenue generated from federal meal reimbursements (free and reduced students) as well as student-paid meals and a la carte sales.</td>
<td>This relates to both student meal participation and a la carte purchases.</td>
</tr>
<tr>
<td>Meal participation</td>
<td>Based on estimates of average daily participation in lunch and breakfast programs. These include total participation for lunch and breakfast separately, as well as breakdowns by free and reduced lunch versus student paid. Overall participation measures the sum of breakfast and lunch.</td>
<td>Policies on snack and a la carte foods and beverages may affect student meal participation.</td>
</tr>
<tr>
<td>Expenditures²</td>
<td>Food service-specific expenditures only, in total and by employee versus food expenses.</td>
<td>Policies on snack and a la carte foods and beverages may affect school services’ expenditures.</td>
</tr>
<tr>
<td>Revenue per student</td>
<td>Calculated in total and by source; estimates of revenue per participating student with and without controls for the observable factors noted above (breakfast versus lunch participation and federal versus local revenue).³</td>
<td>This provides information on how revenues may be changing outside of meal participation.</td>
</tr>
<tr>
<td>Total revenue</td>
<td>Food service-specific revenue (i.e., school meals and a la carte) is combined with enterprise revenue, which includes revenues from vending machines and other venues (e.g., school stores).</td>
<td>The sum of these revenue streams provides a measure of the net change across all areas of food-related revenue.</td>
</tr>
<tr>
<td>Combined revenue and</td>
<td>The combined measures of revenue and expenditure are ratios of revenue to expenditures. These ratios are calculated for (1) food service revenue and expenditures only, and (2) the sum of enterprise and food service revenues to food service expenditures.</td>
<td>This provides a “profit/loss” measure across the revenue and expenditure categories.</td>
</tr>
</tbody>
</table>

¹ Twelve states have no reported enterprise revenue within the study period, eight of which are states included in the study. Two states report enterprise revenue in only five of the six study years. These observations are excluded (Minnesota in 2003, North Carolina in 2008) from the analyses where enterprise revenues are involved. Given this, the research team estimates the policy effects on enterprise revenue, and any measures including it, for all states included in the study analyses generally (except for the two exceptions noted above) and for only those states with positive enterprise revenue.  
² Expenditures for enterprise-related labor or commodity costs were not available in the NCES CCD data.  
³ Changes in federal revenues per participating student may reflect fluctuations in the mix of free and reduced-price meals or in buying federal food commodities. Changes in local revenue per participating student may reflect variations in prices charged or in the mix of a la carte items and meals sold. Both measures will vary with mix of breakfast and lunch participation.
CHAPTER 2

Health Impact Assessment: National Nutrition Standards for Snack and a la Carte Foods and Beverages

State Finance Measures

The primary source of school food-related finance data is the Local Educational Agency (LEA) Finance Survey that is part of the Common Core of Data (CCD) of the National Center for Education Statistics (NCES). The LEA Finance Survey collects specific and consistent finance data from local school districts that can be aggregated to the state level. These include revenue in total by type (food service-specific and enterprise) and by source (local, state, federal); and expenditures (food service-specific only) in total and by type (wages, benefits, commodities) (see Table 2.2 on page 20). Data on school meal program participation, as well as some specific revenue sub-categories (e.g., free versus reduced-price federal revenue), have been obtained either from USDA or through state statistics compiled by the Food Research and Action Center.

Enterprise revenues, as defined in the LEA Finance Survey, specifically include those funds from any activity for which a fee is charged to external users for goods or services. Vending machine sales fall into this category, as do non-food and non-beverage sales (e.g., school supplies sold in a school store). As such, the impact on each state’s enterprise revenue by any policy change will be dependent upon the ratio of food and beverage sales to other nonfood items.

State Policy Analysis: Impact on School Revenue

This HIA conducted original empirical analysis to examine the relationship between snack and a la carte food and beverage policies and school-related finances at the state level. Using the overall snack food and beverage policy scores for the 50 states and the District of Columbia, policy strength was compared against changes in revenues between state-years (an observational unit of analysis). Revenue changes were also explored for states moving from no policy to a policy, as well as for states transitioning to a stronger policy.

Control Variables

A set of general control variables for student and school system characteristics that could influence outcomes was included in all analyses. The school system characteristics include the total number of students, the number of schools providing school lunch, and the number of schools providing breakfast.

The student characteristic measures account for potential differences in student preferences (e.g., for meal participation or types of meals or food) and income. These include the percentage of the state population with food insecurity (measured as an average of the current and two prior years), the poverty rate for children and adolescents under the age of 18, the percentage of school-age children of non-Caucasian race or ethnicity, the percentage of children in elementary school, and the percentage of children in middle school. Student gender was not available within the data sets used.

These data were drawn from the Food Research and Action Center, the U.S. Census, Bureau of Labor Statistics, and the State Nonfiscal Public Elementary/Secondary Education Survey used in the NCES CCD.
Stakeholder Involvement

This HIA involved an advisory committee, stakeholder interviews, and a peer review process (see Appendix 2 for details on sampling and how input was used beyond interviews). The HIA used structured interviews with field experts to revise its research scope, to confirm or expand on literature and secondary data findings, and to gather input on policy recommendations. Interviews informed the research team on how to apply literature and policy analysis findings to different groups, such as children, school nutrition service professionals, or district administrators from a firsthand perspective.

Interviews were confidential and phone-based and followed a semi-structured script. Interview participants were selected using purposive sampling and a stakeholder analysis. Participants included students, school district representatives, parents, policy experts, school board members, and vending representatives (see Appendix 2 for a list of interview participants).

Assessment of Impacts and Development of Policy Recommendations

HIAs evaluate the potential impact of a policy proposal on various health outcomes and populations. In chapters 4 and 5, this HIA uses assessment information to predict what could happen when USDA updates national standards for snack foods and beverages. Table 2.3 explains how judgments of potential impacts were made throughout the analyses.

The assessment of impacts is a starting point for developing policy and implementation recommendations. An HIA can offer alternatives to a proposal and/or mitigation measures; make suggestions to other affected agencies about the policy being analyzed; and offer indicators to monitor, elements for reassessment or adaptation in the future to deal with uncertainties discovered in the HIA, and future avenues for research. Details regarding the policy recommendations in this HIA and how they were developed can be found in Chapter 7.
## TABLE 2.3 HIA Impact Characterization Elements and Definitions

| Impacted and most vulnerable populations | Vulnerable populations are disproportionately more susceptible to health impacts. These include children, the elderly, communities of color, those with pre-existing health conditions, and low-income individuals, as well as inner-city, rural, or frontier populations with limited resource access. This report uses “most impacted” to indicate sub-populations among all vulnerable children. |
| Magnitude of impact | The numbers of people affected, the direction of the impact, and the extent of the impact. |
| **Strong impact**: Effect results in moderate or severe injury, harm, or illness (e.g., health outcome) that requires some intervention or, conversely, a reduction of risk for such an illness or health outcome. |
| **Moderate impact**: Effect results in annoyance, minor injury, or risk of illness that does not require intervention or, conversely, a reduction of that risk. |
| **Small impact**: Effect is not perceptible but may contribute to risk of illness or, conversely, a preventive effect over time. |
| **Uncertain**: Effect is unclear |
| **No effect**: None |
| **Many**: (more than 1 million children) |
| **Moderate number**: 500,001 to 999,999 |
| **Few**: 500,000 or less |
| Likelihood of impact on outcome | How likely health impacts are to occur based on the evidence. This report use likelihood measures from *Health Impact Assessment—A Guide for Practice*. |
| **Unlikely**: Logically implausible effect with substantial evidence against mechanism of effect |
| **Possible**: Logically plausible effect with limited or uncertain supporting evidence |
| **Likely**: Logically plausible effect with substantial and consistent supporting evidence and substantial uncertainties |
| **Very likely/Certain**: Adequate evidence for a causal and generalizable effect |
| **Insufficient evidence** or Not evaluated |
| Quality of evidence | This measure indicates the quality, quantity, and consistency of the evidence base for a particular direction, likelihood, or magnitude of impact on a specific health outcome. The characterization measures are initially based on the literature evidence and added or reduced by one star with data analysis and input from stakeholder or case studies. |
| ~ Sufficient evidence not available to evaluate this outcome with confidence |
| * <5 studies, inconsistent results, and the claim is consistent with public health principles |
| ** 5+ studies of weak and moderate quality with consistent or mixed results; 5+ studies of mixed quality with mixed results |
| *** 5–10 strong studies with consistent findings |
| **** 10+ strong studies with consistent findings |

**Sources:**
CHAPTER 3

Current Conditions: The School Food Environment and Students’ Health

This chapter summarizes the current state of the school food environment, as well as health trends among school aged children. Specifically, the school service-related and diet- and nutrition-related outcomes examined in detail in Chapters 4 and 5 of this HIA are covered in order to establish a baseline against which the potential impacts of USDA’s proposed guidelines can be assessed. It describes existing:

1. School meal participation levels and food security in public schools;
2. Access and availability of snack and a la carte foods and beverages;
3. State and district policies governing snack and a la carte foods and beverages;
4. Estimates of school and school district use of revenue from snack and a la carte food and beverage sales;
5. Student purchase and consumption of snack and a la carte foods and beverages;
6. Child weight status, overweight and obesity, and physical activity; and
7. Chronic illness trends among children.

3.1 Current School Lunch Participation and Food Security

The federal government authorized schools to serve lunches to students in need in the 1946 National School Lunch Act. Designed to help feed hungry children, school meal programs must be operated on a nonprofit basis and meet the current (2010) Dietary Guidelines for Americans. In exchange for meeting these and other criteria, schools receive a federal reimbursement for each meal served. In addition to this reimbursement, schools participating in the NSLP also receive USDA foods, or “entitlement” foods, to supplement the meals. The program is intended to be revenue neutral with each participating child’s meal covered by the federal reimbursement and USDA foods credit (see Table 3.1) or the price the child pays

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1In the 2011–2012 fiscal year, schools participating in the NSLP were entitled to receive USDA foods at a value of 22.25 cents for each meal served.
for the meal. In some cases, a state may decide to also contribute additional funds to the reimbursement of meals.

Close to 95 percent of public schools in the United States participate in this program, translating into more than 31 million students served annually (as of 2011). During the 2011 fiscal year, more than 66 percent of the 31.7 million students participating in the program received a free or reduced-price lunch, with eligibility based on need and determined by household income. For the period July 1, 2011, through June 30, 2012, a family must earn no more than 130 percent of the poverty level to qualify for a free lunch ($29,055 for a family of four), and no more than 185 percent of the poverty level to qualify for a reduced-price lunch ($41,348 for a family of four). The federal government reimburses these meals in a tiered fashion. In the 2011–2012 school year, the government reimbursed $2.77 for each free meal, $2.37 for each reduced-price meal, and $0.26 for each paid meal served in a school in the 48 contiguous states. These reimbursements are higher for schools in Alaska and Hawaii, as well as for those schools that are serving a large number of students in the free or reduced-price categories, as indicated in Table 3.1. The students receiving these meals are not expected to pay anything if they qualify for a free lunch; however, those qualifying for a reduced-price lunch are expected to pay up to $0.40 per meal, and those receiving a paid meal are responsible for paying whatever price is set by the school district.

See Appendix 5, Table A5.1 for details on state-by-state enrollment, reflective of total population levels in each state.

**TABLE 3.1** Program Reimbursement Rates for School Meals (July 1, 2011–June 30, 2012)

<table>
<thead>
<tr>
<th></th>
<th>National School Lunch Program</th>
<th>School Breakfast Program</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt; 60% of F/R meals*</td>
<td>&gt; 60% of F/R meals*</td>
</tr>
<tr>
<td>Contiguous states</td>
<td>Paid</td>
<td>Reduced-price</td>
</tr>
<tr>
<td></td>
<td>0.26</td>
<td>0.28</td>
</tr>
<tr>
<td></td>
<td>2.37</td>
<td>2.39</td>
</tr>
<tr>
<td></td>
<td>2.77</td>
<td>2.79</td>
</tr>
<tr>
<td>Alaska</td>
<td>Paid</td>
<td>0.43</td>
</tr>
<tr>
<td></td>
<td>4.10</td>
<td>4.52</td>
</tr>
<tr>
<td></td>
<td>Reduced-price</td>
<td>Free</td>
</tr>
<tr>
<td></td>
<td>4.50</td>
<td>4.12</td>
</tr>
<tr>
<td></td>
<td>4.50</td>
<td>4.52</td>
</tr>
<tr>
<td>Hawaii</td>
<td>Paid</td>
<td>0.31</td>
</tr>
<tr>
<td></td>
<td>2.85</td>
<td>2.87</td>
</tr>
<tr>
<td></td>
<td>Reduced-price</td>
<td>Free</td>
</tr>
<tr>
<td></td>
<td>3.25</td>
<td>3.27</td>
</tr>
</tbody>
</table>

* F/R: free/reduced-price meals
* If 40 percent or more of a school’s lunches served are free or reduced-price meals in the preceding year, the school is considered to be in severe need.

Meal and snack payments to states and school food authorities expressed in dollars or fractions thereof.

While a majority of funding comes from the federal government, state agencies administer the school meal programs through local school food authorities (SFAs), which are individual schools or school districts. SFAs manage the process locally, ensuring that applicants for the school meal programs receive the intended services, and states monitor the SFAs’ performance. Both are responsible for making certain that federal standards are met.

School Meals and Food Security

School meals play a critical role in addressing child food insecurity, or lack of adequate food, which affects children’s health and can adversely affect their academic performance. Several studies indicate that household food insecurity is associated with nutrient deficiencies, poor cognitive development, behavioral and psychosocial dysfunction in both children and adults, and generally poor health (see Table 3.2). Additional studies demonstrate that child hunger is associated with lower academic achievement and contributes in the long term to a less competitive workforce. Workers who experienced hunger as children are not as well-prepared mentally, physically, emotionally, or socially when compared to their better-fed counterparts.

<table>
<thead>
<tr>
<th>Physical Health</th>
<th>Mental Health</th>
<th>Academic Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low birth weight</td>
<td>Behavioral and emotional problems</td>
<td>Academic problems</td>
</tr>
<tr>
<td>Fair/poor health</td>
<td>Lower social skills</td>
<td>Lower math scores</td>
</tr>
<tr>
<td>Hospitalization</td>
<td>Difficulty getting along with others</td>
<td>Repeating a grade</td>
</tr>
<tr>
<td>Iron deficiency anemia</td>
<td>Psychosocial dysfunction</td>
<td>Suspension from school</td>
</tr>
<tr>
<td>Chronic illness</td>
<td>Aggression and anxiety</td>
<td>Higher levels of hyperactivity</td>
</tr>
<tr>
<td>Stomachaches, headaches, colds</td>
<td>Depression, thoughts of death, attempted suicide</td>
<td>Higher levels of absenteeism and tardiness</td>
</tr>
<tr>
<td>Increased BMI, weight gain</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SOURCE:** J. Cook and K. Jeng, *Child Food Insecurity: The Economic Impact on Our Nation* (Feeding America, 2009).

In 2009, nearly one-quarter of children (21.3 percent) lived in food-insecure households where adults, children, or both were experiencing low or very low food security (see Figure 3.1). One child in 10, or 4.2 million children, is considered food insecure or is experiencing very low food security (10.6 percent). More black (17.2 percent) and Hispanic children (18.7 percent) are food insecure or experiencing very low food security compared to white non-Hispanic children (7 percent). These numbers have been steadily climbing since 2005, when 15.6 percent of children were in food-insecure households, and 8.2 percent of children were considered food insecure.
CHAPTER 3  CURRENT CONDITIONS: THE SCHOOL FOOD ENVIRONMENT AND STUDENTS’ HEALTH

3.2 Current School Food Access and Availability

As discussed in Chapter 1, the school food environment is inclusive of all food sources in a school. In addition to school breakfast and lunch, most children have access to snack and a la carte foods and beverages while at school. Options for purchasing these items include a la carte sales during mealtimes, as well as items sold in vending machines, food carts, school stores, snack bars, and fund-raisers. Multiple studies between the 2004 and 2011 school years, using nationally representative information and various methodologies, show consistently that snack foods and beverages are widely available to U.S. children, with variation across school levels and types of venues (see Appendix 5, Table A5.2).123-135

State nutrition policies have historically set a policy floor for the food environment in local school districts. To date, 39 states have some type of policy in place affecting what or when snack foods and beverages can be sold (see Appendix 7). These policies vary in content and strength. One study found that state policies restricting unhealthy snack foods in elementary and middle schools were significantly associated with schools offering less of these items, while district policies did not show this relationship.136 The same study found that neither state nor district policy restrictions were associated with reductions in high school snack food availability, indicating that high schools may have more complex challenges in implementing such policies.137

This HIA examined state and district policies using data from CLASS and other studies such as those conducted by Bridging the Gap, a nationally recognized research program. Policies were compared to the 2005 and 2010 DGAs and the 2007 IOM recommendations, Nutrition Standards for Foods in Schools: Leading the Way Toward Healthier Youth, where possible. The 2005 DGA remains relevant since the primary recommendations differ very little from the 2010 version (see Appendix 1).
State Snack and a la Carte Food and Beverage Nutrition Policies

The CLASS scores use data from 2008 and include policies affecting nutrient standards for snack foods and beverages by school level and venue. In reviewing this data, most states do not have policies in place meeting nutrition standards in the 2005 DGA. Only eight of the 45 states that were scored (17 percent) met or exceeded these guidelines (see Figure 3.2). It is important to note, however, that five states had policies that were excluded from the scoring system, and another seven have since strengthened their state policies.138-140

The HIA also compared state nutrition policies to the IOM’s 2007 recommendations. A recent study examining state policies from 2010 found that more than half of states (28 states, or 56 percent) had policies requiring schools to implement nutrition standards of some type for snack and a la carte foods and beverages.141 Of these, only six states had policies rated “exemplary” or “strong” on the nine IOM nutrient standards of (1) dietary fat, (2) total sugars, (3) calories, (4) sodium, (5) nonnutritive sweeteners, (6) caffeine, (7) Tier 1 foods,11 (8) water, and (9) sports drinks (see Figure 3.3).

These findings are similar to the aforementioned results comparing CLASS to the 2005 DGA (see Figure 3.2). The CLASS system reveals that state policies are generally stronger in elementary schools than in middle and high schools. Of the 30 states scored in CLASS that identified having some level of nutrition policy applying to snack foods and beverages sold in vending machines, a la carte lines, and other venues such as school stores or snack bars, one-third (9 of 30) had lower levels of restrictions in middle schools, and nearly half (14 of 30) had weaker restrictions in high schools (see Appendix 2).

---

1 Per the 2007 IOM Report, Nutrition Standards for Foods in Schools, Tier 1 foods are defined as fruits, vegetables, whole grains, and related combination products and nonfat and low-fat dairy that are limited to 200 calories or less per portion as packaged and adhere to additional limits on total fat, saturated fat, trans fat, sugars, and sodium.
Of the nutrients examined by IOM, state policies have given the least regulatory attention to setting limits on sodium, total calories, and fund-raisers. Only 10 states partially meet IOM standards on sodium, 20 states partially or fully address IOM standards on calorie limits, and 21 states partially meet IOM standards on fund-raisers. Nearly half the states partially address or fully meet IOM nutrient standards setting limits on dietary fat (24 states), setting limits on sugar (24 states), providing access to Tier 1 healthy foods (34 states), and limiting sports drinks (23 states) (see Figure 3.4).

**FIGURE 3.4** How 2010 State Food Policies Meet IOM Standards

![Figure 3.4](image)

**District Wellness Policies and Snack and a la Carte Food and Beverages**

Since 2004, school districts have been implementing wellness policies that include nutrient standards for foods sold outside of the school meal programs. A study conducted by Bridging the Gap found that between the 2006 and 2008 school years, there were 16 percent more students in districts with wellness policies that included such guidelines, indicating a positive trend. Additionally, an analysis of a representative sample of school district wellness policies in the 2008–2009 school year indicated that at least two-thirds of all students were in districts with some level of nutrition guidelines in place at the time (see Table 3.3). However, these district policies usually do not address all the requirements included in the law. District guidelines often do not apply to all products or venues on campus, and many guidelines apply only to certain times of day.
Many studies indicate that more schools have been restricting access to various foods in the past five to 10 years. The Centers for Disease Control and Prevention (CDC) found that from 2006 to 2008, the percentage of schools in which students could not purchase candy or salty snacks increased in 37 of 40 states evaluated (from 45.7 percent in 2006 to 63.5 percent in 2008). Similarly, compared with 2006, the percentage of secondary schools in which students could not purchase regular soda was significantly higher in all 34 states examined, and the percentage of schools in which students could not purchase sports drinks was significantly higher in 23 of these states in 2008.

Similar to state policies, district policies are generally stronger at the elementary and middle school levels than in high schools by overall strength and by specific food and beverage content restrictions. According to 2008–2009 data from Bridging the Gap:

- One-quarter to one-third of all elementary- and middle-school students attended schools with district policies requiring stronger restrictions on sugar.
- Four in 10 middle school students attended schools in districts with stronger restrictions on fat, compared to three in 10 elementary and high school students.
- Less than 15 percent of students attended schools with district policies requiring stronger limits on trans fats, sodium, or calories in snacks.
- More elementary students than middle or high school students were in districts with a complete competitive food ban, or a ban on locations where products can be sold.
- More than one-third of elementary students and high school students and more than half of middle school students were in schools with district policies that have a “strong” policy restricting drinks with added caloric sweeteners such as regular soda.
- Most students did not attend schools that restricted sugar or calories in flavored milk or fat in milk, or that placed serving size limits on beverages.

### TABLE 3.3

<table>
<thead>
<tr>
<th></th>
<th>ES students (%)</th>
<th>MS students (%)</th>
<th>HS students (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nutrition guidelines for snack foods and beverages</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No policy or weak policy</td>
<td>29</td>
<td>33</td>
<td>40</td>
</tr>
<tr>
<td>Strong policy</td>
<td>70</td>
<td>67</td>
<td>60</td>
</tr>
<tr>
<td><strong>Fund-raisers during the school day</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No policy or weak policy</td>
<td>64</td>
<td>75</td>
<td>87</td>
</tr>
<tr>
<td>Strong policy</td>
<td>36</td>
<td>24</td>
<td>14</td>
</tr>
</tbody>
</table>

1 Weak policy provisions offered suggestions or recommendations, with some requiring action, but only for certain grade levels or times of day.
2 Strong policy provisions required action and specified an implementation plan or strategy.

All numbers rounded. Due to rounding, some percentages may not sum to exactly 100. Exact numbers are available at www.bridgingthegapresearch.org.

**SOURCE:** Health Policy Center, Institute for Health Research and Policy, *Bridging the Gap* (Chicago: University of Illinois at Chicago, 2010).
• More elementary students (14.5 percent) than middle (2.5 percent) or high school (1.25 percent) students attended schools in districts with a complete beverage ban, or a ban on locations where products can be sold.152

See Appendix 5 and Tables A5.3 and A5.4 for more details on food and beverage content restrictions in districts with wellness policies addressing snack foods and beverages.

**Alliance for a Healthier Generation Competitive Food Standards**

In the 2007–2008 school year, 26 percent of public elementary and 50 percent of middle and high school students were in a school that had implemented, or was in the process of implementing, the nutritional guidelines for competitive foods set by the Alliance for a Healthier Generation.153,154 In the same year, 33 percent of public elementary students, 60 percent of middle school students, and 70 percent of high school students attended a school where the Alliance School Beverage Guidelines were being implemented or were already in place.155 The Alliance’s guidelines cover foods and beverages sold in school vending machines, a la carte lines, snack bars, fund-raisers, and school stores, thereby both encouraging healthy items while also limiting calories, fats, sugar, and sodium.

See Appendix 1 for a comparison of the Alliance’s guidelines with the 2010 DGA principles and the 2007 IOM guidelines.

**Differences in Snack and a la Carte Food and Beverage Availability by School Level**

According to the third School Nutrition and Dietary Assessment (SNDA III) study, in the 2004–2005 school year, at least one source of snack foods and beverages was available in 80 percent of elementary schools, 97 percent of middle schools, and 100 percent of high schools during the school day.156 In addition, 5.8 percent of elementary schools, 14.6 percent of middle schools, and 49.6 percent of high schools allowed students to purchase these foods and beverages before classes began in the morning; and 4.4 percent of elementary schools, 12.2 percent of middle schools, and 41.1 percent of high schools allowed students to purchase these items during any school hours when meals were not being served.157

The Bridging the Gap studies indicate that although there have been decreases since the SNDA III study, as of the 2007–2008 school year, 62 percent of children in elementary schools, 69 percent of children in middle schools, and 83 percent of students in high schools were still able to purchase a food or beverage from at least a vending machine or other venue (not including a la carte).158,159 More recently, the School Nutrition Association’s 2011 nationally representative member survey indicated that nine of every 10 districts (91 percent) offer a la carte service selling snack foods and beverages to some extent. A la carte service is most likely to be available at the high school or middle school levels, declining somewhat at the elementary school level (especially in the smaller districts).160
The Bridging the Gap reports indicate middle and high school students generally have more healthy snack food and beverage options available to them than elementary students (see Table 3.4). During the 2007–2008 school year, just over one-third of public elementary school students were consistently able to purchase fresh fruits, vegetables, or salad through at least one venue. This contrasts with the 2006 School Health Programs and Policy Study, which found that, during a typical week, three-quarters of elementary schools sold fruit, and two-thirds sold lettuce, vegetable, or bean salads in a la carte venues. For secondary students, three-quarters had fruits, vegetables, and salads available in the 2007–2008 school year.

### TABLE 3.4

<table>
<thead>
<tr>
<th>Snack food and/or beverage</th>
<th>ES students (%)</th>
<th>MS students (%)</th>
<th>HS students (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fruits, vegetables, salads</td>
<td>38</td>
<td>76</td>
<td>82</td>
</tr>
<tr>
<td>Salty or sweet snacks</td>
<td>44</td>
<td>61</td>
<td>77</td>
</tr>
<tr>
<td>Healthier drinks</td>
<td>55</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bottled water</td>
<td>40</td>
<td>96</td>
<td>99</td>
</tr>
<tr>
<td>Low- or no-calorie drinks</td>
<td>18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sugar-sweetened drinks (MS, HS includes regular soda)</td>
<td>17</td>
<td>71</td>
<td>92</td>
</tr>
<tr>
<td>2% or whole milk</td>
<td>38</td>
<td>61</td>
<td>72</td>
</tr>
</tbody>
</table>

1 Included less-healthy foods such as potato chips, candy, ice cream, cakes, cookies, and french fries.
2 “Healthier drinks” follow the Alliance beverage guidelines for middle and high school, and include bottled water, 100% fruit juice, 1% milk, and skim milk.
3 For middle and high schools, bottled water is incorporated in the healthier drink category.

One nationally representative study found that the mean number of “more-healthy” food items, such as low-fat and low-sugar items, available to students was significantly lower for middle school students (1.9 items) than for high school students (2.4 items). High school students, on average, have a greater variety of food types from which to choose, both more and less healthy.

### Vulnerable Populations: Differences in Student Access to Snack Foods and Beverages

The studies reviewed for this HIA showed variations in access to snack foods and beverages based on student or school socio-economic status (SES), student ethnicity or race, student age, and venue. In a national study from 2004 to 2005, black middle school students were significantly more likely than white and Hispanic students to have access to a la carte lunch items. Findings from another study using the same data determined that Hispanic students appear to have greater access throughout the day to soft drinks sold in vending machines. In the 2004–2005 school year, among middle schools, 18 percent of Hispanic students had access, compared to 9 percent of white and 6 percent of black students.
There were no significant differences in high schools across the sub-groups. By the 2008 school year, Latino middle and high school students had greater access to school stores, snack bars or carts compared to white or black students. In that same study, white middle and high school students had greater access to vending machines and a la carte options than black or Latino students (see Figure 3.5).

In 2004–2005, among both middle and high schools, children with a higher socioeconomic status had greater access to beverages in vending machines—both healthy and unhealthy options—including low-fat milk, fruit or vegetable juice, and sugary drinks. Bridging the Gap researchers found similar results for the 2008 school year in which students attending higher SES high schools had statistically greater access to snack foods in vending machines (100 percent compared to 91 percent) and a la carte lines (98 percent compared to 86 percent).

Students attending public elementary schools in the Northeast and South had much greater access to beverages (68.1 percent and 72.9 percent, respectively) than did public elementary school students in the Midwest and Western United States (48.5 percent and 50.2 percent, respectively). Among public school students with access to at least one beverage venue, those in the South, compared with those in the West, were significantly less likely to have only healthy beverages available (24.9 percent versus 38.8 percent) and significantly more likely to have higher-fat milk available (60.2 percent versus 41.1 percent). There may also be differences in snack food and beverage availability across schools, school districts, and states. For example, a study found that smaller schools in Kansas had significantly fewer vending machines than large schools: a median of three compared to a median of 6.5.
CHAPTER 3

CURRENT CONDITIONS: THE SCHOOL FOOD ENVIRONMENT AND STUDENTS’ HEALTH

3.3 Current Use of Revenue from Snack and a la Carte Foods and Beverages Sold in Schools

In a 2003 U.S. Government Accountability Office report examining food service revenue across six states, federal meal reimbursements provided 53 percent of total food service revenues while other food sales, including snack foods and beverages, contributed 39 percent. Of the six states, Ohio and Virginia reported that snack food and beverage sales provided more revenue to schools than federal reimbursements for school years 1996—1997 through 2000—2001. In a different study of California school districts researchers found equally significant contributions of snack food and beverage sales to food service bottom lines, with 60 percent of school district administrators reporting that a la carte sales account for up to 40 percent of food service revenues. Administrators typically use the revenues from these sales for discretionary spending in schools to supplement a variety of enrichment activities for students.

However, in the 2008 School Lunch and Breakfast Cost Study II, the United States Department of Agriculture found that, on average, school districts were underpricing foods and beverages sold outside of school meal programs at mealtimes by 39 percent. Revenues from non-reimbursable items sold, such as those in a la carte lines, fell short of the cost of producing those items by a total revenue to cost ratio of 61 percent. This finding indicated that funds designated for reimbursable meals at lunch and breakfast were being used to make up for shortfalls in snack and a la carte food and beverage sales.

Revenues Received from a la Carte Sales

SNDA III provides information on the current conditions of the net revenue schools receive from the sale of a la carte foods and beverages. When examining a la carte revenue during a target week, the most commonly reported range across all school levels (50 percent) was at the low end—$1-<$100. When broken down by grade level, the most commonly reported weekly revenue from a la carte foods was:

- Elementary: 63.9 percent of schools reported weekly revenue of $1 - <$100;
- Middle: 47.3 percent of schools reported weekly revenue of $100 - $400;
- High: 32.0 percent of high schools reported weekly revenue of $1 - <$100.

However, the SNDA III data on a la carte revenues does not take the budgetary shortfall discussed above into account. See Appendix 5, Table A5.5 for additional details.

Beginning in the 2012-2013 school year, section 206 of the Healthy Hunger Free Kids Act (P.L. 111-296) requires that the proportion of total school food service revenue from items sold outside of the meal programs be equal or greater than the costs of selling those items, which will allow for more accurate revenue data to be captured in the future.

Revenues Received from School Stores and Vending Machines

SNDA III also reports annual revenues received from snack food and beverage sales in school stores and vending machines (see Appendix 5, Table A5.6). Of the schools included in SNDA III, no elementary schools reported having school stores and only 17.2 percent reported having vending machines available.
to students. Similarly, none of the middle schools reported having school stores; however, 81.7 percent had vending machines available to students. In middle schools, the groups receiving the most money from vending machines were schools’ general accounts (51.3 percent); school food service (24.0 percent); and other school district departments or funds (18.7 percent). Of the high schools, 24.8 percent reported having access to student stores and 96.7 percent reported having vending machines available to students. Within high schools, those receiving the highest percentage of money from school stores were the schools’ general accounts (37.0 percent), followed by associated student body organizations, such as business classes or clubs (27.5 percent) and student councils, activities, and clubs (21.5 percent). The high school organizations receiving the most funds from vending machines sales were schools themselves (52.0 percent); athletic departments (32.8 percent); and student councils, activities, and clubs (28.4 percent).

The monthly net income to schools or SFAs from school stores or vending machines is shown in Table 3.5.185 The sample size for elementary schools reporting was too small to estimate net income from school stores or vending machines. This was also the case for middle schools and school stores. However, for vending machines, among middle schools, the highest percentage (29.8 percent) receiving funds reported monthly income in the $100–$999 range. Of high schools included in SNDA III, a majority of schools (24.5 percent) indicated that they receive $100–$999 a month from school stores and (45.7 percent) $100–$999 from vending machines.

| TABLE 3.5 | Monthly Net Income to School or SFA from School Store or Vending Machines |
|-----------------|------------------|------------------|------------------|------------------|
| Monthly net income to school or SFA from school store | ES (%) | MS (%) | HS (%) | All schools† |
| Less than $100 | – | – | 8.3 | 22.2 |
| $100 to $999 | – | – | 24.5 | 44.4 |
| $1,000 to $5,000 | – | – | 24.0 | 14.2 |
| More than $5,000 | – | – | 5.5 | 1.9 |
| No income to school or district | 100 | 100 | 19.2 | 10.8 |
| Don’t know | – | – | 18.5 | 6.5 |

| Number of schools reporting | 143 | 127 | 125 | 395 |

<table>
<thead>
<tr>
<th>Monthly net income to school or SFA from vending machines (not including food service income, as reported by principals)</th>
<th>ES (%)</th>
<th>MS (%)</th>
<th>HS (%)</th>
<th>All schools†</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than $100</td>
<td>*</td>
<td>24.9</td>
<td>4.1</td>
<td>20.2</td>
</tr>
<tr>
<td>$100 to $999</td>
<td>*</td>
<td>29.8</td>
<td>45.7</td>
<td>31.3</td>
</tr>
<tr>
<td>$1,000 to $5,000</td>
<td>*</td>
<td>7.4</td>
<td>13.5</td>
<td>10.4</td>
</tr>
<tr>
<td>More than $5,000</td>
<td>*</td>
<td>0.0</td>
<td>2.1</td>
<td>0.9</td>
</tr>
<tr>
<td>No income to school or district</td>
<td>*</td>
<td>0.9</td>
<td>0.0</td>
<td>1.3</td>
</tr>
<tr>
<td>Don’t know</td>
<td>*</td>
<td>37.0</td>
<td>34.6</td>
<td>36.0</td>
</tr>
</tbody>
</table>

| Number of schools reporting | 12 | 47 | 64 | 123 |

– No schools reported
* Sample sizes are too small for reliable estimates.
† “All schools” is a total for ES, MS, and HS, as well as additional schools not fitting into these discrete categories (e.g., a school with grades K-8).

**SOURCES:**
2. School Nutrition Dietary Assessment III, Principal Survey, school year 2004–2005. Tabulations prepared by Mathematica Policy Research, Inc. are weighted to be representative of all public schools offering the NSLP.
3. School Nutrition Dietary Assessment III, Foodservice Manager Survey and Principal Survey, school year 2004–2005. Tabulations prepared by Mathematica Policy Research, Inc. are weighted to be representative of all public schools offering the NSLP.
Regional and Sub-Regional Differences in Snack and a la Carte Food and Beverage Sales

Snack food and beverage sales and revenues vary regionally. For example, a study of Kansas school districts found that rural districts were 2.4 times more likely than urban and suburban districts to have low to moderate a la carte sales. Of the 206 rural districts, 33 percent had low a la carte sales and 67 percent had moderate and high a la carte sales. Of the 76 urban and suburban districts, 21.1 percent had low a la carte sales and 78.9 percent had moderate and high a la carte sales. For the districts with low a la carte sales, these items had lower nutritional quality, and fewer free or reduced-price lunches (40 percent) were served compared to districts with high a la carte sales. Variations such as these indicate that the possible impact of a nationwide snack food and beverage policy will not be uniform across school districts.

3.4 Children’s Snack and a la Carte Food and Beverage Behaviors: Purchase and Consumption

National Data on Children’s Consumption

The proportion of calories that children consume from different types of foods and nutrients has changed in the past 40 years. Between 1971–1974 and 1999–2000, children consumed a lower percentage of calories from fat and saturated fat and an increased number of calories from carbohydrates. In 2004, research found that children consumed an average of 527 “empty calories” over a 24-hour period from foods low in nutrition and high in energy density. Currently, sugar-sweetened beverages (SSBs) are the leading contributor to childhood energy consumption, accounting for 10 to 15 percent of total calories consumed.

Research indicates children’s fruit and vegetable consumption is lower than recommended by the 2010 DGA. When examining data from the 1999–2002 National Health and Nutrition Examination Survey (NHANES), research found that non-Hispanic black children and adolescents consumed significantly more dark-green vegetables and fewer deep-yellow vegetables than Mexican-American and non-Hispanic white children and adolescents. Total fruit intake was significantly higher by Mexican-Americans than non-Hispanic white children and adolescents. Children and adolescents most at risk for higher intakes of energy-dense fruits and vegetables (e.g., fruit juice and fried potatoes) were generally boys, adolescents, children at risk for overweight or currently overweight, and those living in households below 350 percent of the poverty level.

Data from the 2009 Youth Risk and Behavior Survey indicate that nationwide, about one-third of students had eaten fruit or drunk 100 percent fruit juices two or more times during the seven days before the survey. Overall, the prevalence of having eaten fruit or drunk 100 percent fruit juices two or more times a day was higher among black (37.3 percent) than white (32.2 percent) students, and higher among black male (39.6 percent) and Hispanic male (35.9 percent) students than black female (35.0 percent) and Hispanic female (32.4 percent) students, respectively. Nationwide, 1.8 percent of schoolchildren had eaten vegetables three or more times per day during the seven days before the survey. The prevalence of having eaten vegetables three or more times per day was higher among Hispanic male (15.9 percent) than Hispanic female (11.5 percent) and white male (12.8 percent) students. Nationwide, 22.3 percent of schoolchildren had eaten fruits or vegetables five or more times during the previous seven days.
Data from the 2010 National Youth Physical Activity and Nutrition study found that high school students consumed a median of 1.2 servings of fruits and vegetables per day.\textsuperscript{199} Non-Hispanic black students and Hispanic students ate a lower median number of vegetables (1.0 and 1.2, respectively) than non-Hispanic white students (1.4).\textsuperscript{200} Overall, about one-third of high school students consumed less than one serving of fruit (28.5 percent) and less than one serving of vegetables a day (33.2 percent). The authors conclude that “these results make it likely that the majority of students are not meeting the daily fruit and vegetable recommendations for adolescents participating in <30 minutes of daily physical activity: 1.5 cups of fruit and 2.5 cups of vegetables for females and 2 cups of fruit and 3 cups of vegetables for males. The recommendations are higher for adolescents participating in more physical activity.”\textsuperscript{201,202}

**Purchase and Consumption in Schools**

The differences in access to snack foods and beverages noted in the previous section contribute to student purchasing patterns and, therefore, consumption. While research indicates that schools have been reducing access to unhealthy foods over time, there is still a wide array of unhealthy options available to students.

Researchers examining SNDA III found that one-third of elementary school children, nearly half of middle school children, and more than half of high school children are eating snack foods and beverages from various venues while at school.\textsuperscript{203,204} Of the children consuming these items, more than half (53 percent) are consuming desserts or snacks that are energy-dense and low in nutrients.\textsuperscript{205,206} Children eating school lunches were less likely than nonparticipants to eat these foods.\textsuperscript{207} Overall, students not participating in the NSLP were nearly twice as likely to eat one or more snack foods and/or beverages during the school day (37 percent compared to 19 percent).\textsuperscript{208}

As indicated in Table 3.6, in the 2004–2005 school year, SNDA III found that, in elementary school, the most common sources of snack foods were fund-raisers such as bake sales, classroom parties, and teacher rewards, followed by vending machines.\textsuperscript{209} Vending machines and a la carte lines were the most common sources among middle school and high school students.\textsuperscript{210}

<table>
<thead>
<tr>
<th>Source</th>
<th>ES students (%)</th>
<th>MS students (%)</th>
<th>HS students (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any venue</td>
<td>29</td>
<td>44</td>
<td>55</td>
</tr>
<tr>
<td>Vending machines</td>
<td>15</td>
<td>22</td>
<td>41</td>
</tr>
<tr>
<td>School stores</td>
<td>3</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>A la carte</td>
<td>4</td>
<td>21</td>
<td>25</td>
</tr>
<tr>
<td>Snack bars</td>
<td>0</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>Fund-raisers, parties, rewards, other</td>
<td>27</td>
<td>12</td>
<td>15</td>
</tr>
</tbody>
</table>

**TABLE 3.6** Sources of Snack and a la Carte Foods and Beverages (2004–05 School Year)

CHAPTER 3

CURRENT CONDITIONS: THE SCHOOL FOOD ENVIRONMENT AND STUDENTS’ HEALTH

Research examined for this HIA confirmed that children consume between one-quarter and one-half of their daily energy intake at school. For example, using the SNDA III data from 2004 to 2005, it was determined that sources of foods and beverages eaten or obtained at school contributed a range of 34 to 35 percent of total energy intake, depending on the grade level. On average, children who consumed one or more snack foods and beverages obtained 177 calories from low-nutrient, energy-dense sources, with high school children consuming nearly two-thirds more total calories than elementary age children (see Figure 3.6 and Table 3.7).

The most commonly consumed items outside of the school meals are foods and beverages that are low in nutrients and high in energy density. The number of calories that students consume from low-nutrient, energy-dense foods and the percentage of students who consume SSBs increase as children progress from elementary school, to middle school, and finally into high school. One study found that on an average school day, more than 65 percent of students consumed SSBs.

Differences in purchase and consumption of these items can be found when looking at regional, ethnic, and SES differences in and among schools. One study found that children in the South, black non-Hispanic, and low-income children were significantly more likely to consume soft drinks at school, based on availability. In a 2005 national survey, compared to non-Hispanic whites, surveyed children who were non-Hispanic black, Hispanic, or “other” showed an increased likelihood of purchasing from a vending machine at least once a week.

![Average Number of Calories Obtained from Snack and a la Carte Foods and Beverages in Schools among U.S. Public School Children](image)

**FIGURE 3.6**

<table>
<thead>
<tr>
<th>Main Calories</th>
<th>Other competitive foods</th>
<th>Low-nutrient/energy-dense competitive foods</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>50</td>
<td>81</td>
<td>117</td>
</tr>
<tr>
<td>100</td>
<td>100</td>
<td>177</td>
</tr>
<tr>
<td>150</td>
<td>216</td>
<td>273</td>
</tr>
<tr>
<td>200</td>
<td>277</td>
<td>336</td>
</tr>
<tr>
<td>250</td>
<td></td>
<td></td>
</tr>
<tr>
<td>300</td>
<td></td>
<td></td>
</tr>
<tr>
<td>350</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on weighted data from SNDA III, one 24-hour dietary recall, school year 2004–2005. All students (n=984), elementary school (n=208), middle school (n=348), high school (n=428).


**TABLE 3.7**

<table>
<thead>
<tr>
<th></th>
<th>ES students (%)</th>
<th>MS students (%)</th>
<th>HS students (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calories obtained from consuming one or more low-nutrient, energy-dense snack foods</td>
<td>135</td>
<td>171</td>
<td>219</td>
</tr>
<tr>
<td>Percent of daily energy intake from low-nutrient, energy-dense snack foods</td>
<td>7</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>Percent of daily energy intake from all snack foods</td>
<td>11</td>
<td>13</td>
<td>15</td>
</tr>
</tbody>
</table>

In Florida, the proportions of students buying lunch from vending machines were significantly higher in association with the availability of beverage vending machines, smoking status, non-Hispanic black race or ethnicity, Hispanic ethnicity, and being an older age.221

3.5 Child Weight Status, Physical Activity, and Diet-Related Chronic Diseases

Child Weight Status

There have been significant increases in the percent of children who are overweight since the 1960s.222 Although the prevalence of obesity varies by race, age, and region, obesity is an issue that touches children across the United States (see Tables A5.7 and A5.8 in Appendix 5).

In 2008, the prevalence of obesity was 19.6 percent among all children 6–11 years old and 18.1 percent among 12–19 year olds.223 Between 2003 and 2007, low-income, publicly insured, black, and Hispanic children were significantly more likely to be overweight or obese.224,225 In 2007, after adjusting for socioeconomic, behavioral, and state residence factors, black and Hispanic children had 71 percent and 76 percent higher odds of being obese and 55 percent and 78 percent higher odds of being overweight than their white, non-Hispanic peers.226 Another 2007 study indicated that Hispanic, non-Hispanic white, and American Indian children had 3 to 3.8 times higher odds of being obese or overweight than Asian children; and children from low-income and low-education households had 3.4 to 4.3 times higher odds of being obese than children from higher socioeconomic households.227 Children in Illinois, Tennessee, Kentucky, West Virginia, Georgia, and Kansas had more than twice the adjusted odds of being obese than children in Oregon.228

Child Physical Activity

Both calorie intake and expenditure are important in weight maintenance, with physical activity playing an important role.229 Research indicates that adolescents and teens are not getting the recommended 60 minutes per day of moderate to vigorous physical activity (MVPA) as suggested by the Dietary Guidelines for Americans.230 In one study using cross-sectional data from the 2003–2004 NHANES, researchers found that physical activity declined dramatically across age groups between childhood and adolescence and continued into adulthood.231 For example, nearly half (42 percent) of children between six and 11 obtain 60 minutes a day of physical activity, while less than one-tenth (8 percent) of adolescents reach this level.232 Similarly, in a longitudinal study from 1991 to 2007, it was found that at age nine, children engaged in MVPA approximately three hours a day on both weekdays and weekends.233 By the time adolescents reached 15 years, they were engaging in MVPA for only 49 minutes per weekday and 35 minutes per weekend day. Furthermore, boys were found to be more active than girls, spending 18 and 13 more minutes per day in MVPA on the weekdays and weekends, respectively.234
Type 2 Diabetes, High Cholesterol, and High Blood Pressure

As the numbers of children who are overweight and obese have risen, so too has the prevalence of obesity-related chronic illness. In the United States, there are varying levels and trends of obesity-related illnesses among youth. The leading chronic disease among children and adolescents is type 2 diabetes; it has grown alongside the rate of childhood obesity and risen to affect one out of every 400 children in the United States (see Appendix 5, Table A5.9). More adolescents ages 10–19 are experiencing type 2 diabetes mellitus than younger children ages 0–9. In 2001, there were no significant differences by ethnicity in the prevalence of type 2 diabetes. However, if current trends persist, it is estimated that one in three children born in the United States in the year 2000 will go on to develop type 2 diabetes at some point in their lives; make that nearly one in two if the child is black or Hispanic.

Similarly, while trends have lagged behind obesity, the prevalence of high blood pressure among youth has been increasing since the late 1980s (see Appendix 5, Table A5.10). Despite a decrease in age-adjusted high blood pressure prevalence between 1963 and 1988, it is again on the rise, with black and Mexican American youth disproportionately affected. Although hypertension affects more than 10 percent of obese children with a body mass index (BMI) in the 95th percentile, high blood pressure is only one cardiovascular risk factor, in addition to high cholesterol, that threatens obese and overweight youth into adulthood (see Table A5.11). Between 1999 and 2002, there were no overall differences by race or ethnicity in blood pressure; however, black and Mexican American males had higher blood pressure than their white male peers. Between 1999 and 2006, more boys, older teens (18–19), non-Hispanic whites, and obese children had higher lipid abnormalities, such as high cholesterol or triglycerides, which is an important risk factor for cardiovascular disease, than their peers (see Appendix 5, Table A5.11). As the incidence of childhood overweight increases, chronic diseases typically associated with adult obesity are also expected to grow.

Childhood Tooth Decay

Although childhood tooth decay, or cavities, has decreased since wide-scale implementation of population-based fluoridation efforts, the risk persists as this is the most common childhood disease. A little more than half (54 percent) of children had a cavity in at least one primary or permanent tooth between 1999 and 2004, and about the same percentage of adolescents ages 13 to 15 years had a cavity during the same time period. Nearly two in 10 (19 percent) children ages 2 to 19 years have untreated tooth decay.

Low-income children and black, non-Hispanic children and Mexican-American children have higher rates of untreated tooth decay than their white, non-Hispanic counterparts. For data collected on children ages 6 to 19 years from 2001 to 2004, 28 percent of black, non-Hispanic children and 31 percent of Hispanic children of Mexican origin had untreated tooth decay, compared to 19 percent of white, non-Hispanic children. Low-income children were also disproportionately affected by untreated tooth decay in 2001–2004: 31 percent of children below 100 percent of the poverty level, compared to 15 percent of children ages 6–19 at or above 200 percent the poverty level.
Dental disease can lead to pain, a lack of ability to focus in school, and reduced quality of life, including the inability to eat healthier foods as a result of tooth loss.\textsuperscript{250} It is commonly reported in literature that more than 51 million school hours are lost each year due to dental-related problems.\textsuperscript{251-254} Researchers in North Carolina found that children with poor oral health were nearly three times more likely to miss school as a result of dental pain.\textsuperscript{255} Tooth decay and poor oral health that begin in childhood may be associated with longer-term health problems.\textsuperscript{256,257}

Health Disparities and Vulnerable Children
This HIA examines how specific subgroups of vulnerable children—including low-income, black, and Hispanic students—might be differentially affected by a USDA policy on snack and a la carte foods and beverages. This question is important because, at baseline, these students have higher rates of many illnesses that could be affected by the policy and may, therefore, be particularly sensitive to changes that result from the updated USDA standards. As delineated in the body of this chapter, low-income, black, and Hispanic children have higher rates of food insecurity; they are more likely to be overweight or obese; and they are more likely to have untreated tooth decay, which is also associated with reduced quality of life, more frequent school absences, and longer-term health problems.

Available data indicate that the school food environment could contribute to the observed disparities. Although findings are not entirely consistent, two national studies suggested that black and Hispanic students may have greater access to foods such as a la carte lunch items and soft drinks sold in vending machines at school, and lower access to healthier options in vending machines. Further data collection may be warranted to better evaluate this question and to allow improved tracking and management of impacts on vulnerable children when the updated nutrition standards are implemented.
This chapter explores whether a national snack food and beverage policy will impact school district revenue and thus student health. As discussed in Chapter 2, key research questions include:

- Will updated standards affect students’ participation in the school meal programs and school food service revenue?
- Will updated standards affect school-district or other types of revenue that pay for school services?
- If revenue changes occur, will they affect student health via changes to enrichment learning opportunities and school-supported physical activity?

The research team hypothesized that setting a national snack and a la carte food and beverage policy floor will change the types of foods that are available for sale in elementary, middle, and high schools, and that such changes in the types of foods offered might also affect school meal participation, food service revenue, and student consumption habits (see Figure 4.1). For example, the team predicted that a national snack and a la carte food and beverage policy could result in fluctuations in sales of these items in some districts where the existing policy restrictions do not meet the 2010 DGA. These changes could then affect children’s health outcomes as changes in the food available outside of the school meal could contribute to potential beneficial increases in school meal participation. Such an outcome can also lead to increased food service revenue (see Figure 4.1).

Changes in what can be sold in vending machines, school stores, and food carts could also affect the net revenue of certain school groups, including athletic teams, student government, and teacher- or administrator-led groups.

In cases where money does not go to school food service administrators, these funds are often reported as part of school district enterprise revenue in which schools earn income by charging users for activities.
or services, or by selling either food or nonfood items for profit. School district enterprise revenue could be affected by a national policy that changes the types of foods and beverages sold in school stores, vending machines, and other venues outside of the cafeteria. These potential shifts may impact the availability of student enrichment activities, such as student government or clubs, and school-supported physical activities, such as sports teams, that can affect children’s health. This HIA was not able to make a firm judgment of potential impacts in this area due to lack of sufficient information.

Section 208 of the HHFKA gave the Secretary of Agriculture the authority to exempt infrequent fundraisers from nutrition standards. Thus, this HIA does not explore what impact these regulations might have on revenue from such sales.

In reviewing the literature on this topic, several notable characteristics emerged:

- School wellness policies and, by extension, snack food and beverage policies, vary considerably from school district to school district and state to state. Consequently, the results of studies that have examined the impact of such policies on school service revenues reflect, in part, the diversity of school wellness policies.
- Policies varied by study and included a range of interventions, such as restrictions on access to snack foods and beverages based on time of day or venue; differential pricing for healthier food choices; and marketing and educational strategies, including posters, student groups, and outreach.²⁵⁸-²⁷²
- Studies focus predominantly on public middle and high schools, though several studies also include public elementary schools.²⁷³-²⁷⁷

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**Figure 4.1** School Services Health Determinant Pathway

- **Policy**
  - National nutrition standards for snack foods and beverages sold in schools¹
  - ES, MS, HS snack food and beverage availability²
    - Access to healthy foods and beverages
    - Access to unhealthy foods and beverages
    - School snack foods meeting DGA

- **Snack food and beverage sales**
  - A la carte sales
  - Vending sales
  - School store and snack bar sales

- **Revenue**

- **Enterprise revenue¹**
  - Vending machines
  - School stores

- **District food service net revenue**
  - NSLP participation⁴
    - Vending machines
    - A la carte sales
    - Other venues
    - Food service expenses

- **Enrichment learning opportunities**

- **School-supported physical activity**

- **Food safety**
  - Overweight/obesity
  - Child healthy weight

- **Chronic disease risk**
  - High blood pressure
  - Type 2 diabetes
  - High cholesterol and early heart disease
  - Dental caries

---

¹ Fund-raisers are not included.
² ES, MS, HS: Elementary school, middle school, high school.
³ Enterprise revenues, as defined in the LEA Finance survey, includes revenue from vending machine sales as well as funds from any activity for which a fee is charged to external users for goods or services, whether or not it is food and beverage based.
⁴ NSLP: National School Lunch Program.

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**Health Impact Assessment:** National Nutrition Standards for Snack and a la Carte Foods and Beverages
• Studies included a mix of urban, rural, and suburban samples. The majority of the studies reviewed are state-specific and are often exclusive to regions of certain states.
• Many of the studies included limited sample sizes, hindering the generalizability of their findings to broader populations. To date, there are no nationally representative studies that examine the relationship between state-level snack food and beverage policies and food service revenue.

This chapter presents findings from a literature review, stakeholder interviews, and original empirical analysis of state policy and revenue changes in order to answer these questions. Each of the following sections of this chapter further explores the direct and intermediate impacts and health outcomes of the school services health determinant pathway as outlined in Figure 4.1.

4.1 Direct Impacts

Will a national snack and a la carte food and beverage policy affect the number of schoolchildren participating in the school meal programs?

The literature review and policy analysis demonstrate a consistent relationship between snack food and beverage sales (namely a la carte foods) and school meal participation; specifically, as access to snack and a la carte foods and beverages decreases, school meal participation increases.278-280

Literature Review

In addition to participation in school meals increasing as a result of decreased access to snack and a la carte foods and beverages, changes in nutrition policies and standards (i.e., stricter guidelines) have also been found to be positively correlated with participation in NSLP as described by Wharton and colleagues in a literature review of four peer-reviewed papers and three state-based reports on the impacts of food-related policies on revenues.281 Their review did not support the claim that changes in food policies affecting the school nutrition environment will negatively impact school food service revenues. In fact, there appears to be little evidence or support for the argument that eliminating snack and a la carte foods and beverages, or implementing nutrition standards for them, will negatively affect the school food service environment.

State-by-State Policy Analysis

As discussed in Chapter 2, this HIA used data from the Classification of Laws Associated with School Students in the financial analysis. Using this data, the research team developed an overall categorical policy index, ranging from 0 to 3, designed to reflect policy strength (see Table 4.1).
TABLE 4.1 Overall Snack and a la Carte Food and Beverage Policy Scores

<table>
<thead>
<tr>
<th>Rank</th>
<th>Score</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>No policy</td>
<td>0</td>
<td>No state policy (as defined by the SNESPSC) or a policy that provides recommendations but no requirements. State policies with recommendations only were treated as no policy since they do not require any policy response from school districts.</td>
</tr>
<tr>
<td>Restrictions but no standards</td>
<td>1</td>
<td>All or a majority of specific policy measures have requirements but no specific standards for those requirements.</td>
</tr>
<tr>
<td>Restrictions do not meet DGA</td>
<td>2</td>
<td>All or a majority of policy measures have requirements and specific standards, but the standards do not meet the 2005 DGA.</td>
</tr>
<tr>
<td>Meets or exceeds DGA</td>
<td>3</td>
<td>All or a majority of policy measures have requirements and specific standards that meet the 2005 DGA or approach IOM recommendations.</td>
</tr>
</tbody>
</table>

The state-by-state policy analysis of the relationship between implementing snack food and beverage policies and meal participation supports the conclusion that states that move from no policy to any sort of policy experience an overall increase in total meal participation.

Increases in meal participation are largely driven by rises in lunch participation, particularly free and reduced-price meal participation, as shown in Table 4.2. These numbers reflect each state’s total from all reporting school districts (see Chapter 2). Overall meal participation (the sum of breakfast and lunch) increased significantly, on average by between 1.7 percent and 2.6 percent, for states moving from no policy to some sort of policy (first three columns). Overall breakfast participation appears virtually unchanged by policy shifts.

Further, there appeared to be an association between increasing snack food and beverage standards and greater free or reduced-price meal participation within states that began with no policy in place, though this was more evident among states moving from no policy to a policy with some level of restrictions without nutrient standards (level 1). Meal participation went down when states moved from a level 1 or level 2 policy to a level 3 policy where nutrient standards aligned with the 2005 DGA (far right columns of Table 4.2), but none of the effects were statistically significant.

The general trend in average paid meal participation indicates that states that shifted from no policy to a policy with some restrictions (level 1) or some nutrient standards (level 2) experienced nonsignificant reductions in paid meals. However, states moving from no policy to a policy meeting the 2005 DGA (level 3) experienced nonsignificant increases in paid meals. The estimated effects of moving from either a level 1 or level 2 policy to a policy that meets or exceeds the 2005 DGA were positive. States that shifted from having only a few nutrient standards in their food policy restrictions (level 2) to a policy aligning with the 2005 DGA (level 3) experienced relatively large and statistically significant increases in paid meal participation, on average by 7.3 percent.

The separate free and reduced-price lunch and breakfast effects generally mirrored those for overall free and reduced-price meal participation, with the change in breakfast participation somewhat larger and more consistently negative. Only states moving from a level 2 policy with some nutrient standards to a level 3 policy aligning with the 2005 DGA experienced a statistically significant increase of 5.7 percent in paid lunch participation (see bottom far right column of Table 4.2).
TABLE 4.2 Impact on School Meal Participation When Snack and a la Carte Food and Beverage Policies Are Strengthened

<table>
<thead>
<tr>
<th>Change from to</th>
<th>No policy</th>
<th>No policy</th>
<th>No policy</th>
<th>Level 1</th>
<th>Level 1</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1</td>
<td>Level 1</td>
<td>Level 2</td>
<td>Level 3</td>
<td>Level 2</td>
<td>Level 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change in overall meal participation</td>
<td>1.7% *</td>
<td>2.3%</td>
<td>2.6% *</td>
<td>0.6%</td>
<td>0.8%</td>
<td>0.2%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change in lunch</td>
<td>1.9% *</td>
<td>2.7%</td>
<td>2.6% *</td>
<td>0.8%</td>
<td>0.7%</td>
<td>-0.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change in breakfast</td>
<td>0.6%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>-0.6%</td>
<td>-0.6%</td>
<td>0.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Free/reduced-price participation</td>
<td>2.4% *</td>
<td>3.5%</td>
<td>0.9%</td>
<td>1.0%</td>
<td>-1.5%</td>
<td>-2.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lunch</td>
<td>2.6% *</td>
<td>3.9%</td>
<td>0.8%</td>
<td>1.3%</td>
<td>-1.8%</td>
<td>-3.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breakfast</td>
<td>1.7%</td>
<td>2.3%</td>
<td>0.6%</td>
<td>0.6%</td>
<td>-1.1%</td>
<td>-1.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paid participation</td>
<td>-0.5%</td>
<td>-4.2%</td>
<td>3.0%</td>
<td>-3.7%</td>
<td>3.5%</td>
<td>7.3% *</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lunch</td>
<td>-0.1%</td>
<td>-2.8%</td>
<td>3.0%</td>
<td>-2.7%</td>
<td>3.0%</td>
<td>5.7% *</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breakfast</td>
<td>-2.7%</td>
<td>-9.2%</td>
<td>-1.7%</td>
<td>-6.6%</td>
<td>0.9%</td>
<td>7.5%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Statistically significant (p < .05)
Level 1 = Policy restrictions do not have nutrient standards
Level 2 = Policy restrictions have standards but do not meet the 2005 DGA
Level 3 = Policy restrictions have standards that meet or exceed the 2005 DGA

4.2 Intermediate Impacts

What is the impact of a snack and a la carte food and beverage policy on food service revenue?

Because of the financial significance of snack foods and beverages in many schools, recent studies have begun to explore the relationship between the implementation of policies and changes in school food service revenue.\textsuperscript{282-284} The majority of the research examined for this HIA shows that more rigorous standards for snack and a la carte foods and beverages do not negatively impact school food services’ net revenue at the district level. Rather, the evidence shows that school food service fiscal health is likely to improve as a result of updating nutrition standards for snack foods and beverages.

However, in interviews for this assessment, most school administrators expressed concern about the potential negative impact of a national snack food and beverage policy on school food service revenues resulting from changes to a la carte sales. This apprehension stems from the fact that a la carte food and beverage sales can have a substantial effect on overall food service revenue.\textsuperscript{285-288} There is a commonly held misconception that school districts need to sell snack foods and beverages, particularly a la carte items, in order to help support the school meal programs. However, a national USDA cost study conducted in 2008 showed that money earned through reimbursable school meals actually fund a la carte foods, not the other way around. The study found that by an average of 29 percent, revenues from nonreimbursable foods (such as those sold a la carte) fell short of the cost of producing those items, thus schools often pulled funds from subsidized meals to cover expenses related to purchasing and preparing snack food.
and beverages.\textsuperscript{289,290} Along those lines, a 2003 study of all 1,256 Texas school districts reports that annual income from vending machines was more than $54 million but resulted in up to $60 million in lost income from school meals. It also found that in 2001, the “total deficit for school food operations in these school districts was $23.7 million, which had to be subsidized from other district funds.”\textsuperscript{291}

As mentioned in Chapter 3, practices to offset the true cost of snack foods and beverages have been addressed in Section 206 of the HHFKA, which requires schools to ensure that non-program foods (e.g., a la carte items) sold in competition with federal meal programs are sold for at least as much as it costs to purchase and prepare them. This practice has not yet been fully implemented in schools across the country, thus it is not reflected in the literature review or financial data obtained for this report.

\textbf{Literature Review}

The proportion of food service revenue generated from snack foods and beverages varies from district to district.\textsuperscript{292-294} For example, in the 2004–2005 school year, across all school levels, SNDA III reported half of schools received only up to $100 in weekly revenue from a la carte foods.\textsuperscript{295} In that same year, of the public high schools generating the most revenue from snack and a la carte food and beverage sales, nearly one-third reported earning more than $125,000.\textsuperscript{296} A review of six large states’ food service revenue from 1996 to 2001 found that sales of snack and a la carte foods and beverages accounted for more than 40 percent of total food service revenue, whereas state funding supplied only 3 percent of revenues (see Appendix 4).\textsuperscript{297} However, a number of studies in this review suggest that schools and school districts can both be financially stable and enforce strong nutrition standards.

In a 2009 evaluation of the West Virginia Healthy Lifestyles Act,\textsuperscript{1} the authors report that 80 percent of West Virginia principals reported little or no change in revenues after implementing a state policy requiring schools to offer healthier beverages, such as milk and water, while at the same time restricting the sale of “junk foods” and soda.\textsuperscript{298} Pilot projects on policies in Connecticut and Arizona convey similar trends of increased food sales, increased meal participation, and no significant change or losses in food service revenue.\textsuperscript{299,300} French and colleagues describe similar results in their studies, which report no change in overall food service revenue in schools with more stringent snack food and beverage standards.\textsuperscript{301-303} In a joint report by the CDC and USDA, 15 of the 16 schools and districts included reported an increase or no change in revenue after implementing strategies to improve the nutritional quality of foods sold on campus.\textsuperscript{304}

\textsuperscript{1}The policy included grade-specific restrictions of unhealthy beverages: no soft drinks in elementary or middle school during the day, as well as mandates for the inclusion of only healthy beverages (defined as water, 100 percent fruit and vegetable juice, low-fat milk, and juice beverages with at least 20 percent juice). Additionally, the policy included complementary mandates in physical education, fitness testing, the collection of BMI measurements, and health education instruction and assessment.
Several studies actually show an upswing in food service revenue after the implementation of more stringent snack and a la carte food and beverage policies. Brown and colleagues report an increase in sales of both water and 100 percent fruit juice after restricting the availability of other sugar-sweetened beverages in 18 schools in Mississippi.305 Similarly, in a pilot study by Wojcicki and Heyman, the authors report that the implementation of more rigorous nutrition and beverage standards generated more revenue from food sales than a larger middle school in the same district that continued to sell sodas and fast food.306 The authors also report an increase in school meal participation: Of the 40 middle and high schools in the sample, NSLP participation went up in 67.5 percent of schools.

Even when a la carte sales declined, many schools demonstrated an ability to maintain, or even increase, net revenues. A 2005 report from the Center for Weight and Health at the University of California, Berkeley states that 13 of 16 schools in the study reported an increase in gross revenue after implementing nutrition standards.307 Of these 13 schools, 11 were able to maintain gross revenue in the face of initial declines in a la carte sales, which is attributed to growth in meal sales and the increased appeal and accessibility of meals. In this study, decreases in a la carte food sales were common, with 88 percent experiencing reduced a la carte revenues in the first year. Those interviewed in the study attributed this phenomenon to the limitations in finding items that met the nutritional standards. They report that, given time for vendors to adjust to new standards, a la carte sales could rebound.308

Differential pricing in which healthier options are priced lower than other, less healthy choices, has been a successful tool in offsetting initial snack and a la carte food and beverage policy standards.309-311 In these studies, for example, food sales and revenue were maintained or increased when healthier options were priced 25 percent and 50 percent lower than less healthy food options. To this end, according to the most recent SNDA report, it is common practice among school food service administrators to mark up the cost of certain a la carte items on the reimbursable menu.312

State-by-State Policy Analysis

Results from the state-by-state policy analysis examining the impact of state nutrition policy on aggregated school district-related revenues were similar to findings from the literature. Table 4.3 provides a summary of results on the experiences of different states between 2003 and 2008 in implementing various strengths of policies for snack and a la carte foods and beverages and their effects on school district food service revenue. Food service revenue reported here is aggregated across all school districts in each state included in the analysis (see Chapter 2).

The policy analysis data suggest that snack food and beverage policies, and particularly those that meet or surpass the 2005 DGA, are associated with small to moderate increases in total food service revenue. Table 4.3 shows that states that moved from no policy to a policy with general restrictions not meeting the 2005 DGA (level 2) saw, on average, a statistically significant 6 percent increase in food service revenue.

The San Francisco Unified School District implemented a mix of general nutrition and beverage standards, including limitations on the types of juice and milk beverages offered, limitations on calories from fat per food item, requirements for all snack foods to meet USDA standards, limitations on portion size, availability of fruits and vegetables, and preferential purchase of products that are healthier. See Wojcicki and Heyman (2006) for a full explanation.
Those that moved from no policy to a policy that met or exceeded the 2005 DGA (level 3) experienced a statistically significant 4 percent increase in revenue, on average. Among states that moved from a policy with minor restrictions and no nutrient standards (level 1) to a policy with more nutrient standards approaching (level 2) or meeting (level 3) the 2005 DGA, this trend persisted.

<table>
<thead>
<tr>
<th>Change from</th>
<th>No policy</th>
<th>No policy</th>
<th>No policy</th>
<th>Level 1</th>
<th>Level 1</th>
<th>Level 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>to</td>
<td>Level 1</td>
<td>Level 2</td>
<td>Level 3</td>
<td>Level 2</td>
<td>Level 3</td>
<td>Level 3</td>
</tr>
<tr>
<td>Change in total food service revenue</td>
<td>1.8%</td>
<td>6.0% *</td>
<td>4.0% *</td>
<td>4.2% *</td>
<td>2.3% *</td>
<td>-1.9%</td>
</tr>
<tr>
<td>Change in federal meal revenue</td>
<td>2.8%</td>
<td>5.6% *</td>
<td>5.2%</td>
<td>2.8%</td>
<td>2.4%</td>
<td>-0.5%</td>
</tr>
<tr>
<td>Change in local (student paid meal and a la carte)</td>
<td>1.0%</td>
<td>4.9% *</td>
<td>2.3%</td>
<td>3.9% *</td>
<td>1.2%</td>
<td>-2.7%</td>
</tr>
</tbody>
</table>

* Statistically significant (p<.05)

Policy levels based on CLASS scoring (see Chapter 2).

Though not statistically significant, when states moved from a policy with restrictions and nutrient standards not meeting the 2005 DGA (level 2) to a policy with restrictions and standards meeting or exceeding the 2005 DGA (level 3), revenue decreased by 1.9 percent on average. It is unclear why states moving from a policy without nutrient standards (level 1) to a policy with nutrient standards aligned to the 2005 DGA (level 3) would have a greater revenue increase than states moving from a policy with some nutrient standards (level 2) to a policy where those standards align with the 2005 DGA (level 3). The state-by-state analysis was not able to tease these differences apart.

School food services obtain revenue from a number of founts: the federal government (free and reduced-price meal participation), local or state governments, a la carte sales, and paid student meals. These sources reflect similar trends in the relationship between revenue and policy level. Specifically, total food service revenue increases, on the whole, appeared to primarily come from an increase in student participation in free and reduced-price meals, rather than from the sale of student paid meals and a la carte items.

**Types of Revenue**

- **Total food service revenue**: the combination of federal and local revenue sources.
- **Federal meal revenue**: reimbursements obtained from the federal government in exchange for serving meals that meet federal requirements for the NSLP and SBP.
- **Local revenue**: funds received from the sale of full priced school meals and a la carte items.
4.3 Outcomes

Several outcomes of snack and a la carte food and beverage policies were examined for this HIA, including changes in food safety, school-supported physical activity, enrichment learning opportunities, and diet and nutrition health outcomes. Diet and nutrition are detailed in Chapter 5; the other outcomes are examined here.

Will a snack and a la carte food and beverage policy affect school meal quality or food safety through revenue?

This HIA proposed four tracks through which a national snack and a la carte food and beverage policy might reasonably influence meal quality.

1. Directly through improved access to healthier food options sold a la carte
2. Indirectly through financial constraints and possible price increases for healthier food options
3. Indirectly through changes in food service revenue that might impact the ability to purchase kitchen equipment
4. Indirectly through changes in both revenue and food preparation protocol that may influence food safety

Improved Access to Healthier Food Options

Snack and a la carte food and beverage policies have a direct effect on students’ diet and nutrition quality by shifting what products are available to them during the school day. One report found, “While competitive foods may be earning schools needed revenue, the introduction of a la carte foods in middle school has been shown to significantly reduce the amount of fruits, vegetables, and milk that children consume at lunch while increasing consumption of sweetened drinks and high-fat vegetables. Additionally, students in schools with policies that restrict access to foods high in fat and sugar have lower rates of consumption of these foods.” National nutrition standards for these items are likely to reduce the amount of energy-dense, nutrient-poor foods and beverages available to students, while simultaneously increasing the availability of healthier options. This relationship is evaluated in greater detail in Chapter 5.

Financial Constraints

Changes in food service expenses and revenue were hypothesized to have the potential to influence meal quality. However, the literature review did not find any evidence to support this link. Labor and food purchases tend to be the principal food service outlays, comprising more than 80 percent of total food service expenses in the six states evaluated by the Government Accountability Office.

The state-by-state policy analysis provides some insight into how a national policy may affect school food service expenses. Despite increases in meal participation, states experienced no, or very limited, apparent increases in total food service costs. The policy analysis found that total food service expenses generally increased when states moved from no policy to more restrictive policies, but the changes were not statistically significant (see Table 4.4, first row).
Food service employee expenditures generally increased at a slightly higher rate than overall costs in states that changed from no policy or only minor restrictions (level 1) to a level 2 or level 3 policy where restrictions approach or meet the 2005 DGA. Only states moving from a level 1 policy without nutrient standards to a level 2 or 3 policy experienced statistically significant increases in food service employee expenses on average of 4.2 percent and 3.0 percent, respectively (see Table 4.4, middle row). This suggests that employee expenditures may not change much with marginal differences in meal service.

<table>
<thead>
<tr>
<th>Change from to</th>
<th>No Policy Level 1</th>
<th>No Policy Level 2</th>
<th>No Policy Level 3</th>
<th>Level 1 Level 2</th>
<th>Level 1 Level 3</th>
<th>Level 2 Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total food service expenses</td>
<td>0.0%</td>
<td>1.8%</td>
<td>1.2%</td>
<td>1.8%</td>
<td>1.2%</td>
<td>-0.6%</td>
</tr>
<tr>
<td>Food service employee expenses</td>
<td>-1.3%</td>
<td>3.0%</td>
<td>1.8%</td>
<td>4.2% *</td>
<td>3.0% *</td>
<td>-1.2%</td>
</tr>
<tr>
<td>Food-only expenses</td>
<td>0.1%</td>
<td>0.6%</td>
<td>0.4%</td>
<td>0.5%</td>
<td>0.3%</td>
<td>-0.2%</td>
</tr>
</tbody>
</table>

* Statistically significant (p < 0.05)
Level 1 = Policy restrictions do not have nutrient standards.
Level 2 = Policy restrictions have standards, do not meet the 2005 DGA.
Level 3 = Policy restrictions have standards that meet or exceed the 2005 DGA.

Policy levels based on CLASS scoring (see Chapter 2).

Increases in food expenses would be expected given the increases in meal participation, but these were not found. Food-only expenditures were virtually unchanged, with no policy effect greater than 1 percent and results were not statistically significant (bottom row of Table 4.4). Possible explanations for this finding are that any increases in food costs were mitigated by the greater use of free or subsidized federal food commodities or lower-cost foods, or the serving of smaller portions.

In summary, this report cannot infer that increases in expenses would lead to a compromise of meal quality.

Changes in Food Service Revenue as it Relates to Kitchen Equipment and Food Safety

A review of the literature did not find any substantial evidence on the connection between snack and a la carte food and beverage policies and either the purchase of kitchen equipment or the ability to meet food safety requirements. While one report noted that vending and advertising contracts may play a significant role in food service profits and the purchase of equipment, there is conflicting evidence on whether they are actually as profitable as they might seem to be. Vending contracts typically give food and beverage companies selling rights in return for cash and non-cash benefits (e.g., school kitchen equipment, computers) to the school or district. Many existing vending contracts require schools to allow the marketing of products high in added fats and sugars; others provide incentives for schools to encourage their students to choose those products. However, several studies reviewed for this HIA indicated that schools only see a small percentage of profits from vending purchases, with a majority of the revenues going back to the vending company or product manufacturer. Thus, it cannot be said with certainty how the possible loss of these contracts as a result of updated nutrition standards for snack foods and beverages may impact the ability of schools to ensure food safety or to purchase food service equipment.
CHAPTER 4

CHAPTER 4 POTENTIAL IMPACT OF A NATIONAL COMPETITIVE FOODS POLICY ON SCHOOL SERVICES

Will a national snack and a la carte food and beverage policy affect educational and athletic programs through revenue?

Literature Review

There is not enough evidence in the literature on this topic to forecast the potential impact of specific snack and a la carte food and beverage policies on educational and athletic programming. Several studies, in addition to the interviews conducted as part of this HIA, suggest that schools and school districts use funds from a la carte sales, vending, and fund-raising to support educational and sports programming, as this is one of the only funding streams that is purely discretionary at the school level. In several conversations, school district representatives reported that revenue is used to support clubs and activities such as athletic teams, the arts, and drama clubs.

A report focused on California school districts demonstrated that more than 85 percent of those surveyed used profits from a la carte and vending sales to support food service operations. Some districts used part of this revenue as an alternative funding source for other things, including extracurricular activities, athletics, and educational programs. Moreover, 30 percent of respondents reported using a la carte sales to subsidize other food service costs in order to keep the department from operating in the red. However, several studies, as reported in the previous section, also indicated that the profits schools saw from such sales were extremely low.

State-by-State Policy Analysis

The results from the state-by-state policy analysis suggest that states shifting from less restrictive (no policy or level 1 policy) to more restrictive snack food and beverage policies (level 1, 2, or 3) experienced nonsignificant decreases in school district aggregated enterprise revenue (Table 4.5). States that moved from a policy with some nutrient standards (level 2) to a policy that meets the 2005 DGA (level 3) experienced a nonsignificant increase in this category (far right column of Table 4.5). Though the majority of findings in this category were not statistically significant, Table 4.5 demonstrates that there is a great deal of variation in enterprise revenues among the various policy level changes. Largely this could be due to the fact that there is a great deal of variation in enterprise revenue around the country, with some schools selling a large proportion of nonfood items (e.g., binders, backpacks, t-shirts) not affected by a food and beverage policy, others selling mostly food items, and some states or schools reporting no enterprise revenues at all. While an association between implementing a snack and a la carte food and beverage policy and a drop in enterprise revenue is possible, the true effect cannot be consistently or efficiently estimated within the study data.

In the bottom half of Table 4.5, when all revenue types (i.e., food service plus enterprise revenues) are evaluated together, the large negative effects in enterprise revenue disappear, and in fact become positive. This suggests that the losses experienced in some states are counterbalanced by increases in overall food service returns.
CHAPTER 4

POTENTIAL IMPACT OF A NATIONAL COMPETITIVE FOODS POLICY ON SCHOOL SERVICES

### TABLE 4.5

<table>
<thead>
<tr>
<th>Change from No policy</th>
<th>Level 1</th>
<th>No policy Level 2</th>
<th>No policy Level 3</th>
<th>Level 1 Level 2</th>
<th>Level 1 Level 3</th>
<th>Level 2 Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enterprise revenue only</td>
<td>9.7%</td>
<td>-33.1%</td>
<td>-9.3%</td>
<td>-42.8%</td>
<td>-19.0%</td>
<td>23.8%</td>
</tr>
<tr>
<td>Enterprise revenue only</td>
<td>-8.7%</td>
<td>-36.1%</td>
<td>-26.7%</td>
<td>-27.5%</td>
<td>-18.0%</td>
<td>9.4%</td>
</tr>
<tr>
<td>Total of both food service and enterprise revenue</td>
<td>1.6%</td>
<td>5.2%</td>
<td>3.1%</td>
<td>3.6%</td>
<td>1.5%</td>
<td>-2.1%</td>
</tr>
<tr>
<td>Total of both food service and enterprise revenue</td>
<td>-0.7%</td>
<td>1.0%</td>
<td>-0.4%</td>
<td>1.7%</td>
<td>0.3%</td>
<td>-1.4%</td>
</tr>
</tbody>
</table>

* Statistically significant (p<.05)

Level 1 = Policy restrictions do not have nutrient standards.
Level 2 = Policy restrictions have standards, do not meet the 2005 DGA.
Level 3 = Policy restrictions have standards that meet or exceed the 2005 DGA.
1 Excludes observations for Michigan in 2003 and North Carolina in 2008 in which the recorded enterprise revenue is 0.
2 Excludes all observations in which the recorded enterprise revenue is 0.

Policy levels based on CLASS scoring (see Chapter 2).

Overall, the extent of the decreases observed in state aggregated school district enterprise revenue is highly variable and likely contingent on the type and level of specific activities that schools undertake to raise such funds, as well as their ability to adjust to new policy environments. One possible, though unsubstantiated, explanation for this variation is that these reductions occur at the onset of policy implementation or change, but decline over time as schools adjust to the new policy requirements. As this HIA policy analysis measures policy changes that range from one to five years, time variant effects on enterprise revenue could lead to inconsistent and inefficient estimates of policy effects on this measure. Based on the literature review, state policy analysis, and feedback from stakeholder interviews, this HIA determines that it is possible that a school district or a student activity group could experience either no change or a reduction in revenue from a national snack food and beverage policy.

While there is not a large amount of data presented in the literature, the state-by-state policy analysis and stakeholder interviews indicate that even if there is some enterprise revenue loss, it does not appear to be at a level that impacts programming, and it is unlikely that programming will suffer. Of the studies reviewed, none reported reductions in education and athletic programming due to changes in snack food and beverage policies.

### 4.4 Summary

Based on the stakeholder interviews, literature review, and state-by-state policy analysis presented in this chapter, this HIA predicts that it is possible for a national snack and a la carte food and beverage policy to have a small or moderate positive impact on school district food service revenues in those districts currently without a local or state policy in place, or with policies that do not currently align with the 2010 DGA as required by the HHFKA. This positive effect is largely a result of increased participation in school meal programs.

There was not enough data to fully forecast the potential impact of such a policy on enterprise revenues. While some declines in enterprise revenues were observed in the state policy analysis, none of the results were statistically significant. Additionally, when results from the policy analysis were combined for food service and enterprise revenues (observed in Table 4.5 as “Total of all revenue types”) statistically
significant revenue increases were still observed, indicating that any potential lost revenues from placing some restrictions on the sale of snack and a la carte foods and beverages are not likely to impact educational or athletic programming. It is important to note that a national snack and a la carte food and beverage policy will likely not ban all sales of these foods. Rather, it will limit the types or amounts of snack foods and beverages that can be sold to students. Thus, alternative foods and beverages can be offered to meet new nutrition standards (e.g., selling water or juice instead of soda in vending machines), and if implemented well, will allow for maintenance of current revenues from these products. In theory, it is possible that since schools in low-income neighborhoods may sometimes face more severe budget shortfalls, a revenue reduction for these schools could have more serious consequences for programming. However, no data were available to analyze this concern. Additional data collection may be warranted to further evaluate this question.

The results of the examination of school services outcomes are further summarized in Table 4.6.

<table>
<thead>
<tr>
<th>Impacts and outcomes</th>
<th>Impacted and most vulnerable populations</th>
<th>Magnitude of impact</th>
<th>Direction of impact on outcome</th>
<th>Likelihood of impact</th>
<th>Quality of evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strength of impact</td>
<td>Number impacted</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary, direct outcomes resulting from the policy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food service net revenue</td>
<td>~</td>
<td>None, small or moderate Variable</td>
<td>No change to decrease</td>
<td>Possible</td>
<td>***</td>
</tr>
<tr>
<td>School district or activity group vending net revenue</td>
<td>~</td>
<td>None, small or moderate Variable</td>
<td>No change to decrease</td>
<td>Possible</td>
<td>**</td>
</tr>
<tr>
<td>School district fund-raising revenue</td>
<td>~</td>
<td>~</td>
<td>~</td>
<td>~</td>
<td>Insufficient evidence</td>
</tr>
</tbody>
</table>

Secondary, indirect outcomes related to the policy

| Food safety | ~ | ~ | ~ | ~ | Insufficient evidence |
| School physical activity programs | ~ | ~ | ~ | ~ | Insufficient evidence |
| School enrichment programming | ~ | ~ | ~ | ~ | Insufficient evidence |

Possible: Logically plausible effect with limited or uncertain supporting evidence.
Insufficient evidence or not evaluated
~ Sufficient evidence not available to evaluate this outcome with confidence
** 5+ studies of weak and moderate quality with consistent or mixed results; 5+ studies of mixed quality with mixed results
*** 5–10 strong studies with consistent findings

TABLE 4.6 Impact of a National Snack and a la Carte Food and Beverage Rule on School Services
The previous chapter explored how a national snack and a la carte food and beverage policy will affect school services, which as a health determinant contributes to student meal participation, education, and physical activity opportunities. This chapter reviews how such a policy will affect access to healthy and unhealthy food options, acting as a determinant to children’s school-based diet and nutrition and, by extension, long-term health outcomes. As discussed in Chapter 2, key research questions included:

- Will updated standards affect the availability of snacks and drinks sold in schools, student purchases of these items, and student consumption?
- Will changes in student consumption of snacks affect different chronic disease health outcomes?

The research team examined whether or not a national snack food and beverage policy will alter the school food environment and change children’s access to both healthy and unhealthy foods and beverages (Figure 5.1). As of 2008, most elementary, middle, and high school children had access to snack foods and beverages at school through one or more venues, including vending machines and a la carte lines. The research examined in this chapter indicates that a national snack and a la carte food and beverage policy will increase the availability of healthy food options for all children and reduce access to unhealthy options.

The research team hypothesized that changes in food access and availability will lead to changes in students’ purchase and increased consumption of more healthy nutrient-dense items, and fewer high-calorie or energy-dense foods at schools.

As discussed in Chapter 3, poor diet quality is associated with childhood obesity, dental caries or cavities, type 2 diabetes, high cholesterol, and other chronic conditions. As of 2007, nearly one in three children was overweight or obese, and an increasing number of children are being diagnosed with type 2 diabetes and high cholesterol. Children from lower socioeconomic status, and black and Hispanic children are
at a higher risk of experiencing one or more of these illnesses. Additionally, poor diets are associated with an increased risk of tooth decay, which also impacts students' health and learning outcomes. These conditions can exact a toll on student learning, including dental pain absenteeism, diabetes-related high school dropout rates, and reduced focus from depression.

This HIA finds that a national snack and a la carte food and beverage policy will likely increase students’ purchase and consumption of healthier items, while also reducing their purchase and consumption of unhealthy items at school. However, this HIA is unable to make a judgment on whether or not such a policy will impact a child’s total dietary intake, as food consumption at school is only a fraction of total daily consumption—approximately 13 percent, according to SNDA III. More research is needed to examine the effect of such a policy on overall daily consumption as it may remain unchanged if the student compensates by consuming larger amounts of less-healthy foods when out of school, or it may decrease or remain unchanged should a child not compensate when out of school. This chapter outlines how this conclusion was reached.

In reviewing the literature on this topic, several notable characteristics emerged:

- Having snack and a la carte food and beverage policies in place limits students’ access to low-nutrient, calorie-dense foods and, in most cases, increases access to healthy foods.
- Reducing access to unhealthy foods in schools results in reduced consumption of these foods during the school day.
- Changing the school food environment is likely to affect children’s calorie consumption during the school day.
- More research is needed to examine the effect of changing school foods on overall food and calorie intake beyond the school day.
- More research is needed to link school foods and dietary intake to health risks and other longer-term outcomes.
- Based on limited evidence, snack food and beverage policies may improve academic performance, particularly through increasing school meal participation.

This chapter further explores the direct and intermediate impacts, as well as outcomes of the diet and nutrition health determinant pathway (see Figure 5.1).
5.1 Direct Impacts

Will a national snack and a la carte food and beverage policy affect school district policies? If so, how?

As required by the Healthy, Hunger-Free Kids Act, national nutrition standards for snack and a la carte foods and beverages must at a minimum meet the 2010 Dietary Guidelines for Americans. This will affect school districts that do not currently have nutrition standards in place or that have standards that do not meet or exceed the 2010 DGA. This includes most public schools in the United States. To date, school nutrition standards have been largely directed by district wellness policies or state-level policies. Although the current conditions research in Chapter 3 shows that states and districts have been moving to increase the strength of nutrition standards for snack foods and beverages sold in schools since the 2004 federal wellness policy requirement, a national snack and a la carte food and beverage policy will still affect most of the states and districts in the nation (see Figure 5.2).
This HIA completed an analysis of state policies, measuring the strength of existing snack and a la carte food and beverage standards, and reviewed seven sources that examined the strength of state or district policies. As demonstrated in Table 5.1, approximately 63 percent of elementary, 74 percent of middle, and 79 percent of high school students currently attend schools that have wellness policies in place with either no food restrictions or weak ones. Similarly, approximately 67 percent of elementary, 76 percent of middle, and 83 percent of high school students attend schools with no or weak beverage restrictions. Thus, USDA’s updated snack food and beverage standards will require most school districts to make changes (see Appendix 3).
TABLE 5.1  Percentage of Students Nationwide in Districts with Either No Policy or a Weak Wellness Policy on Snack and a la Carte Foods and Beverages (2008–09 School Year)

<table>
<thead>
<tr>
<th>Food content</th>
<th>ES %</th>
<th>MS %</th>
<th>HS %</th>
<th>Beverage content</th>
<th>ES %</th>
<th>MS %</th>
<th>HS %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sugar content</td>
<td>55.3</td>
<td>65.0</td>
<td>72.3</td>
<td>Regular soda</td>
<td>39.5</td>
<td>42.5</td>
<td>60.8</td>
</tr>
<tr>
<td>Fat content</td>
<td>48.5</td>
<td>57.0</td>
<td>61.8</td>
<td>Other sugar-sweetened beverages</td>
<td>71.8</td>
<td>89.5</td>
<td>95.0</td>
</tr>
<tr>
<td>Trans fats</td>
<td>74.3</td>
<td>85.3</td>
<td>89.0</td>
<td>Sugar/calorie content of flavored milk</td>
<td>68.8</td>
<td>74.5</td>
<td>79.0</td>
</tr>
<tr>
<td>Sodium content</td>
<td>72.0</td>
<td>83.5</td>
<td>87.8</td>
<td>Fat content of milk</td>
<td>75.0</td>
<td>86.3</td>
<td>87.5</td>
</tr>
<tr>
<td>Calorie content</td>
<td>66.0</td>
<td>77.0</td>
<td>83.5</td>
<td>Serving size limit for beverages</td>
<td>77.5</td>
<td>88.3</td>
<td>93.8</td>
</tr>
<tr>
<td>Average of the five categories</td>
<td>63.2</td>
<td>73.6</td>
<td>78.9</td>
<td>Average of the five categories</td>
<td>66.5</td>
<td>76.2</td>
<td>83.2</td>
</tr>
<tr>
<td>Snack food or location ban</td>
<td>16.3</td>
<td>3.5</td>
<td>1.8</td>
<td>Beverage or location ban</td>
<td>14.5</td>
<td>2.5</td>
<td>1.3</td>
</tr>
</tbody>
</table>

All numbers rounded. Due to rounding, some percentages may not sum to exactly 100. Exact numbers are available at www.bridgingthegapresearch.org.


The adoption of a national snack and a la carte food and beverage policy aligned with the 2010 DGA, which would require all foods and beverages sold in schools to provide some nutritional value, would be expected to have a strong impact on existing school district and state policies (see Table 5.2). Districts that have been striving to make their snack standards meet the 2010 DGA may have to make only slight modifications to existing practices to meet the updated rule. Districts with policies meeting the IOM’s or the Alliance for a Healthier Generation’s competitive food guidelines will be affected by USDA’s new standards only if they are more restrictive.

TABLE 5.2  Impact of a National Snack and a la Carte Food and Beverage Rule on District Policies

<table>
<thead>
<tr>
<th>Impacts and outcomes</th>
<th>Impacted and most vulnerable populations</th>
<th>Magnitude of impact</th>
<th>Direction of impact on outcome</th>
<th>Likelihood of impact</th>
<th>Quality of evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strength of impact</td>
<td>Number impacted</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary, direct outcomes resulting from the policy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>District policies will require school foods sold meet DGA</td>
<td>Children in schools without strong snack food and beverage policies</td>
<td>Strong</td>
<td>Many+</td>
<td>Increase</td>
<td>Certain</td>
</tr>
</tbody>
</table>

**Very likely/Certain:** Adequate evidence for a causal and generalizable effect
+ 60–75% of public school children
*** 5–10 strong studies with consistent findings
Will a national snack and a la carte food and beverage policy change the availability of healthy and unhealthy items for elementary, middle, and high school students?

It is likely that a national snack food and beverage policy will reduce the availability of unhealthy low-nutrient, energy-dense items while also increasing healthier options for all ages, impacting middle and high school students the most.

As discussed in Chapter 3, high school students with a higher socioeconomic status tend to have a greater variety of food options available at school, both healthy and unhealthy, than more vulnerable groups, such as low-income, black, and Hispanic children. A 2007 study found that fewer black students had access to healthier options such as fruits and vegetables in vending machines. Similarly, a 2008 study found that middle school Hispanic children had greater access to snack bars and food carts than others, demonstrating that some groups have less access to healthier options. This finding is particularly important because these vulnerable populations already have a higher risk of diet-related chronic illnesses, which will be discussed in more detail later in this chapter.

Fifteen studies and two literature reviews examined for this HIA explored the impact of policies or interventions on snack and a la carte food and beverage availability. The studies were fair to strong, and the policies and intervention types were diverse, with various population sizes, school levels, and study designs.

Key findings include:

- Twelve of 15 studies consistently found a reduction in the availability of or access to some, if not all, unhealthy snack and a la carte foods or beverages as a result of policies requiring changes to nutrients, portion sizes, or time of access. For example, one study found that in a national sample of middle and high school students, district wellness policies implemented between 2004 and 2007 significantly reduced the availability of food items high in sugar and fat.

- Six of the 15 studies found a general increase in the availability of healthier items as a result of policy implementation requiring nutrient standards. For example, in Minnesota, a two-year randomized controlled trial found that intervention schools offered significantly more low-fat, healthy a la carte foods than control schools. Another review concluded that four studies using nutrition guidelines increased fruit and vegetable availability ranging from 0.28 servings to 0.48 servings a day during lunchtime.

- Seven of the 15 studies found inconsistent relationships or no impacts of policies on the availability of healthier food options. For example, nationally between 2004 and 2007, secondary schools did not increase fruit and vegetable offerings as a result of district wellness policies. This may be due to lack of implementation of the policies, or it may be that district policies only restricted unhealthy options, rather than also requiring healthy choices to be offered. For example, in Colorado, 40 school districts offered more fresh fruits and healthier options at school parties, but did not offer more vegetables or significantly change what was sold in vending machines after implementing district wellness policies. An additional study found that significantly fewer students reported in-school access to sugary drinks in states with policies banning all SSBs, yet found no difference for policies only banning regular soda or allowing all SSBs.
This HIA determined that a national snack food and beverage policy that meets the 2010 DGA is certain to decrease children’s access to low-nutrient, high-calorie, high-fat foods and sugary beverages, and is likely to also increase children’s access to healthy items at school (see Table 5.3). If the national policy requires schools to sell healthier items from the 2010 DGA’s foods to encourage list, such as fruits, vegetables, low-fat dairy, whole grains, and water, in all venues, then this impact becomes more certain. The degree to which these changes in access will impact students’ weight and health outcomes depends on the degree to which these foods are consumed by the students, as well as the extent that students do or do not replace these calories by consuming more energy-dense foods outside of school hours.

### TABLE 5.3

<table>
<thead>
<tr>
<th>Impacts and outcomes</th>
<th>Impacted and most vulnerable populations</th>
<th>Magnitude of impact</th>
<th>Direction of impact on outcome</th>
<th>Likelihood of impact</th>
<th>Quality of evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Primary, direct outcomes resulting from the policy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access to healthy foods and beverages</td>
<td>All children; low-income, Hispanic, and black children</td>
<td>Small to moderate</td>
<td>Many+</td>
<td>Increase</td>
<td>Likely if policy only suggests access to healthier options, such as the DGA’s foods to encourage; certain if access is required at all sites</td>
</tr>
<tr>
<td>Access to unhealthy foods and beverages</td>
<td>All children; low-income, Hispanic, and black children</td>
<td>Small to moderate</td>
<td>Many+</td>
<td>Decrease</td>
<td>Certain</td>
</tr>
</tbody>
</table>

**Likely:** Logically plausible effect with substantial and consistent supporting evidence and substantial uncertainties  
**Very likely/Certain:** Adequate evidence for a causal and generalizable effect  
+ 60–75% of public school children  
*** 5–10 strong studies with consistent findings  
**** 10+ strong studies with consistent findings

### 5.2 Intermediate Impacts

**Will changes to snack and a la carte food and beverage availability affect what students purchase and consume?**

It is likely that changes in snack food and beverage availability will translate to changes in student purchase and consumption behaviors at school. For example, a 2010 literature review concluded that with few exceptions, when unhealthy foods are restricted, students consume foods of higher nutritional quality while at school. Conversely, children tend to purchase unhealthy items when they are available.

This HIA examined one review and 25 studies evaluating the effects of nutrient policies on student purchases and consumption of snack foods and beverages based on access and availability.
The studies were mostly fair to strong in quality; they varied by policy components and intervention types, study design, population size and age, and location. Key findings include:

- Sixteen of the 25 studies indicated that having nutrient standards or limited availability of unhealthy foods and drinks was associated with increased student purchases and consumption of healthier items and decreased consumption of unhealthy items.\(^\text{439-454}\) For example, a Connecticut study found that, when a policy limited various nutrients and serving sizes, students in intervention middle schools drank significantly more healthy drinks and ate fewer salty snacks and chips than students in the control schools.\(^\text{455}\) In a nationally representative sample, when middle schools offered more fruits and vegetables, the odds of children eating them increased. In high schools, offering more fruits and vegetables at lunch correlated with greater vegetable consumption.\(^\text{456}\)

- However, three of the 25 studies found that nutrient-related interventions had no impact on student consumption of foods meeting standards.\(^\text{457-459}\) For example, one intervention showed that a policy restricting nutrients and serving sizes had no impact on consumption of these new healthier foods by fourth- to sixth-grade students and middle school students.\(^\text{460}\)

- Six of the 25 studies found that a change in snack and a la carte food or beverage policies resulted in students buying fewer unhealthy items, but student consumption results were inconsistent across the studies.\(^\text{461-466}\) For example, when Boston public schools implemented a policy restricting the sale of SSBs, high school students drank significantly less soda (-0.16 servings) and other SSBs (-0.14 servings) per day between 2004 and 2006.\(^\text{467}\) Other research has also concluded that children bought fewer SSBs when alternative beverages were available.\(^\text{468}\) However, policies restricting all SSBs in schools have also been found to be potentially inconsequential on overall student consumption of sugary drinks because students have other non-school options to support the behavior.\(^\text{469}\) For example, four national studies using similar data found that fifth and eighth graders with less access to sugary beverages due to policies restricting SSBs made fewer purchases and had lower school-based consumption, but did not drink less overall than those with access.\(^\text{470-473}\)

Some critics suggest that, because many children do not like the taste of healthy foods, changing the food environment to include healthier options will not impact their consumption. Children’s food and drink selection is based primarily on taste preferences more than convenience or price.\(^\text{474,475}\) For example, focus group results from Minneapolis seventh and tenth graders found that children rated the appeal of school food (largely taste) as the most important factor in their purchasing, second only to “hunger and food cravings.”\(^\text{476}\) In other studies, students rated taste as the most important factor when selecting snacks from a school vending machine, and children with a taste preference for soft drinks were 4.5 times more likely to consume them five or more times per week.\(^\text{477,478}\)

There is also evidence that increasing the availability of healthy foods, and thus increasing exposure, can affect students’ preferences for these items. There is evidence that supports the use of repeated food exposure as a method for increasing taste preferences and consumption among children.\(^\text{479}\) When limited in exposure, children tend to have a lower taste preference for fruit and vegetables.\(^\text{480}\) However, with increased availability of fruits and vegetables, students in at least one study have shown increased intakes regardless of taste preferences.\(^\text{481}\)
Based on most studies reviewed, this HIA determines that a national snack and a la carte food and beverage policy will likely decrease the number of unhealthy purchases children make in school, while also having a small to moderate positive impact on children’s purchase and consumption of healthier items in school (see Table 5.4). However, if USDA does not require schools to offer high-nutrient, low-calorie items at all venues, students will not have the ability to make as many of these healthier choices, and the impact of such a rule will be less certain. If the USDA policy is similar to, or more restrictive than, IOM’s 2007 guidelines, it is certain that students will consume fewer unhealthy and more healthy items at school, but this may not reduce their overall consumption of unhealthy items outside of school.

### TABLE 5.4 Impact of a National Snack and a la Carte Food and Beverage Rule on Student Purchase and Consumption

<table>
<thead>
<tr>
<th>Impacts and outcomes</th>
<th>Impacted and most vulnerable populations</th>
<th>Magnitude of impact</th>
<th>Direction of impact on outcome</th>
<th>Likelihood of impact</th>
<th>Quality of evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strength of impact</td>
<td>Number impacted</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary, direct outcomes resulting from the policy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Purchase or consume healthy foods and beverages in school</td>
<td>Secondary students</td>
<td>Small to moderate</td>
<td>Many</td>
<td>Increase</td>
<td>Likely if policy only suggests access to healthier options, such as the DGA’s foods to encourage; certain if these options are required at all access sites</td>
</tr>
<tr>
<td>Purchase or consume unhealthy foods and beverages in school</td>
<td>Secondary students</td>
<td>Small to moderate</td>
<td>Many</td>
<td>Decrease</td>
<td>Likely</td>
</tr>
</tbody>
</table>

Likely: Logically plausible effect with substantial and consistent supporting evidence and substantial uncertainties
Very likely/Certain: Adequate evidence for a causal and generalizable effect
*** 5–10 strong studies with consistent findings
**** 10+ strong studies with consistent findings

Will a national snack and a la carte food and beverage policy affect children’s school-based calorie consumption?

In addition to general changes in unhealthy food consumption, this HIA examined caloric consumption from snack foods and beverages specifically because children have been found to consume as much as one-half to one-third of daily energy needs while at school. Additionally, studies indicate there is a relationship between excess energy intake and consumption of snack food and beverage items. One review and 13 studies investigated the relationship between the availability of snack foods and beverages in schools and changes in calorie-dense, or energy-dense, item consumption. These studies ranged from strong to weak in quality and showed reductions in caloric consumption or no impact. Key findings include:

- One review and 10 of the 13 studies found that students consumed fewer energy-dense foods and beverages in school after nutrient standards for snack and a la carte foods and beverages were applied or venues were removed. For example, limiting up to three snack food and beverage
practices (i.e., fund-raising, class incentives, venues available, etc.) in middle school was associated with reductions of in-school energy consumption from SSBs of between 16 and 90 calories. 499

• Two of the 13 studies found that portion control of snack and a la carte foods and beverages had beneficial effects on reducing daily calorie consumption. 500, 501 One study determined that reducing portion sizes of foods sold in snack bars to smaller, single-serving packages provided an average energy savings of 47 calories (between 13 and 75 calories) per student per day. 502

• Five of the 13 studies found nutrient policy on foods and beverages sold in schools had an impact inconsistent with the other literature. One of these studies found that a policy did not change student intake of certain high-calorie foods; another found no change in student calorie consumption during the school day from a snack and beverage policy; and three found little to no change in total calorie intake over the day following implementation of nutrition standards for sugary beverages. 503-507

One systematic review and 10 of 13 studies indicated that altering the snack and a la carte food and beverage environment can reduce the amount of excess calories consumed from energy-dense foods while children are at school (see Table 5.5). Consuming snack foods and beverages, which are commonly high in calories and low in nutrients, can be characteristic of poor diet quality, high energy intake, and excessive weight gain when energy intake exceeds energy expenditure. 508-511 Given these relationships, combined with the large percentage of calories children consume while at school and the research that demonstrates snack and a la carte food and beverage policies tend to decrease the amount of excess calories consumed at school, this HIA determines that a national policy to limit the calorie content of snack foods and beverages is likely to have a small to moderate impact on reducing student energy consumption from energy-dense foods and beverages sold at school.

**TABLE 5.5** Impact of a National Snack and a la Carte Food and Beverage Rule on Student Caloric Consumption in School

<table>
<thead>
<tr>
<th>Impacts and outcomes</th>
<th>Impacted and most vulnerable populations</th>
<th>Magnitude of impact</th>
<th>Direction of impact on outcome</th>
<th>Likelihood of impact</th>
<th>Quality of evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strength of impact</td>
<td>Number impacted</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary, direct outcomes resulting from the policy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>School caloric consumption from energy-dense foods and beverages</td>
<td>All children</td>
<td>Small to moderate</td>
<td>Many</td>
<td>Decrease</td>
<td>Likely</td>
</tr>
<tr>
<td>Total daily school calorie consumption</td>
<td>All children</td>
<td>~</td>
<td>~</td>
<td>Uncertain</td>
<td>Uncertain</td>
</tr>
</tbody>
</table>

Likely: Logically plausible effect with substantial and consistent supporting evidence and substantial uncertainties
Uncertain: Effect is unclear
~ Sufficient evidence not available to evaluate this outcome with confidence
* < 5 studies, inconsistent results, and the claim is consistent with public health principles
*** 5-10 strong studies with consistent findings

Though two of the studies examined showed a positive effect of snack food and beverage policies on reducing daily calorie consumption at school, this HIA cannot make a determination on the magnitude or direction of impact in this area. While there is adequate research to determine that snack food and beverage policies tend to decrease the amount of excess calories consumed at school, this HIA did not examine overall caloric intake from all meals. Likewise, there is sufficient evidence (presented in the previous chapter) that such policies also increase participation in the NSLP. Daily energy consumption at school...
could be increased for those students who are now eating a school lunch rather than snacks, or conversely could be decreased if they are no longer eating snacks in addition to meals. Daily energy consumption could also go unchanged depending on what items are served as part of the meal. For example, one national report found that secondary school students participating in the school lunch program consumed fewer calories than nonparticipants from sugary beverages, but more from meal items such as french fries.512 Since the Healthy Hunger Free Kids Act also required extensive changes to school meal food offerings (which will go into effect in the 2012–2013 school year), this HIA cannot determine the direction of impact on total calories consumed from changes to snacks and beverages alone.

Additionally, it is important to note that snack and a la carte foods and beverages in schools represent only a portion of a child’s daily intake. This review does not account for foods that children bring from home or consume before and after the school day.

5.3 Outcomes

While the most immediate impacts of a national snack and a la carte food and beverage rule will be on the types of foods sold in schools and student consumption of them, this HIA looks further downstream to the relationship between changes in the school food environment and children’s health outcomes.

Will a national snack and a la carte food and beverage policy affect children’s weight status, or BMI?

Weight status (i.e., BMI) is an important determinant of health and can be used as a biomarker for increased risk of certain chronic diseases, such as type 2 diabetes and hypertension. Since weight management is a balance between energy intake and energy expenditure, both sides of this equation should be considered when evaluating the impacts of school food policies. The most successful weight management interventions have been multifaceted and, in some cases, include improving the food environment as well as increasing physical activity.513-515 However, this HIA examines only the “energy intake” part of the equation.

Dietary behaviors related to excessive weight gain include the consumption of large portion sizes, as well as of foods high in calories and dietary fat.516-518 In 2004–2005, candy was the most commonly consumed snack food in schools, with baked goods (e.g., cookies, cakes, brownies) a close second.519,520 These foods, in addition to refined carbohydrates and high-calorie sugary drinks and fruit juices, are associated with childhood weight gain yet remain common among snack and a la carte food and beverage offerings in schools.521,522

Based on the earlier conclusion that a national policy will reduce consumption of energy-dense foods at school and possibly increase consumption of healthier foods, there is the potential that this could also result in a reduction of students’ weight. For example, research has found that replacing one 12-ounce can of a sugar-sweetened beverage with water in students’ diets could reduce their energy gap, or difference between energy intake and expenditure, by 150 calories per day.523 Assuming that the consumption of 3,500 calories leads to an average of a one-pound weight gain as fat, a daily reduction of as little as 110–165 calories could reduce weight gain in children.524

Twelve individual studies, two reviews, and one meta-analysis reviewed for this HIA investigated the relationship between snack food and beverage nutrition policies and student weight status or BMI.525-540
These studies, ranging from strong to weak quality, demonstrated mixed results; some reporting associations between snack foods and weight status, with others showing inconsistent results or no relationship. Their findings are as follows:

- Four studies report a relationship between snack food and beverage availability and weight status, demonstrating significant increases in BMI associated with each serving of SSB, each additional food practice in a school (i.e., fund-raising, class incentives), and each new school in a county that allowed students access to "junk food."\(^{541-544}\)

- One study found a reduction in overweight incidence as a result of a snack and a la carte food and beverage intervention that limited exposure.\(^{545}\)

- The two reviews and one meta-analysis reported small relationships between SSB consumption and weight gain.\(^{546-548}\)

- Four studies demonstrated inconsistent impacts in which some age groups experienced changes in weight status and others did not, or there was a reduction in the incidence of overweight but no change in obesity rates.\(^{549-552}\) For example, one study found that the rate of increase for overweight prevalence significantly diminished among fifth graders after a school district implemented nutrition standards for snack and a la carte foods and beverages; the same study revealed that after California implemented nutrition policies, fifth-grade boys and all seventh graders across the state experienced a lower rate of increase in overweight, though the fifth-grade girls did not.\(^{553}\)

- Two studies showed a relationship between certain snack and a la carte food and beverage venues and weight outcomes in some age groups but not in others.\(^{554,555}\) Researchers established that middle school children had a higher BMI \(z\) score\(^i\) if they had access to low-nutrient, energy-dense foods in vending machines near the food service area, as well as in the a la carte line. No association was found between the school food environment and the BMIs of high school children.\(^{556}\)

- One study analyzed data on the same age groups from the nationally representative Youth, Education, and Society (YES) study and the Monitoring the Future (MTF) study from 2004 to 2007. It showed that the availability of regular-sugar/fat food items in vending machines and other snack food outlets was associated with increased odds of obesity among middle school students. No significant association was indicated for high school student incidence of overweight or obesity.\(^{557}\)

- Four studies conveyed no significant relationship between the availability of snack foods or SSBs and weight.\(^{558-561}\) For example, a 2012 national study found that the introduction and duration of exposure to snack foods and beverages in middle schools was not associated with student weight gain between fifth and eighth grade. However, these results are limited as this study examined the impact of exposure to all snack foods and beverages, healthy and unhealthy alike, in school food environments where healthier items were more commonly available (e.g., bottled water, fruit juice, and low-fat salty snacks) than unhealthy items.\(^{562}\)

\(^i\) A BMI \(z\) score reflects the number of standard deviations a child's BMI is from the mean BMI of the CDC reference population for a given age and sex. A positive \(z\) score indicates a higher-than-average BMI compared to other children of the same age and sex, and a negative \(z\) score indicates a lower-than-average BMI. Results for the BMI \(z\) score outcome capture differences in body fatness associated with school food environments and practices across all students, regardless of weight status. Thus, if a specific characteristic of school food environments and practices was associated with higher mean weight, overall, an increase in mean BMI \(z\) score associated with that characteristic would be expected.
More than two-thirds of the literature (eight studies, two reviews, and one meta-analysis) reviewed indicates limits on snack foods and beverages can reduce childhood weight gain in some age groups.

There is an established relationship between excess energy intake and weight gain. As discussed in the previous section, snack and a la carte foods and beverages sold in schools are typically high in calories and low in nutrients. Additionally, the literature reviewed in the previous section shows that energy consumption from these sources declines in schools when snack and a la carte food and beverage policies and/or interventions are put in place. Thus, this HIA has determined that a national policy regulating the snack and a la carte foods and beverages sold in schools can have a small to moderate impact on reducing, for some students, the risk of gaining weight. However, because snacks and beverages are only one component of a student’s total daily diet, this HIA judges these possible impacts as being small for those children who are already experiencing overweight or obesity.

Table 5.6 shows that it is possible for a national snack food and beverage policy to support students’ maintaining a healthy weight, as well as reduced risk of overweight/obesity.

### Table 5.6

**Impact of a National Snack and a la Carte Food and Beverage Rule on Student Weight**

<table>
<thead>
<tr>
<th>Impacts and outcomes</th>
<th>Impacted and most vulnerable populations</th>
<th>Magnitude of impact</th>
<th>Direction of impact on outcome</th>
<th>Likelihood of impact</th>
<th>Quality of evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Strength of impact</td>
<td>Number impacted</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Healthy weight</td>
<td>All children; low-income, black, Hispanic children</td>
<td>None to small or moderate</td>
<td>Many*</td>
<td>Maintain</td>
<td>Possible</td>
</tr>
<tr>
<td>Overweight</td>
<td>All children; low-income, black, Hispanic children</td>
<td>None to small</td>
<td>Many</td>
<td>Reduce risk</td>
<td>Possible</td>
</tr>
<tr>
<td>Obesity</td>
<td>Currently obese children; low-income, black, Hispanic children</td>
<td>None to small</td>
<td>Many</td>
<td>Reduce risk</td>
<td>Possible</td>
</tr>
</tbody>
</table>

*Possible: Logically plausible effect with limited or uncertain supporting evidence
* <5 studies or inconsistent results, and the claim is consistent with public health principles

Will a national snack and a la carte food and beverage policy affect children’s diet-related chronic disease risk?

Studies addressed previously in this chapter have shown that improving nutritional standards for snack and a la carte foods and beverages sold in schools leads to improved diet quality, reduced calorie intake, and a reduced incidence of students being overweight. Improving dietary intake is also likely to impact children’s risk of chronic diseases. Studies have shown that consumption of energy-dense foods, saturated fats, and foods high in carbohydrate and sugar content is associated with insulin resistance independent of obesity, insulin sensitivity, type 2 diabetes, and metabolic syndrome. Therefore, reducing consumption of these foods at schools is likely to reduce children’s risk of these chronic diseases.
Dietary intake is also associated with the risk of chronic illness because of its impact on childhood overweight and obesity. Obesity commonly precedes insulin resistance in children, and children who are overweight have increased risks of insulin resistance, high blood pressure, certain types of cancer, and high blood cholesterol as they age into young adulthood.571-574 Such conditions put children at increased risk of type 2 diabetes and cardiovascular disease in childhood and contribute to the risk of chronic illness in adulthood.575-577

In adults, insulin resistance is also associated with other risk factors for type 2 diabetes and cardiovascular disease, including abdominal obesity, high blood pressure, and elevated levels of cholesterol and triglycerides.578-581 Chapter 3 examines the higher risk of specific subgroups to develop chronic illness. For example, more non-Hispanic white children ages 0–9 and black and non-Hispanic children ages 10–19 had type 2 diabetes in 2001.582 In 2002, more non-Hispanic black and Mexican American males ages 8–17 had high blood pressure compared to their peers.583 From 1999 to 2006, more obese, overweight and non-Hispanic white children had the abnormal lipid measures that contribute to high cholesterol.584

There is a strong data link between diet and the risk for these chronic diseases. Given the relationship between childhood obesity, calorie consumption, and the development of chronic disease risk factors at a young age, this report proposes that a national snack and a la carte food and beverage policy could alter childhood and future chronic disease risk factors by reducing access to energy-dense snack foods in schools (see Table 5.7). To the extent that the national policy results in increases in students’ total dietary intake of healthy foods and reductions in the intake of low-nutrient, energy-dense snack foods, it is likely to have a beneficial effect on the risk of these diseases. However, the magnitude of this effect would be proportional to the degree of change in students’ total dietary intake, and this factor is uncertain.

### Table 5.7: Impact of a National Snack and a la Carte Food and Beverage Rule on Student Risk of Chronic Disease Outcomes

<table>
<thead>
<tr>
<th>Impacts and outcomes</th>
<th>Impacted and most vulnerable populations</th>
<th>Magnitude of impact</th>
<th>Direction of impact on outcome</th>
<th>Likelihood of impact</th>
<th>Quality of evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strength of impact</td>
<td>Number impacted</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Secondary, indirect outcomes related to the policy
| Chronic illness: Type 2 diabetes, high blood pressure, high cholesterol | All children; type 2 diabetes—black, Hispanic, low-income, high blood pressure—black and Hispanic, high cholesterol—low-income, non-Hispanic white, overweight and obese children | None to small | Many | Reduce risk | Possible |

Possible: Logically plausible effect with limited or uncertain supporting evidence
* <5 studies, studies have inconsistent results, and the claim is consistent with public health principles
Will a national snack and a la carte food and beverage policy and the resulting changes in food items in schools affect the risk of getting cavities?

It is possible that changes in snack foods and beverages sold in schools could lower the risk of children’s development of cavities, also known as dental caries or tooth decay. Those with tooth decay as children might be more likely to have dental problems and a range of chronic diseases and adverse health outcomes as adults. Several studies show an association between poor oral health and coronary heart disease, and between periodontal disease and chronic kidney disease or diabetes. Furthermore, many experts think that cavities increase systemic inflammation, leading to an increase in chronic disease risk.

Evidence shows a link between diet and the development of cavities. According to the World Health Organization, “the strength of the evidence linking dietary sugars to dental caries risk is in the multiplicity of the studies rather than the power of any individual study.” The presence of sugar in the diet, both the frequency and the quantity consumed, increases the risk of tooth decay development. Some studies suggest that the type of sugar (i.e., sticky foods), as well as the amount of time sugar remains in the mouth, affects the risk of cavity development.

This HIA examined 13 studies and one review examining the associations between dietary habits and cavities. Most studies investigate the interaction between SSBs and cavities, with a majority indicating that soda consumption increases cavities risk. Three studies (one strong, one fair, and one weak quality) showed that the more soda children consumed, the higher the number of cavities they developed. However, two weaker studies with methodological concerns did not find this interaction. Finally, an association was found between lower cavity risk and milk and water consumption. Given such results, it is reasonable to expect that replacing soda consumption with water and milk would decrease the risk of cavity development.

Access to snack foods may also impact cavity development. At least two studies show that most children consume more sugar than recommended, with the largest amount of added sugar coming from soda consumption, followed by sweets, and then sweetened grains. One very small study showed a significant correlation between dental decay and children’s access to vending machines at school. Only a few studies looked at food consumption, of which three found that eating starchy foods, such as chips, increased the risk of developing cavities. One review published prior to these three studies did not find this interaction.

Based on the available data, limiting consumption of sweets and SSBs is likely to reduce the risk of cavities (see Table 5.8). This HIA determines that it is possible the updated snack and a la carte food and beverage rule would successfully limit students’ consumption of these foods while at school and, therefore, potentially decrease the risk of cavities. Similar to the prior discussion, the magnitude of this effect would be proportional to the degree of change in students’ total dietary intake, which is uncertain.
TABLE 5.8  Impact of a National Snack and a la Carte Food and Beverage Rule on Student Cavities

<table>
<thead>
<tr>
<th>Impacts and outcomes</th>
<th>Impacted and most vulnerable populations</th>
<th>Magnitude of impact</th>
<th>Direction of impact on outcome</th>
<th>Likelihood of impact</th>
<th>Quality of evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strength of impact</td>
<td>Number impacted</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary, indirect outcomes related to the policy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dental cavities</td>
<td>All children; low-income children</td>
<td>Small</td>
<td>Few or many**</td>
<td>Reduce risk</td>
<td>Possible</td>
</tr>
</tbody>
</table>

Possible: Logically plausible effect with limited or uncertain supporting evidence
** 5+ studies of weak and moderate quality with consistent and mixed results; 5+ studies of mixed quality with mixed results

Will a national snack and a la carte food and beverage policy affect child food security?

School meal programs provide a primary meal source for food-insecure, hungry children. Studies indicate that food-insecure children receive a higher percentage of their daily caloric and nutrient intake from school meals. On average, children from insecure and marginally secure households obtained 26 percent and 24 percent of their daily calories from school meals respectively, while children from highly secure households obtained only 16 percent. Additionally, the National School Lunch Program and School Breakfast Program benefits supplement household food expenditures.

School meal participation in both the breakfast and lunch programs improves the diet and nutrition of food-insecure, hungry children. In Chapter 4, the policy analysis found that those states that moved from a less restrictive to a more restrictive snack food and beverage policy increased school meal participation. For nutritionally vulnerable students, having access to more and healthier foods through the school meals program, particularly school breakfast, might improve learning outcomes. At the very least, participation in the School Breakfast Program is likely to improve attendance, reduce tardiness, and ensure that students are present at school and ready to learn (see Chapter 3).

What is the link between child eligibility for and participation in free and reduced-price school meals and stigma?

There is little to no research that directly assesses students’ perceptions of or experiences with stigma related to their participation in federally funded school meal programs. Children are influenced by their peers, including when it comes to food selection. Research indicates social modeling occurs during school meals and that children base their food selection on what others around them are eating. Although the NSLP legislatively prohibits any intentional stigmatizing of children who participate in the program, many factors, including the presence of snack foods and beverages in the school environment, might unintentionally stigmatize students because they do not have the means to purchase foods sold outside of the school meal.
The research team hypothesized that nutrition standards for snack foods and beverages could reduce stigma associated with participating in school meal programs as a result of increased participation as well as by more closely aligning alternative offerings, specifically a la carte items, with components of the school meal. While this HIA was unable to evaluate this hypothesis formally, interviewed stakeholders suggested that increased participation would reduce the stigma around eating school meals. To achieve this end, school administrators and food service directors can make changes, such as creating universal school breakfast, having only one “point of service” for purchasing all foods, and directly certifying children who are eligible for school meals—tactics that have all been shown to increase the number of students who take part in school meal programs.\textsuperscript{634-638} Eliminating different lines in the cafeteria for a la carte items and school lunches, for example, might improve school meal participation.\textsuperscript{639} Additionally, students will be more likely to partake in, and consume food from, the school meals program if the overall quality and taste of the school meal improves. Finally, it is important to engage students and others in the school community to change attitudes and social norms around eating “healthy” foods. Research also suggests that school leaders need to ensure all students have equal access to school food programs.

If the national snack and a la carte food and beverage policy results in more eligible students eating school meals, as indicated in Chapter 4, it could have a small to moderate impact on reducing child food insecurity and hunger. Increasing school meal participation, overall, can have a reduction on stigmatizing students who are eligible for free or reduced-price lunches; however, this HIA does not have enough information to assess the full impact of a national snack food and beverage policy on child stigma (see Table 5.9).

<table>
<thead>
<tr>
<th>Impacts and outcomes</th>
<th>Impacted and most vulnerable populations</th>
<th>Magnitude of impact</th>
<th>Direction of impact on outcome</th>
<th>Likelihood of impact</th>
<th>Quality of evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tertiary, indirect outcomes related to the policy</td>
<td>Students eligible for free/reduced-price meals</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Increase</td>
<td>Possible if NSLP participation increases</td>
</tr>
<tr>
<td>Stigma</td>
<td>Students eligible for free/reduced-priced meals</td>
<td>~</td>
<td>~</td>
<td>~</td>
<td>Insufficient evidence</td>
</tr>
</tbody>
</table>

\textbf{Possible}: Logically plausible effect with limited or uncertain supporting evidence

~ Sufficient evidence not available to evaluate this outcome with confidence

** 5+ studies of weak and moderate quality with consistent or mixed results; 5+ studies of mixed quality with mixed results
Will a national snack and a la carte food and beverage policy affect students’ learning potential?

Student learning potential—the ability to focus, attend class, and learn—is affected by a variety of health outcomes associated with snack and a la carte food and beverage intake. In this section, the HIA briefly examines how a child’s learning potential can be affected by hunger, dental decay, other chronic illnesses, and the relationship between these issues and the foods and beverages sold in schools.

It is reasonable to expect that some students may be able to focus better in school when they are eating fewer snack foods and beverages since this practice contributes to better nutrition, dental health, and reduced risk of chronic illness. Though the evidence is limited, research suggests that children’s cognition, behavior, and learning are impacted by nutritional status or feelings and perceptions of hunger, and that participation in school meals—school breakfast in particular—is associated with better academic outcomes. Five studies suggest that eating breakfast has positive outcomes related to learning, such as improved cognition, math skills, memory, or English scores. Other studies found a positive correlation between school breakfast programs, attendance, and/or tardiness. One strong study found that the NSLP has a significant impact on educational achievement and outcomes. Especially for food-insecure children, greater participation in school meals contributes to making them healthier, more focused students.

Though the evidence is mixed, research suggests that food-insecure children and those at higher risk for being food insecure do not do as well academically as their food-secure peers and are more likely to be late to school, have poor attendance, and do worse academically. Overall, studies suggest that students who are malnourished, particularly those who are severely malnourished, seem to be at greater risk for learning problems than those with better nutritional status. Likewise, this group’s performance seems to improve most when provided with additional meals, such as through school meal programs.

Dental decay and oral health problems also place children at increased risk of poor learning outcomes and, if untreated, can lead to other chronic illnesses. Low-income children are disproportionately affected by tooth decay, particularly untreated cavities. Studies show that children with tooth decay are absent from school more than their peers and, when present, are often in pain and unable to focus. Dental decay can exacerbate problems for children who may already be at educational risk, contributing to difficulty learning.

Other chronic illnesses can affect learning potential. Children with diabetes have more absences than their siblings and are more likely to drop out of high school. Childhood obesity can reduce children’s focus through poor body image or depression, or as a result of bullying.

Based on the findings that nutrition standards for snack foods and beverages can increase school meal participation, improve diet quality, and improve health outcomes, this HIA concludes that it is possible for changes in snack foods and beverages to contribute to small or moderate increases in children’s learning potential (see Table 5.10).
### TABLE 5.10
Impact of a National Snack and a la Carte Food and Beverage Rule on Children’s Learning Potential

<table>
<thead>
<tr>
<th>Impacts and outcomes</th>
<th>Impacted and most vulnerable populations</th>
<th>Magnitude of impact</th>
<th>Direction of impact on outcome</th>
<th>Likelihood of impact</th>
<th>Quality of evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tertiary, indirect outcomes related to the policy</td>
<td>All children; low-income, overweight, obese, black and Hispanic children</td>
<td>Small to moderate</td>
<td>Moderate</td>
<td>Increase</td>
<td>Possible</td>
</tr>
</tbody>
</table>

Possible: Logically plausible effect with limited or uncertain supporting evidence

** 5+ studies of weak and moderate quality with consistent and mixed results; 5+ studies of mixed quality with mixed results

### 5.4 Summary

The literature included in this review indicates that schools have been selling students of all ages high-calorie, low-nutrient snack and a la carte foods and beverages and that these items often take the place of healthier foods and beverages at school. The associations found are largely consistent across a number of studies. The school food environment contributes to students’ overall intake of calories because when schools offer high-calorie, low-nutrient items, children purchase and consume them. A national snack food and beverage policy that meets the 2010 DGA will decrease access to unhealthy foods and is likely to improve students’ access to healthy foods and beverages while at school, subsequently affecting student purchase and consumption.

While this HIA indicates a national snack food and beverage policy will likely help reduce children’s intake of calories at school, it is uncertain whether changes to the school food environment will be enough to substantially reduce children’s overall consumption of high-calorie foods and beverages throughout the day. Thus, only limited conclusions about the policy’s impacts on overall diet and nutrition, and rates of obesity and chronic illnesses can be made; rather, in most instances, the focus is on risk of these outcomes.

Even small changes to students’ school-based diet resulting from the USDA rule may make it possible to reduce children’s risk of experiencing tooth decay, becoming overweight, or developing a chronic illness. Because low-income, black, and Hispanic children are at a greater risk for health problems related to a poor diet, the policy may have a particularly strong effect on reducing the risks for these vulnerable children. The possibility of not having enough to eat may also decrease for children who are eligible for free and reduced-price meals, given the data that suggest snack food and beverage policies tend to increase participation in school meal programs. Finally, since children from these subgroups tend to also be at higher risk for poor academic outcomes, and good nutrition and eating a healthy breakfast improve cognition and school performance, USDA’s rule may also reduce the chance of these problems.
Overall, the literature indicates that by changing snack food and beverage policies, states, school districts, and researchers have affected student food choices and consumption at school. And ultimately, the resulting new behaviors have the potential to lead to reduced short- and long-term risks of chronic diseases, such as diabetes and obesity. The assessment in Chapters 4 and 5 demonstrate that the national policy, if aligned with the 2010 Dietary Guidelines for Americans, is likely to have small to moderate positive effects on most of the health outcomes examined in this HIA. This chapter discusses the implications of the main findings from the assessment, the HIA limitations, inconsistencies in the literature, and areas for further research. This chapter also provides the rationale for different snack and a la carte food and beverage standards based on the HIA findings.

6.1 Implications of Changes to Snack and a la Carte Food and Beverage Revenue on School Services

Snack food and beverage policies have influenced both school food services and enterprise revenues as a result of changes to what items are offered and purchased by students. These changes have impacted multiple stakeholders from student groups to school districts; however, much of the evidence on the degree of impact is mixed.

The findings in Chapter 4 indicate that a policy requiring snack food and beverage offerings to meet minimum nutrition criteria neutrally affects food service finances in the worst case and, at best, is likely to increase net food service revenue. This is largely a result of increased participation in school meal programs. The revenue analysis conducted in this HIA illustrates that when snack foods and beverages are limited, meal participation increases, with the largest growth among students in the free and reduced-price categories. Additionally, snack foods and beverages often serve as substitutes for school meals among students, thus, snack and a la carte food and beverage sales, even if revenue enhancing, effectively “rob” some of the revenue they generate from potential sales of school meals.
For sales from vending machines, school stores, and other venues, characterized as enterprise revenue, the assessment found that such a policy at worst can result in nonsignificant declines in returns and at best have a neutral effect. However, the financial impact on school groups and programs that rely heavily on these revenue sources varies. Both the literature reviewed for this HIA and the stakeholder interviews suggest that many schools and school districts use funds from school stores, vending, and fund-raising to support educational and sports programming, as this revenue is one of the only funding streams that is purely discretionary at the school level. The degree to which a school may see a negative effect in this area varies with how much it relies on such income. In general, those schools that do not rely heavily on enterprise revenues from food and beverage sales are not likely to experience significant negative financial consequences of a national snack food and beverage policy.

Several stakeholders and advisory committee members noted the potential for school food service to initially see a decline in revenue when changes to offerings are implemented. Some stakeholders stated that their own school districts saw a decline for about a year or so before their revenue recovered. Although a decrease in revenue is possible, it is not inevitable. Stakeholder interviews and advisory committee members suggested that, with careful planning, a graduated transition, and support for effective implementation, schools can avoid this potential challenge. As noted in the recommendations (see Chapter 7), USDA can increase the likelihood for successful implementation through enhanced technical assistance to schools and districts.

**Inconsistent Findings: Enterprise Revenue and Snack Foods and Beverages**

The policy analysis results on enterprise revenue impacts are irregular and must be interpreted with caution. Enterprise funds come from a variety of sources, including nonfood items, and thus will fluctuate due to conditions beyond a snack and a la carte food and beverage policy. The literature is equally mixed and contingent upon a number of factors, such as vending contracts, the ability to substitute healthier food options for less healthy options, and the products offered at various points of sale.

Analyses suggest that a decline in enterprise revenue associated with more rigorous snack food and beverage policies is possible, though the results were not statistically significant. Conversely, there was a statistically significant increase in overall revenue, suggesting that gains in other categories, such as from increased NSLP participation, will counter any potential losses to enterprise revenues. Because of the wide variation in the makeup of enterprise revenue across the country—i.e., food versus nonfood sources—it is challenging to assess the degree to which schools will be impacted.

Anecdotally, in an interview, an industry representative noted vending machine revenue declines when snack food and beverage policies are implemented in school districts. Other studies reviewed in Chapter 4, however, demonstrated that vending sales can remain financially buoyant in the presence of snack food and beverage policies. In cases where a school or district relies heavily on enterprise revenue, identifying and sharing best practices to adjust activities to the new policy environment is likely the best means to
mitigate any negative financial policy effects. For example, the same industry representative stated in the interview, “we have tried it all from cut fruits to veggies … and if the machines are all on and not competing with the cafeteria, school store, or donut sales, [we] can make it work.”

Gaps in the Literature: Revenue and School Services
No data exist on the impact of snack food and beverage policies on fund-raising revenue for school groups and the potential effect of revenue shifts on the provision of school services such as physical activity, enrichment programming (clubs, student government, theater programs, etc.), or the ability to purchase food services equipment. In regard to future research, regionally or nationally representative studies at the school and district policy level could provide much clearer, more detailed, and more externally valid information on the financial impacts of snack food and beverage policies. In particular, studies could provide information on the impact at the school level specifically examining the effect on various student demographics and the ability to provide student services.

This HIA was not able to evaluate how other elements of the HHFKA that will affect school district and school food service revenue would interact with a national snack and a la carte food and beverage rule, as they are not yet in place nationwide. These include Section 206, which requires all items sold as part of the a la carte line be revenue neutral, and Section 201, which provides an additional $0.06 in federal funding for school districts that demonstrate they are successfully implementing the recently revised school meal requirements. Both of these sections are intended to financially benefit school districts.

Table 6.1 summarizes school service outcomes, discussed in detail in Chapter 4, resulting from a national snack and a la carte food and beverage policy. The table outlines expected impacts on revenue as well as the resulting effects of revenue changes on student enrichment activities, physical activity, and the ability to meet food safety requirements.
CHAPTER 6 DISCUSSION AND CONCLUSIONS

### Impacts and outcomes

<table>
<thead>
<tr>
<th>Impacts and outcomes</th>
<th>Impacted and most vulnerable populations</th>
<th>Magnitude of impact</th>
<th>Direction of impact on outcome</th>
<th>Likelihood of impact</th>
<th>Quality of evidence</th>
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<tbody>
<tr>
<td></td>
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<tr>
<td><strong>Direct outcomes resulting from the policy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food service net revenue</td>
<td>~</td>
<td>Small or moderate impact/variable</td>
<td>None</td>
<td>No change to increase</td>
<td>Possible ***</td>
</tr>
<tr>
<td>School district or activity group vending net revenue</td>
<td>~</td>
<td>Small or moderate impact/variable</td>
<td>None</td>
<td>No change to decrease</td>
<td>Possible **</td>
</tr>
<tr>
<td>School district fund-raising revenue</td>
<td>~</td>
<td>~</td>
<td>~</td>
<td>Insufficient evidence</td>
<td>~</td>
</tr>
<tr>
<td><strong>Intermediate outcomes related to the policy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>School physical activity programs</td>
<td>~</td>
<td>~</td>
<td>~</td>
<td>Insufficient evidence</td>
<td>~</td>
</tr>
<tr>
<td>School enrichment programming</td>
<td>~</td>
<td>~</td>
<td>~</td>
<td>Insufficient evidence</td>
<td>~</td>
</tr>
<tr>
<td>Food safety</td>
<td>~</td>
<td>~</td>
<td>~</td>
<td>Insufficient evidence</td>
<td>~</td>
</tr>
</tbody>
</table>

**Possible:** Logically plausible effect with limited or uncertain supporting evidence

~ Sufficient evidence not available to evaluate this outcome with confidence

** 5+ studies of weak and moderate quality with consistent or mixed results; 5+ studies of mixed quality with mixed results

*** 5–10 strong studies with consistent findings

### 6.2 Implications of USDA Snack and a la Carte Food and Beverage Rule for Diet and Nutrition Health Outcomes

Through the use of nutrient standards, snack food and beverage policies and interventions have changed the types of foods available to students, leading to changes in student purchase and consumption patterns at school. This HIA determined that a national policy will have similar results, likely limiting the availability of unhealthy foods and beverages at schools while increasing the availability of healthier food items, such as fruits, vegetables, and whole grains. This impact becomes more certain if the policy requires that foods to encourage from the DGA are required at all points of sale. Again, because food choices made at school represent only a portion of total daily consumption, limited conclusions can be drawn about the impact of this policy on the incidence of diet and nutrition health outcomes. However, there is enough evidence and available scientific knowledge to determine how changes to the snack food and beverage environment might affect the risk of becoming obese and/or developing chronic diseases.
This HIA determines that a national snack and a la carte food and beverage rule has the potential to:

- reduce the amount of calories and potentially sugar and fat consumed by students;
- increase the amount of nutrient-dense items children consume;
- decrease the risk of dental decay, obesity, and long-term diet-related chronic diseases; and
- improve learning potential for students eligible to participate in school meals.

Snack and a la carte food and beverage policies can structure the school food environment so healthy foods are available and low-nutrient, high-calorie foods are not. Policies can require that schools sell healthy options such as fruits and vegetables at all venues, and standards can improve the nutrient content of items, for example, by limiting the total calories, fat, and sugar.

Children currently do not consume enough fruits and vegetables, a trend that has the potential to change if fresh fruits and vegetables are offered to children more frequently and in more venues. However, the literature on nutrient policies in Chapter 5 indicated that policies with no requirement for schools to offer healthy items may not increase children’s consumption of them. For example, in Washington State, school district personnel implemented nutrient standards in the form of a ban on snack foods and beverages but did not make healthier items available to students. The policy was successfully implemented, but children did not increase their consumption of fruits and vegetables, which may be due in part to the fact that offering healthier alternatives was not part of this policy. Evidence suggests that to succeed in changing eating habits, competitive food policies need to be specific about not only limiting snack foods and beverages, but also requiring healthy items, such as fruits, vegetables, and non-sugary beverages to be offered at all venues. This is reflected in the policy recommendations presented in Chapter 7.

A national snack and a la carte food and beverage policy will most greatly affect middle and high school students. Current conditions in Chapter 3 demonstrate that existing policies are weakest in secondary schools. Further, research shows that after the age of 11, children are not achieving the recommended level of physical activity, with only 8 percent of middle schools and 2 percent of high schools providing daily physical education or its equivalent. Thus, these students have fewer discretionary calories available per day for consuming “extras,” such as snack foods and beverages. Given the current high-calorie, low-nutrient composition of snack and a la carte foods and beverages, a national rule will help reduce student energy intake that contributes to the risk for obesity. This is especially important as research demonstrates that adolescence is a critical period for the development of obesity, and weight status during this developmental period is the single best predictor of adult obesity.

A national snack and a la carte food and beverage policy limiting portion sizes, sugar, and fat has the potential to reduce calories consumed by students at school, thus reducing the risk of student weight gain and diminishing the risk of diet-related chronic illnesses. The literature reviewed in Chapter 5 indicates that nutrient standards and portion size limits can help reduce students’ overconsumption of high-calorie, low-nutrient snack foods. These types of foods are associated with poor diets, high energy intake, and increased weight gain, particularly without

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A national snack and a la carte food and beverage policy limiting portion sizes, sugar, and fat has the potential to reduce calories consumed by students at school, thus reducing the risk of student weight gain and diminishing the risk of diet-related chronic illnesses.
adequate physical activity to offset high calorie intake. Given these relationships, this HIA concludes that a national snack food and beverage rule is likely to reduce student energy consumption through the setting of nutrient levels that limit total calories, calories from sugar, and calories from saturated fat among snack food and beverage offerings at school. The relationship between excess energy density and weight gain and the typically high-calorie, low-nutrient value of snack foods means the school environment should be structured to reinforce nutrient rich, low energy-dense diets, with portions that reflect an appropriate number of calories, as reflected in the recommendations presented in the next chapter.

This report also found that reductions of sugar in the diets of youth, particularly by limiting SSBs, can reduce the risk of tooth decay. In the short term, dental decay can impact student learning and academic achievement; children with tooth decay are more likely to be absent from school or in pain and unfocused when present. In the longer-term, poor oral health and periodontal disease are associated with increased risk of chronic diseases. While the relationship between SSBs and tooth decay is clear, very few studies examined the impact of snack foods on the development or prevention of dental decay (see Chapter 5).

Hunger and poor nutrition can also negatively impact children’s learning and academic achievement. For students who are already at academic risk, hunger increases the odds that they will not succeed academically. Participation in the NSLP, which is likely to increase as a result of more stringent snack and a la carte food and beverage policies, can mitigate child hunger and improve dietary intake. Additionally, as reported in Chapter 5, one study showed that students who participated in the NSLP had better academic outcomes; however, there is more existing evidence to support the link between participation in the School Breakfast Program and academic achievement. Participation in a school breakfast program can decrease tardiness and increase attendance, both factors that increase the odds of students remaining engaged in school.

Regardless of the snack and a la carte food and beverage policy enacted and implemented, social norms around school meal participation and healthy foods will be important to consider. Although there is no research showing a direct correlation between stigma and consumption of snack food and beverages or dietary outcomes, qualitative research suggests that students’ dietary habits are somewhat influenced by their peers. This provides an excellent opportunity for schools to work aggressively to consider student participation in strategies that would help make the healthy choice the “cool” choice.

### Diet and Nutrition Gaps in Literature and Inconsistent Findings

When evaluating this literature, it is important to discern that snack and a la carte foods and beverages represent just one component of a child’s total dietary environment. While the literature examines the effect of modifying snack foods and beverages on energy consumption at school, this review does not account for foods that children consume at home or bring with them to school. In order to ascertain the complete effect of competitive foods on total dietary intake, future research may need to target and evaluate the complete food environment.

Little research exists that looks into the potential for students to reserve consumption of unhealthy foods for time outside of school after the implementation of a snack food and beverage policy. One study
examined for this HIA found that students brought items from home after policies were in place, and three national studies indicate that students continue to consume SSBs outside of school regardless of sugar-sweetened beverage policy restrictions in school.\textsuperscript{698-701} In places where healthy and unhealthy items were sold, one study found that students bought proportionately more unhealthy items than healthy items, even though their overall diet improved. These studies indicate that more research is needed to better understand the relationship between food environments and dietary behaviors.\textsuperscript{702}

More studies are needed on the role snack and a la carte foods and beverages play in contributing to risk of obesity and other chronic illnesses. In Chapter 5, the HIA determined that the linkage between snack foods and beverages and student weight status is probable, however, in some cases results were inconsistent where one location was associated with higher student BMI and another was associated with lower student BMI. The literature may mirror similar inconsistencies in clinical practice where various interventions do not work for some populations, but do for others.\textsuperscript{703}

The research on learning outcomes related to diet and dietary quality was highly varied, with different research designs, populations, and outcomes assessed. Additional studies are needed to explore the relationships between diet-related chronic illness and lost learning potential.

The literature was also limited on the impact of a snack and a la carte food and beverage policy at the district and school level. Many articles described the effects of implementing state policies, and changes in wellness policies from the 2004 Child Nutrition Act; however more research is needed on the local school and district barriers for implementation and adherence.

Although portion size was examined as a mechanism to significantly reduce the energy density of snack and a la carte foods and beverages that children consumed, there was an insufficient literature base regarding the use of this method alone to limit energy consumption from these foods.\textsuperscript{704,705} In Chapter 5 this HIA noted that there were few studies exploring the relationship between student BMI and weight status over time based on changes to the school food environment. By extension, there were few studies examining how snack food and beverage intake contributes to students’ overall risk of diet-related illnesses, such as diabetes mellitus, high blood pressure, and cardiovascular disease.

One common difficulty throughout these studies was the collection of consumption data from children. Several studies collected consumption data from students via self-reported intake.\textsuperscript{706-712} Although this type of data collected immediately after school meals has been found to maximize the accuracy of these reports, self-reports are limited by memory and subject to recall and response bias, which can lead to reporting errors that can alter study outcomes.\textsuperscript{713}

Additional concerns regarding consumption data included consumption measured through observation, which may be flawed as foods, specifically SSBs, consumed at school may have come from home or convenience stores.\textsuperscript{714} Among studies measuring the effect of limiting access to SSBs in schools reviewed in Chapter 5, one was associated with significant reductions in sweetened beverage consumption, and
another concluded that a ban on SSBs would have negligible impact on consumption. In addition, the absence of consumption data from locations other than school makes conclusions regarding overall consumption of calories and other nutrients difficult to assert.

Table 6.2 (page 86) summarizes diet and nutrition outcomes, discussed in detail in Chapter 5, resulting from a national snack and a la carte food and beverage policy. The table outlines expected impacts on access to, purchase of, and consumption of both healthy and unhealthy foods and beverages, as well as the resulting effects on calorie consumption, weight, and risk of various chronic diseases. Additionally, judgments are made regarding the potential impact of such a policy on child food security, stigma, and student learning potential.

6.3 Linking the HIA Research Findings to Policy Recommendations

In Chapters 4 and 5, the HIA evaluated and weighed evidence in order to make judgments about the potential impacts a national snack and a la carte food and beverage rule could have on various outcomes. The research team developed the policy and implementation recommendations presented in Chapter 7 to increase potential positive health outcomes and minimize potential negative health outcomes. This at times involves compromises in order to balance conflicting findings. For example, the research team chose not to recommend that USDA develop a full snack food and beverage ban or to heavily restrict the beverages available in high schools because (1) making such a large-scale change would be impractical for most school districts; (2) the national rule is intended to set a baseline in which school districts have the discretion to implement more restrictions if they choose; and (3) the uncertainties surrounding school district and student group revenue findings indicate high school students may benefit from these sales in other ways, such as through enrichment programming.

Instead, the policy recommendations in this report set reasonable calorie, portion, and nutrient limits that allow for a variety of options to be offered while limiting the total calories a high school student could obtain from purchasing both a snack and a beverage to a maximum of 280 calories—10 percent of a moderately active high school student’s total dietary needs. The research team acknowledges this would be too many calories for a sedentary student to consume daily and encourages schools and districts to use other elements, such as nutrition education and promotion of healthier items to help the student make healthy choices. Such a combination of policy and education will help provide students with the skills they need to make healthy choices both in and outside of the school environment.

This HIA did not develop impact assessments on different potential levels of nutrition standards because the current evidence base did not make that feasible. Where literature on impacts of nutrition policy was lacking, the research team looked to the 2010 DGA, the IOM reports, medical literature, existing state and district policies, and other organizations’ snack food and beverage guidelines. This is the process the team used to develop a nutrient limit on sodium and total fat. It also gathered feedback from stakeholder interviews and the advisory committee in several revisions of the recommendations.
### TABLE 6.2

#### Diet and Nutrition Outcomes Resulting from a National Snack and a la Carte Food and Beverage Rule

<table>
<thead>
<tr>
<th>Impacts and outcomes</th>
<th>Impacted and most vulnerable populations</th>
<th>Magnitude of impact</th>
<th>Direction of impact on outcome</th>
<th>Likelihood of impact</th>
<th>Quality of evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Strength of impact</td>
<td>Number impacted</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct outcomes resulting from the policy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>District policies will require school foods sold meet DGA</td>
<td>Children in schools without strong snack and a la carte food and beverage policies</td>
<td>Strong Impact</td>
<td>Many+</td>
<td>Increase</td>
<td>Certain</td>
</tr>
<tr>
<td>Access to healthy foods and beverages</td>
<td>All children, low-income, Hispanic, and black children</td>
<td>Small to moderate impact</td>
<td>Many+</td>
<td>Increase</td>
<td>Likely if policy only suggests access to healthier options, such as the DGAs foods to encourage; certain if these options are required at all access sites</td>
</tr>
<tr>
<td>Access to unhealthy foods and beverages</td>
<td>All children; low-income, Hispanic, and black children</td>
<td>Small to moderate impact</td>
<td>Many+</td>
<td>Decrease</td>
<td>Certain</td>
</tr>
<tr>
<td>Purchase or consume healthy foods and beverages in school</td>
<td>Secondary students</td>
<td>Small to moderate impact</td>
<td>Many</td>
<td>Increase</td>
<td>Likely if policy only suggests access to healthier options, such as the DGAs foods to encourage; certain if these options are required at all access sites</td>
</tr>
<tr>
<td>Purchase or consume unhealthy foods and beverages in school</td>
<td>Secondary students</td>
<td>Small to moderate impact</td>
<td>Many</td>
<td>Decrease</td>
<td>Likely</td>
</tr>
<tr>
<td>School caloric consumption</td>
<td>All children</td>
<td>Small to moderate impact</td>
<td>Many</td>
<td>Decrease</td>
<td>Likely</td>
</tr>
</tbody>
</table>

Intermediate outcomes related to the policy

| Chronic illness: Type 2 diabetes, high blood pressure, high cholesterol | All children; type 2 diabetes—black, Hispanic, low-income, high blood pressure—black and Hispanic; high cholesterol—low-income, non-Hispanic white; overweight and obese children | None to small impact | Many | Reduce risk | Possible | x |
| Healthy weight | All children; low-income, black, Hispanic children | None to small or moderate impact | Many | Maintain | Possible | x |
| Overweight | All children; low-income, black, Hispanic children | None to small impact | Many | Reduce risk | Possible | x |
| Obesity | Currently obese children; low-income, black, Hispanic children | None to small impact | Many | Reduce risk | Possible | x |

Outcomes related to the policy

| Child food security | Students eligible for free/ reduced meals | Small to moderate impact | Moderate | Increase | Possible if NSLP participation increases | x |
| Stigma | Students eligible for free/ reduced meals | ~ | ~ | Insufficient evidence | ~ |
| Learning potential | All children; low-income, overweight, obese, black, and Hispanic children | Small to moderate impact | Moderate | Increase | Possible | ** |

Unlikely: Logically implausible effect; substantial evidence against mechanism of effect
Possible: Logically plausible effect with limited or uncertain supporting evidence
Likely: Logically plausible effect with substantial and consistent supporting evidence and substantial uncertainties
Very likely/Certain: Adequate evidence for a causal and generalizable effect
+ 60–75% of public school children
~ Sufficient evidence not available to evaluate this outcome with confidence
* <5 studies, inconsistent results, and the claim is consistent with public health principles
** 5+ studies of weak and moderate quality with consistent or mixed results; 5+ studies of mixed quality with mixed results
*** 6–10 strong studies with consistent findings
**** 10+ strong studies with consistent findings

**Health Impact Assessment:** National Nutrition Standards for Snack and a la Carte Foods and Beverages
6.4 Effective Implementation of Snack Food and Beverage Policies

Regardless of the specifics of USDA policy, those responsible for implementation might be challenged by a range of issues. As previously mentioned, technical assistance will help improve the likelihood that the policies will be effectively implemented and mitigate any possible negative consequences. Two studies indicate the need for technical assistance to accompany policy implementation. One examined the impact of district practices after the implementation of a state nutrition policy in Washington, finding that although more schools restricted access to snack foods and beverages based on the time of day, schools also offered fewer healthy food options in these venues.717 As a result, implementation of the policy effectively acted as a ban rather than limiting unhealthy options and increasing healthy options. The second study found that after implementing a Texas nutrition policy three middle schools altered beverage contracts and snack machine inventories and offered more fruits and vegetables in a la carte options; however, the snack bar then provided more unhealthy items, and children brought more sugary drinks, desserts, candy, and snack chips from home.718 These findings serve as a reminder that the school food environment is only one access point to unhealthy items for students.

Advisory committee members and interviewed stakeholders also emphasized the need for technical assistance and support for effective implementation. This includes not only having solid ideas for implementation, such as those contained in this report’s Promising Practices section in the next chapter, but also having a strong planning process that includes constant quality monitoring, assessment, and a mechanism for revising and updating plans if implementation does not go as planned.

Fortunately, many states and districts have already successfully implemented robust snack and a la carte food and beverage policies and can serve as examples to others. Many have published toolkits or guides, or have other materials publicly available for reference. Additionally, many nongovernmental partners provide critical funding, support, and technical assistance to schools in their efforts to improve the nutrition environment. Federal agencies, such as the CDC and USDA’s Food and Nutrition Service, are also funding similar or complementary efforts in both the school and community settings. These additional funding streams can provide resources, staff, and expertise to assist in the effective implementation of new regulations.

6.5 HIA Limitations

This report’s findings relate only to changes to snack and a la carte foods and beverages in schools. These foods are only one part of the entire school food and nutrition environment. Studies indicate that comprehensive changes related to food and physical activity—including changes to foods offered, policies about fund-raisers, nutrition education, and increased physical education or opportunities to be physically active—are needed to change social norms and behaviors among schools and students.719-727
Schools have the potential to play a powerful role in promoting good health among students and adults who spend many hours there every day, including a beneficial nutrition environment, for the sake of school and student well-being. Many educators, policy makers, parents, and others feel it is a school’s responsibility to provide as positive and healthy an environment for students as possible. Students learn as much or more from social and environmental cues as from lessons in a classroom. When students see unhealthy foods in the school setting, such as in the school cafeteria or vending machines, it can undermine any messages about healthy eating students might hear at home or in health education or other venues.728-731

The school environment is still only one of many social and physical environments where youth spend their days, albeit many hours of the day. Home dietary practices; general social norms, such as peer and parent behaviors around food; and neighborhood eating venues also influence students’ eating choices.732,733 The highest mean amount of energy consumed from low-nutrient, energy-dense foods comes from those eaten at home.734 Neighborhood structure is powerful; studies have found that children are more likely to be overweight if they live in close proximity to fast-food establishments.735-744 For example, one study found that children who lived within one-tenth or one-quarter of a mile from a fast-food restaurant had significantly higher BMI measures, while another found that students were at an increased risk of being overweight or obese if they attended school within a half-mile of a fast-food restaurant.745,746 A national snack food and beverage policy will not address these food environments; however, it will help ensure schools are a healthy influence on children’s dietary choices.

This HIA also did not examine specific nutrition elements that might have an effect on child health and long-term health outcomes, such as caffeine, artificial sweeteners, water flavoring, carbonation, or food supplementation. The research team followed guidance from Section 208 of the HHFKA on elements to include in the analysis. Presumably, these elements could have an additional impact on child health and nutrition.

Another goal of this HIA was to examine potential health disparities and inequities resulting from a national snack and a la carte food and beverage rule. The HIA was unable to tease these nested disparities apart completely given the limitations of the available data. The existing conditions indicate differences among age, socio-economic status, race and ethnicity, and region of the country in terms of access to and consumption of snack foods and beverages. Data was limited for certain population subgroups, such as Native American. The information needs to be revisited in order to better understand various health disparities and health equity by population and health outcomes.

For example, current conditions in Chapter 3 indicate that students from a higher socio-economic status have more access to both healthy and unhealthy food items at all ages.747-749 However, studies indicate that low-income and black children are more likely to purchase and consume snack foods and beverages such as soft drinks.750-752 Hispanic and black students have more access to specific types of venues, such as school stores and snack bars in secondary schools.753-755 For example, a 2005 study that surveyed children who were non-Hispanic black, Hispanic, or biracial showed an increased likelihood of purchasing from a
vending machine at least once a week when compared to their non-Hispanic white peers.\textsuperscript{756} Two studies also indicate regional differences across the country, with children in the South significantly more likely to consume soft drinks at school, based on availability.\textsuperscript{757,758}

There are inconsistencies related to healthy eating behaviors. For example, research shows that non-Hispanic black children and adolescents consumed significantly more dark-green vegetables and fewer deep-yellow vegetables than Hispanic, specifically Mexican-American, and non-Hispanic white children and adolescents.\textsuperscript{759} This same study found that boys, adolescents, and lower-income children at risk of overweight or obese are most at risk for higher intakes of higher-calorie fruits and vegetables, such as juices and fried foods.\textsuperscript{760}

A future study is needed to clarify these important distinctions because certain demographic groups are at greater risk of dietary and health challenges. For example, more than twice as many black and Hispanic children are food insecure or experiencing very low food security compared to white non-Hispanic children.\textsuperscript{761} Low-income children, black non-Hispanic children, and Mexican children have higher rates of untreated dental caries than their white, non-Hispanic counterparts.\textsuperscript{762} Black and Hispanic low-income males and male youth were more likely to have a BMI at or above the 85th percentile between 1988 and 2003.\textsuperscript{763} There are also inconsistencies in measures of risk. For example, from 1999 to 2006, the CDC found that more non-Hispanic whites had at least one abnormal lipid measure associated with cardiovascular disease and obesity than non-Hispanic black youths.\textsuperscript{764}

Finally, this HIA considered only scenarios that USDA might propose and ultimately implement. As noted in Chapter 3, current snack and a la carte food and beverage policies at the state and local level differ widely. In some cases, the existing policy will have more restrictions or will consider elements that USDA does not include. National regulations, as promulgated by USDA, are meant to offer a minimum level of guidance. States and districts can go further, depending on the needs and context of the state or district. The research team found that the stronger or more restrictive the guidelines, the greater the potential for health impacts. States currently with a weak or no policy will be most affected with the implementation of USDA’s nutrition standards for snack food and beverages in the schools.
7.1 Introduction

This chapter outlines a set of administrative and operational recommendations to address potential health and financial impacts of developing and implementing nutrition standards for snack foods and beverages sold in schools. Specifically, the research team and advisory committee developed these recommendations to maximize the positive impact that strong policies can have on the health of children, and to minimize the possible negative impact on revenue generated from the sale of snack foods and beverages.

In crafting recommendations, the research team considered the HIA findings, the principles of the 2010 Dietary Guidelines for Americans, the nutrition standards for foods sold in schools recommended by the Institute of Medicine and the Alliance for a Healthier Generation, and existing state policy and standards used in individual school district wellness policies. Recommendations draw on the available scientific literature, well-accepted principles of public health and nutrition, and the knowledge and judgment of the advisory committee.

Outline of Recommendations

Recommendation 1: USDA Nutrition Standards for Foods
- Foods to encourage
- Age-appropriate calorie limits
- Maximum limit for sugar
- Maximum limits for fats
- Incremental reductions in sodium

Recommendation 2: USDA Nutrition Standards for Beverages
- Beverages in elementary and middle schools
- Sugar-sweetened beverages in high schools

Recommendation 3: Implementation
- Training and technical assistance
- Clear guidance to address terms
- Updating nutrition standards
- Monitoring implementation
7.2 Administrative Recommendations

This section consists of recommendations for USDA to consider in developing competitive food and beverage regulations and implementation strategies. There are three primary recommendations addressing nutrition standards for foods, nutrition standards for beverages, and implementation.

Recommendation 1: USDA should establish nutrition standards for all foods sold regularly on school grounds outside of the school meal programs. These standards should include:

- a requirement that schools sell items from the Dietary Guidelines for Americans list of “foods to encourage;”
- age-appropriate calorie limits for items sold individually (snacks: 100 calories for elementary, 140 calories for middle, and 180 calories for high school students; entrée items: 300 calories for elementary and middle and 400 calories for high school students);
- a maximum of 35 percent of total calories from sugar;
- maximum limits for fats (no more than 35 percent of calories from total fat, 10 percent of calories from saturated fat, and less than or equal to 0.5 gram of trans fat per serving); and
- incremental reductions in sodium, with a target timeframe of 10 years, to achieve full alignment with the Dietary Guidelines for Americans.

Recommendation 2: USDA should establish nutrition standards for all beverages sold on school grounds. At a minimum, these standards should:

- limit beverages sold in elementary and middle schools to only water, low-fat and fat-free milk, and 100 percent fruit juice in appropriate portions; and
- establish calorie and serving size restrictions for all beverages sold in high schools so as to ensure calories obtained from sugar-sweetened beverages during the school day are minimal.

Recommendation 3: USDA should adopt policies and practices that ensure effective implementation of the standards. At a minimum, USDA should:

- provide technical assistance and training to schools and districts;
- provide clear guidance that addresses the terms infrequent, school day, and school campus as included in the Healthy, Hunger-Free Kids Act;
- ensure that nutrition standards are kept up to date with future iterations of the Dietary Guidelines for Americans; and
- collaborate with states and non-governmental organizations to monitor the implementation of the standards.
CHAPTER 7

POLICY RECOMMENDATIONS

7.3 Discussion of Recommendations

Recommendation 1: USDA Nutrition Standards for Foods

With children in the United States struggling nationally to meet basic dietary recommendations as set forth in the 2010 Dietary Guidelines for Americans, it is important that USDA set nutrition standards for all foods sold in schools outside of the school meal programs. These standards should aim to increase access to healthy foods and beverages, while also decreasing access to unhealthy items.

- Foods to encourage

It is important that USDA require all venues, including school stores, vending machines, and a la carte lines, to sell items from the 2010 Dietary Guidelines for Americans list of foods to encourage, such as fruits, vegetables, low-fat dairy, and whole grains. Fruits and vegetables should be allowed in all forms—fresh, frozen, canned, and dried—as all provide essential vitamins and minerals. All of these items, including combination products such as granola bars or trail mix, which may contain whole grains and some fruit, should meet additional nutrient standards as outlined in Recommendation 1.

While fortification was outside of the scope of this HIA, USDA should recognize that this could be an issue with nutrients of concern, especially in combination products as described in the previous paragraph.

Precedent exists for requiring all venues where food is served to provide items from the Dietary Guidelines for Americans foods to encourage category. As of 2010, 34 states have policies in place partially meeting the IOM’s recommendation that only Tier 1 foods, which include foods to encourage from the 2010 Dietary Guidelines for Americans, be allowed during the school day.

- Age-appropriate calorie limits

With one in three children in the United States currently overweight or obese, it is important for USDA to set calorie limits for snack and a la carte foods and beverages using ranges that are determined based on age/grade levels and estimating current physical activity, rather than applying one maximum calorie level across all age groups.

For non-entrée items, this limit should be within 10 percent of the range of daily estimated energy needs by age for children with low physical activity (PA), as suggested in the 2010 Dietary Guidelines for Americans’ dietary pattern.765

- Elementary school = 1000 (low PA)—1600 (moderate PA) calories/day;
  10 percent low = 100 calories/item
- Middle school = 1400 (low PA)—2000 (moderate PA) calories/day;
  10 percent low = 140 calories/item
- High school = 1800 (low PA)—2800 (moderate PA) calories/day;
  10 percent low = 180 calories/item
Foods sold individually as entrées (i.e., a la carte) should meet a total calorie limit consistent with the comparable National School Lunch Program entrée items they replace, with a maximum of 400 calories for entrées served in high school, and 300 calories for entrées served in elementary and middle schools.

The calorie ranges included in this recommendation are broken down for elementary, middle, and high school age levels and include low and moderate activity levels. They are indicated for weight maintenance and do not take overweight or obesity into account.

Research discussed in Chapters 5 and 6 indicates that the increase in child weight observed between 1988 and 2002 may have been prevented by an average reduction of 110–165 calories per day. This is the difference of providing an elementary student a 150-calorie snack rather than a 250-calorie snack, as indicated by the child’s daily energy needs. Combined with a recent study conducted by the National Institutes of Health National Cancer Institute demonstrating that physical activity levels are not high enough in children to compensate for excess calorie consumption, these trends indicate that USDA should stick to the lower end of the indicated calorie range. Such research also indicates the need for calorie caps on a la carte entrée items.

While implementation of varying calorie levels may be challenging at the school level, schools participating in the Alliance for a Healthier Generation’s Healthy Schools Program have shown it can be done. The Alliance’s Competitive Foods Guidelines use calorie limits based on age and grade levels—150 calories for elementary, 180 calories for middle, and 200 calories for high school—that are currently being applied in more than 14,000 schools across the country. Similarly, state policies in Massachusetts, Oregon, and California use different calorie limits for age and grade levels. Iowa, Oregon, and California also set maximum calorie limits for a la carte entrées.

■ Maximum limit for sugar

It is common for a limit on sugar content of foods to be included in nutrition recommendations. The 2010 Dietary Guidelines for Americans suggests that most Americans should obtain no more than 15 percent of calories from added sugar; however, this recommendation is difficult to put into practice at this time because manufacturers are currently not required to list added sugars as part of the nutrition facts panel. Most existing state and local policies are primarily based on the 2007 IOM recommendations for competitive foods—a maximum of 35 percent of calories from total sugars per portion in snack foods and beverages. As several of the Dietary Guidelines for Americans foods to encourage have naturally occurring sugars, exceptions should be allowed for:

- 100 percent fruits and fruit juices in all forms without added sugars;
- 100 percent vegetables and vegetable juices without added sugars; and
- unflavored nonfat and low-fat milk and yogurt.

However, it is important to note that IOM intended for this 35 percent ceiling to be an interim recommendation until added-sugars information is more readily available to school food service operators. When this information does become available, USDA should consider updating the standard to a maximum of 25 percent of total.
calories from added sugars. This change will be important given the research presented in Chapter 5 that shows that increased sugar consumption is linked to a variety of negative health impacts, including dental caries, which are a leading cause of school absences, and by extension can be linked to adverse learning outcomes.

Of the 19 state policies with nutrient standard restrictions that partially or fully meet the 2005 Dietary Guidelines for Americans examined in detail for this HIA, 15 include limits on total sugar that are in line with IOM (see Appendix 7). However, this does not include states with voluntary recommendations.

Several states also have sugar limits based on a percentage of the total weight of the product. While there is no research to determine what type of sugar limit is more effective (i.e., one based on a percentage of total calories from sugar versus one based on a percentage of total weight of the product), the HIA policy analysis determined that a standard based on calories would allow for a greater variety of products in schools. The IOM committee on school foods found similar results in its analysis.

USDA’s recently revised nutrition standards for school meals do not contain a total sugar limit because USDA determined that sugar would be limited by a cap on total calories. While this approach is logical for school meals that include multiple components, limits on total sugars are important for individual food and beverage items. Consider fruit-type snacks—a 120-calorie product can contain more than 50 percent of its total calories from sugar. This is the case for many types of snack products, especially those that are energy-dense.

- **Maximum limits for fats**

While some amount of fat is important in every diet, research indicates that consumption of too much fat, especially too much saturated and trans fats, is associated with negative health outcomes, such as increased risk for overweight, obesity, and chronic diseases. More specifically, overconsumption of saturated fat is linked to increased risk for coronary heart disease and type 2 diabetes; overconsumption of trans fat can increase “bad” cholesterol while simultaneously decreasing “good” cholesterol. Strong evidence supports the need for USDA to set limits in these areas, especially as children are increasingly being diagnosed with these chronic conditions, as outlined in Chapter 5.

The above recommendations for total, saturated, and trans fats are consistent across the 2010 Dietary Guidelines for Americans, the IOM, the Alliance for a Healthier Generation, and many state and local policies.

- **Incremental reductions in sodium**

Research suggests that modest population-wide reductions in dietary salt could substantially reduce cardiovascular events and medical costs. More specifically, a recent study suggests that reducing dietary salt in adolescents could yield substantial health benefits by decreasing the number of teenagers with hypertension and the rates of cardiovascular disease and death as these teenagers reach young- and middle-age adulthood.
The 2010 Dietary Guidelines for Americans suggests that people should reduce their intake of foods with added sodium, but changes will need to be made gradually in order for taste preferences to adjust, as Americans have become accustomed to salty foods. With few district-level policies meeting the 2007 IOM recommendations for sodium in snack foods (maximum of 200 mg per portion for snack foods and maximum of 480 mg for a la carte entrée items), the most commonly used is the Alliance for a Healthier Generation standard, which ranges from 230 mg to 480 mg.

Reducing sodium in foods sold outside of the school meal programs is possible, but it will need to be done gradually as recommended in the recent changes to nutrition standards for school meals. In this case, IOM recommended a gradual but significant reduction in sodium over time and suggested that USDA establish intermediate targets to help schools progress to the final sodium standards for each age and grade group. This type of gradual reduction over a 10-year period is consistent with public health initiatives aiming to reduce sodium in the nation’s food supply. USDA should adopt a similar procedure for reducing sodium in foods sold outside of the school meal programs.

**Recommendation 2: USDA Nutrition Standards for Beverages**

- **Beverages in elementary and middle schools**
  All beverages for sale to elementary and middle school students outside of the school meal programs should be limited to water, nonfat or low-fat (1 percent or less) milk or USDA-approved milk alternatives, and 100 percent fruit juice (or 100 percent juice diluted with water) with no added sugars. As discussed in Chapters 5 and 6, research shows that when beverages are limited to only water, milk, and 100 percent juice, children consume more healthy drinks.

  While low-fat milk (or USDA-approved milk alternatives) and many 100 percent juices provide essential vitamins and minerals, it is important that consumption still be limited given calorie, fat and sugar levels. As such, USDA should set maximum portion sizes for these beverages. The IOM recommends limiting milk (or USDA-approved milk alternatives) to eight-ounce servings across all grades, while the Alliance limits milk and USDA-approved alternatives to eight-ounce servings in elementary, 10-ounce servings in middle, and 12-ounce servings in high schools. For juice, the Alliance applies the same portion limits as for milk, while the IOM recommends four-ounce servings in elementary and middle schools, and eight-ounce servings in high schools.

  This report does not recommend that USDA apply a maximum serving size to water; however, it suggests that the term water be clearly defined. With the plethora of new water products in the market place that feature added flavorings, essences, carbonation, etc., it is important for USDA to clearly define what is or is not allowed. Massachusetts is an example of a state policy that has addressed this issue.

- **Sugar-sweetened beverages in high schools**
  In high school settings, USDA should similarly require water, milk, and juice to be sold at all venues. Additionally, the sale of other beverages meeting calorie and portion size requirements should be permitted.
As presented in Chapter 5, studies reviewed for this HIA suggest that total energy intake can be significantly reduced by replacing higher calorie beverages with lower-calorie alternatives, indicating that a calorie limit on beverages is necessary. While many state policies have set limits on sugar-sweetened beverages, very few meet the IOM recommendation of eliminating them entirely from all schools.

Recent research demonstrates that calories consumed from beverages do not contribute to feelings of fullness, and thus often do not replace calories from food. This evidence, combined with the fact that students often have the ability to purchase both a snack food and drink while at school, suggests that USDA should set calorie limits for beverages that are as close to zero as possible.

The Alliance for a Healthier Generation, in collaboration with industry, has established limits on portion sizes and calories for beverages sold in schools as follows:

- no- or low-calorie beverages with up to 10 calories per eight ounces are allowed in any size; and
- other drinks allowed in up to a 12-ounce portion with a maximum of 99 calories (66 calories per eight ounces)

While these standards have been widely accepted and implemented in schools participating in the Alliance’s initiative, research indicates that USDA should set stricter limits in order to have an impact on total calorie intake.

**Recommendation 3: Implementation**

- **Training and technical assistance**

USDA should provide technical assistance (TA) to local education agencies to assist schools and districts as they implement these updated standards. This TA should be geared toward multiple stakeholders in the school environment, including school personnel (e.g., food service staff, teachers, athletic directors, coaches, administrators, etc.), student groups, and parent groups such as the Parent Teacher Association. USDA should consider partnering with other entities, such as the Department of Education, the CDC, and nongovernmental organizations, to provide this TA.

Many types of TA have proven useful at the state and local levels, including:

- lessons learned from districts that have successfully made the transition to offering healthier foods;
- suggestions for addressing common implementation issues, such as education, promotion of new items, purchasing and/or vendor issues, and student acceptance;
- ideas for nonfood items that have successfully been used by student groups and school districts to generate revenue; and
- recommendations for schools and districts to develop alternative revenue streams during the transition to healthier products.
At a minimum, USDA should provide TA on the revenue issue. As presented in Chapter 4, research shows that some schools and districts may face initial financial fluctuations upon making changes in snack food and beverage offerings. Typically in these situations, schools report a decrease in vending machine profits; however, school meal participation and, by extension, proceeds from this program, tend to increase. Therefore, USDA should place an emphasis on increasing enrollment and participation in the National School Lunch and Breakfast Programs. Additionally, USDA should offer TA on preferential pricing strategies—setting healthier food prices 25 to 50 percent lower than less healthy snacks results in an increase in their purchase. Such pricing strategies, in combination with promotion of healthy food, can result in a positive or neutral effect on the overall school food budget.

Furthermore, because other areas besides food services may benefit from vending machines and school store sales, USDA should provide ideas for schools and districts to assist in developing alternative revenue streams during this transition period.

- Clear guidance to address terms

As required by the Healthy, Hunger-Free Kids Act, USDA should provide guidance to schools on how to address the terms infrequent, school day, and school campus. USDA does not currently have such definitions in place.

While the literature does not provide enough evidence for this HIA to recommend optimal definitions for infrequent or school campus, several variations of the term school day are used in practice. USDA should consider these existing definitions in crafting possible recommendations. Definitions should be created in such a way that third parties, such as outside companies, are required to be in compliance with these nutrition standards if soliciting sales on school grounds.

- Updating nutrition standards

Section 208 of the Healthy, Hunger-Free Kids Act requires that USDA review the nutrition standards for foods sold outside of the school meal programs with the release of a new edition of the Dietary Guidelines for Americans. If USDA and HHS determine that a new set of DGA will be released in 2015, it will be important to determine if the changes warrant modifications to any of the standards established for foods sold outside of school meals.

- Monitoring implementation

USDA should collaborate with states, nongovernmental organizations, and other stakeholders to monitor implementation of nutrition standards for foods sold outside of the school meal programs in order to increase accountability.
Stakeholders interviewed for this HIA emphasized that the implementation of a national snack food and beverage rule should include monitoring systems and accountability to ensure optimal implementation of updated standards. Under Section 244 of the Healthy, Hunger-Free Kids Act, a research, demonstration, and technical assistance program was established, a component of which involves determining what implementation barriers exist and then helping districts with technical assistance to address them. While this has not yet been funded by Congress, executing this research study and applying the findings will be critical to supporting districts with implementation. It may be beneficial for USDA to set aside such funding in its budget for monitoring and enforcement of these rules.

USDA should clarify specific indicators that will be monitored, who will do the monitoring and how often, and how the results will be reported. Many organizations such as Bridging the Gap are already engaged in monitoring school food environments. USDA should consider collaborating with non-governmental organizations to assess progress and identify additional needs for technical assistance. States should also be encouraged to monitor implementation and increase accountability. States could also require districts, through local wellness policies or by other means, to report on their progress toward implementation or publicly disclose all products sold in schools in order to increase transparency.

7.4 Promising Practices in Support of Implementation

This section of the report discusses promising practices for school districts and states to consider that are complementary to national snack food and beverage nutrient standards. Implementation of any new policy is challenging; however, numerous food service and district personnel have successfully implemented many of these policy changes to date. These recommendations draw from those successful experiences, as well as stakeholder interviews, research, and existing toolkits, and are intended to improve children’s health while also mitigating financial risk. While many of them have not been formally evaluated, additional research could be done in each of these areas. Where possible, these promising practices are cited back to a data source.

These promising practices are divided into six categories: integration, communication, and outreach; overarching implementation suggestions; school food environment; food service implementation; vendor relationships; and fund-raising.

Integration, communication, and outreach

When implementing updated nutrient standards for snack foods and beverages, it is important to consider other assets to enhance or amplify the effects of these standards at the school or district level. For example, it may prove useful to integrate these new regulations and strategies for achieving them into the local school wellness policy. The amount and type of resources needed for this transition to healthier items will vary from school to school. As such, it may be necessary to explore available complementary funding, expertise from institutions of higher education, and lessons learned from similar districts that have successfully made the transition to healthier products.
Experience has shown that including communication—whether to students, school personnel, the school board, or the broader community—about the reasons for policy changes is an important part of implementation, which leads to greater buy-in. Most stakeholders interviewed for this HIA mentioned that education was an important component of changing the school food environment. Involving students in food selection and educating them about reasons for new nutritious items, for example, can lead to improved student acceptance of menu changes and consumption of healthier food items.

Research and stakeholder interviews demonstrate that, when possible, students should be involved in the selection of the healthier food portfolio. One stakeholder interviewed for this HIA indicated that Utah and Indiana conducted surveys, focus groups, and taste tests with students to identify their food preferences. Another approach is to gather feedback from students around new menu items, which can help address the scaling challenges that accompany translating taste-test results to ongoing food preparation. This method is also similar to seasonal menu-planning used by districts engaging in farm to school activities. The National Education Association has many resources available to assist in developing and disseminating educational campaigns geared toward school and food service personnel. Similarly, it may be beneficial to ensure that the local school board and school governance representatives are involved in a meaningful and sustained way during the development of guidance, regulations, and policy at every stage of development and implementation.

- **Overarching implementation suggestions**

While the nutrition standards for snack foods and beverages set by USDA will apply only to foods sold on campus to students, several stakeholders, including some education groups, interviewed for this HIA expressed the need for these standards to apply to all foods and beverages sold on campus regardless of student access (i.e., staff or teacher lounges). The most common reasoning provided was that it is important for teachers and school staff to send a consistent message to students.

Additionally, several stakeholders recommended closing campuses so that students may not leave during the day to purchase lunch elsewhere. Currently, 90 percent of schools across the United States operate under a closed campus policy; however, 30 percent of high schools still have an open campus policy that allows students to leave during the lunch hour. While some schools have this policy in place due to a lack of space for serving school meals on campus, those schools where it is administratively feasible may want to consider this option.

- **School food environment**

As discussed in Chapter 1, the school food environment plays an important role in shaping students’ eating behavior at school. The food and beverages available at schools can affect food choices and thus consumption patterns among students. In order to ensure successful implementation of a healthier school food environment, schools and districts must look beyond snack foods and beverages to other policies that also affect student food access. For example, a local school or district may choose to set standards for foods that are not for sale, and thus outside the scope of the Healthy, Hunger-Free Kids Act, but are widely available in schools, such as those provided for classroom parties, treats, and student rewards.
Similarly, altering the physical environment to make the healthy choice the easy choice is more likely to result in increased purchase and consumption of healthier foods. For example, streamlining the a la carte and school meal purchase lines will likely result in a higher percentage of students purchasing a reimbursable school meal. Schools may also consider making the cafeteria space more comfortable and less chaotic or noisy by adjusting schedules to give students more time to eat a meal, and possibly placing recess before lunch. While this is not an option in all schools, those that have adequate space to do so may consider making these changes.

Finally, USDA, states and local governments, and departments of education and agriculture can work to ensure that there is adequate kitchen equipment, space, training for staff, and other necessary infrastructure for implementation. It is likely that, with serving a larger quantity of fresh, healthy food items, staff will need more training, storage, refrigeration, and equipment for proper food preparation. Specifically, it will be important to provide technical assistance to food service staff on cafeteria configuration techniques, for instance to highlight healthier items such as fruit by displaying them at eye level. Additional promising practices to consider when altering the physical environment include preferential pricing, enhanced visual appearance, marketing and promotion, and repeated exposures to healthy food.

- **Food service implementation**

Information uncovered in the stakeholder interviews and literature review indicate that additional training and technical assistance should be provided to food service staff upon making the transition to serving healthier foods in schools. Several promising practices were uncovered, including:

- offering multiple vegetable and fruit options simultaneously and ensuring that when fresh produce is available, it is appealing (for example, free of blemishes) to encourage student selection;
- placing healthier foods such as the salad bar and fruit bar at the beginning of the lunch line where feasible;
- planning menus strategically and redistributing labor so that items requiring hands-on work (like preparing apple or orange slices) are paired with lower-maintenance sides such as frozen broccoli or whole fruits;
- purchasing ready-cut fresh fruits and vegetables when they are affordable (or partnering with the school garden for herbs like basil); and
- participating in farm-to-school programs and/or partnering with local growers to increase the availability of fruits and vegetables.

References to farm-to-school programs were often found in the literature as a promising practice for increasing consumption of healthier items without significantly increasing costs. For example, in Kentucky, schools that purchase Kentucky-grown products receive a rebate between 14 and 16 percent of the total cost of the food. This incentive has encouraged the Montgomery County school district to develop more relationships with local growers. Other states may want to consider offering similar rebates to districts and counties purchasing healthy in-state products.
Although not examined in this HIA, advertising and marketing of unhealthy products in the food environment also shapes dietary behavior; adolescents are exposed to a high volume of these messages.\textsuperscript{778-781} While a national snack food and beverage policy will support schools in promoting healthier food options in the school food environment, more research may be needed on best practices for marketing these healthier items.\textsuperscript{782,783}

- **Vendor relationships**

When implementing snack food and beverage standards, it will be important for schools and districts to communicate these standards to vendors and work collaboratively to identify options that are in compliance with the updated guidelines. Stakeholders interviewed for this HIA recommend that schools should aggressively promote and market these healthier food options to students and may even consider offering the healthier items at a reduced price in venues where this is feasible such as the a la carte line.

The school does have the authority to set prices in the a la carte line; however, the school is often not the entity setting the prices in vending machines. Additionally, vendors often have contracts with companies to advertise unhealthy foods and beverages on the outside of vending machines placed in schools. When possible, schools may choose to prohibit the advertising on vending machines of foods that do not meet nutrition standards. Some vendors already have policies in place that require their vending machine fronts to match the products for sale in the machines. Product pricing and marketing may serve as important negotiating points when renewing contracts with vendors.

Non-governmental organizations might consider providing technical assistance to schools and districts around vendor contracts, such as sample letters to vending companies about providing healthier options, and when applicable, changing the images on vending machines to include only those that meet the standards.

- **Fund-raising**

While USDA will set a standard around fund-raisers, likely addressing the frequency of those that are food related, it will be important for schools to also take a proactive stance on the topic. Food-related fund-raisers can be healthy. Consider selling boxes of seasonal fruits and vegetables, specialty foods, and gift baskets, etc. For example, farm-raisers have been a big hit across the country, selling items such as locally produced salsas and jams. Additionally, there are many options for nonfood-related fund-raisers. Examples include selling lotions, soaps, or other bath products; kitchenware; jewelry; candles; raffle tickets for items such as gift certificates, electronics, and events; and movement related activities, such as walk-a-thons or dance-a-thons. The National Alliance for Nutrition and Activity\textsuperscript{1} and the Alliance for a Healthier Generation\textsuperscript{2} both have multiple resources available for healthy fund-raising ideas.

\textsuperscript{1}National Alliance for Nutrition and Activity alternative fund-raiser information can be found at www.cspinet.org/nutritionpolicy/priority_nutritionprogram.html.

\textsuperscript{2}Alliance for a Healthier Generation alternative fund-raiser information can be found at schools.healthiergeneration.org/.
7.5 Summary

Setting national nutrition standards for competitive foods in schools will encourage the increased consumption of foods children need while discouraging the excess consumption of calories, unhealthy fats, sodium, and sugar. Such a change has the potential to shift children’s diets enough to impact their overall health, a critical outcome given the current trends toward increasing overweight, obesity, and chronic illness among young people.

Implementation of these standards may not be simple, but the promising practices discussed in this HIA and developed by school districts already embracing healthy standards, offer a credible way forward. If implemented effectively at the district and school level, these changes can be made with little to no negative financial impact and may even result in improved financial outcomes for schools and districts. Thus, USDA should promulgate scientifically sound nutrition standards and adopt practices—as recommended by this HIA—that are most likely to maximize positive health impacts while assisting schools in effectively implementing new standards.
Acronyms and Abbreviations

Alliance—The Alliance for a Healthier Generation
BMI—Body mass index
CCD—Common Core of Data
CDC—Centers for Disease Control and Prevention
CLASS—Classification of Laws Associated with School Students
DGA—Dietary Guidelines for Americans
ES—Elementary school
FMNV—Foods of minimal nutritional value
HHFKA—Healthy, Hunger-Free Kids Act
HHS—United States Department of Health and Human Services
HIA—Health impact assessment
HS—High school
IOM—Institute of Medicine
LEA—Local Education Agency
MS—Middle school
MTF—Monitoring the Future study
MVPA—Moderate-to-vigorous physical activity
NHANES—National Health and Nutrition Examination Survey
NSLP—National School Lunch Program
PA—Physical activity
RDA—Recommended Daily Allowance
RIA—Risk impact assessment
SES—Socioeconomic status
SFA—School Food Authority
SNDA III—School Nutrition Dietary Assessment III
SNESPCS—School Nutrition-Environment State Policy Classification System
SSB—Sugar-sweetened beverage
TA—Technical assistance
USDA—United States Department of Agriculture
SBP—School Breakfast Program
YES—Youth, Education, and Society study
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TABLE A1.1 Principles of the 2010 Dietary Guidelines for Americans

<table>
<thead>
<tr>
<th>Differences by grade level</th>
<th>Age-level differences in food guide calorie levels for meal patterns, sodium suggestions by age</th>
</tr>
</thead>
</table>
| Calories                   | Reduce empty calorie intake from solid fats and added sugars; USDA food pattern calorie limits for sedentary and moderately active children are:  
  • Elementary school (ES) = 1,000–1,600; 10% = 100–160  
  • Middle school (MS) = 1,400–2,000; 10% = 140–200  
  • High school (HS) = 1,800–2,800; 10% = 180–280 |
| Sugar                      | Reduce intake of foods with added sugar; most people should get a maximum of 15% calories from added sugar |
| Saturated and trans fats   | Trans fat: <0.5 g per serving  
  Saturated fat: <10% calories per serving  
  <300 mg per day of dietary cholesterol |
| Total fat                  | Eat less saturated fat, more healthy fats from seeds, nuts, and fish; removed 35% calories from fat from main 2005 DGA recommendations; however, still recommend overall reduction. |
| Sodium                     | Reduce intake of foods with added sodium. Adequate Intake for individuals:  
  • ages 9–50: 1,500 mg/day; 10% is 150  
  • ages 4–9: 1,200 mg/day, 10% is 120 |
| Foods to Encourage         | Nutrients of concern for children (potassium, dietary fiber, calcium, and vitamin D)  
  • Eat more fruits, vegetables: a 2,000 calorie diet needs 4–5 servings of fruits and 4–5 servings of vegetables  
  • Reduce intake of refined grains; <50% whole grains  
  • Increase intake of fat-free or low-fat milk and other dairy products  
  • Eat a variety of protein such as seafood, lean meat, poultry, eggs, beans and peas, soy products, and unsalted nuts and seeds  
  • Replace high-solid fat protein foods with foods lower in solid fats and calories and/or those that are sources of oils  
  • Replace solid fats with oils |

Dietary Behavior Socioecological Model

This HIA used a socioecological framework developed by Mary Story (see Figure A1.1). This framework describes the multiple social and environmental factors that influence healthy eating behavior. This HIA focuses on the potential impact that macro-level environments, such as legislative policy, and physical environment features, such as school food access, may have on healthy eating behavior among school-aged children.

**FIGURE A1.1** Socioecological Model of Dietary Behavior

### TABLE A1.2

<table>
<thead>
<tr>
<th>Alliance for a Healthier Generation</th>
<th>Institute of Medicine</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Grade levels</strong></td>
<td><strong>Other provisions</strong></td>
</tr>
<tr>
<td>Calorie level differences for fruit packed in own juice</td>
<td>All other foods must meet only one of the following requirements:</td>
</tr>
<tr>
<td>• ES = &lt;150</td>
<td>A la carte entrée items meet fat and sugar limits as listed below and have a sodium content of 480 mg or less; 200 calorie limit does not apply; items cannot exceed calorie content of comparable NSLP entrée items</td>
</tr>
<tr>
<td>• MS = &lt;180</td>
<td></td>
</tr>
<tr>
<td>• HS = &lt;200</td>
<td></td>
</tr>
<tr>
<td><strong>Calories</strong></td>
<td><strong>Sodium</strong></td>
</tr>
<tr>
<td>≤100</td>
<td>&lt;230 mg sodium per portion as packaged; &lt;480 mg sodium if the item meets the following criteria: Low-fat and fat-free dairy, and vegetables with sauce and soups must also contain 1 or more of: 2 g fiber; or 5 g protein; or 10 percent DV of Vitamin A, C, E, folate, calcium, magnesium, potassium, or iron, or 1/2 serving (1/4 cup) of fruit or vegetables.</td>
</tr>
<tr>
<td>&lt;150 calories for vegetables with sauce and soup that also meets two more nutrient requirements; Meet two of the following:</td>
<td>Sodium content of 200 mg or less per portion as packaged</td>
</tr>
<tr>
<td>&lt;150 cal ES, &lt;180 cal MS, &lt;200 cal HS and either &gt;2 g fiber, &gt;5 g protein, 10 percent DV of Vitamin A, C, E, folate, calcium, magnesium, potassium, or iron, or one-half serving of fruit and vegetables</td>
<td></td>
</tr>
<tr>
<td><strong>Sugar</strong></td>
<td><strong>Fats</strong></td>
</tr>
<tr>
<td>35 % total sugars by weight; dry fruit exempt</td>
<td>0 g trans fat</td>
</tr>
<tr>
<td></td>
<td>Less than 10% calories from saturated fat Zero trans fat (0.5 g per serving)</td>
</tr>
<tr>
<td><strong>Fats</strong></td>
<td><strong>Total fat</strong></td>
</tr>
<tr>
<td>0 g trans fat</td>
<td>35% total calories from fat, nuts, butters, one egg with no added fat exempt</td>
</tr>
<tr>
<td><strong>Total fat</strong></td>
<td>35% calories from fat</td>
</tr>
<tr>
<td><strong>Sodium</strong></td>
<td>Sodium content of 200 mg or less per portion as packaged</td>
</tr>
<tr>
<td>In incorporated into sodium and calorie requirements</td>
<td>Included in the “Calorie” row above</td>
</tr>
</tbody>
</table>

* Combination products must contain a total of one or more servings as packaged of fruit, vegetables, or whole grain products per portion.

**SOURCES**
## TABLE A1.3 Competitive Beverages Standards

<table>
<thead>
<tr>
<th>Alliance for a Healthier Generation</th>
<th>Institute of Medicine</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>For all ages, the following are permitted:</strong></td>
<td><strong>Tier 1 (during school day): For all ages, the following are permitted:</strong></td>
</tr>
<tr>
<td>• Water,</td>
<td>• Water,</td>
</tr>
<tr>
<td>• 100% juice</td>
<td>• 100% juice</td>
</tr>
<tr>
<td>• Low-fat or nonfat dairy or soy-based beverages in all schools</td>
<td>• Low-fat or nonfat dairy or soy-based beverages in all schools throughout the school day</td>
</tr>
</tbody>
</table>

**Portion sizes for juice:**
- **ES:** < 8 oz
- **MS:** 10 oz
- **HS:** 12 oz

There is a calorie limit for juices of <120 calories per eight ounces and a requirement for at least 10% of recommended daily value of three or more nutrients.

**Portion sizes for milk:**
- **ES:** 8 oz
- **MS:** 10 oz
- **HS:** 12 oz calorie cap of <150 per eight oz

HS: Other beverages are allowed, including calorie-free or low-calorie beverages and other beverages as long as they do not exceed 12 oz and have <66 calories per 8 oz portion.

**Portion sizes for milk:**
- 8 oz any age, total sugar not to exceed 22 g

---

**SOURCES:**
Appendix 2: HIA Process and Assessment Methods

The National Research Council defines an HIA as a “systematic process that uses an array of data sources and analytic methods and considers input from stakeholders to determine the potential effects of a proposed policy, plan, program, or project on the health of a population and the distribution of those effects within the population. A Health Impact Assessment provides recommendations of those effects within the population and provides recommendations on monitoring and managing those effects.” HIAs use a variety of methods, including collaboration with stakeholders, to develop recommendations to improve positive health benefits for a proposal.

A2.1 Policy Scenarios

As Section 208 of the HHFKA was interpreted by the research team, the proposed USDA snack food and beverage nutrition standards will set a national baseline, ensuring that all school districts will have to meet some minimum guideline, while states and districts that want something more comprehensive are still able to do so. The research team followed the direction from Section 208 of the HHFKA, which states that standards must apply to the entire school day (to be defined by USDA), with after-school programming being optional; meet/be aligned with the 2010 Dietary Guidelines for Americans; and take into account existing science, other recommended standards, and district and state policies.

Because the USDA had yet to propose any nutrition standards at the time of this HIA, the research team developed two plausible policy scenarios: a baseline “A” level that meets a loose interpretation of the 2010 DGA, and a higher “C” level that follows or surpasses the IOM standard. The two levels are both in the realm of possibility for the USDA guidelines and were too similar to create an intermediate policy level.

The research team used these scenarios to hypothesize how various outcomes would be affected. For simplification, policy scenario “A” food standards were applied equally to elementary, middle, and high schools. After completing literature reviews and interpreting the 2010 DGA based on recommended daily caloric intake for appropriate age and physical activity levels, the research team determined that scenario A was not specific enough. Thus, the research team could use the lessons learned about what products could be sold to children only as guidance for developing policy recommendations.

## APPENDIX 2

### TABLE A2.1a

<table>
<thead>
<tr>
<th>Draft Policy Scenarios for Foods for Analysis Only</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Policy Scenario A:</strong></td>
</tr>
<tr>
<td><strong>Meets Principles of 2010 DGA for Snack Foods (less restrictive)</strong></td>
</tr>
<tr>
<td>Offer foods to encourage: Fruits, vegetables, whole grains, nuts, low-fat dairy such as yogurt or low-fat cheese, and combination products</td>
</tr>
<tr>
<td>Other snack foods sold are limited to:</td>
</tr>
<tr>
<td><strong>Fat:</strong> snacks meet dietary fat criteria per portion as packaged:</td>
</tr>
<tr>
<td>• Trans fat: ≤0.5 g per serving</td>
</tr>
<tr>
<td>• Saturated fat: calories &lt;10% per serving</td>
</tr>
<tr>
<td><strong>Portion size, calories:</strong> snack items portion and package are &lt;250 (CA) calories and a la carte entrée items do not exceed calorie limits on similar National School Lunch Program items.*</td>
</tr>
<tr>
<td><strong>Sodium:</strong></td>
</tr>
<tr>
<td>≤480 mg sodium per non-entrée snacks</td>
</tr>
<tr>
<td>≤600 mg per a la carte entrée (Healthier US School Challenge)</td>
</tr>
<tr>
<td><strong>Sugar:</strong> total sugar in snacks, foods, and beverages per portion as packaged &lt;40% sugar by weight (WV)*</td>
</tr>
<tr>
<td><strong>Policy Scenario C:</strong></td>
</tr>
<tr>
<td><strong>Meets 2007 IOM + Alliance for a Healthier Generation (more restrictive)</strong></td>
</tr>
<tr>
<td>Snack foods for sale: only Tier 1 foods (i.e., fruits, vegetables, whole grains, nuts, low-fat dairy, and related combination products)</td>
</tr>
<tr>
<td>All items must still meet the following limits:</td>
</tr>
<tr>
<td><strong>Fat:</strong> snacks meet dietary fat criteria per portion as packaged:</td>
</tr>
<tr>
<td>• Calories from total fat: &lt;35% per serving</td>
</tr>
<tr>
<td>• Trans fat: &lt;0.5 g per serving</td>
</tr>
<tr>
<td>• Saturated fat: calories &lt;10% per serving</td>
</tr>
<tr>
<td><strong>Portion size, calories:</strong></td>
</tr>
<tr>
<td>≤200 (HS), ≤180 MS, ≤150 ES (the Alliance) and a la carte entrée items do not exceed calorie limits on similar National School Lunch Program items.</td>
</tr>
<tr>
<td><strong>Sodium:</strong></td>
</tr>
<tr>
<td>≤200 mg per non-entrée snacks</td>
</tr>
<tr>
<td>≤480 mg or less per a la carte entrée (Healthier US School Challenge Gold w/Distinction)</td>
</tr>
<tr>
<td><strong>Sugar:</strong> total sugar in snacks, foods, and beverages per portion as packaged must be ≤35% sugar by weight or &lt;15 g</td>
</tr>
</tbody>
</table>

*These interpretations of the principles of the 2010 Dietary Guidelines for Americans were deemed too loose when considering age and physical activity levels. Sugar and calorie levels should be specific to age groups (i.e., ES, MS, HS) for the best possible health outcome.

**Sources:**
**APPENDIX 2**

**TABLE A2.1b**

**Draft Policy Scenarios for Beverages for Analysis**

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Elementary school:</strong></td>
<td><strong>For all ages:</strong></td>
</tr>
<tr>
<td>• Water (no sugar added)</td>
<td>• Water, no flavoring, additives, or carbonation</td>
</tr>
<tr>
<td>• 50–100% fruit or vegetable juice—8 oz, maximum of 15 calories per ounce or 120 calories total*</td>
<td>• Milk—low-fat (1% or less) and fat-free (skim), flavored (maximum of 22 g total sugars per 8 oz or 150 calories) or unflavored fluid milk, and/or USDA approved alternative dairy beverages (lactose-free, soy); maximum of 8 fluid oz</td>
</tr>
<tr>
<td>• Milk or dairy alternative—10 oz, maximum of 15 calories per ounce or 150 calories total</td>
<td>• 100% full strength fruit and vegetable juices with no sweeteners (nutritive or non-nutritive)</td>
</tr>
<tr>
<td><strong>Middle and high school:</strong></td>
<td>• ES/MS: 4 oz portion</td>
</tr>
<tr>
<td>• Water (no sugar added)</td>
<td>• HS: 8 oz portion</td>
</tr>
<tr>
<td>• 50–100% fruit or vegetable juice—12 oz, no added sweeteners, maximum of 15 calories per ounce or 180 calories total*</td>
<td>• Caffeine-free</td>
</tr>
<tr>
<td>• Milk or dairy alternative—12 oz, maximum of 15 calories per ounce if flavored or 180 calories total</td>
<td>• Sports drinks not available except for sports activities more than one hour in duration</td>
</tr>
<tr>
<td>• No-calorie or low-calorie beverage—12 oz, maximum of 10 calories per ounce</td>
<td></td>
</tr>
<tr>
<td>• Any other beverage that is not more than 12 oz and contains no more than 8 calories per oz (maximum of 96 total calories); sports drinks allowed</td>
<td></td>
</tr>
</tbody>
</table>

+ Adapted from Oregon, similar to the Alliance

* Oregon policy is for 100% juice; in speaking with the policy’s authors, the standard was found to be overly restrictive because it did not allow for higher-nutrient, lower-sugar beverages that were only 75% juice, for example.

**SOURCES:**
In addition to the 2010 DGA, existing nutrition standards, and state and local nutrition policies, the research team also reviewed award programs such as USDA's Healthier U.S. School Challenge, nutrition policy classification systems, and generic product ingredient lists. Table A2.1c indicates what items schools would be able to sell in both the A and C levels.

<table>
<thead>
<tr>
<th>Policy scenario A</th>
<th>Policy scenario C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Example foods—not allowed in A</strong></td>
<td><strong>Example foods—not allowed in C</strong></td>
</tr>
<tr>
<td>• Name brand peanut chocolate bar—total calories 271; calories from fat 45%</td>
<td>• Potato chips (regular)—total calories 155; calories from fat 61%</td>
</tr>
<tr>
<td>• Name brand pretzels: total calories—110; calories from fat 8%; sodium 580 mg</td>
<td>• Trail mix and chocolate—total calories 180; calories from fat 55%</td>
</tr>
<tr>
<td>• Coconut almond bar—total calories 220; total fat 13 g (20%); sat fat 8 g (40%); sodium 50 mg; sugars 20 g (44% weight)</td>
<td>• Peanut butter chocolate wafers—total calories 52; calories from fat 44%</td>
</tr>
<tr>
<td>• Peanut bar—total calories 240; calories from fat 120, total fat 13 g (20%); sat fat 2.5 g (13%); sugars 21 g (40% weight); sodium 120 mg</td>
<td>• Pretzels: total calories—110; calories from fat 8%; sodium 580 mg</td>
</tr>
<tr>
<td>• Potato chips (regular)—total calories 155; calories from fat 61%</td>
<td>• Mixed grain chips—total calories 210; calories from fat 38%; sodium 180 mg</td>
</tr>
<tr>
<td>• Trail mix and chocolate—total calories 180; calories from fat 55%</td>
<td>• Onion rings (1 oz portion)—140 calories; total fat 7 g (11%); sodium 240 mg; sugars less than 1 g</td>
</tr>
<tr>
<td>• Peanut butter chocolate wafers—total calories 52; calories from fat 44%</td>
<td><strong>Example foods—allowed under A</strong></td>
</tr>
<tr>
<td>• Mixed grain chip—total calorie 210; calories from fat 38%; sodium 180 mg</td>
<td>• Baked potato chips—total calories 130; calories from fat 10%; sodium: 170 mg</td>
</tr>
<tr>
<td>• Chocolate chip granola bar—total calories 124; total fat 4.6 g; sat fat 3.2 g; sodium 97.5 mg; dietary fiber 1.2 g</td>
<td>• Fruit roll up—total calories: 104; calories from fat 8%; sodium 89 mg; sugars 10.8 g</td>
</tr>
<tr>
<td><strong>Example foods—allowed under C</strong></td>
<td>• Granola bars (peanut butter)—calories 190; calories from fat 60; total fat 7 g (10%); sodium 180 mg; sugars 11 g</td>
</tr>
<tr>
<td>• Baked potato chips—total calories 130; calories from fat 10%; sodium: 170 mg</td>
<td>• MS/HS—Corn scoop chips (1 oz portion if use whole corn): calories 160; total fat 10 g; sodium 110 mg; sugars 0 g</td>
</tr>
</tbody>
</table>

### A2.2 Literature Reviews

The research team conducted literature reviews based on health outcomes and the school services and diet and nutrition health determinants. The team met several times to discuss and refine the use of grading criteria for evaluating the quality and strength of the evidence. The tools and process used are listed below.

#### Literature Review Tools

**Scope health determinant pathways:** Pathway diagrams helped develop research questions, health outcomes, and indicators.

**Scope spreadsheet:** The team tracked research questions (current conditions, impact questions), indicators, data sources, priority, and research approach.

**Research log:** The team tracked literature search results, including search terms, database used, and articles retained.
### TABLE A2.2 Search Terms for the Diet and Nutrition and the School Services Health Determinant Pathways

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Databases</th>
<th>Search Terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access and availability</td>
<td>EBSCO Academic Search Complete, Medline: Pubmed, Medline: EBSCO, Academic Search Complete</td>
<td>Soda, SSBs, children’s health, chronic conditions, competitive foods policy, school food environment, competitive foods standards, impact, nutrition, schools, snacks, calories, children, snack bar, vending, a la carte, dietary intake, overweight, obesity, food preferences, environment, school, food environment, policy, snacks, calories, obesity, children</td>
</tr>
<tr>
<td>Purchase and consumption; calorie and energy dense food consumption</td>
<td>Medline: Pubmed</td>
<td>Taste, schools, school, food, preference, high density foods, competitive foods, eating, availability, children, taste preference, physical environment, food preference, competitive food, policy, food availability, adolescent behavior</td>
</tr>
<tr>
<td>Taste preferences</td>
<td>Medline: Pubmed</td>
<td>Taste preferences, Medline: Pubmed, CINAHL (EBSCO) JAMA</td>
</tr>
<tr>
<td>Type 2 diabetes</td>
<td>Medline: Pubmed, CINAHL (EBSCO) JAMA</td>
<td>Competitive foods, school, children, food, obesity, BMI, blood pressure, systolic, diastolic, diabetes, insulin resistance, waist circumference, blood glucose, cholesterol, HDL, LDL, chronic disease, overweight, body mass index, health policy, United States, food habits, obesity/etiology, students, Child Nutritional Physiological Phenomena, students, health policy, food, child, adolescent, nutrition policy, cholesterol, USA, dietary, lipoproteins, MH, vending machines, food dispensers, automatic, insulin resistance, diet, obesity prevention and control, school health services, child behavior, health behavior, health status, obesity/epidemiology, food services/standards, intervention studies</td>
</tr>
<tr>
<td>Healthy weight</td>
<td>Medline: Pubmed</td>
<td>Healthy weight, taste preferences, Medline: Pubmed, CINAHL (EBSCO) JAMA</td>
</tr>
<tr>
<td>Overweight, obesity</td>
<td>Medline: Pubmed</td>
<td>Overweight, obesity, taste preferences, Medline: Pubmed, CINAHL (EBSCO) JAMA</td>
</tr>
<tr>
<td>Blood pressure</td>
<td>Medline: Pubmed</td>
<td>Blood pressure, taste preferences, Medline: Pubmed, CINAHL (EBSCO) JAMA</td>
</tr>
<tr>
<td>Cardiovascular disease</td>
<td>Medline: Pubmed</td>
<td>Cardiovascular disease, taste preferences, Medline: Pubmed, CINAHL (EBSCO) JAMA</td>
</tr>
<tr>
<td>Mental health</td>
<td>Medline: Pubmed, Scopus, CINAHL (EBSCO)</td>
<td>Mental health, taste preferences, Medline: Pubmed, CINAHL (EBSCO) JAMA</td>
</tr>
<tr>
<td>Dental caries</td>
<td>Medline: Pubmed, Scopus, CINAHL (EBSCO)</td>
<td>Dental caries, snack food, children, sweets, sugar-sweetened beverages, soda, cavities, schools, carbonated, oral health, relationship, primary dentition, permanent dentition, prediction of caries in primary dentition</td>
</tr>
<tr>
<td>Stigma</td>
<td>ERIC, Medline: Ovid</td>
<td>Stigma, ERIC, Medline: Ovid, school meal eligibility, stigma, free and reduced lunch, free lunch, participation, school meals, mental stress, school lunches, stress</td>
</tr>
<tr>
<td>Student learning</td>
<td>ERIC, Medline: Ovid</td>
<td>Student learning, ERIC, Medline: Ovid, nutrition, educational outcomes, academic outcomes, academic achievement, school performance, nutritional status, school breakfast, school lunch, school meals, competitive foods, school performance, nutritional status</td>
</tr>
<tr>
<td>Food security</td>
<td>ERIC, Medline: Ovid</td>
<td>Food security, school meals, children, hunger, schools, breakfast, lunch</td>
</tr>
<tr>
<td>School food services revenue</td>
<td>Medline: Pubmed, SCOPUS, Psychinfo, Cochrane, Medline</td>
<td>School food services revenue, USDA meal program revenue, competitive foods, revenue, schools, school district, vending</td>
</tr>
<tr>
<td>Vending, other revenue</td>
<td>Plus, Health Reference Center Academic, Science.gov, Google</td>
<td>Vending, other revenue, plus, Health Reference Center Academic, Science.gov, Google</td>
</tr>
</tbody>
</table>

**Process**

- **Search term list:** The team developed search terms relevant to research questions, health outcome, indicators, and health determinants.
- **Search databases:** The team used relevant databases, at least three for each search.
- **Title, abstract, and content review:** The team reviewed the title, abstract, and content search to determine if literature fit with research question.
- **Used reference lists of existing literature.**
- **Used related authors and related articles in databases.**
### TABLE A2.3 Weight of evidence criteria

<table>
<thead>
<tr>
<th>From the team's previous HIA experience</th>
<th>From research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality: Effect estimates (i.e., dose response, association)</td>
<td>Quality: the aggregate of quality ratings for individual studies, predicated on the extent to which bias was minimized</td>
</tr>
<tr>
<td>Quantity</td>
<td>Quantity: number of studies, sample size or power, and magnitude of effect</td>
</tr>
<tr>
<td>Consistency</td>
<td>Consistency: for any given topic the extent to which similar findings are reported using similar and different study designs</td>
</tr>
</tbody>
</table>

**SOURCES:**

The research team calculated the initial quality score for each article based on study design (see Table A2.4). It then increased or decreased grades of a paper based on how well the paper addressed threats to validity and the strength or limitations of the evidence. For each article, the team determined a final score that takes into account the initial score with modifications. In practice, some of the modifications were difficult to apply, as some literature did not always reference things in the methods section. Most often, article scores did not change beyond the quality of study design. The team used these as rough estimates or indicators of quality where “strong” (3 or above), “fair” (2), or “weak” (1 or lower) studies could then be evaluated together. In the impact characterization table, the team developed a “quality of evidence” of all articles for each prediction research question based on (1) quality of articles, (2) quantity, and (3) consistency of all articles.

### TABLE A2.4 Method for determining article quality scores

<table>
<thead>
<tr>
<th>Empirical studies</th>
<th>Literature reviews</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Quantitative:</strong></td>
<td>Each literature review should be given a score of 2 and then adjusted based upon the following criteria (a 2 assumes that the following are answered, but if more than two of these are missing, downgrade to a 1):</td>
</tr>
<tr>
<td>• Experimental (e.g., randomized, with control) = 3</td>
<td>• How well the authors state their inclusion/exclusion criteria</td>
</tr>
<tr>
<td>• Observational study (cohort, case control, cross-sectional, pre-post) = 2</td>
<td>• Time period of search—is it indicated?</td>
</tr>
<tr>
<td>• Other evidence (convenience samples, grey literature, qualitative papers, non-experimental designs) = 1</td>
<td>• Whether or not search terms or topics are listed</td>
</tr>
<tr>
<td>Increase/decrease grade for how well the following are addressed:</td>
<td>• Use of multiple databases</td>
</tr>
<tr>
<td>• Threats to validity (deduct, for serious (-1) or very serious (-2) limitation to study quality)</td>
<td>• Whether a certain method of literature review was used and if it was followed (e.g., systematic vs. integrative)</td>
</tr>
<tr>
<td>• Bias</td>
<td>• Can the literature support conclusions made by the authors of the lit review?</td>
</tr>
<tr>
<td>• Sufficient sample size (+1)</td>
<td><strong>Note:</strong> Deduct 1 or 2 points based on the cumulative weakness of the article (a subjective assessment).</td>
</tr>
<tr>
<td>• All plausible confounders have been considered (or discussed if data were unavailable to measure them)</td>
<td><strong>Note:</strong> Deduct 1 or 2 points based on the cumulative weakness of the article (a subjective assessment).</td>
</tr>
<tr>
<td>• Flaws in study design such as insufficient sample size or sampling methodology</td>
<td><strong>Note:</strong> Deduct 1 or 2 points based on the cumulative weakness of the article (a subjective assessment).</td>
</tr>
<tr>
<td>• Strong evidence of association or statistically significant measures of association</td>
<td><strong>Note:</strong> Deduct 1 or 2 points based on the cumulative weakness of the article (a subjective assessment).</td>
</tr>
</tbody>
</table>
A2.3 Stakeholder Interviews

All interviews were confidential and lasted between 30 minutes and one hour, depending on the stage of the HIA and the individual (see Table A2.5 for list of interviewees). For each interview, participants received materials ahead of time and had an opportunity to ask clarifying questions about the content before providing their feedback. For some interviews, especially with students or school district staff and administrators, the research team held a group interview of two or three individuals in order to broaden the discussion with multiple perspectives. The interviewer took notes during the discussion and provided the participants with a copy of these notes for review. The team asked for permission to attribute people in the final report and quote people directly.

The research team can provide interview scripts and questions upon request by emailing the contacts at the beginning of this report. Here is a sample set of interview questions for a research scope interview:

1. Looking at the list of “impact questions” for diet and nutrition, do you see anything missing?
2. Which of these questions would you say is most important for us to answer to add value to USDA's discussion?
3. Looking at the list of impacted groups, including those who may be more vulnerable, are we missing any group?
4. Can you tell us about the different types of competitive foods options you have (e.g., vending machines, student stores, fund-raisers, a la carte lines)?
5. How does your school/district use sales revenue from each of these options?
6. What programs are affected by changes in revenue from competitive foods policy (e.g., school nutrition services, physical activity programming, after-school enrichment, arts programming)? How are they affected?
7. How do changes affect school meal participation? School nutrition service revenue?
8. Do you have concerns about how competitive foods may impact children's diet and nutrition that are not encompassed by these research topics?
9. Looking at the list of “impact questions” for school services, do you see anything missing?
10. Which of these questions would you say is most important for us to answer to add value to USDA's discussion?
11. Looking at the list of impacted groups, including those who may be more vulnerable, are we missing any group?
12. Do you have concerns about how competitive foods may impact school services that are not encompassed by these research topics?
13. Do you have general concerns about competitive foods or this research project you'd like to share?
### TABLE A2.5 Interviewees

<table>
<thead>
<tr>
<th>Name</th>
<th>Organization</th>
<th>Perspective</th>
<th>State</th>
</tr>
</thead>
</table>
| Roberta R. Friedman, Sc.M.  
Director of Public Policy | Rudd Center for Food Policy and Obesity | Policy | CT |
| Kathryn Henderson, Ph.D.  
Director of School and Community Initiatives |  |  |  |
| Anne Travis, CEO | The Bower Foundation | Policy | MS |
| Lucy Gettman, M.A., M.S.W.  
Director, Federal Programs | National School Boards Association | Policy | VA |
| Margo G. Wootan, D.Sc.  
Director, Nutrition Policy | Center for Science in the Public Interest | Policy | DC |
| Nora Howley, Manager of Programs |  |  |  |
| Lisa L. Creighton, M.P.H., M.B.A.  
Senior Program Coordinator, Nutrition, Hunger and Physical Activity | NEA Health Information Network | Policy | DC |
| Guido Dominguez | Youth Advisory Board Alliance for a Healthier Generation | Student | FL |
| Mataio Swain |  |  | WV |
| High School Student from Arkansas |  |  | AR |
| Penny Parham  
Administrative Director  
Department of Food and Nutrition | Miami-Dade County Public Schools | School and District | FL |
| Susan Rothstein  
Wellness Coordinator |  |  |  |
| Carol Chong  
Food and Menu Director |  |  |  |
| John Skretta, Ed.D.  
Superintendent | Norris School District | School and District | NE |
| Linda Truscott  
Food Service Director |  |  |  |
| Mary Jo Rupert  
Middle School Principal |  |  |  |
| Jane Hansmeyer  
Family and Consumer Science and Wellness Coordinator |  |  |  |
| M. Caitlin Westfall, M.S., M.P.H.  
Wellness Policy and Promotions Manager  
Shamil Mohammed  
Interim Director, Food and Nutrition Services | Boston Public Schools | School and District | MA |
| Jill Carter  
Executive Director, Health and Wellness |  |  |  |
| Danny D. Seymour  
Dean of Education  
Cathy Schuchart  
Vice President for Policy | School Nutrition Association | School Food Services | MD |
| Jon Fox  
District Athletic Director | Duval County Public Schools | Small School | FL |
| Tracey Leslie  
Parent and school volunteer | Centennial School District | School | OR |
| Consultant | American Beverage Association | Industry | DC |

Researchers also interviewed several industry representatives and a parent who are not listed individually.
Process Interviews on HIA Scope and Recommendations
The research team used these interviews to gather input on the draft scope developed jointly with the advisory committee. Participants gave feedback to modify the scope of research questions, health determinants, health outcomes, and elements of a health determinant pathway. Stakeholders who were willing were also interviewed in a follow-up call to (1) inform participants of preliminary findings; (2) explain policy or operations recommendations based on those findings; (3) gather modifications to draft recommendations based on participant expertise; and (4) prioritize operations recommendations. The team sent a draft set of recommendations and criteria for prioritization to participants ahead of time, answered questions in an interview, and gave them a time span to make tracked changes to the draft recommendations document. This created a record of their input in addition to the interviewers’ notes.

Key Informant Interviews
These interviews helped the research team better understand the nuances related to snack food and beverage policy implementation, challenges, and impacts—such as how it affected school meal quality, access to food, school meal revenue, and school service offerings (i.e., education, athletics, fund-raisers). Subjects were queried about how the policy affected school meal quality and other impacts that may not have originally been considered by the research team. They also were asked how different changes were implemented (e.g., with additional funding).

Key informants included school district representatives or industry representatives that were not reached in the HIA process interviews. The team interviewed one group of students to find out their interpretation of the research scope and impacts of snack food and beverage policies on school meal quality and access to food.

Interviewer Synthesis
The interviewer summarized feedback from participants at each stage, provided copies of interview notes, and shared copies of participant feedback to the participants and to members of the advisory committee and research team. The interviewers guided the research team and advisory committee based on what they learned from stakeholders.

Interview Feedback on Scope
This section lists general themes that emerged from the stakeholder interviews on the research scope, based on the HIA’s assessment research questions.

A. Diet and Nutrition
General feedback on diet and nutrition scope
- A policy expert and a school district representative mentioned the impact of snack food and beverage policies on school faculty and staff and suggested it might be important to include adults in the food policy recommendations so as not to set a double standard.
• A policy expert said that if kids lose weight and feel better, they may be more likely to participate in physical activities, which will lead to further improvements in their health.

• A policy expert said that both the short- and long-term effects of the guidelines on changing kids’ food preferences should be considered (how changes might impact what kids actually choose to eat), as well as what changes to preferences might mean for kids that do not have healthy foods available to them at home or in their broader communities.

• Three policy experts and two school districts talked about the impacts of guidelines on students’ families and the community broadly, or “spillover effects.”

• One policy expert said that federal guidelines could include policies restricting vending machines from advertising unhealthy foods, and requiring the promotion of healthier foods and physical activity. An industry representative mentioned that healthy vending machines generally do not perform as well and quite often go out of business, particularly when there are other choices present.

• A few respondents (school district and industry representatives and students) highlighted the need for other changes within schools to support the changes to healthier foods, such as nutrition education and training for school food service personnel. They felt that these components would make the consumption of healthy foods and healthy choices more practical and easier for schools and students.

• One research expert did not think looking further into the impact on chronic illness would be helpful, as the literature would be too thin.

Impact on vulnerable groups
• Several respondents (two school district representatives, two policy experts, and an industry representative) said that it is important to change the overall norm and help all kids be healthier.

• Two policy experts and students pointed out that significant regional and geographic differences may come into play when considering the impact of a national snack food and beverage rule. One HIA and one policy expert noted that it is also important to look at kids who are low-income, on the Supplemental Nutrition Assistance Program (formerly known as food stamps), or generally food insecure. However, a policy expert and school district representative mentioned that some higher-income students might be impacted more because of the greater presence of snack foods and beverages in higher-income areas.

• One research expert noted that food security was missing from the scope, and hungry children are likely to be affected if they participate in more school meals as a result of a national policy.

• Two policy experts thought it important to differentiate risks by school level (elementary, middle, and high), as the presence of snack foods and beverages is different at each level.

• One policy expert said these polices may have greater impact on kids who have diabetes. Kids who are pre-diabetic may also see large impacts if onset of diabetes can be prevented.
APPENDIX 2

B. School Services

General feedback on school services scope
• There was much discussion among various interviewees regarding the impact on school meal participation, and one respondent wanted to make sure that the HIA looked at impacts on the breakfast and lunch programs.
• Interviewees from one school district wondered whether the new regulations will address the practice of using food as part of a reward system.
• A policy expert and personnel from two school districts talked about the time of day at which guidelines are in effect; for example, whether or not they would apply to after-school care programs.
• One school staff member said that these types of policies generally help push the wellness agenda forward and encourage other healthy activities in schools.
• Representatives from three school districts and an industry representative brought up the issue of open campuses and competing food venues, including non-school-sponsored fund-raisers.
• A school district representative and policy expert mentioned the need for accountability and monitoring mechanisms for policy requirements. The former mentioned that it is hard to enforce rules within a school when some of the biggest offenders are individual teachers or boosters who buy food to sell for fund-raisers within a school.

Impact on vulnerable groups
• One policy expert said that if schools lose funding for extracurricular activities such as athletic programming, they may need to start charging students who participate. This would be a greater hardship for students from low-income families and could lead to less participation by those students in the enrichment activities.

Interview Feedback on Assessment

Experiences with snack food and beverage policies
• Experiences are wide-ranging.
• Although anecdotally the research team heard that kids “wait it out” until they get home to eat junk food or else they bring it from home to school, another interviewed researcher did not find this to be true in her study.
• Multiple interviewees discussed the importance of transition time to adapt to healthier items and the ultimate recovery of sales revenues.
• Industry representatives generally welcome national guidelines from USDA as a way to streamline the current variety of state and district guidelines.

Snack food and beverage options
• Students are able to purchase unhealthy foods (including fried foods) via a la carte lines, vending machines, and fund-raisers.
• Representatives from one school mentioned that there is a “healthy” vending machine on campus.
• The adults—parents, teachers, school staff—rather than the students are sometimes the obstacle to creating a healthy food environment.

Revenue from snack food and beverage sales (comments primarily from school district representatives)
• Though widely variable, revenue is generally used to support clubs and activities, including athletics, the arts, and drama.
• Overall, funding declined when the a la carte or vending options were changed to include more healthy options, but then recovered somewhat over time.
• Non-food fund-raisers generally do not seem to raise as much money as food-related fund-raisers.
• Several interviewees mentioned concerns about revenue related to the implementation of the new regulations, including the impact on extracurricular activities and the potential timeline needed to find alternative revenue streams.

Impact on school meal participation
• One school district representative reported lagging participation after changing food options, but there were also other factors in play; since then, participation has gone back up.
• One national group representative observed that it would help to have alignment between nutrition standards for school meals and foods sold individually, which could potentially make implementation easier and less costly.

Other observations
• Two district officials and two students remarked on the need for improved training for food service workers to
  - Improve the quality and taste of foods sold a la carte.
  - Increase their understanding of the food being served and the rationale for selling healthier foods so that they can communicate this information to the students with whom they are in day-to-day contact (“they need to explain to students why the meals are healthier and good and not a punishment”).

Interview Feedback on Policy Recommendations
The stakeholders involved in the key informant interviews were appreciative of the opportunity to review the draft policy recommendations. They had mostly positive comments about the policy recommendations and the HIA process in general. The interviewers collected feedback on the draft set of policy recommendations that were incorporated into subsequent drafts. Feedback was mostly related to clarifications and a desire for things to be more or less restrictive, based upon stakeholder perspective.
Appendix 3: Policy Classification Results

This HIA used the Classification of Laws Associated with School Students (CLASS) system as the basis for identifying competitive foods polices at the state level. CLASS, developed by the National Cancer Institute, uses two policy classification systems to score state-level codified laws for physical education (PE) and nutrition in schools. Specifically, it used the school nutrition portion of CLASS known as the School Nutrition-Environment State Policy Classification System (SNESPCS). Within the SNESPCS, this report focuses on measures specific to school competitive foods policies as described in more detail below.

The research team converted the CLASS scale measurements to simplify and align them to the 2005 Dietary Guidelines for Americans. To obtain an overall state score in each year, each of the seven variables was rescaled and then averaged (or summed) across the three grade levels. To get a score above 1.5, the majority of the policies on the different variables had to on average partially meet or exceed the 2005 Dietary Guidelines for Americans. These policy indicators are the main variables of interest in identifying whether any policy has a revenue effect and whether effects vary by policy level. In general, these variables are measured on a 0–6 scale (a la carte entrées are an exception at 0–5). To simplify this scale and better anchor it around the 2005 DGA, the research team converted each variable to a 0–3 scale (see Table A3.1).

- Original scores of 0 (no policy) or 1 (recommendations only) are recoded to 0, or effectively a “no policy” level. As state policies set a floor for school districts, this report does not differentiate recommendations, which require no action, from no policy at all.
- Original scores of 2 make recommendations representing policies with specific requirements that do not meet the 2005 DGA, and are recoded to 1. This represents a “low” policy level that is characterized as “not meeting the 2005 DGA.”
- Original scores of 4, 5, or 6 are combined, representing policies with one or multiple specific requirements that meet or exceed the 2005 DGA and approach the IOM standard. These are recoded as a 3. This represents a policy level “meeting or exceeding the 2005 DGA.”

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TABLE A3.1 State Policy Scores from CLASS
The SNESPCS also includes binary variables related to each of the 21 competitive foods variables, as applicable, that indicate whether any of the measured competitive foods restrictions allow for some portion of “junk” food or whether they apply for less than the whole school day. These conditions, where present, would suggest a “downgrading” of the total score. There is no clear way to incorporate them as simple binary variables (yes/no) directly in the total score. They are not generally common among states with any policy. “Some junk food” provisions tend to be present among otherwise lower scoring states. The “less than full day provisions” are most common among the highest scoring states.

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Policy-level values reflect total scores averaged to a 0–3 scale for competitive foods variables for each grade level and across all venues.

• 2.5–4: Meets/exceeds 2005 DGA
• 1.5–2.4: Restrictions do not meet DGA
• 0.1–1.4: Recommendations or minor restrictions
• 0: No policy restrictions

This analysis includes seven variables from the CLASS competitive foods domain:
1. A la carte snacks
2. A la carte beverages
3. A la carte entrées
4. Vending food
5. Vending beverages
6. Other venues’ food
7. Other venues’ beverages

<ref>Original CLASS 0–6 scale was converted to a 0–4 scale (0,1=0; 2=1; 3=2; 4,5=3; 6=4). The sum of all variables (maximum for all age levels is 21, 7 is the total for each grade level) was averaged to an overall 0–3 policy level for clarity. ** State agency has requirements for school districts that aren’t codified into a statute, regulatory, or administrative code (e.g., a state school board requirement) and thus are not scored by CLASS.</ref>

SOURCES
### TABLE A3.3

**CLASS Competitive Foods and Beverage Scores by Age Level for State Policies in Effect as of December 31, 2008**

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<td>1.7</td>
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<td>RI</td>
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<td>2.6</td>
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<td>0</td>
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<td>SC</td>
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<td>2.7</td>
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<td>1</td>
<td>WA</td>
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<td>1</td>
<td>1</td>
<td>1</td>
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<tr>
<td>WA</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>TX**</td>
<td></td>
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</table>

All values reflect total scores averaged to 0–3 scale for competitive foods variables for each grade level and across all venues:
- **2.5–4 = Meets/exceeds 2005 DGA**
- **1.5–2.4 = Restrictions do not meet DGA**
- **0.1–1.4 = Recommendations or minor restrictions**
- **0 = No policy restrictions**

This analysis includes seven variables from the CLASS competitive foods domain:
1. A la carte snacks
2. A la carte beverages
3. A la carte entrées
4. Vending food
5. Vending beverages
6. Other venues’ food
7. Other venues’ beverages

* Passed new competitive nutrition standard rules, regulations, or policies in 2009, 2010 or 2011, as determined by the Trust for America’s Health, *F as in Fat: How Obesity Threatens America’s Future* (2011 and 2010).  
** State agency has requirements for school districts that aren’t codified into a statute, regulatory, or administrative code (e.g., a state school board requirement) and thus are not scored by CLASS.

---

**References for Appendix 3**

## Table A4.1 National School Lunch Program Participation (2010 and 2011)

<table>
<thead>
<tr>
<th>State/Territory</th>
<th>FY 2010</th>
<th>FY 2011</th>
<th>State/Territory</th>
<th>FY 2010</th>
<th>FY 2011</th>
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<tbody>
<tr>
<td>Alabama</td>
<td>579,210</td>
<td>571,297</td>
<td>Montana</td>
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<tr>
<td>Alaska</td>
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<td>54,476</td>
<td>Nebraska</td>
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<td>661,584</td>
<td>Nevada</td>
<td>188,017</td>
<td>212,484</td>
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<td>Arkansas</td>
<td>353,472</td>
<td>344,049</td>
<td>New Hampshire</td>
<td>109,991</td>
<td>109,036</td>
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<td>California</td>
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<td>3,275,512</td>
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<td>727,457</td>
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<td>399,566</td>
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<td>228,426</td>
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<td>301,259</td>
<td>New York</td>
<td>1,826,027</td>
<td>1,811,558</td>
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<td>Delaware</td>
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<td>94,727</td>
<td>North Carolina</td>
<td>955,810</td>
<td>948,250</td>
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<td>Pennsylvania</td>
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<td>109,203</td>
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<td>54,542</td>
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<td>435,109</td>
<td>Virginia</td>
<td>757,862</td>
<td>755,431</td>
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<td>Massachusetts</td>
<td>544,130</td>
<td>536,655</td>
<td>Virgin Islands</td>
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<td>Michigan</td>
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<td>910,412</td>
<td>Washington</td>
<td>543,940</td>
<td>546,063</td>
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<td>West Virginia</td>
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<td>405,577</td>
<td>400,483</td>
<td>Wisconsin</td>
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<td>606,765</td>
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<td>Wyoming</td>
<td>56,540</td>
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<td><strong>Totals for all states</strong></td>
<td><strong>31,746,525</strong></td>
<td><strong>31,759,353</strong></td>
<td><strong>Totals for all states</strong></td>
<td><strong>31,746,525</strong></td>
<td><strong>31,759,353</strong></td>
</tr>
</tbody>
</table>

Data as of December 1, 2011. Participation data are nine-month averages with summer months (June–August) excluded. Participation is based on average daily meals divided by an attendance factor of 0.927.

<table>
<thead>
<tr>
<th>Study</th>
<th>Sample</th>
<th>Method</th>
<th>Years</th>
<th>ES</th>
<th>MS</th>
<th>HS</th>
</tr>
</thead>
<tbody>
<tr>
<td>School Nutrition Association Survey</td>
<td>National</td>
<td>Survey SNA members</td>
<td>2011</td>
<td>91%</td>
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<td></td>
</tr>
<tr>
<td>Bridging the Gap*</td>
<td>National</td>
<td>Food service, admin, teacher, staff or</td>
<td>Reporting</td>
<td>62%</td>
<td>69%</td>
<td>83%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>principal mail-back survey</td>
<td>2007–08 of 3 years</td>
<td></td>
<td></td>
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</tr>
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<td></td>
<td></td>
<td></td>
<td>here</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>School Health Profiles (CDC)**</td>
<td>36 states, 13 largest</td>
<td>2004, 2006</td>
<td>61.9%–94.0% (med:</td>
<td>83.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>urban school districts</td>
<td></td>
<td>31.5%–88.6% (med:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>79.2%) across states</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>across urban SDs</td>
<td></td>
<td></td>
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<tr>
<td>SHPPS***</td>
<td>National</td>
<td>Survey or interview</td>
<td>2006</td>
<td>33%</td>
<td>71%</td>
<td>89%</td>
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<td>SNDA III****</td>
<td>National</td>
<td>Principal, food service manager surveys and</td>
<td>2004–05</td>
<td>17%</td>
<td>71%</td>
<td>92%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>direct observation</td>
<td></td>
<td>V</td>
<td>ALC</td>
<td>ALC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>97%</td>
<td>99%</td>
<td>93%</td>
</tr>
<tr>
<td>Youth Education &amp; Society and Monitoring</td>
<td>National, secondary</td>
<td></td>
<td>2004–05</td>
<td>87%</td>
<td>92%</td>
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<tr>
<td>the Future*****</td>
<td>schools</td>
<td></td>
<td></td>
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</tbody>
</table>

ALC = a la carte, V= vending, SD = large school district

1 Can purchase from at least one vending machine, school store or snack bar, or a la carte line


SOURCES:
### TABLE A4.3
Percentage of Students Nationwide in Districts with Wellness Policies Addressing Snack Food and Beverage Content Restrictions by Grade Level* (2008–2009 SY)

<table>
<thead>
<tr>
<th>Food content restrictions</th>
<th>ES % (K–5)</th>
<th>MS % (6–8)</th>
<th>HS % (9–12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete snack food or location ban</td>
<td>16.3</td>
<td>3.5</td>
<td>1.8</td>
</tr>
<tr>
<td>Sugar content</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weak or no policy</td>
<td>55.3</td>
<td>65.0</td>
<td>72.3</td>
</tr>
<tr>
<td>Strong policy. Did not meet IOM</td>
<td>9.5</td>
<td>10.5</td>
<td>10.0</td>
</tr>
<tr>
<td>Strong policy. Met IOM (&lt;35% of total calories/total weight from sugar)</td>
<td>19.5</td>
<td>21.3</td>
<td>15.8</td>
</tr>
<tr>
<td>Any strong policy (total of above two rows)</td>
<td>29.0</td>
<td>31.8</td>
<td>25.8</td>
</tr>
<tr>
<td>Fat content</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weak or no policy</td>
<td>48.5</td>
<td>57.0</td>
<td>61.8</td>
</tr>
<tr>
<td>Strong policy. Did not meet IOM</td>
<td>15.5</td>
<td>24.0</td>
<td>26.0</td>
</tr>
<tr>
<td>Strong policy. Met IOM (&lt;35% of total calories from fat)</td>
<td>20.5</td>
<td>15.5</td>
<td>10.3</td>
</tr>
<tr>
<td>Any strong policy (total of above two rows)</td>
<td>35.5</td>
<td>39.5</td>
<td>36.3</td>
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<tr>
<td>Trans fats</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weak or no policy</td>
<td>74.3</td>
<td>85.3</td>
<td>89.0</td>
</tr>
<tr>
<td>Strong policy. Did not meet IOM</td>
<td>8.0</td>
<td>9.8</td>
<td>8.8</td>
</tr>
<tr>
<td>Strong policy. Met IOM (no more than 0.5 g)</td>
<td>1.3</td>
<td>1.6</td>
<td>1.0</td>
</tr>
<tr>
<td>Any strong policy (total of above two rows)</td>
<td>9.3</td>
<td>11.3</td>
<td>9.8</td>
</tr>
<tr>
<td>Sodium content</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weak or no policy</td>
<td>72.0</td>
<td>83.5</td>
<td>87.8</td>
</tr>
<tr>
<td>Strong policy. Did not meet IOM</td>
<td>10.8</td>
<td>12.8</td>
<td>10.3</td>
</tr>
<tr>
<td>Strong policy. Met IOM (&lt;200 mg sodium/portion)</td>
<td>0.0</td>
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<td>0.0</td>
</tr>
<tr>
<td>Any strong policy (total of above two rows)</td>
<td>10.8</td>
<td>12.8</td>
<td>10.3</td>
</tr>
<tr>
<td>Calorie content</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weak or no policy</td>
<td>66.0</td>
<td>77.0</td>
<td>83.5</td>
</tr>
<tr>
<td>Strong policy. Did not meet IOM</td>
<td>4.0</td>
<td>15.0</td>
<td>13.0</td>
</tr>
<tr>
<td>Strong policy. Met IOM (&lt;200 calories/serving)</td>
<td>13.8</td>
<td>4.3</td>
<td>1.8</td>
</tr>
<tr>
<td>Any strong policy (total of above two rows)</td>
<td>17.8</td>
<td>19.3</td>
<td>14.8</td>
</tr>
</tbody>
</table>

* At vending machines, school stores, a la carte meals, and fund-raisers

All numbers rounded. Due to rounding, some percentages may not sum to exactly 100. Exact numbers are available at www.bridgingthegapresearch.org.

### TABLE A4.4

Percentage of Students Nationwide in Districts with Wellness Policies Addressing Beverage Content Restrictions by Grade Level* (2008–2009 SY)

<table>
<thead>
<tr>
<th>Beverage content restrictions</th>
<th>ES % (K–5)</th>
<th>MS % (6–8)</th>
<th>HS % (9–12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete beverage or location ban</td>
<td>14.5</td>
<td>2.5</td>
<td>1.3</td>
</tr>
<tr>
<td>Regular soda</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weak or no policy</td>
<td>39.5</td>
<td>42.5</td>
<td>60.8</td>
</tr>
<tr>
<td>Strong policy. Did not meet IOM (bans regular soda, not all SSBs)</td>
<td>32.8</td>
<td>48.3</td>
<td>34.5</td>
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<tr>
<td>Strong policy. Met IOM (beverages w/added caloric sweeteners prohibited)</td>
<td>13.5</td>
<td>8.5</td>
<td>3.5</td>
</tr>
<tr>
<td>Any strong policy (total of above two rows)</td>
<td>46.3</td>
<td>56.8</td>
<td>38.0</td>
</tr>
<tr>
<td>Other sugar-sweetened beverages (SSBs)**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weak or no policy</td>
<td>71.8</td>
<td>89.5</td>
<td>95.0</td>
</tr>
<tr>
<td>Strong policy. Did not meet IOM (bans regular soda but not all SSBs)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Strong policy. Met IOM (beverages with added caloric sweeteners prohibited)</td>
<td>13.5</td>
<td>8.3</td>
<td>3.5</td>
</tr>
<tr>
<td>Any strong policy (total of above two rows)</td>
<td>13.5</td>
<td>8.3</td>
<td>3.5</td>
</tr>
<tr>
<td>Sugar/calorie content of flavored milk</td>
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<td></td>
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<tr>
<td>Weak or no policy</td>
<td>68.8</td>
<td>74.5</td>
<td>79.0</td>
</tr>
<tr>
<td>Strong policy. Did not meet IOM</td>
<td>15.0</td>
<td>20.8</td>
<td>17.8</td>
</tr>
<tr>
<td>Strong policy. Met IOM (&lt;200 calories/serving)</td>
<td>2.0</td>
<td>2.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Any strong policy (total of above two rows)</td>
<td>17.0</td>
<td>22.8</td>
<td>19.8</td>
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<tr>
<td>Fat contents of milk**</td>
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<td>87.5</td>
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<tr>
<td>Strong policy. Met IOM standards (only low-fat (1%) or non-fat/skim allowed)</td>
<td>10.5</td>
<td>11.5</td>
<td>11.3</td>
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<tr>
<td>Serving size limit for beverages</td>
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<td>Weak or no policy</td>
<td>77.5</td>
<td>88.3</td>
<td>93.8</td>
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<tr>
<td>Strong policy. Did not meet IOM</td>
<td>8.0</td>
<td>9.3</td>
<td>4.8</td>
</tr>
<tr>
<td>Strong policy. Met IOM (milk: 8 oz, 100% juice, 4 oz)</td>
<td>0.0</td>
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<td>0.0</td>
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<tr>
<td>Any strong policy (total of above two rows)</td>
<td>8.0</td>
<td>9.3</td>
<td>4.8</td>
</tr>
</tbody>
</table>

* At vending machines, school stores, a la carte meals, and fund-raisers
** For other sugar-sweetened beverages and fat content of milk, the only strong policy category was the IOM standard.

All numbers rounded. Due to rounding, some percentages may not sum to exactly 100. Exact numbers are available at www.bridgingthegapresearch.org.

### TABLE A4.5  A la Carte Revenue during Target Week by School Type (Percentage of Schools)

<table>
<thead>
<tr>
<th>Weekly revenue</th>
<th>ES</th>
<th>MS</th>
<th>HS</th>
<th>All schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>21.6</td>
<td>10.5</td>
<td>15.4</td>
<td>18.3</td>
</tr>
<tr>
<td>$1 - &lt;$100</td>
<td>63.9</td>
<td>24.7</td>
<td>32.0</td>
<td>50.0</td>
</tr>
<tr>
<td>$100 - $400</td>
<td>13.8</td>
<td>47.3</td>
<td>24.9</td>
<td>22.3</td>
</tr>
<tr>
<td>$400 - &lt;$1,000</td>
<td>0.1</td>
<td>16.2</td>
<td>17.9</td>
<td>7.2</td>
</tr>
<tr>
<td>$1,000 or more</td>
<td>0.0</td>
<td>1.3</td>
<td>9.8</td>
<td>2.3</td>
</tr>
<tr>
<td>Mean (dollars per week)</td>
<td>45</td>
<td>250</td>
<td>351</td>
<td>146</td>
</tr>
<tr>
<td>Number of schools</td>
<td>143</td>
<td>127</td>
<td>125</td>
<td>395</td>
</tr>
</tbody>
</table>

Tabulations prepared by Mathematica Policy Research, Inc. are weighted to be representative of all public schools offering the NSLP.

**SOURCE:** School Nutrition Assessment-III, Daily Meal Count Form, School Year 2004–05.
TABLE A4.6a  Revenues Received from School Stores by Enrollment and School Type  (Percentage of Schools)

<table>
<thead>
<tr>
<th>Has school stores for students*</th>
<th>ES</th>
<th>MS</th>
<th>HS</th>
<th>All schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who receives income from school stores??</td>
<td>—</td>
<td>—</td>
<td>24.8</td>
<td>11.0</td>
</tr>
<tr>
<td>School</td>
<td>—</td>
<td>—</td>
<td>37.0</td>
<td>58.7</td>
</tr>
<tr>
<td>Student council, activities/clubs</td>
<td>—</td>
<td>—</td>
<td>21.5</td>
<td>21.2</td>
</tr>
<tr>
<td>Business/marketing class or club (includes DECA, Inc., an association of marketing students)</td>
<td>—</td>
<td>—</td>
<td>27.5</td>
<td>11.0</td>
</tr>
<tr>
<td>School food service only</td>
<td>—</td>
<td>—</td>
<td>3.3</td>
<td>5.7</td>
</tr>
<tr>
<td>Athletic department</td>
<td>—</td>
<td>—</td>
<td>1.8</td>
<td>5.1</td>
</tr>
<tr>
<td>School food service with others</td>
<td>—</td>
<td>—</td>
<td>5.5</td>
<td>2.2</td>
</tr>
<tr>
<td>Other</td>
<td>—</td>
<td>—</td>
<td>9.7</td>
<td>5.3</td>
</tr>
<tr>
<td>Number of schools</td>
<td>143</td>
<td>127</td>
<td>125</td>
<td>395</td>
</tr>
</tbody>
</table>

* n=80  
** Multiple answers allowed  
— Indicates sample sizes are too small for reliable estimates  
Tabulations prepared by Mathematica Policy Research, Inc. are weighted to be representative of all public schools offering the NSLP.  
SOURCES:  

TABLE A4.6b  Revenues Received from Vending Machines, by Enrollment and School Type  (Percentage of Schools)

<table>
<thead>
<tr>
<th>Has vending machines for students*</th>
<th>ES</th>
<th>MS</th>
<th>HS</th>
<th>All schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who receives income from vending machines??</td>
<td>17.2</td>
<td>81.7</td>
<td>96.7</td>
<td>44.4</td>
</tr>
<tr>
<td>School</td>
<td>—</td>
<td>51.3</td>
<td>52.0</td>
<td>57.2</td>
</tr>
<tr>
<td>School food service</td>
<td>—</td>
<td>24.0</td>
<td>16.0</td>
<td>19.8</td>
</tr>
<tr>
<td>Other school district department or fund</td>
<td>—</td>
<td>18.7</td>
<td>15.3</td>
<td>17.8</td>
</tr>
<tr>
<td>Athletic department</td>
<td>—</td>
<td>7.6</td>
<td>32.8</td>
<td>17.2</td>
</tr>
<tr>
<td>Student council, activities/clubs</td>
<td>—</td>
<td>16.3</td>
<td>28.4</td>
<td>17.2</td>
</tr>
<tr>
<td>Other</td>
<td>—</td>
<td>0.0</td>
<td>0.8</td>
<td>0.4</td>
</tr>
<tr>
<td>Number of schools reporting (vending)</td>
<td>29</td>
<td>104</td>
<td>122</td>
<td>255</td>
</tr>
<tr>
<td>Number of schools</td>
<td>143</td>
<td>127</td>
<td>125</td>
<td>395</td>
</tr>
</tbody>
</table>

* n=255 as reported by principals  
** Multiple answers allowed  
— Indicates sample sizes are too small for reliable estimates  
Tabulations prepared by Mathematica Policy Research, Inc. are weighted to be representative of all public schools offering the NSLP.  
SOURCES:  
Appendix 4

Table A4.7


<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>5.0</td>
<td>5.5</td>
<td>10.0</td>
<td>13.9</td>
<td>15.4</td>
<td>17.1</td>
<td>15.5</td>
<td>16.9</td>
<td>16.9</td>
<td></td>
</tr>
<tr>
<td>2–5</td>
<td>—</td>
<td>5.0</td>
<td>5.0</td>
<td>7.2</td>
<td>10.3</td>
<td>10.6</td>
<td>13.9</td>
<td>11.0</td>
<td>10.4</td>
<td>12.1</td>
</tr>
<tr>
<td>6–11</td>
<td>4.2</td>
<td>4.0</td>
<td>6.5</td>
<td>11.3</td>
<td>15.1</td>
<td>16.3</td>
<td>18.8</td>
<td>15.1</td>
<td>19.6</td>
<td>18.0</td>
</tr>
<tr>
<td>12–19</td>
<td>4.6</td>
<td>6.1</td>
<td>5.0</td>
<td>10.5</td>
<td>14.8</td>
<td>16.7</td>
<td>17.4</td>
<td>17.8</td>
<td>18.1</td>
<td>18.4</td>
</tr>
</tbody>
</table>


Table A4.8


<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Obesity only, all children</td>
<td>14.8%</td>
<td>16.4%</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Overweight and obesity combined, all children</td>
<td>30.6%</td>
<td>31.6%</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Among subgroups</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family income below poverty level</td>
<td>39.8%</td>
<td>44.8%**</td>
<td>1.48</td>
<td>1.58</td>
</tr>
<tr>
<td>Family income more than 400% of poverty level</td>
<td>22.9%</td>
<td>22.2%</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Non-Hispanic black</td>
<td>41.2%</td>
<td>41.1%</td>
<td>1.55</td>
<td>1.53</td>
</tr>
<tr>
<td>Non-Hispanic white</td>
<td>26.6%</td>
<td>26.8%</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Hispanic</td>
<td>37.7%</td>
<td>41.0%</td>
<td>1.28</td>
<td>1.39</td>
</tr>
<tr>
<td>Non-Hispanic</td>
<td>29.5%</td>
<td>29.6%</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

* A ratio of 1.00 indicates equal prevalence between two groups; above 1.00 indicates higher prevalence for the lower socioeconomic group. Data include only states with at least twenty-five cases of overweight/obesity data whose rate had a relative standard error of less than 30 percent. Each state’s specific rate and rank for 2003 and 2007 are available on request from the authors.
** 2003 versus 2007 rates are significantly different (P<0.05).

FIGURE A4.1  Percentage of High School Students Considered Overweight in 2009

% Overweight
- 0.1–12%
- 12.1–14%
- 14.1–16%
- 16.1–18%
- No Data

SOURCE: MMWR Youth Risk Behavior Surveillance, United States 2009. Table 91. Percentage of high school students who were obese and who were overweight by gender at selected U.S sites.

FIGURE A4.2  Percentage of High School Students Considered Obese in 2009

% Overweight
- 0.1–12%
- 12.1–14%
- 14.1–16%
- 16.1–18%
- No Data

SOURCE: MMWR Youth Risk Behavior Surveillance, United States 2009. Table 91. Percentage of high school students who were obese and who were overweight by gender at selected U.S sites.
### TABLE A4.9
Estimated Number of Cases of Diabetes Mellitus among Youth in the United States in 2001 According to Age and Race/Ethnicity

<table>
<thead>
<tr>
<th>Age 0–9 years</th>
<th>SEARCH prevalence, cases per 1,000 youth</th>
<th>U.S. population</th>
<th>Estimated number of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>NHW</td>
<td>1.06</td>
<td>23,810,026</td>
<td>25,156</td>
</tr>
<tr>
<td>Black</td>
<td>0.61</td>
<td>6,184,407</td>
<td>3779</td>
</tr>
<tr>
<td>Hispanic</td>
<td>0.45</td>
<td>7,542,892</td>
<td>3363</td>
</tr>
<tr>
<td>API</td>
<td>0.29</td>
<td>1,632,604</td>
<td>467</td>
</tr>
<tr>
<td>AI</td>
<td>0.24</td>
<td>401,750</td>
<td>95</td>
</tr>
<tr>
<td>All groups</td>
<td>0.83</td>
<td>39,571,679</td>
<td>32,860</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age 10–19 years</th>
<th>SEARCH prevalence, cases per 1,000 youth</th>
<th>U.S. population</th>
<th>Estimated number of cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>NHW</td>
<td>3.19</td>
<td>26,227,882</td>
<td>83,644</td>
</tr>
<tr>
<td>Black</td>
<td>3.23</td>
<td>6,281,586</td>
<td>20,261</td>
</tr>
<tr>
<td>Hispanic</td>
<td>2.18</td>
<td>6,543,747</td>
<td>14,275</td>
</tr>
<tr>
<td>API</td>
<td>1.36</td>
<td>1,671,206</td>
<td>2268</td>
</tr>
<tr>
<td>AI</td>
<td>2.32</td>
<td>457,331</td>
<td>1061</td>
</tr>
<tr>
<td>All groups</td>
<td>2.95</td>
<td>41,181,752</td>
<td>121,509</td>
</tr>
<tr>
<td>Totals</td>
<td>1.91</td>
<td>80,753,431</td>
<td>154,369</td>
</tr>
</tbody>
</table>


### TABLE A4.10
Age-Adjusted and Age-Specific Prevalence of High Blood Pressure among Children Ages 8–17 by Gender and Race/Ethnicity Over Time

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>37.2%</td>
<td>16.9%</td>
<td>11.1%</td>
<td>4.7%</td>
<td>2.7%</td>
<td>3.7%</td>
</tr>
<tr>
<td>Non-Hispanic black</td>
<td>34.7%</td>
<td>17.8%</td>
<td>10.5%</td>
<td>—</td>
<td>3.7%</td>
<td>4.2%</td>
</tr>
<tr>
<td>Non-Hispanic white</td>
<td>37.5%</td>
<td>16.7%</td>
<td>11.2%</td>
<td>—</td>
<td>2.5%</td>
<td>3.3%</td>
</tr>
<tr>
<td>Mexican-Americans</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>4.8%</td>
<td>2.5%</td>
<td>4.6%</td>
</tr>
<tr>
<td>Male</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Hispanic black</td>
<td>32.7%</td>
<td>12.7%</td>
<td>9.3%</td>
<td>—</td>
<td>4.1%</td>
<td>5.5%</td>
</tr>
<tr>
<td>Non-Hispanic white</td>
<td>35.4%</td>
<td>15.8%</td>
<td>10.4%</td>
<td>—</td>
<td>3.6%</td>
<td>3.5%</td>
</tr>
<tr>
<td>Mexican-Americans</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>6.1%</td>
<td>3.1%</td>
<td>5.3%</td>
</tr>
<tr>
<td>Female</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Hispanic black</td>
<td>36.7%</td>
<td>22.9%</td>
<td>11.7%</td>
<td>—</td>
<td>3.2%</td>
<td>3.0%</td>
</tr>
<tr>
<td>Non-Hispanic white</td>
<td>39.7%</td>
<td>17.7%</td>
<td>12.0%</td>
<td>—</td>
<td>1.3%</td>
<td>3.2%</td>
</tr>
<tr>
<td>Mexican-Americans</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>3.5%</td>
<td>1.9%</td>
<td>3.9%</td>
</tr>
</tbody>
</table>

* Data obtained from the CDC, National Health Examination Survey II and III
** Data obtained from the CDC, National Health and Nutrition Examination Survey
*** Data obtained from the CDC, Hispanic Health and Nutrition Examination Survey

### TABLE A4.11 Estimated Prevalence for Lipid Abnormalities among Youth Ages 12–19

<table>
<thead>
<tr>
<th></th>
<th>High LDL-C*</th>
<th>Low HDL-C*</th>
<th>High triglycerides*</th>
<th>≥ Lipid abnormality**</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total % of children</strong></td>
<td>7.63%</td>
<td>7.6%</td>
<td>10.2%</td>
<td>20.3%</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td>8.4%</td>
<td>11.0%</td>
<td>11.4%</td>
<td>24.3%</td>
</tr>
<tr>
<td>Girls</td>
<td>6.8%</td>
<td>4.0%</td>
<td>8.8%</td>
<td>15.9%</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12–13</td>
<td>7.3%</td>
<td>4.7%</td>
<td>9.5%</td>
<td>18.2%</td>
</tr>
<tr>
<td>14–15</td>
<td>6.9%</td>
<td>8.7%</td>
<td>8.1%</td>
<td>18.4%</td>
</tr>
<tr>
<td>16–17</td>
<td>5.2%</td>
<td>7.2%</td>
<td>7.0%</td>
<td>16.5%</td>
</tr>
<tr>
<td>18–19</td>
<td>11.4%</td>
<td>10.4%</td>
<td>16.4%</td>
<td>28.8%</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Hispanic white</td>
<td>7.7%</td>
<td>8.5%</td>
<td>12.1%</td>
<td>22.4%</td>
</tr>
<tr>
<td>Non-Hispanic black</td>
<td>8.9%</td>
<td>4.7%</td>
<td>3.7%</td>
<td>14.6%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>5.4%</td>
<td>7.9%</td>
<td>9.3%</td>
<td>18.6%</td>
</tr>
<tr>
<td><strong>BMI</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal weight</td>
<td>5.8%</td>
<td>4.3%</td>
<td>5.9%</td>
<td>14.2%</td>
</tr>
<tr>
<td>Overweight</td>
<td>8.4%</td>
<td>8.3%</td>
<td>13.8%</td>
<td>22.3%</td>
</tr>
<tr>
<td>Obese</td>
<td>14.2%</td>
<td>20.5%</td>
<td>24.1%</td>
<td>42.9%</td>
</tr>
</tbody>
</table>

n = 3,125

* Low-density lipoprotein (high=LDL-C ≥ 130 mg/dL); high-density lipoprotein (low=HDL-C ≥ 35 mg/dL); high triglycerides (≥ 150 mg/dL) levels.
** Defined as having high LDL-C, low HDL-C, and/or high triglyceride levels.

**SOURCES**
Appendix 5: Meeting HIA Practice Standards

This appendix reviews how the research team used and met guidelines from the North American HIA Practice Standards Version 2 to develop each stage of the HIA. The partners are interested in furthering HIA practice while creating an assessment of the federal rulemaking process on snack foods and beverages sold in schools. This report and its appendices were designed with this and expediency in mind. The team created a checklist for HIA practice standards and referred to them in anticipation of each stage of the HIA.

Stakeholder Engagement

The advisory committee, composed of experts on school food policy and research, helped the research team understand who may be affected by national standards and restrictions for snack foods and beverages sold in schools. More specifically, the advisory committee provided counsel regarding health determinants, health outcomes, vulnerable populations, priority research questions, potential health disparities and inequities, potential data sources, and potential methods. The team held five meetings coinciding with the scoping, assessment, recommendations, and reporting phases of the HIA. All committee members reviewed at least one section of the draft report and two members read the entire document.

<table>
<thead>
<tr>
<th>Stakeholder Involvement in Four Stages of the HIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advisory committee</td>
</tr>
<tr>
<td>Scoping</td>
</tr>
<tr>
<td>Assessment</td>
</tr>
<tr>
<td>Recommendations</td>
</tr>
<tr>
<td>Reporting</td>
</tr>
</tbody>
</table>

Screening

In the screening stage, a potential HIA is evaluated to determine whether the policy has significant health impacts that would be otherwise unconsidered by decision makers, whether the analysis is feasible and timely, and whether the decision-making process would be receptive to the HIA findings and recommendations. There are many applications for HIA, and government officials at all levels are increasingly using it to inform their decisions. However, an HIA is not always the right policy planning tool. If health is already a focus of a proposed policy or project, or if the potential health effects are too hypothetical, an HIA may not offer decision makers new information. That is why the screening stage of an HIA is critical.
An effective approach to screening can determine whether an HIA will add value and is the right tool for the decision at hand. At the end of the screening phase, the partners concluded that an HIA on the federal rulemaking process for all foods sold outside of the school meal programs could help synthesize relevant information, communicate comparative outcomes of rule scenarios, increase transparency in the policy decision-making process, and inform discussions about compromises related to elements of snack foods and beverages sold in schools. The following are the results from the screening stage of the HIA.

Potential Overlooked Health Impacts
The partners determined that the amount of information available on the impacts of nutrition standards on school district and school food services revenue is relatively thin and would be bolstered with an analysis of the impact of different state policies in the past five or 10 years. Nutrient standards for snack foods and beverages sold in schools have clear connections to dietary intake; however, the research team thought more abstract outcomes such as links to school services provisions, student learning outcomes, and chronic illness would be useful to examine. Additionally, it was concerned that there was a potential for unequally distributed impacts.

Feasibility and Timeliness
The partners determined that there was adequate scientific evidence and sufficient resources available to conduct an HIA on standards for snack food and beverages sold in schools. The research team thought it would be timely because the release of the report could be part of scientific evidence USDA would consider in developing proposed standards.

Receptiveness of Decision-Making Process
USDA’s decision-making process on the proposed standards was closed during this HIA; thus staff from USDA could not be involved to serve as advisory members or guide the report. However, Section 208 requires the department to examine relevant scientific information, including the results of this HIA. The research team notified USDA of its decision to conduct an HIA. The team also informed the general public through newsletter postings in prominent venues during the assessment stage, and notified other stakeholders by inviting them to participate.

Stakeholder Involvement and Participants
During the screening phase, the partners conducted a stakeholder analysis to develop a list of populations, stakeholders, and organizations that might be affected by, have expertise about, or have an interest in the federal rulemaking process on competitive foods standards.2-5 Stakeholder analysis is an analytical method used by facilitators, urban planners, and project managers to understand conflict and potential shared interests among collaborating stakeholders.6-8 From this initial list, the partners invited individuals to participate as advisory committee members or stakeholder interviews. In addition to adhering to the practice standards, the research team had central objectives for engaging stakeholders related to the HIA goals.
TABLE A5.2a  HIA Goals and Stakeholder Engagement Objectives

<table>
<thead>
<tr>
<th>HIA goals</th>
<th>Engagement objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synthesize the health effects of nutritional and school district financial changes that will result from USDA setting a national standard for foods sold outside of the school meal programs.</td>
<td>Interviews and advisory committees improve the comprehensiveness and accurateness of the research scope and health determinant pathways.</td>
</tr>
<tr>
<td>Evaluate and communicate comparative outcomes of different scenarios for the forthcoming USDA rule (e.g., strong, moderate, or weak nutrition standards).</td>
<td>Interviews improve the quality of the revenue analysis by including qualitative, contextual information for understanding how the revenue shapes school services and what the literature indicates (e.g., how the team interprets its findings).</td>
</tr>
<tr>
<td>Identify potential health disparities and inequities resulting from national standards for snack foods and beverages sold in schools.</td>
<td>Process interviews about research scope and recommendations that will help target vulnerable populations. Key informant interviews with school groups and students will provide context for interpreting findings related to stigma and other outcomes.</td>
</tr>
<tr>
<td>Inform national and state discussions about compromises related to policy elements.</td>
<td>Advisory committee participants and other HIA advisors will contribute to the dissemination strategy.</td>
</tr>
<tr>
<td>Make recommendations to increase positive health outcomes and minimize potential health risks.</td>
<td>Interviews and advisory committees improve the relevance of findings to the decision-making process, for policy content, and for policy implementation.</td>
</tr>
</tbody>
</table>

The research team engaged stakeholders to guide the research scope, help interpret research findings, gather qualitative information lacking from existing literature and data in the assessment phase, and develop policy recommendations. Stakeholders were involved through three strategies: (1) an advisory committee, (2) HIA process interviews, and (3) key informant interviews. As USDA’s policy is national in geographic reach, the team aimed to include voices from urban, rural, suburban, and frontier districts across the three levels of engagement.

TABLE A5.2b  Stakeholder Involvement by HIA Stage

<table>
<thead>
<tr>
<th>HIA Goals</th>
<th>Engagement Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synthesize the health effects of nutritional and school district financial changes that will result from USDA setting a national standard for foods sold outside of the school meal programs.</td>
<td>Interviews and advisory committees improve the comprehensiveness and accurateness of the research scope and health determinant pathways.</td>
</tr>
<tr>
<td>Evaluate and communicate comparative outcomes of different scenarios for the forthcoming USDA rule (e.g., strong, moderate, or weak nutrition standards).</td>
<td>Interviews improve the quality of the revenue analysis by including qualitative, contextual information for understanding how the revenue shapes school services and what the literature indicates (e.g., how the team interprets its findings).</td>
</tr>
<tr>
<td>Identify potential health disparities and inequities resulting from national standards for snack foods and beverages sold in schools.</td>
<td>Process interviews about research scope and recommendations that will help target vulnerable populations. Key informant interviews with school groups and students will provide context for interpreting findings related to stigma and other outcomes.</td>
</tr>
<tr>
<td>Inform national and state discussions about compromises related to policy elements.</td>
<td>Advisory committee participants and other HIA advisors will contribute to the dissemination strategy.</td>
</tr>
<tr>
<td>Make recommendations to increase positive health outcomes and minimize potential health risks.</td>
<td>Interviews and advisory committees improve the relevance of findings to the decision-making process, for policy content, and for policy implementation.</td>
</tr>
</tbody>
</table>

The research team engaged stakeholders to guide the research scope, help interpret research findings, gather qualitative information lacking from existing literature and data in the assessment phase, and develop policy recommendations. Stakeholders were involved through three strategies: (1) an advisory committee, (2) HIA process interviews, and (3) key informant interviews. As USDA’s policy is national in geographic reach, the team aimed to include voices from urban, rural, suburban, and frontier districts across the three levels of engagement.
Scope Development

Participant Roles

Upstream was responsible for conducting the HIA stages from scoping through completing a final draft report. The Pew Charitable Trusts’ Kids’ Safe and Healthy Foods Project and the Health Impact Project finalized and disseminated the final report and are responsible for evaluation and monitoring.

Decision Alternatives

The primary decision assessed by this report is the plausible set of regulations that will be developed by the USDA Secretary based on Section 208 of the Healthy, Hunger-Free Kids Act. As USDA has not previously set standards for all foods sold in schools throughout the school day, and Section 208 requires USDA to consider multiple sources of information in the development of standards, there are multiple potential alternatives. The development of two policy scenarios was based on the research team’s interpretation of Section 208 with guidance from the advisory committee.

Potential Significant Health Determinants, Health Impacts, and Impacted Populations

Children’s diet and nutrition-related health outcomes are the focus of this HIA. Children’s dietary intake, in addition to physical activity, affects weight status and other chronic disease risk factors. Changes in revenue from selling snack foods and beverages can affect the school services provided by school district food service departments, education administration, student groups, and enrichment programs. Because revenue changes occur upstream and can affect children’s eating behaviors or other health outcomes through the provision of school services, they are included in this report.

Children are the vulnerable population most impacted by standards for snack foods and beverages sold in schools. Within this population, sub-groups may be disproportionately affected through different levels of exposure. For example, the research team heard anecdotally from stakeholder interviews that higher-income students have more healthy and unhealthy food options available to purchase than low-income students and thus might experience a larger relative shift in product changes after implementation of standards. This is important, as low-income children are more likely to experience household food insecurity. The team also heard anecdotally from stakeholders that low-income students who are eligible for free or reduced meals might be disproportionately affected by standards because there would be fewer unhealthy non-meal options available. The team looked at existing disparities among geographic regions and among children’s demographic characteristics as much as the data would allow. Where possible, it looked at regional disparities among states, and age, income, and ethnic or racial disparities among children populations.

Boundaries of Analysis

The current condition information encompasses children populations in all 50 states and the District of Columbia. Assessment of impacts was limited to existing data sets and populations studied in research literature that encompassed specific schools, school districts, communities, states, and nationally.
representative samples. Empirical analysis of state policies’ impact on school district revenue was limited by the data sets. Changes from the policy analysis could be evaluated in only 39 states and the District of Columbia based on limits to the policy classification system and available revenue information.

Data Gaps

The research team used existing data, literature, and stakeholder interviews to inform this report. State revenue data are from the Common Core of Data and the Food Research and Action Center. State food and nutrition environment policy scoring data are from the National Cancer Institute. Health outcome data are from the Centers for Disease Control and Prevention or other national sources and are cited where used in the report.9-13 See the methods section in Chapter 2 for a description of the databases used to find current literature.

Gaps in data can be traced to the following:

• Qualitative interviews were not representative of all groups potentially impacted by the national policy. The timeline did not permit a representative sampling.
• The state-by-state policy analysis does not allow the understanding of specific impacts at the district or school level.
• Recent qualitative and quantitative data on school administrator, student group, activity clubs, or other organizations’ use of revenue from snack food and beverage sales are lacking.
• Multiple outcomes the research team wanted to study have not been researched extensively, including children’s stigma associated with federal meal programs and the relationship between snack foods and beverages and risk factors for specific chronic diseases (e.g., cancer, type 2 diabetes).
• Data on ethnic or racial disparities.

Stakeholder Review of Scope and Health Determinant Pathways

The research team developed a draft scope considering all potential pathways that linked the policy decision with direct, indirect, or cumulative health outcomes. The advisory committee helped revise and prioritize specific health outcomes and research questions. The team focused on outcomes with the greatest potential significance and those that would add the most to the existing national discussion. It also gathered input and revisions on scope through stakeholder interviews and a discussion with one HIA expert peer reviewer. It used guidance from the HIA Practice Standards and aligned various forms of stakeholder input with this HIA’s goals. For a list of how stakeholder engagement aligned with these goals, see Table A5.2a.
Assessment

Baseline Conditions

The research team documented existing conditions based on the final health outcomes it could evaluate in relation to the policy. It evaluated and synthesized the best available evidence.

Impact Characterization

The team used notes from a recent HIA of the America’s Methods Committee meeting prepared by Habitat Health Impact Consulting to develop a menu of impact characterization options. Team members reviewed characterization element definitions from six sources in a team meeting and created a revised version based on the scope of the policy.14-17

Recommendations

The research team developed recommendations based on findings from the assessment with input from the advisory committee and stakeholder interviews. The policy recommendations indicate where this report led to inconclusive results, the potential negative consequences, and the potential positive outcomes.

Reporting and Dissemination

This publicly available report includes a discussion of each stage of the HIA, current baseline conditions, identification of health impacts, relevant findings, and recommendations to manage potential impacts.

Peer Review Process

The Robert Wood Johnson Foundation requires all reports to involve an external review process. The research team developed a list of content and HIA process experts and invited two individuals to review the report. Advisory committee members also had the opportunity to review report drafts and provide feedback. The team asked one HIA expert and one school foods policy content expert to review the HIA report. The HIA expert reviewed the research scope and the final report. The content expert gave feedback on the final report.

Dissemination Plan

In the scoping phase, the research team developed a draft set of outlets and methods for distribution that it shared with the advisory committee for input. The report will be publicly available and will use a variety of dissemination methods, including public presentations, an executive summary, a policy brief, a press release, and newsletter postings.
Evaluation and Monitoring

Upstream suggests that the Kids’ Safe and Healthful Foods Project team monitor the impact of the HIA on the policy decision-making process based on the following measures:

- Track media references to USDA’s snack food and beverage regulatory process, the rule, and the HIA (e.g., the number and types of media, including websites, news articles, magazine articles, and the legislative process).
- Track academic and government studies that cite the HIA.
- Determine the extent to which HIA recommendations were used in the policy (e.g., in revised versions after public comment).
- Track other policies or projects that incorporate recommendations or other elements from the HIA.

Upstream recommends that The Pew Charitable Trusts and Robert Wood Johnson Foundation work with a university intern or hire an external evaluator to complete an evaluation of the HIA process, following these steps:

- First, review the final HIA report against the HIA practice standards. Have the evaluator fill out a form reviewing the report and the project manager from Upstream (or from the Kids’ Safe and Healthful Foods Project) fill out a duplicate form repeating the same steps. The evaluator will then align the two sets of responses and conduct an interview with the project manager to understand what was not completed, or changed, from practice standards. The evaluator will then provide feedback about improvements for the next HIA.
- Second, conduct six to 12 confidential stakeholder interviews that include advisory committee members, USDA staff, a reporter, and an external HIA expert. The summary document of the interviews will not attribute responses to individuals in such a way that they can be identified.
References for Appendix 5

3. P. Harris et al., *Health Impact Assessment: A Practical Guide* (Sydney, Australia: Centre for Health Equity Training, Research and Evaluation [CHETRE], Part of the UNSW Research Centre for Primary Health Care and Equity, UNSW, 2007).
10. Classification of Laws Associated with School Students, “CLASS Data.”
Appendix 6: Review of Existing State Policies’ Guidelines on Snack and a la Carte Foods and Beverages Sold in Schools

This review is based on information provided by the National Association of State Boards of Education website, state websites, the CLASS policy analysis discussed in Chapter 2, and the Centers for Disease Control and Prevention’s scan of existing state policies. This was an informal policy scan; a legal consultant was not used to review administrative code language. Hence, these are rough estimates of where a state ranks in relation to the 2005 DGA (from CLASS) or the IOM standards.

### TABLE A6.1 Summary of Range of Snack Food Policies

<table>
<thead>
<tr>
<th>Snack dietary standards (non-a la carte)</th>
<th>Differences by grade level</th>
<th>Other provisions</th>
<th>Calories</th>
<th>Sugar</th>
<th>Total fat</th>
<th>Saturated and trans fats</th>
<th>Sodium</th>
<th>Fruits and vegetables</th>
<th>Fiber and whole grains</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Range of state policies</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strong (among states with each provision)</td>
<td>Strong policy across all grades (many states)</td>
<td>Restrictions on deep fat frying (AZ, KY, TX)</td>
<td>ES—150, MS—180, HS—200 (OR) 1 oz for snacks (LA) 1 oz for some items (many states)</td>
<td>32% by weight (KY) 8 g (HI)</td>
<td>7 g (MS) 30% of calories (KY, NV, RI, SC)</td>
<td>2 g saturated fat (HI, MD, MS, NJ, NM)</td>
<td>200 mg for snacks (HI, WV) 450 mg for certain entrees (KY) 480 for all entrées (CT, MA)</td>
<td>Fruits and vegetables offered at all points of service (AR, TX)</td>
<td>2 g fiber for snacks (HI) All grain-based products must be whole grain (MA)</td>
</tr>
<tr>
<td>Average</td>
<td>Stronger policies in ES</td>
<td>No competitive foods around meal times No FMNV</td>
<td>200 for snacks 35% by weight 35% of calories</td>
<td>10% of calories from saturated fat No trans fat</td>
<td>No typical policy</td>
<td>No typical policy</td>
<td>No typical policy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weaker</td>
<td>Guidelines apply only to ES (GA, NC, SC)</td>
<td>No additional policies</td>
<td>250 for snacks (CA) 400 (IA) 450 for a la carte (OR)</td>
<td>40% by weight (WW) 30 g (LA)</td>
<td>23 g, except 28 g once per week (TX)</td>
<td>10% of calories from saturated fat (many states)</td>
<td>800 mg for entrees and 600 mg for snacks (AZ)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### TABLE A6.2 Summary of Range of Beverage Policies

<table>
<thead>
<tr>
<th>Beverage dietary standards (non-a la carte)</th>
<th>Allowed</th>
<th>Differences by grade</th>
<th>Soda summary</th>
<th>Milk details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Strong state policy</strong></td>
<td>Water, milk (8 oz), 100% fruit or vegetable juice (8 oz), no artificial sweeteners (MA)</td>
<td>Strong policy across all grades (many states)</td>
<td>None allowed (many states)</td>
<td>1% milk 8 oz: 22 g sugar Dairy alternatives allowed (MA)</td>
</tr>
<tr>
<td><strong>Average or typical (among states with a policy)</strong></td>
<td>Water, milk, 100% fruit or vegetable juice, some other beverage (50% juice, sports drink, or low-calorie beverages)</td>
<td>Stronger policy in ES and MS</td>
<td>None allowed</td>
<td>1% milk Limit on sugar of 22–32 g per 8 oz Dairy alternatives allowed</td>
</tr>
<tr>
<td>State</td>
<td>Rank re: IOM or 2005 DGA Year enacted or revised</td>
<td>Differences by grade level</td>
<td>Other provisions</td>
<td>Calories</td>
</tr>
<tr>
<td>---------------------</td>
<td>------------------------------------------------</td>
<td>-----------------------------</td>
<td>------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>Alabama</td>
<td>Close to IOM 2007</td>
<td>No CF during meals FMNV cannot be sold</td>
<td>Some items limited to 1 or 1.5 oz</td>
<td>30 g carbohydrate for snacks</td>
</tr>
<tr>
<td>Alaska</td>
<td>No state policy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arizona</td>
<td>2007</td>
<td>HS: guidelines do not apply</td>
<td>Final preparation method cannot be deep-fat fried No deep-fat fried chips or crackers</td>
<td>400 calories for entrées and fruit smoothies</td>
</tr>
<tr>
<td>Arkansas</td>
<td>Close to IOM 2007</td>
<td>ES: no vending machines; only items that are part of school meal can be sold in the cafeteria; no extra servings of desserts or french fries</td>
<td>French fries are limited by portion size and frequency No CF until 30 minutes after lunch</td>
<td>35% by weight, with exceptions</td>
</tr>
<tr>
<td>California</td>
<td>Close to 2005 DGA 2007</td>
<td>ES: only items part of school meal can be sold during meals, allows dairy and whole grain items up to 175 calories in vending machines</td>
<td>A la carte—400 calories and 4 g fat per 100 calories</td>
<td>200 calories for snacks</td>
</tr>
<tr>
<td>Colorado</td>
<td>1998</td>
<td>HS: restriction may be waived for mechanically vended beverages</td>
<td>No CF 30 minutes before and after meals</td>
<td>200 calories for snacks</td>
</tr>
<tr>
<td>Connecticut</td>
<td>Close to IOM 2006</td>
<td>No CF 30 minutes before and after meals</td>
<td>200 calories for snacks</td>
<td>35% by weight, with exceptions</td>
</tr>
<tr>
<td>District of Columbia</td>
<td>2011</td>
<td>Must meet HUSSC Gold requirements</td>
<td>200 calories or part of school meal</td>
<td>35% by weight, with exceptions</td>
</tr>
<tr>
<td>Florida</td>
<td>2006</td>
<td>ES and MS: no FMNV</td>
<td>FMNV can be sold one hour after lunch</td>
<td>200 calories for snacks</td>
</tr>
<tr>
<td>State</td>
<td>Rank re: IOM or 2005 DGA Year enacted or revised</td>
<td>Differences by grade level</td>
<td>Other provisions</td>
<td>Calories</td>
</tr>
<tr>
<td>---------------</td>
<td>---------------------------------------------------</td>
<td>-----------------------------</td>
<td>------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Georgia</td>
<td>2002</td>
<td>ES: no FMNV from beginning of school day until end of last lunch period</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hawaii</td>
<td>Close to IOM 2008</td>
<td>ES: no CF</td>
<td>No FMNV or foods listing sugar as first ingredient</td>
<td>200 calories for snacks</td>
</tr>
<tr>
<td>Idaho</td>
<td>No state policy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illinois</td>
<td>2006</td>
<td>HS: no restrictions ES: no confections, candy and potato chips during meal periods</td>
<td>Restrictions do not apply to the lunch room during meals</td>
<td>200 calories, with exceptions</td>
</tr>
<tr>
<td>Indiana</td>
<td>2006</td>
<td>ES: no vending machines</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iowa</td>
<td>Close to IOM 2009</td>
<td></td>
<td></td>
<td>400 calories for entree 200 calories for other part of school meal</td>
</tr>
<tr>
<td>Kansas</td>
<td>2010</td>
<td>No FMNV</td>
<td></td>
<td>200 calories with exceptions</td>
</tr>
<tr>
<td>Kentucky</td>
<td>Close to 2005 DGA 2005</td>
<td></td>
<td></td>
<td>1 oz portion for cookies Other snacks have limits of 2 oz or higher</td>
</tr>
<tr>
<td>Louisiana</td>
<td>2009</td>
<td>No FMNV or fresh pastries Mealtime restrictions</td>
<td></td>
<td>150 calories for snacks</td>
</tr>
<tr>
<td>State</td>
<td>Differences by grade level</td>
<td>Other provisions</td>
<td>Calories</td>
<td>Sugar</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------------------</td>
<td>----------------------------------------------------------------------------------</td>
<td>--------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Maine</td>
<td>2006</td>
<td>No FMNV</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CF must contribute both to the nutritional needs of children and the development of desirable food habits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maryland</td>
<td>2005</td>
<td>HS: fat and sugar limits do not apply</td>
<td>15 g sugar,</td>
<td>9 g, with</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No FMNV until end of lunch</td>
<td>exceptions</td>
<td>exceptions</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>Close to IOM 2010</td>
<td>No artificial sweeteners</td>
<td>200 calories, except a la carte entrees</td>
<td>35% of calories, with exceptions</td>
</tr>
<tr>
<td>Michigan</td>
<td>Close to IOM 2010</td>
<td>State guidelines are voluntary</td>
<td>200 calories, with exceptions</td>
<td>35% by weight, with exceptions</td>
</tr>
<tr>
<td>Minnesota</td>
<td>No state policy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mississippi</td>
<td>Close to IOM 2008</td>
<td>ES: no CF</td>
<td>200 calories</td>
<td>35% by weight or 15 g, with exceptions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CF restrictions around meal times Only food items that are part of the school meal can be sold a la carte, and only if student has purchased meal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Missouri</td>
<td>No state policy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Montana</td>
<td>No state policy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nebraska</td>
<td>No state policy</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### TABLE A6.3: State List of Competitive Foods Policies

<table>
<thead>
<tr>
<th>State</th>
<th>Differences by grade level</th>
<th>Other provisions</th>
<th>Calories</th>
<th>Sugar</th>
<th>Total fat</th>
<th>Saturated and trans fats</th>
<th>Sodium</th>
<th>Foods to encourage: fruits and vegetables, fiber, and whole grains</th>
<th>Snack dietary standards (non-a la carte)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nevada</td>
<td>Close to 2005 DGA 2005</td>
<td>ES: no food in vending machines</td>
<td>No FMNV</td>
<td>Various size limits on snack foods</td>
<td>35% by weight, with exceptions</td>
<td>30% of calories, with exceptions</td>
<td>10% of calories from saturated fat</td>
<td>600 mg</td>
<td></td>
</tr>
<tr>
<td>New Hampshire</td>
<td>No state policy</td>
<td>No FMNV, candy, or foods with sugar as first ingredient</td>
<td>8 g, with exceptions</td>
<td>2 g of saturated fat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Jersey</td>
<td>2007</td>
<td>No FMNV</td>
<td>Calories</td>
<td>Sugar</td>
<td>Total fat</td>
<td>Saturated and trans fats</td>
<td>Sodium</td>
<td>Foods to encourage: fruits and vegetables, fiber, and whole grains</td>
<td>Snack dietary standards (non-a la carte)</td>
</tr>
<tr>
<td>New Mexico</td>
<td>Close to 2005 DGA 2006</td>
<td>ES: no CF in vending machines</td>
<td>200 calories, with exceptions</td>
<td>15 g, with exceptions</td>
<td>8 g, with exceptions</td>
<td>2 g saturated + trans fat, with exceptions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New York</td>
<td>2006</td>
<td>No sweetened soda water, chewing gum, candies, water ices (except for those that contain fruit or fruit juices) until after lunch</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>North Carolina</td>
<td>2005</td>
<td>ES: no snack vending; other nutrition guidelines for a la carte</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>North Dakota</td>
<td>No state policy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ohio</td>
<td>No state CF policy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oklahoma</td>
<td>2007</td>
<td>ES and MS: no FMNV except for special occasions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oregon</td>
<td>Close to 2005 DGA 2007</td>
<td>See calories</td>
<td>A la carte entrée: 450 calories Snacks: ES—150, MS—180, HS—200</td>
<td>35% by weight, with exceptions</td>
<td>35% of calories, with exceptions</td>
<td>10% of calories from saturated fat, with exceptions</td>
<td>No trans fat</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Health Impact Assessment: National Nutrition Standards for Snack and a la Carte Foods and Beverages**
**TABLE A6.3**  
State List of Competitive Foods Policies

<table>
<thead>
<tr>
<th>State</th>
<th>Differences by grade level</th>
<th>Other provisions</th>
<th>Calories</th>
<th>Sugar</th>
<th>Total fat</th>
<th>Saturated and trans fats</th>
<th>Sodium</th>
<th>Foods to encourage: fruits and vegetables, fiber, and whole grains</th>
<th>Snack dietary standards (non-a la carte)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pennsylvania</td>
<td>ES: vending limited to fruits, vegetables, yogurt, low-fat yogurt, and reduced-fat cheese</td>
<td>Guidelines are voluntary, but schools that follow guidelines receive a supplemental state reimbursement No FMNV No fried foods</td>
<td>250 calories</td>
<td>35% by weight, with exceptions Sugar cannot be the first ingredient</td>
<td>35% of calories, with exceptions</td>
<td>10% of calories from saturated fat, with exceptions Minimal trans fat</td>
<td>Fruits or vegetables will be available in at least one food vending area In school stores: at least 50% of grains must be whole grains</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rhode Island</td>
<td>Close to 2005 DGA</td>
<td>Various restrictions on different foods</td>
<td>7 g per oz for grain products</td>
<td>30% of calories for grain products</td>
<td>10% of calories from saturated fat for grain products</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>South Carolina</td>
<td>CF guidelines only apply to ES</td>
<td></td>
<td>35% by weight, with exceptions</td>
<td>30% of calories, with exceptions</td>
<td>10% of calories from saturated fat 1% of calories from trans fat</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>South Dakota</td>
<td>No state policy</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Tennessee</td>
<td>HS: no restrictions</td>
<td>Anything part of school meal can be sold a la carte</td>
<td>1 oz portion for cookies other snacks have limits of 2 oz or higher</td>
<td>35% by weight</td>
<td>35% of calories, with exceptions</td>
<td>10% of calories from saturated fat</td>
<td>480 mg for certain entrées 600 mg for other entrées 230 mg for snacks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Texas</td>
<td>ES: no CF</td>
<td>No onsite deep-fat frying Restrictions on fried potatoes No FMNV</td>
<td>Portion sizes for certain snacks</td>
<td>23 g, except 28 g once per week</td>
<td>Schools must include a request for trans fat information in all product specifications</td>
<td>Fruits or vegetables must be offered daily at all points of service</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Utah</td>
<td>2008</td>
<td>Guidelines are voluntary No FMNV</td>
<td>300 calories</td>
<td>35% by weight, with exceptions</td>
<td>35% fat, with exceptions</td>
<td>10% of calories from saturated fat, with exceptions No trans fat</td>
<td>200 mg, with exceptions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vermont</td>
<td>2008</td>
<td>Guidelines are voluntary</td>
<td>Various calorie limits</td>
<td>35% by weight, with exceptions or 30 g per 8 oz</td>
<td>35% of calories, with exceptions</td>
<td>10% of calories from saturated fat, with exceptions</td>
<td>230 mg, with exceptions</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# APPENDIX 6

## TABLE A6.3  State List of Competitive Foods Policies

<table>
<thead>
<tr>
<th>State</th>
<th>Differences by grade level</th>
<th>Other provisions</th>
<th>Calories</th>
<th>Sugar</th>
<th>Total fat</th>
<th>Saturated and trans fats</th>
<th>Sodium</th>
<th>Foods to encourage: fruits and vegetables, fiber, and whole grains</th>
<th>Snack dietary standards (non-a la carte)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Virginia*</td>
<td></td>
<td>Only school nutrition services can sell food during meals and only parts of school meal can be sold.</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>2010</td>
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<td></td>
</tr>
<tr>
<td>Washington</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Close to 2005 DGA 2007</td>
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<td></td>
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</tr>
<tr>
<td>West Virginia</td>
<td>ES: no food can be sold until 20 minutes after students have been served lunch</td>
<td>Only meal items during breakfast Only milk, milkshakes, and water during lunch No candy</td>
<td>200 calories</td>
<td>35% of calories, except fruit</td>
<td>35% of calories, with exceptions</td>
<td>10% of calories from saturated fat, with exceptions</td>
<td>200 mg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Close to IOM 2008</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Wisconsin</td>
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<td></td>
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<tr>
<td>No state policy</td>
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<tr>
<td>Wyoming</td>
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<tr>
<td>No state policy</td>
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</tr>
</tbody>
</table>

CF = Competitive foods  
FMNV = Foods of minimal nutritional value  
* New guidelines (currently under review) must be either IOM or Alliance for a Healthier Generation Standards.
<table>
<thead>
<tr>
<th>State</th>
<th>Rank re: IOM or 2005 DGA</th>
<th>Allowed</th>
<th>Differences by grade</th>
<th>Soda summary</th>
<th>Milk details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>Close to IOM 2007</td>
<td>Water, milk, 100% fruit or vegetable juice (12 oz, 15 calories per oz), sports drinks, light juices, and teas (12 oz and 99 calories)</td>
<td>ES: water, milk, 100% juice (8 oz) MS: water, milk, juice (10 oz)</td>
<td>HS: diet soda (2002)</td>
<td>Low-fat Dairy alternatives allowed—no artificial sweeteners ES: 8 oz, 150 calories MS: 10 oz, 187 calories HS: 12 oz, 270 calories</td>
</tr>
<tr>
<td>Alaska</td>
<td>No state policy</td>
<td>Water, milk, 50% fruit or vegetable juice (12 oz), 50% fruit smoothie, sports and electrolyte-replacement drinks (12 oz)</td>
<td>ES: juice must be 100% fruit or vegetable (8 oz); smoothies must use 100% fruit, no sports drinks or electrolyte-replacement drinks</td>
<td>None</td>
<td>2% 12 oz dairy alternative allowed No more than 4 g of sugar per oz in flavored milk</td>
</tr>
<tr>
<td>Arizona</td>
<td>2007</td>
<td>At least 50% of beverages shall be water, low-fat milk, or 100% juice 12 oz, except unflavored water</td>
<td>12 oz</td>
<td>12 oz</td>
<td>12 oz Must offer 1% milk No more than 30 g sugar per 8 oz</td>
</tr>
<tr>
<td>Arkansas</td>
<td>Close to IOM 2007</td>
<td>Water, milk, 50% fruit or vegetable juice with no added sweeteners, electrolyte drinks (42 g sugar per 20 oz)</td>
<td>ES: no electrolyte drinks</td>
<td>None</td>
<td>Low-fat Dairy alternatives allowed</td>
</tr>
<tr>
<td>California</td>
<td>Close to 2005's DGA 2007</td>
<td>Water, milk, 100% fruit or vegetable juice (12 oz, 120 calories per 8 oz), low calorie beverages (10 calories per 8 oz), other drinks (12 oz, 66 calories per 8 oz)</td>
<td>ES: water, milk (8 oz), 100% juice (8 oz) MS: water, milk (10 oz), 100% juice (10 oz)</td>
<td>HS: diet soda</td>
<td>Low-fat 12 oz Dairy alternative allowed Flavored milk: 150 calories per 8 oz</td>
</tr>
<tr>
<td>Connecticut</td>
<td>Close to IOM 2011</td>
<td>Water, milk, 100% fruit or vegetable juice Beverages that are water and fruit or vegetable juice with no added sweeteners 12 oz, except water No artificial sweeteners</td>
<td>None</td>
<td>4 g sugar per oz and no artificial sweeteners Dairy alternatives allowed if 35% calories from fat and 10% from saturated fat</td>
<td></td>
</tr>
<tr>
<td>Delaware</td>
<td>No state beverage policy</td>
<td>Water, milk, 100% fruit or vegetable juice (8 oz)</td>
<td>ES and MS: juice limited to 6 oz</td>
<td>None</td>
<td>Low-fat 8 oz dairy alternatives allowed</td>
</tr>
<tr>
<td>District of Columbia</td>
<td>2011</td>
<td>Water, milk, 100% fruit or vegetable juice (8 oz)</td>
<td>ES and MS: juice limited to 6 oz</td>
<td>None</td>
<td>Low-fat 8 oz dairy alternatives allowed</td>
</tr>
<tr>
<td>Florida</td>
<td>2006</td>
<td>HS: FMNV may be sold one hour after lunch</td>
<td>HS: one hour after lunch</td>
<td>2% or more fat limited to 8 oz servings 22 g sugar per 8 oz Dairy alternatives allowed</td>
<td></td>
</tr>
<tr>
<td>Georgia</td>
<td>2002</td>
<td>ES: no FMNV from beginning of school day until end of last lunch period</td>
<td></td>
<td>2% or more fat limited to 8 oz servings 22 g sugar per 8 oz Dairy alternatives allowed</td>
<td></td>
</tr>
<tr>
<td>Hawaii</td>
<td>Close to IOM 2008</td>
<td>Water (no flavoring or carbonation), milk, 50% fruit or vegetable juice 12 oz, except water and 1% milk</td>
<td></td>
<td>None</td>
<td>2% or more fat limited to 8 oz servings 22 g sugar per 8 oz Dairy alternatives allowed</td>
</tr>
</tbody>
</table>
## Table A6.4: List of Beverage Guidelines by State

<table>
<thead>
<tr>
<th>State</th>
<th>Allowed</th>
<th>Differences by grade</th>
<th>Soda summary</th>
<th>Milk details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idaho</td>
<td>Water (non-flavored, non-carbonated), milk, 50% fruit or vegetable juice, fruit smoothie (400 calories) with no added sugars and made from fruit or fruit drinks that contain at least 50% fruit juice, any beverage exempted from USDA's list of FMNV</td>
<td>HS: no restrictions</td>
<td>HS only</td>
<td>Dairy alternatives allowed</td>
</tr>
<tr>
<td>Illinois</td>
<td>Water, milk, 100% fruit or vegetable juice, sports drinks</td>
<td>ES: no sports drinks or flavored water</td>
<td>None</td>
<td>Low-fat 27 g sugar per 8 oz in 2014</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower in 2017 and 2020</td>
</tr>
<tr>
<td>Iowa</td>
<td>Water, milk, 100% fruit or vegetable juice, sports drinks</td>
<td>Electrolyte replacement beverages (48 g of sweetener per 20 oz) in drink machines located near HS athletic training centers</td>
<td>None</td>
<td>1% Dairy alternatives allowed</td>
</tr>
<tr>
<td>Indiana</td>
<td>At least 50% of beverages must be better choice beverages</td>
<td>ES: no vending machines</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Kansas</td>
<td>Water, milk, 100% fruit or vegetable juice</td>
<td></td>
<td>Diet soda</td>
<td></td>
</tr>
<tr>
<td>Kentucky</td>
<td>Water (non-carbonated), milk, 100% fruit or vegetable juice Other beverages (10 g sugar)</td>
<td>ES: 17 oz MS and HS: 20 oz</td>
<td>1%</td>
<td></td>
</tr>
<tr>
<td>Louisiana</td>
<td>Water, milk, 100% fruit or vegetable juice (16 oz)</td>
<td>HS: beginning 10 minutes before lunch ends—water, 100% fruit or vegetable juice (12 oz, 120 calories per 8 oz), other beverages (10 calories per 8 oz)</td>
<td>HS: diet soda</td>
<td>Low-fat</td>
</tr>
<tr>
<td>Maine</td>
<td>Beverages must contribute both to the nutritional needs of children and the development of desirable food habits</td>
<td></td>
<td>No FMNV</td>
<td></td>
</tr>
<tr>
<td>Maryland</td>
<td>Water, flavored water (20 calories), milk, 100% fruit or vegetable juice (12 oz), fruit or vegetable juice beverages with at least 10% juice and 100% vitamin C (12 oz), isotonic beverages (16 oz)</td>
<td></td>
<td>None</td>
<td>Flavored milk (30 g sugar per 8 oz)</td>
</tr>
<tr>
<td></td>
<td>Caffeinated, fortified, or flavored beverages (20 oz, 5 calories per serving)</td>
<td></td>
<td></td>
<td>Soy milk allowed</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>Water, 100% fruit or vegetable juice (8 oz) No artificial sweeteners</td>
<td>ES: juice limit 4 oz</td>
<td>None</td>
<td>1% 8 oz 22 g sugar per 8 oz Dairy alternatives allowed</td>
</tr>
<tr>
<td>Michigan</td>
<td>State guidelines are voluntary Water (no flavoring or carbonation), milk, 100% juice or juice/water (10 oz) Caffeinated, fortified, or flavored beverages (20 oz, 5 calories per serving) 100% juice or 100% juice/water blends with carbonation (12 oz)</td>
<td>ES and MS: water (no flavoring or carbonation), milk, 100% juice or juice/water (10 oz)</td>
<td>HS: diet soda</td>
<td>1% Dairy alternatives allowed</td>
</tr>
</tbody>
</table>
### TABLE A6.4  List of Beverage Guidelines by State

<table>
<thead>
<tr>
<th>State</th>
<th>Rank re: IOM or 2005 DGA</th>
<th>Allowed</th>
<th>Differences by grade</th>
<th>Soda summary</th>
<th>Milk details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minnesota</td>
<td>No state policy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mississippi</td>
<td>Close to IOM 2008</td>
<td>Water, milk, 100% fruit or vegetable juice (120 calories per 8 oz)</td>
<td>ES and MS: no light juice or sports drinks</td>
<td>HS: diet soda</td>
<td>Low-fat 160 calories per 8 oz</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Light juice and sports drinks (99 calories and 12 oz)</td>
<td>Juice and milk: ES—8 oz, MS—10 oz, HS—12 oz</td>
<td></td>
<td>Serving size: ES—8 oz, MS—10 oz, HS—12 oz</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other beverages (10 calories per 8 oz)</td>
<td></td>
<td></td>
<td>Dairy alternatives allowed</td>
</tr>
<tr>
<td>Missouri</td>
<td>No state policy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Montana</td>
<td>No state policy</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Nebraska</td>
<td>No state policy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nevada</td>
<td>2005</td>
<td></td>
<td>MS and HS: allow electrolyte replacement beverages (12 oz)</td>
<td>None</td>
<td></td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Hampshire</td>
<td>No state policy</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>New Jersey</td>
<td>2007</td>
<td>12 oz limit on beverages except for milk with 2% or less fat</td>
<td>ES: only water, milk, 100% fruit or vegetable juice</td>
<td>None</td>
<td>Whole milk limited to 8 oz</td>
</tr>
<tr>
<td>New Mexico</td>
<td>close to 2005 DGA 2006</td>
<td>Water, milk, 50% fruit juice (20 oz), sports drinks</td>
<td>ES: water, milk in vending machines; only after lunch</td>
<td>Only in HS: diet soda after lunch</td>
<td>2% Soy milk allowed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>MS: water, milk, 100% fruit juice (125 calories)</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>ES and MS: no carbonated drinks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New York</td>
<td>2006</td>
<td></td>
<td>No sweetened soda water until after last lunch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>North Carolina</td>
<td>2005</td>
<td>ES: water, milk (1%), 50% fruit or vegetable juice</td>
<td>No soda during meals</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ES: no soda</td>
<td></td>
<td></td>
</tr>
<tr>
<td>North Dakota</td>
<td>No state policy</td>
<td></td>
<td>MS: no sugared soda</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Table A6.4: List of Beverage Guidelines by State

<table>
<thead>
<tr>
<th>State</th>
<th>Rank re: IOM or 2005 DGA Year enacted or revised</th>
<th>Allowed</th>
<th>Differences by grade</th>
<th>Soda summary</th>
<th>Milk details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ohio</td>
<td>2010</td>
<td>Water, milk, 100% fruit juice or 100% fruit juice and water blend (12 oz, 160 calories per 8 oz) Other beverages (12 oz, 66 calories per 8 oz) Any beverage (10 calories per 8 oz)</td>
<td>ES and MS: Water, milk, 100% fruit juice or 100% fruit juice and water blend (ES—8 oz, MS—10 oz, 160 calories per 8 oz)</td>
<td>HS: diet soda (12 oz)</td>
<td>Low-fat flavored milk: 16 oz, 170 calories per 8 oz, changes to 150 calories per 8 oz in 2014 ES and MS: limited to 8 oz</td>
</tr>
<tr>
<td>Oklahoma</td>
<td>2007</td>
<td></td>
<td></td>
<td>HS: soda</td>
<td>ES and MS: diet soda</td>
</tr>
<tr>
<td>Oregon</td>
<td>Close to 2005 DGA 2007</td>
<td>Water, milk, 100% fruit or vegetable juice (12 oz and 120 calories per 8 oz) Other beverages (12 oz, 66 calories per 8 oz)</td>
<td>ES and MS: no sports drinks</td>
<td>HS: diet soda</td>
<td>Low-fat 150 calories per 8 oz Serving size: ES—8 oz, MS—10 oz, HS—12 oz Dairy alternatives allowed</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>2007</td>
<td>Guidelines are voluntary, but schools that follow guidelines receive a supplemental state reimbursement Water, flavored water with artificial sweeteners (17 oz), milk, 100% fruit or vegetable juice (12 oz), carbonated beverages with 70–100% pure juice with water</td>
<td></td>
<td>None</td>
<td>At least 75% of milk offered must be 2% fat or less 12 oz or less No more than 30 g of sugar per 8 oz No artificial sweeteners</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>Close to DGA 2008</td>
<td>Water (sweetened with 100% fruit), milk, 50% fruit or vegetable juice</td>
<td></td>
<td>None</td>
<td>2% Dairy alternatives allowed 4 g sugar per oz</td>
</tr>
<tr>
<td>South Carolina</td>
<td>2006</td>
<td>No soda, soft drinks, sports drinks, punches, iced teas and coffees, and fruit-based drinks that are not 100% real fruit juice Portion size limit of 12 oz except water or nonfat, low-fat, and reduced-fat milk Must make available non-fat and 1% milk, water, and 100% juices</td>
<td>Guidelines apply only to ES schools</td>
<td>ES: no soda</td>
<td>12 oz limit for whole milk in ES school</td>
</tr>
<tr>
<td>South Dakota</td>
<td>No state policy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tennessee</td>
<td>Close to DGA 2008</td>
<td>Water (no flavorings or carbonation), milk, 100% fruit or vegetable juice, other beverages (non-carbonated, 15 calories) 8 oz except water</td>
<td>HS: no restrictions</td>
<td>HS only</td>
<td>Reduced-fat Dairy alternatives allowed</td>
</tr>
<tr>
<td>Texas</td>
<td>Close to DGA 2009</td>
<td>30 g sugar per 8 oz</td>
<td>Only in HS school (12 oz) No more than 15% of beverages can be sugared, carbonated soft drinks</td>
<td></td>
<td>2%</td>
</tr>
<tr>
<td>Utah</td>
<td>2008</td>
<td>Guidelines are voluntary</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table A6.4 (continued):**

<table>
<thead>
<tr>
<th>State</th>
<th>Rank re: IOM or 2005 DGA Year enacted or revised</th>
<th>Allowed</th>
<th>Differences by grade</th>
<th>Soda summary</th>
<th>Milk details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>APPENDIX 6</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## TABLE A6.4 List of Beverage Guidelines by State

<table>
<thead>
<tr>
<th>State</th>
<th>Allowed</th>
<th>Differences by grade</th>
<th>Soda summary</th>
<th>Milk details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vermont</td>
<td>Guidelines are voluntary</td>
<td>ES: 4 oz limit for juice and 8 oz limit for milk or</td>
<td>None</td>
<td>Low-fat</td>
</tr>
<tr>
<td></td>
<td>Water, milk, 100% fruit or vegetable juice (12 oz), drinkable yogurt</td>
<td>drinkable yogurt</td>
<td></td>
<td>150 calories per 8 oz</td>
</tr>
<tr>
<td></td>
<td>(12 oz, 200 calories per 8 oz)</td>
<td>MS: 10 oz limit for milk, juice, drinkable yogurt</td>
<td></td>
<td>ES—8 oz, MS—10 oz, HS—12 oz</td>
</tr>
<tr>
<td>Virginia</td>
<td>New guidelines (under review now) must be either Alliance for a Healthier Generation or IOM Standards</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Washington</td>
<td></td>
<td></td>
<td></td>
<td>30 g sugar per serving</td>
</tr>
<tr>
<td>West Virginia</td>
<td>Some of the beverage guidelines are voluntary</td>
<td>Juice sizes: ES—4 oz, MS and HS—8 oz</td>
<td>Only in HS and not during meals</td>
<td>1%</td>
</tr>
<tr>
<td></td>
<td>Water, milk, 100% fruit or vegetable juice</td>
<td>Only milk, milkshakes, and water during lunch</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Only in HS and not during meals</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wisconsin</td>
<td>No state policy</td>
<td></td>
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### References for Appendix 6

The analysis included in this report is that of The Pew Charitable Trusts and the Robert Wood Johnson Foundation and does not necessarily reflect the views of outside reviewers, committee members, or interviewed stakeholders. This report is intended for educational and informative purposes. References to specific policy makers, individuals, schools, policies, or companies have been included solely to advance these purposes and do not constitute an endorsement, sponsorship, or recommendation.

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The Kids’ Safe and Healthful Foods Project is an initiative launched by The Pew Charitable Trust and the Robert Wood Johnson Foundation that provides a nonpartisan analysis and evidence-based recommendations on policies that impact the safety and healthfulness of school foods. For more information, see HealthySchoolFoodsNow.org.

The Health Impact Project, a collaboration of the Robert Wood Johnson Foundation and The Pew Charitable Trusts, is a leading national initiative dedicated to promoting the use of health impact assessments in the United States. For more information, see www.HealthImpactProject.org.