

WHITE PAPER

CLOSING THE FIBER GAP IN SCHOOL MEALS

Policy Options to Promote Fiber Adequacy in Children

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SUMMARY



Up to 97% of children in the United States do not consume enough dietary fiber,¹ which federal health authorities have deemed a nutrient of concern among the population at large.² According to previous analyses, school meals that follow the National School Breakfast and Lunch programs still often fail to meet the Institute of Medicine (IOM) minimum adequate intake of 14 g per 1000 kcal. However, the gap, if any, between the dietary fiber in school meals and the fiber needs of children is largely unknown and poorly studied. Moreover, there has been little discussion surrounding the relationship between the federal school nutrition standards and the fiber gap in school meals.

In producing this white paper, we aim to (1) describe the evidence indicating a fiber deficit in school meals, (2) shed light on current policies and practices that hinder fiber consumption in schools, and (3) provide evidence-based recommendations to improve the fiber content and overall healthfulness of school meals.

Our review of the extant literature, as well as findings from our own novel menu analysis, suggests that school breakfast and lunch do not typically reach the IOM adequate intake (AI) of dietary fiber by a magnitude of roughly 3-5 grams (g) per 1000 calories (kcal), with considerable variation within and between districts. Further, our analysis suggests that school nutrition standards, as currently written and implemented, fail to promote fiber adequacy among children, as the high prevalence and magnitude of fiber deficiency would indicate. Currently, some federal policies and district-level practices hinder fiber adequacy by promoting processed foods over whole foods and favoring animal proteins over fiber-rich plant proteins.

WE AIM TO:

1. Describe the evidence indicating a fiber deficit in school meals
2. Shed light on current policies and practices that hinder fiber consumption in schools
3. Provide evidence-based recommendations to improve the fiber content and overall healthfulness of school meals

We recommend prioritizing high fiber foods on the menu by establishing a minimum fiber requirement for school breakfast and lunch, in alignment with the Dietary Guidelines for Americans (DGA) and IOM. This solution has potential to move the needle toward fiber-rich, nutrient dense, plant-forward meals. Centering fiber rich menu items in school meals through a minimum fiber requirement will also offer school food service operators flexibility in menu planning. This practice allows for local tastes and needs while also continuing to support children's health. Additional supportive actions could complement this policy solution, including a U.S. Department of Agriculture (USDA) study on fiber in school meals and federal legislation requiring a minimum seat time of at least 20 minutes during meals to allow adequate time to eat.

BACKGROUND

Dietary fibers are the indigestible polysaccharides found in plants that intestinal bacteria consume and ferment. The impact of fiber on gut microbiota composition, as well as the fermentation byproducts, are thought to play a key role in dietary fiber's numerous health benefits and protections against disease.³ Other mechanisms include increasing bowel transit time and decreasing fat absorption. Positive health outcomes associated with dietary fiber include favorable cardiometabolic effects and higher micronutrient intakes.⁴ Conversely, fiber inadequacy may be linked with allergic and autoimmune disorders,⁵ constipation⁶ and bowel diseases,⁷ type II diabetes,⁸ cardiovascular disease, and even certain cancers.⁹ More studies are needed to fully elucidate the risks and consequences associated with low fiber intake among children and adolescents.

Research investigating fiber intake among American children from the last two decades points to a substantial gap between children's fiber consumption and their needs. The prevalence of fiber deficiency among children and adolescents is estimated to be 93-97%,¹⁰ depending on age group. Indeed, the 2020-2025 Dietary Guidelines for Americans lists fiber as a major "dietary component of public health concern" for all Americans, including children. The 2016 Feeding Infants and Toddlers study reports that only 3%, 9%, and 7.5% of 1-, 2-, and 3-year-olds, respectively, reach the minimum adequate intake of fiber, which is based upon the Institute of Medicine standard of 14 g of dietary fiber per 1000 kcal. Data from 2015-2018 similarly suggest that more than 97% of children and adolescents fail to reach adequate intakes of fiber,¹⁰ with most consuming just half of their needs.¹¹ Moreover, the gap between intake and needs widens in teenage years. (See Table 1 for the dietary fiber adequate intake (AI) by age and sex.

The National School Lunch (NSLP) and Breakfast Programs (SBP) have long helped children increase consumption of critical nutrients. However, some analyses of school meals programs have revealed a dearth in the fiber content of school meals, although the number of studies, which are usually cross-sectional, remains limited. Here, we review existing analyses and perform our own novel investigation into the fiber content of school meals from across the country. Finally, we analyze current policies that affect fiber content of school meals and provide recommendations based on our findings.

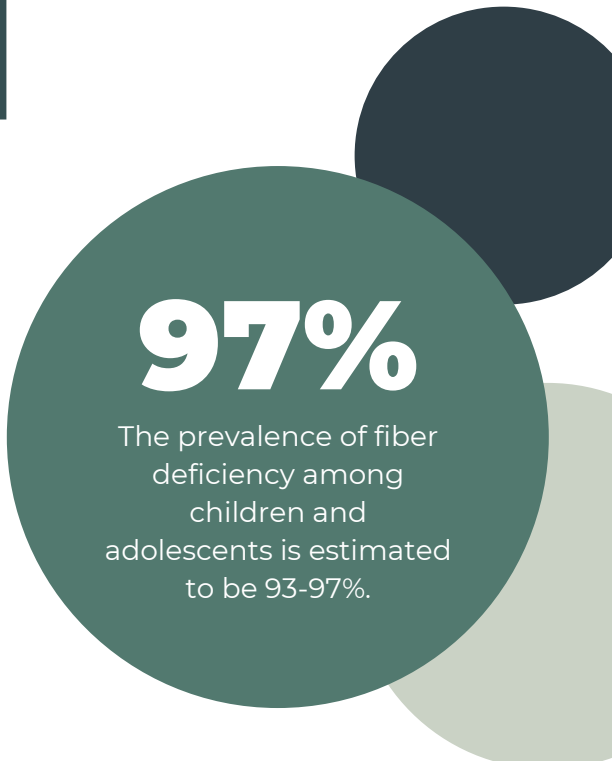


Table 1: Adequate Fiber Intake by Age, Sex

Age (years)	Daily fiber needs (g)	
	Females	Males
2-3	14	14
4-8	17	20
9-13	22	25
14-18	25	31

FIBER IN SCHOOL MEALS

Existing literature on fiber in school meals

The current literature describing the fiber content of school meals is limited, potentially outdated, and only occasionally nationally representative. Thus, it is difficult to draw conclusions about the fiber adequacy of school meals in 2022 based on existing research. Nonetheless, studies conducted during the preceding two decades suggest that most school meals were not conducive to meeting fiber adequacy for any age group.

Two articles from the Journal of the American Dietetic Association published in February 2009 independently described the fiber inadequacy of school meals in SY 2004-2005. While these data are from before the implementation of the Healthy, Hunger-Free Kids Act of 2010 (HHFKA), they provide a useful baseline and are thus included. Authors Clark and Fox found that mean fiber intakes for participants and nonparticipants in NSLP and SBP fell between 6.5 and 7.1 g per 1000 kcal, less than half the IOM minimum of 14 g per 1000 kcal.¹² Although NSLP and SBP participants consumed significantly more fiber than matched nonparticipants, this advantage constituted only an additional 2-5 percentage points of daily needs and may not be of practical or clinical benefit in the long run. Moreover, Crepinsek et al., using nationally representative School Nutrition Dietary Assessment (SNDA) III data, found that fewer than 8% of American public schools offered lunches meeting the fiber AI, and no school offered breakfasts meeting the AI.¹³

School Nutrition Dietary Assessment (SNDA) III data found that fewer than 8% of American public schools offered lunches meeting the fiber AI, and no school offered breakfasts meeting the AI.



Similarly, research and consulting firm Mathematica conducted an analysis of school meals using SNDA-IV data from SY 2009-2010 and found that the fiber content of school lunch was more than 25% lower than the standards outlined in the 2010 Dietary Guidelines for Americans.¹⁴

In 2014, Cummings et al. performed a nutrient analysis of school meals at Los Angeles Unified School District (LAUSD) in California and Cook County School District in Illinois, both before and after the implementation of nutrition interventions that sought to bring meals in line with IOM nutrition standards. Despite menu reforms, both school districts reported breakfast and lunch fiber content below the 14 g/1000 kcal benchmark.¹⁵ Specifically, LAUSD offered 8.2 g/1000 kcal and 12.1 g/1000 kcal at breakfast and lunch, respectively, while Cook County offered 3.2-6.2 g/1000 kcal and 7.3-15.1 g/1000 kcal at breakfast and lunch, respectively.

FIBER IN SCHOOL MEALS

A case study by Hopkins and Gunter, published in *Nutrients* in 2015, investigates the USDA Summer Food Service Program meal pattern, which is less stringent than that of the NSLP. The authors evaluated menus from 2014 taken from a Summer Food Service Program operator in Columbus, Ohio.¹⁶ Breakfasts contained 4 grams of fiber on average, compared to the AI range of 7-10 g, depending on age group. Likewise, lunches contained 7 g of fiber relative to the AI range of 9-13 g. Overall, that makes just 11 g of fiber relative to a need of 16-23 g. These findings should have regulators asking whether the lenient SFSP nutrition standards may actively hinder fiber adequacy, particularly for older students who require more grams of fiber per day.

The most recent study reviewed here was published in February 2022 in *Health Education & Behavior*. Adams et al. measured students' fiber selection and consumption from school lunches served to grades one through five.¹⁷ The data were previously collected by Bean et al. in fall of 2016 from elementary schools in central Virginia.¹⁸ The analysis revealed that average fiber selection was below the HFFKA and IOM recommendations, with only 48% of school lunches reaching fiber adequacy. Moreover, only 7% of all lunch consumption met the fiber recommendations.

These findings suggest a number of important take-away points. At the elementary school level, options adequate in fiber are available at least some of the time, but perhaps a predominance of lower-fiber options and/or a preference for lower-fiber options prevent children from selecting meals that contain the recommended amount of fiber. Further, factors such as taste, food quality, poor preparation, and short duration of mealtimes may preclude children from consuming the fiber-adequate foods on their trays.

Taken together, these studies portray a persistent gap between what children need and what they receive and consume from school meals. This documented history of fiber-inadequate school meals warrants new investigations by the appropriate federal agencies and research institutions into the nutritional content of school meals, especially with respect to dietary fiber, for all age groups.

Policymakers will need a full, updated picture to better understand why and how children do not consume enough fiber in order to implement more effective school nutrition standards and practices in the future.



NOVEL CASE STUDIES

There are no analyses of fiber in school meals using data from 2017 onward, to our knowledge. We therefore conducted our own evaluation using menus from six school districts of varied enrollment size and geographic location. These districts are described in Table 2.

Data Collection and Analysis

We selected random districts from various regions of the country. From each district, we selected one school at random and collected meal nutrient data across four consecutive days of publicly available menus at each school. All data were accessed online and taken from the first week of February 2022, and we assumed those data were accurate as published. Four days of meals, including both breakfast and lunch, gathered from six schools makes for a total of 48 meals evaluated, comprising 150 individual food items (including caloric beverages). We collected fiber and calorie content of individual food items from the publicly available nutrition facts information associated with each menu. As case studies, these samples were not intended to be nationally representative but rather offer a picture of what menus in 2022 look like.

Table 2: Case Study Districts and Fiber Content of Meals

District	City, State	Approximate Enrollment	Fiber at Breakfast (g/1000kcal)	Fiber at Lunch (g/1000kcal)	Overall Fiber (g/1000kcal)
Bismarck Public Schools	Bismarck, ND	13,000	9.0	13.9	11.5
Carson City Schools	Carson City, NV	8,000	9.4	12.2	10.8
Grand Rapids Public Schools	Grand Rapids, MI	15,000	8.5	11.7	10.1
Fairfax County Public Schools	Fairfax, VA	179,000	7.8	10.8	9.3
Fayetteville Public Schools	Fayetteville, AR	10,000	10.3	7.9	9.1
Jefferson City Public Schools	Jefferson City, KY	96,000	9.3	8.1	8.7

We used a meal-based approach in our evaluation. That is, we used the menus like a typical consumer, selecting foods and beverages to create reimbursable meals. Lunchtime meals were constructed such that all meal components—grain, meat/meat alternate, milk, vegetable, and fruit—were included in a sample meal on the first and third day of the school week; on the second and fourth days of the week, only three or four meal components were included in the sample meal, where at least one component was either a fruit or a vegetable. This was a more realistic approach to sampling menu items, as many students do not take all components offered every day, and it follows the Offer versus Serve rule of the NSLP, meaning at lunchtime students must be offered all components in specified quantities but must take on their tray three components, one of them being at least ½ cup fruit or vegetable or combination of the two.¹⁹ Similarly at breakfast, meals were constructed such that grains, milk, and fruit were included in a sample meal on the first and third days of the week, while on the second and fourth days only grain items and fruit were included in the sample meal.

NOVEL CASE STUDIES

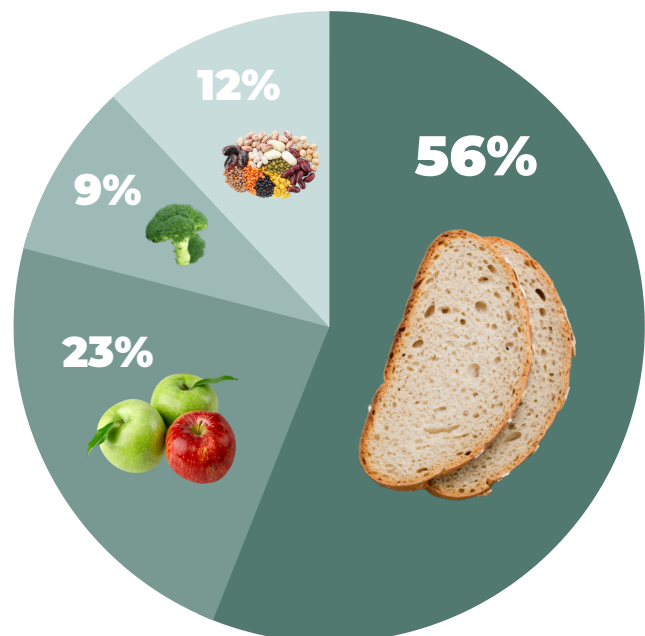
Meal components themselves were selected so as to include prominently featured items as well as other items, such as those from specialty serving lines, salad bars, etc. When fiber-rich legumes were available, they were typically selected. Furthermore, when a variety of milk options (e.g., skim, 1%, and fat-free chocolate) and fruit options (e.g., fresh, canned, dried) were available, we rotated selecting each option in turn so as to capture the full diversity of the menu offerings. This approach may or may not reflect the usual behaviors of a typical student.

Results and Discussion

The fiber and calorie content of each meal component of a given sample meal was recorded and summed to produce the fiber and calorie content of each meal. A mean fiber-to-1000 calorie value was taken across the four days of breakfasts and lunches for each of the six schools.

As depicted in Table 2, the breakfast fiber content from the six schools ranged from 7.8 to 10.3 g/1000 kcal. The lunch fiber content ranged from 7.9 to 13.9 g/1000 kcal. The mean fiber content at breakfast and lunch were 9.0 and 10.8 g/1000 kcal, respectively. The overall mean fiber content (breakfast and lunch combined) was 9.9 g/1000 kcal, roughly 4 grams or 29% below the 14 g/1000 kcal benchmark set by the IOM. These findings seem to align with the fiber gaps described in previous studies. From these data, we also determined which meal components were the largest contributors to meal fiber content across the total 48 meals. Those results are depicted in Figure 1.

Grains accounted for approximately 56% of total meal fiber content, while fruits, vegetables, and legumes accounted for 23%, 9%, and 12%, respectively. The relatively high percentage of fiber from legumes was surprising because only 4 of 150 (or 3%) total food items contained legumes. (See Table 3 for fiber sources' shares of total food items and total fiber.) This underscores the importance of beans as a source of fiber in school meals and highlights their potential to contribute much more fiber to school meals at even low or moderate levels of consumption. Increasing the legume quantity requirement and/or modifying protein requirements such that legumes are more easily used as meat alternates would be excellent strategies for boosting fiber in school meals.



Grains Fruits Vegetables Legumes

Figure 1: Sources of Fiber in School Meals

NOVEL CASE STUDIES

The relatively low contribution by non-leguminous vegetables to total fiber was a surprise for opposite reasons. However, unlike fruit and grains, vegetables are typically offered only at lunch, and their serving sizes are relatively small. When a school is operating under Offer versus Serve, children need only choose a fruit or a vegetable and not both at lunch, which means vegetables may be passed over more readily. Moreover, the most favored vegetable, french fries, tends to contribute little fiber.

Although there are concerns about food waste, requiring children to take a vegetable at lunch would likely boost fiber intake from vegetables, especially if paired with supportive policies. For example, a more strategic approach to including more vegetable fiber in school meals would be to make vegetables an essential ingredient in typical grain-and-protein recipes and products. This would be a significant change to the meal structure, requiring reformulation of certain heat-and-serve products. On the other hand, many scratch-made recipes naturally contain a serving of vegetables.

Fruit contributed nearly one quarter of total fiber and would have contributed a greater share if fruit juices were less prevalent on menus. Fruit juice, which contains no fiber, contributes calories alone, thus negatively impacting fiber status and counteracting many of the benefits of fruit consumption. Conversely, consuming whole fruits contributes more fiber with fewer calories, helping to boost satiety while attenuating blood glucose and insulin responses. Given that students take fruit at both breakfast and lunch, eliminating or restricting fruit juice as a reimbursable fruit equivalent could increase kids' fiber intake by as much as 6 g per day.

Because of its large contribution to meal fiber content, we further broke down the grains component into three types of products: pastries, entrees containing red or processed meats, and 'other grains.' Results are depicted in Figure 2.

Pastries alone accounted for 17% of total fiber, or roughly one-third of the fiber attributed to grains. These products were typically offered at breakfast and contain significant added sugars (e.g., cinnamon rolls, packaged quick breads). Grains paired with red and processed meats, such as corn dogs, cheeseburgers, and pepperoni pizzas, accounted for 22% of total fiber. These products were more often served at lunchtime and contain higher levels of saturated fat and sodium. The remaining 17% of total fiber ('Other grains' category) came from foods like breakfast cereals, brown rice, and cheese pizza.

Table 3: Share of Total Food Items and Total Fiber

Fiber Source	Share of total food items (%)	Share of total fiber (%)
Grain Products	31	56
Vegetables	11	8
Fruits	25	23
Legumes	3	12

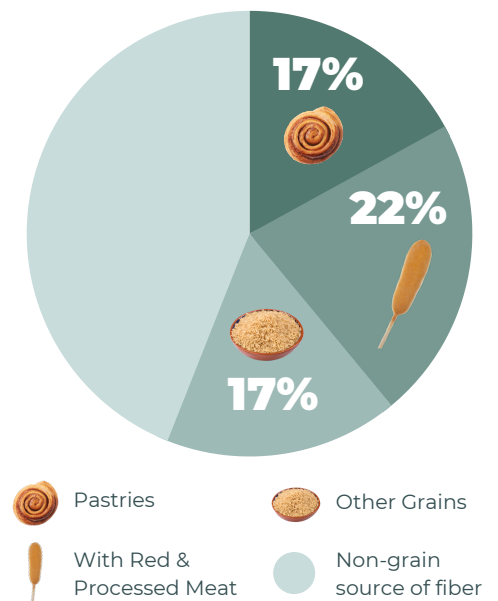


Figure 2: Fiber Contributions from Grains-Containing Products

NOVEL CASE STUDIES

It's clear that grains are the number one source of dietary fiber in school meals and account for over half of all fiber on the lunch tray. Unfortunately, as the breakdown of products suggests, these sources of fiber are often ultra-processed in nature and contain more added sugar, saturated fat, and sodium. However, these data also demonstrate how critical whole grains are to school nutrition and suggest that further strengthening the whole grain requirement is essential to reaching the IOM benchmark of 14 g of fiber per 1000 kcal. This is particularly true for breakfast, where the fiber gap is wider and where meals are predominantly grain-based. A standard of 100% whole grains, as opposed to 'whole grain-rich,' would dramatically increase fiber intake, potentially even closing the fiber gap without additional reforms. The USDA Food and Nutrition Services (FNS) defines whole grain-rich as "the grains components in a product are at least 50 percent whole grain, with the remaining grains being enriched."²⁰ This means that an item that is 100% whole grain-rich is not equivalent to an item that is 100% whole grain. Nevertheless, operators should strive to increase intake of legumes and vegetables, as overreliance on grains leads to low dietary diversity and overconsumption of sugar-added, higher sodium, higher fat foods.

Making space for fiber-dense foods requires, to some degree, a reduction in the reliance on foods and beverages containing little to no fiber. In particular, highly refined foods and certain animal products, like cheese, flavored milk, and fattier meats, are calorically dense and contribute little if any fiber. To make offering and consuming protein from fiber-dense sources easier and more convenient, the 'meat/meat alternate' category would need significant revision. Currently, the most convenient forms of protein for operators to offer are those from animal origin, which are higher in sodium, saturated fat, and cholesterol and contain no fiber. This inaccessibility of fiber-dense proteins ultimately contributes to the fiber deficit in school meals. In the same vein, lowering barriers to fortified plant-based milks like soy milk, which has several grams of fiber per serving, can also improve children's fiber intake. The important thing is that children should be able to select higher-fiber options for all meal components, including protein and milk, as part of a nutritionally and calorically adequate reimbursable meal.

Moreover, it is concerning that, per our case studies, nearly 40% of all fiber is obtained from refined pastries or items containing red and processed meats—foods with demonstrated health risks. For school meals to reach fiber adequacy and boost dietary diversity, it is imperative that policymakers, school food operators, and food service management companies find ways to meaningfully shift menus away from these less-healthy sources of fiber toward more whole-food sources like legumes, vegetables, and whole fruits.

Finally, given the near universality of fiber deficiency among children and the seriousness of its implications, the USDA should consider commissioning new research into the amount and sourcing of dietary fiber that is offered, served, and ultimately consumed by children participating in the School Breakfast and National School Lunch Programs. It would be particularly useful to understand how district size, urbanity-rurality, self-operation, use of food service management companies, socioeconomic and demographic factors, and geographic location impact fiber adequacy.

POLICY CONSIDERATIONS

Potential Policy Interventions

The federal school meals programs have an important role to play in ensuring millions of students have access and opportunity to consume adequate dietary fiber. As discussed earlier, nearly all school-aged children are not meeting dietary fiber recommendations. Many children are eating two out of three meals at school each day, with an average of 22.6 million children eating school lunch²¹ and 12.4 million children consuming breakfast²² daily in Fiscal Year 2020. Thus, potential policy interventions could significantly impact the health of children across the U.S.

Our analysis of potential policy interventions focuses on increasing naturally occurring plant-based fiber found in whole foods including fruits, vegetables, legumes, and whole grains, as these foods are rich in other phytonutrients, vitamins, and minerals. Allowing foods fortified with fiber in the form of psyllium husk, cellulose, guar gum, beta-glucan, among others, to count toward fiber requirements in school meals could potentially displace these nutrient dense whole foods.

Fiber fortification does not offer the same health benefits as fiber from whole foods and should therefore be avoided. This recommendation aligns with the USDA's support for whole foods over fortified foods as stated in the Nutrient Analysis Protocols guidance for state agencies: "USDA is committed to the fundamental Dietary Guidelines premise that nutrients should come primarily from foods."²³ Additionally, for the purposes of this paper, we use the terms 'fiber-rich' and 'high-fiber' to mean whole plant foods that naturally contain fiber, such as fruits, vegetables, whole grains, legumes.

Two main policy approaches within the context of the USDA School Nutrition Programs stand out to address the apparent gap between recommended and actual fiber intakes. Policy Alternative 1 would impose a minimum daily and weekly dietary fiber requirement, while Policy Alternative 2 would strengthen existing meal pattern requirements for whole grains, fruits, legumes, and vegetables to improve dietary fiber offerings in school meals.

POLICY ALTERNATIVE 1	POLICY ALTERNATIVE 2
IMPOSE A MINIMUM DAILY AND WEEKLY DIETARY FIBER REQUIREMENT	STRENGTHEN EXISTING MEAL PATTERN REQUIREMENTS FOR WHOLE GRAINS, FRUITS, LEGUMES, AND VEGETABLES

Below, we first review the current USDA policies and requirements to lay the groundwork. Then, we evaluate each policy alternative using criteria for effectiveness, equity, and feasibility, as defined below. Following the evaluation, we discuss additional supportive policies, potential trade-offs among the policy options, and our recommendations for increasing dietary fiber in school meals.

POLICY CONSIDERATIONS

Review of Current Federal Regulations

The USDA aims to meet the dietary fiber recommendations set by the Dietary Guidelines for Americans²⁴(DGA) for children by requiring school food service operators participating in the federal meal program to offer specific amounts of fruits, vegetables, and 100% whole grain-rich foods. For details on the USDA school meal patterns, see **Figures 3 and 4** below for reference.

In 2018, Secretary of Agriculture Sonny Perdue relaxed regulations to allow 50% of grain products to be whole grain-rich, flavored low-fat milk, and delayed the implementation of sodium targets.²⁵ The roll back of standards was then deemed unlawful by the U.S. District Court in Maryland in 2020.²⁶ However, schools were not required to immediately return to the standards established through the HHFKA. USDA allowed schools to opt into meal pattern waivers, as needed, along with numerous other operational waivers, due to the COVID-19 pandemic to allow flexibility during a time with widespread supply chain issues and staffing shortages.²⁷ In January 2022, Secretary of Agriculture Tom Vilsack released transitional meal pattern standards.²⁸ These standards continue to allow flavored low-fat milk, bumped the whole grain rich requirement from 50% to 80%, and established a new sodium target that is less restrictive than the previously established regulations under the HHFKA, and only applies to the school lunch program. As of 2022, the current meal pattern regulations are more permissive than previously established under the HHFKA. The current meal pattern flexibilities allowed through the transitory rules are meant to serve as a bridge between the pandemic flexibilities and further strengthened requirements. However, there may be setbacks in strengthening the meal pattern regulations if the process extends beyond the current Democratic administration.

Although meal pattern requirements through the HHFKA increased the availability of higher fiber foods, barriers to children's intake of the offered fruits and vegetables remain.

Despite ongoing rollbacks, the amount of fiber-rich foods available in school meals has increased compared to before the HHFKA. Although meal pattern requirements through the HHFKA increased the availability of higher fiber foods, barriers to children's intake of the offered fruits and vegetables remain. For example, the USDA meal pattern requirements allow for fruit juice to count toward 50% of fruit offered during the week. Fruit juice has minimal to no fiber, yet this item is allowable to be served in the place of fiber-rich options such as fresh, canned, or frozen fruits or vegetables. Additionally, allowable items that qualify as whole grain-rich may have less fiber than 100% whole grain items or beans/legumes. Furthermore, there are no federal regulations requiring a minimum seat time for students to consume lunches. Students may find many fiber-rich foods can take longer to chew. Coupled with short meal periods, students have less opportunity to consume these nutrient-dense, high-fiber foods.

POLICY CONSIDERATIONS

Access to nutrient-dense foods at school can vary based on à la carte offerings and menu planning practices. Under typical non-pandemic circumstances, children can receive reimbursable meals that meet the federal meal pattern requirements at school by qualifying for free or reduced-price meals, or households can pay full price if income is too high to receive a meal benefit. Foods like chips, cookies, and other snack foods can still be sold alongside a reimbursable meal as long as they meet the Smart Snacks in Schools regulations.²⁹ Additionally, although all schools participating in the USDA meal programs must meet the same minimum federal meal standards, meal quality can fluctuate from school to school.³⁰

Figure 3: USDA School Lunch Meal Pattern³¹



National School Lunch Program Meal Pattern

Food Components	Grades K-5	Grades 6-8	Grades 9-12
	Amount of Food ^a per Week (minimum per day)		
Fruits (cups) ^b	2½ (½)	2½ (½)	5 (1)
Vegetables (cups) ^b	3¾ (¾)	3¾ (¾)	5 (1)
Dark green ^c	½	½	½
Red/Orange ^c	¾	¾	1¼
Beans and peas (legumes) ^c	½	½	½
Starchy ^c	½	½	½
Other ^{c,d}	½	½	¾
Additional Vegetables to Reach Total ^e	1	1	1½
Grains (oz eq) ^f	8-9 (1)	8-10 (1)	10-12 (2)
Meats/Meat Alternates (oz eq)	8-10 (1)	9-10 (1)	10-12 (2)
Fluid milk (cups) ^g	5 (1)	5 (1)	5 (1)
Other Specifications: Daily Amount Based on the Average for a 5-Day Week			
Min-max calories (kcal) ^h	550-650	600-700	750-850
Saturated fat (% of total calories) ^h	<10	<10	<10
Sodium Interim Target 1 (mg) ^h	≤ 1,230	≤ 1,360	≤ 1,420
Sodium Interim Target 1A (mg) ^h	≤ 1,110	≤ 1,225	≤ 1,280
<i>Trans</i> fat ^h	Nutrition label or manufacturer specifications must indicate zero grams of <i>trans</i> fat per serving.		

^a Food items included in each group and subgroup and amount equivalents. Minimum creditable serving is ½ cup.

^b One-quarter cup of dried fruit counts as ½ cup of fruit; 1 cup of leafy greens counts as ½ cup of vegetables. No more than half of the fruit or vegetable offerings may be in the form of juice. All juice must be 100% full-strength.

^c Larger amounts of these vegetables may be served.

^d This category consists of “Other vegetables” as defined in paragraph (c)(2)(iii)(E) of this section. For the purposes of the NSLP, the “Other vegetables” requirement may be met with any additional amounts from the dark green, red/orange, and beans/peas (legumes) vegetable subgroups as defined in paragraph (c)(2)(iii) of this section.

^e Any vegetable subgroup may be offered to meet the total weekly vegetable requirement.

^f At least 80 percent of grains offered weekly must meet the whole grain-rich criteria specified in FNS guidance, and the remaining grain items offered must be enriched.

^g All fluid milk must be fat-free (skim) or low-fat (1 percent fat or less). Milk may be flavored or flavored, provided that unflavored milk is offered at each meal service.

^h Discretionary sources of calories (solid fats and added sugars) may be added to the meal pattern if within the specifications for calories, saturated fat, *trans* fat, and sodium. Foods of minimal nutritional value and fluid milk with fat content greater than 1 percent are not allowed.

ⁱ Sodium Interim Target 1A must be met no later than July 1, 2023 (SY 2023-2024).

Figure 4: USDA School Breakfast Meal Pattern³²



School Breakfast Program Meal Pattern

Food Components	Grades K-5	Grades 6-8	Grades 9-12
	Amount of Food ^a per Week (minimum per day)		
Fruits (cups) ^{b,c}	5 (1)	5 (1)	5 (1)
Vegetables (cups) ^{b,c}	0	0	0
Dark green	0	0	0
Red/Orange	0	0	0
Beans and peas (legumes)	0	0	0
Starchy	0	0	0
Other	0	0	0
Grains (oz eq) ^d	7-10 (1)	8-10 (1)	9-10 (1)
Meats/Meat Alternates (oz eq) ^e	0	0	0
Fluid milk ^f (cups)	5 (1)	5 (1)	5 (1)
Other Specifications: Daily Amount Based on the Average for a 5-Day Week			
Min-max calories (kcal) ^{g,h}	350-500	400-550	450-600
Saturated fat (% of total calories) ^h	<10	<10	<10
Sodium Target 1 (mg)	≤ 540	≤ 600	≤ 640
<i>Trans</i> fat ^h	Nutrition label or manufacturer specifications must indicate zero grams of <i>trans</i> fat per serving.		

^a Food items included in each group and subgroup and amount equivalents. Minimum creditable serving is ½ cup.

^b One-quarter cup of dried fruit counts as ½ cup of fruit; 1 cup of leafy greens counts as ½ cup of vegetables. No more than half of the fruit or vegetable offerings may be in the form of juice. All juice must be 100% full-strength.

^c Schools must offer 1 cup of fruit daily and 5 cups of fruit weekly. Vegetables may be substituted for fruits, but the first two cups per week of any such substitution must be from the dark green, red/orange, beans/peas (legumes), or “Other vegetables” subgroups, as defined in §210.10(c)(2)(iii) of this chapter.

^d At least 80 percent of grains offered weekly must meet the whole grain-rich criteria specified in FNS guidance, and the remaining grain items offered must be enriched. Schools may substitute 1 oz. eq. of meat/meat alternate for 1 oz. eq. of grains after the minimum daily grains requirement is met.

^e There is no meat/meat alternate requirement.

^f All fluid milk must be fat-free (skim) or low-fat (1 percent fat or less). Milk may be unflavored or flavored, provided that unflavored milk is offered at each meal service.

^g The average daily calories for a 5-day school week must be within the range (at least the minimum and no more than the maximum values).

^h Discretionary sources of calories (solid fats and added sugars) may be added to the meal pattern if within the specifications for calories, saturated fat, *trans* fat, and sodium. Foods of minimal nutritional value and fluid milk with fat content greater than 1 percent milk fat are not allowed.

POLICY ALTERNATIVES

In this section, we will define and assess two policy alternatives according to the criteria of effectiveness, equity, and feasibility.

Alternative 1: Add Dietary Fiber as a Meal Pattern Dietary Specification

Current Dietary Specifications for the USDA meal programs include calories, saturated fat, sodium, and trans fat.³³ Each of these specifications has a maximum level (saturated fat, sodium, trans fat) or a range (calories) that school food operators must stay within while menu planning throughout the week. The USDA does not currently include dietary fiber as a Dietary Specification. Dietary Specifications could be expanded to include dietary fiber from whole-food sources. This would provide a defined metric for measuring fiber and paint a more detailed picture for school food operators of whether the amount and type of fiber-rich foods (fruits, vegetables, whole grains, beans/legumes) offered is sufficient in school meals.

As with other meal pattern requirements, a minimum dietary fiber requirement should align with the 2020-2025 Dietary Guidelines for Americans. See Figure 5 below for an example of how the fiber requirement could be depicted as part of the National School Lunch and School Breakfast meal patterns. We calculated the minimum fiber requirement based on the IOM recommendation of 14 g fiber/1000 kcal and using the upper calorie limits for each age/grade group.

Table 4: Alternative 1 Comparison of Current Requirement to Suggested Change

Add Fiber as a Dietary Specification

Current Requirement

No minimum fiber requirement

Suggested Change

Implement IOM recommendation of 14 g fiber/1000 kcal

Figure 5: USDA National School Lunch Meal Pattern including Recommended Fiber Specification

Other Specifications: Daily Amount Based on the Average for a 5-Day Week			
Min-max calories (kcal)	550-650	600-700	750-850
Saturated fat (% of total calories)	<10	<10	<10
Sodium Interim Target (mg)	≤ 1,230	≤ 1,360	≤ 1,420
Sodium Interim Target 1A (mg)	≤ 1,100	≤ 1,225	≤ 1,280
Trans fat	Nutrition label or manufacturer specifications must indicate zero grams of trans fat per serving		
Fiber (g) (14 g/1000 kcal)	≥ 9	≥ 10	≥ 12

Figure 6: USDA National School Breakfast Meal Pattern including Recommended Fiber Specification

Other Specifications: Daily Amount Based on the Average for a 5-Day Week			
Min-max calories (kcal)	350-500	400-550	450-600
Saturated fat (% of total calories)	<10	<10	<10
Sodium Interim Target (mg)	≤ 540	≤ 600	≤ 640
Trans fat	Nutrition label or manufacturer specifications must indicate zero grams of trans fat per serving		
Fiber (g) (14 g/1000 kcal)	≥ 7	≥ 8	≥ 8

POLICY ALTERNATIVES

Alternative 2: Strengthen Existing Meal Pattern Requirements for Whole Grains, Fruits, Legumes, and Vegetables

Current regulations require that specific quantities of fruits, vegetables and vegetable subgroups, and whole grain-rich foods are offered to students daily and weekly, with majority of schools operating under the Offer Versus Serve model. The components as they currently exist can be improved in three specific ways to enhance fiber availability: (1) At lunch, increase the bean/legume vegetable subgroup requirement from ½ cup to 1 cup per week, (2) At breakfast and lunch, eliminate fruit juice as an allowable food item to count toward the fruit component, and (3) At breakfast and lunch, increase the whole grain requirement from 80% whole grain-rich to 100% whole-grain items.

The current transitional rules increased the whole grain-rich requirement from 50% of grains needing to be whole grain rich to 80% of grains needing to be whole grain-rich; however, ‘whole grain-rich’ is not equivalent to ‘whole grain’. As defined earlier, whole grain-rich means at least 50 percent of the grains are whole grain, the rest being enriched. See Figure 6 for an example of how the strengthened components can be depicted as part of the National School Lunch and School Breakfast meal patterns.

Table 5: Alternative Comparison of Current Requirement to Suggested Change

Increase Fiber-rich Foods in the Meal Pattern

Current Requirement	Suggested Change
1/2 cup beans and peas (legumes) vegetable subgroup/week at lunch	1 cup beans and peas (legumes) vegetable subgroup/week at lunch
Half of the fruit offerings may be in the form of 100% juice at lunch and breakfast	Juice is not allowed to credit toward the fruit component at lunch and breakfast
80% of grains offered must be whole grain rich at lunch and breakfast	100% of grains offered must be whole grain at breakfast and lunch



1 At lunch, increase the bean/legume vegetable subgroup requirement from ½ cup to 1 cup per week.

2 At breakfast and lunch, eliminate fruit juice as an allowable food item to count toward the fruit component.

3 At breakfast and lunch, increase the whole grain requirement from 80% whole grain-rich to 100% whole-grain items.

POLICY ALTERNATIVES

Figure 6: National School Lunch and School Breakfast Program with Strengthened Vegetable Subgroup, Fruit, and Grain Components

National School Lunch Program Meal Pattern

	Grades K-5	Grades 6-8	Grades 9-12
Food Components	Amount of Food per Week		
	(minimum per day)		
Fruits (cups)	2 1/2 (1/2)	2 1/2 (1/2)	5 (1)
Vegetables (cups)	3 3/4 (3/4)	3 3/4 (3/4)	5 (1)
Dark green	1/2	1/2	1/2
Red/Orange	3/4	3/4	1 1/4
Beans and peas (legumes)	1	1	1
Starchy	1/2	1/2	1/2
Other	1/2	1/2	3/4
Additional Vegetables to Reach Total	1/2	1/2	1
Grains (oz eq)	8-9	8-10	10-12
Meats/Meat Alternates (oz eq)	8-10	9-10	10-12
Fluid milk (cups)	5 (1)	5 (1)	5 (1)

- ^a Food items included in each group and subgroup and amount equivalents. Minimum creditable serving is 1/8 cup.
- ^b One-quarter cup of dried fruit counts as 1/2 cup of fruit; 1 cup of leafy greens counts as 1/2 cup of vegetables. Juice is not allowed to credit toward the fruit component.
- ^c Larger amounts of these vegetables may be served.
- ^d For purposes of the NSLP, the "Other vegetables" requirement may be met with any additional amounts from the dark green, red/orange, and beans/peas (legumes) vegetable subgroups.
- ^e Any vegetable subgroup may be offered to meet the total weekly vegetable requirement.
- ^f All grains offered weekly must be 100% whole grain. Schools may substitute 1 oz. eq. of meat/meat alternate for 1 oz. eq. of grains after the minimum daily grains requirement is met.
- ^g All fluid milk must be fat free (skim) or low-fat (1 percent fat or less). Milk may be unflavored or flavored provided that unflavored milk is offered at each meal service.
- ^h Discretionary sources of calories (solid fats and added sugars) may be added to the meal pattern if within the specifications for calories, saturated fat, trans fat, and sodium. Foods of minimal nutritional value and fluid milk with fat content greater than 1 percent milk fat are not allowed.

National School Breakfast Program Meal Pattern

	Grades K-5	Grades 6-8	Grades 9-12
Food Components	Amount of Food per Week		
	(minimum per day)		
Fruits (cups)	5 (1)	5 (1)	5 (1)
Vegetables (cups)	0	0	0
Dark green	0	0	0
Red/Orange	0	0	0
Beans and peas (legumes)	0	0	0
Starchy	0	0	0
Other	0	0	0
Additional Vegetables to Reach Total	0	0	0
Grains (oz eq)	0	0	0
Meats/Meat Alternates (oz eq)	7-10	8-10	9-10
Fluid milk (cups)	5 (1)	5 (1)	5 (1)

- ^a Food items included in each group and subgroup and amount equivalents. Minimum creditable serving is 1/8 cup.
- ^b One quarter cup of dried fruit counts as 1/2 cup of fruit; 1 cup of fruit; 1 cup of leafy greens counts as 1/2 cup of vegetables. Juice is not allowed to credit toward the fruit component.
- ^c Schools must offer 1 cup of fruit daily and 5 cups of fruit weekly. Vegetables may be substituted for fruits, but the first two cups per week of any such substitution must be from the dark green, red/orange, beans/peas (legumes), or "Other vegetables" subgroups.
- ^d All grains offered weekly must be 100% whole grain. Schools may substitute 1 oz. eq. of meat/meat alternate for 1 oz. eq. of grains after the minimum daily grains requirement is met.
- ^e There is no meat/meat alternate requirement.
- ^f All fluid milk must be fat free (skim) or low-fat (1 percent fat or less). Milk may be unflavored or flavored provided that unflavored milk is offered at each meal service.
- ^g The average daily calories for a 5-day school week must be within the ratings (at least the minimum and no more than the maximum values).
- ^h Discretionary sources of calories (solid fats and added sugars) may be added to the meal pattern if within the specifications for calories, saturated fat, trans fat, and sodium. Foods of minimal nutritional value and fluid milk with fat content greater than 1 percent milk fat are not allowed.

POLICY ALTERNATIVES

Evaluation Criteria

These two policy alternatives can be evaluated through the lens of three criteria: effectiveness, equity, and feasibility.

1. **Effectiveness** - Effectiveness will assess the potential impact on the nutritional quality of school meals through the scope of (a) increasing the amount of fiber-rich food offerings during the school day and (b) reducing barriers to children's intake of high-fiber foods.
2. **Equity** - Equity refers to the impact on all of the children served by the meal programs. Options will be compared based on their ability to ensure equal opportunity for children to access nutrient dense meals at school.
3. **Feasibility** - Feasibility will assess the practicality of an option's implementation at the local, state, and federal government levels. Political support for policies impacting meal program requirements plays a role in the viability of each alternative.

Policy Evaluation: Alternative 1: Add Fiber as a Dietary Specification

Effectiveness: Increase the amount of fiber-rich foods during the school day above current standards.

Adding a specification for dietary fiber to the meal pattern would provide a measurable metric for school food service providers to ensure they are offering adequate fiber-rich foods throughout the week. Current meal pattern daily and weekly goals for fruits, vegetables, and whole grains are meant to support adequate fiber intake. However, because lower fiber foods, such as 100% fruit juices and whole grain-rich items, are allowed and commonly found on school menus, the current menu planning requirements may be enhanced by requiring a specific number of grams of fiber at meals. As noted earlier, it is important to specify that the allowable fiber counted toward minimum requirements should come from naturally occurring sources, such as fruits, vegetables, and whole grains. If this is not specified, it could lead to other, less nutrient-dense items that have fiber added through the form of psyllium husk or cellulose, displacing more nutrient dense options like fruit, vegetables, and whole grains.

Effectiveness: Reduce barriers to children's intake of high-fiber foods.

Requiring a minimum amount of dietary fiber throughout the week could lead to more foods offered to children that include naturally occurring plant-based dietary fiber. As previously noted, the USDA meal pattern requirements allow for fruit juice to count toward 50% of fruit offered during the week. Fruit juice has minimal to no fiber, yet this item can be served in place of higher-fiber options such as fresh, canned, or frozen fruits or vegetables. Perhaps by requiring a minimum amount of fiber, schools would reduce the amount of juice offered in order to meet the requirement. With a minimum fiber requirement, more fiber-rich foods would likely be available to children eating meals at schools. However, there is currently no federal minimum seat time requirement to ensure adequate time to eat. Increasing availability of whole plant foods like fruits and vegetables may not meaningfully improve fiber intake if children are not given enough time to consume them. For example, Prescott et al. found that students who had more time to eat (at least 20 minutes of seat time) subsequently ate more fruits and vegetables.

POLICY ALTERNATIVES

Policy Evaluation: Alternative 1: Add Fiber as a Dietary Specification

Equity: Maximize children's access to nutrient dense meals at school.

More lower income families participate in the USDA school meal programs, with nearly 77% of all lunches in 2020 served at the free or at a reduced price.³⁵ With more fiber-rich foods available, there would be greater opportunity for all children to have access to nutrient dense meals at schools. Moving from the current requirement that 80% of grains must be whole grain rich to all grains offered being 100% whole grain is one way to improve the quality of school meals. It is possible that more schools would serve a greater proportion of their grain products as 100% whole grains in order to meet a fiber requirement. Thus, improved fiber requirements would raise the bar for all foods available to children, regardless of meal eligibility status.



Feasibility: Administrative practicality to implement a fiber dietary specification at the local, state, and federal government levels.

The current federal regulations do not include dietary fiber as a Dietary Specification, which would mean the federal meal pattern would need to be amended. It could take time to establish a minimum standard fiber range for the various age groups that aligns with the DGA. The IOM and DGA currently recommend 14 g of fiber per 1000 kcal of food. Although USDA monitoring tools for State Agencies do not include fiber, they need to be updated regardless due to additional meal pattern changes and flexibilities allowed through the Transitional Standards for Milk, Whole Grains, and Sodium. Training and technical assistance would need to be provided for local school operators on the fiber requirements as well. Despite a need for education on a new fiber requirement, many school nutrition operators already use USDA-approved menu planning software programs.³⁶ Many of the software programs currently track, or have the capability to track, fiber in menu items. So although the USDA would need to update menu planning guidance, the menu planning software industry already has the capacity to help food service operators meet a fiber requirement.

POLICY ALTERNATIVES

Policy Evaluation: Alternative 2: Strengthen Existing Meal Pattern Requirements for Whole Grains, Fruits, Legumes, and Vegetables

Effectiveness: Increase the amount of fiber-rich food offerings during the school day above current standards.

Strengthening the meal pattern components can effectively improve the amount of fiber-rich offerings during the school day.

- Increasing the bean/legume vegetable subgroup requirement from ½ cup to 1 cup per week at lunch could shift menu planning practices to include more fiber-rich plant-centric entrees. Many typical school entrees contain a grain component and animal protein (e.g. corndog, hot dog, hamburger, chicken patty on a bun). By incorporating more legumes into main entrees, children selecting the entrée would have access to greater amounts of fiber.
- Eliminating 100% fruit juice as an allowable item to count toward the fruit component at breakfast and lunch would subsequently lead to more whole, fiber-filled fruits, to be offered at breakfast and lunch.
- Raising the bar on whole grains to 100% whole grain instead of 80% whole grain-rich could have the greatest impact on fiber access, considering our previously discussed case study results illustrating how most children access fiber through the grain offerings.

Changing these individual components would offer clear guidelines for how food service operators should menu plan to increase fiber-rich food offerings.

Effectiveness: Reduce barriers to children's intake of high-fiber foods.

Directly addressing the gaps in current meal pattern standards by reducing low fiber foods, such as whole grain-rich pastries and juices, and increasing fiber-rich options through 100% whole grain products and greater amounts of bean/legume offerings will enhance the accessibility of high-fiber foods for children during the school day. Previously noted barriers to higher-fiber foods will be addressed with this option, including the issue of displacement of higher-fiber foods with low-fiber alternatives that are allowable under current meal pattern regulations. With the addition of more high-fiber foods, the barrier of inadequate seat time to consume meals will also need to be addressed.

Directly addressing the gaps in current meal pattern standards by reducing low fiber foods, such as whole grain-rich pastries and juices, and increasing fiber-rich options through 100% whole grain products and greater amounts of bean/legume offerings will enhance the accessibility of high-fiber foods for children during the school day.

POLICY ALTERNATIVES

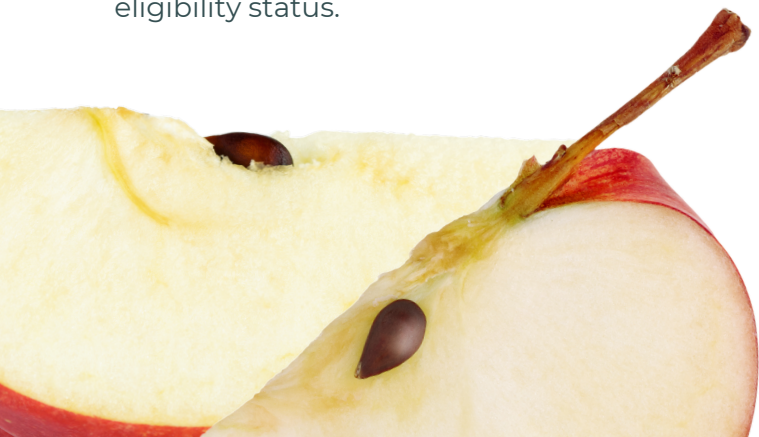
Policy Evaluation: Alternative 2: Strengthen Existing Meal Pattern Requirements for Whole Grains, Fruits, Legumes, and Vegetables

Equity: Maximize children's access to nutrient dense meals at school.

Similar to Policy Alternative 1, by updating the component requirements, a greater amount of foods menued will be fiber-rich foods. Improving the minimum requirements for fiber-rich foods will provide an opportunity for all children participating in the school meal programs to see an increase in fiber offerings at breakfast and lunch. Thus, children receiving a reimbursable meal at school will have improved access to nutrient-dense meals. Also previously noted, children receiving free or reduced-price meals make up a greater proportion of students who eat meals at school, compared to children from households who can pay full price for meals. Improvements to the minimum meal pattern requirements would raise the bar for all foods available to children, regardless of meal eligibility status.

Feasibility: Administrative practicality to implement at the local, state, and federal government levels.

Current federal meal pattern regulations would need to be changed to require 100% whole grains and no juice at breakfast and lunch, as well as increasing the legume subgroup from ½ cup to 1 cup per week. All of these changes fall within the current meal pattern; no additional requirements would be added, potentially minimizing the administrative burden for implementation. Although it would take time for the USDA to update program monitoring tools for State Agencies and to train local school operators on the updates, this administrative burden exists regardless due to additional meal pattern changes and flexibilities allowed through the Transitional Standards for Milk, Whole Grains, and Sodium. A potential challenge for implementing at the local level is operator confusion due to the ongoing changes to the meal programs due to the numerous flexibilities allowed throughout the COVID-19 pandemic, coupled with the current transitional standards. Additionally, there may be pushback from local operators regarding the stricter standards, which leave less menu planning flexibility.



These two policy alternatives can be evaluated through the lens of three criteria: **effectiveness, equity, and feasibility.**

TRADE-OFFS

Policy Alternative Trade-Offs

Both policy methods outlined could improve children’s access to foods rich in fiber. Comparing the benefits of each policy option, Alternative 1, would be the simplest approach and offer the greatest menu planning flexibility for local operators. A minimum requirement for grams of dietary fiber would set a clear standard for nutrition operators to meet or exceed. If choosing this option, it would be necessary to also require that grams of fiber must be naturally occurring and/or in their original form. For example, an ultra-processed grain product with fiber added from sources such as psyllium husk would not count toward the required fiber amounts. This would ensure that when menu planning, these less healthy foods would not displace more nutrient-dense food items like 100% whole grains and fresh or frozen fruits and vegetables.

Many USDA approved menu planning software companies already have the capability to track, or are currently tracking, grams of fiber for food items. With industry seemingly already on track to accommodate this policy change, the implementation of this alternative could be streamlined and easily integrated into current practices.

Although Alternative 1 may be the simplest solution, there are still benefits to choosing Alternative 2. Alternative 2 offers a clearly defined roadmap indicating which foods are higher in fiber to assist in menu planning. However, because the components would be more restrictive in this option, food service operators would have less flexibility in menu planning compared to Alternative 1. For example, for Alternative 1, one week the menu could focus on fiber through beans/legumes and whole grains, and the next, more whole fruits and vegetables and less juice could be menued to assist in meeting a minimum grams of fiber requirement. In contrast, Alternative 2 would mandate that more beans/legumes, 100% whole grain items, and no juice be served every week with no flexibility for serving items like 100% fruit juice on occasion. Despite a lack of flexibility, implementation could be streamlined as the changes are all within the scope of the current meal pattern requirements. In contrast, Alternative 1 would require the establishment of a new Meal Pattern Dietary Specification that aligns with the DGA and IOM fiber recommendation of 14 g/1000 kcal of food.

Policy Alternative 1

- Simpler solution
- Flexible menu planning
- Would require new Meal Pattern Dietary Specification

Policy Alternative 2

- Clearly defined roadmap
- Mandate more beans/legumes, & 100% whole grains
- Could work within current meal pattern requirements

TRADE-OFFS

Policy Alternative Trade-Offs (continued)

With either option, there needs to be a transition period to provide local operators the time to plan ahead for procurement and menu planning as well as to learn how to implement the new requirements. With the pandemic waivers, there have been extensive flexibilities and changes to the programs in the past two years.

Regardless of implementation barriers, it is essential that the school meal programs come into alignment with the Dietary Guidelines for Americans by prioritizing student access to fiber.

Adding an additional fiber specification or changing existing meal pattern components at this specific time may cause further confusion at the local level. Therefore, an implementation period over a period of one to two school years could be beneficial. Regardless of implementation barriers, it is essential that the school meal programs come into alignment with the Dietary Guidelines for Americans by prioritizing student access to fiber.

Although this paper seeks to determine a singular impactful policy change, it is worth acknowledging that implementing both policy alternatives is an option. Strengthening meal pattern components as well as establishing a fiber minimum could be viewed as complementary solutions. Despite feasibility of this more rigorous third option not being particularly high based on the previous analysis of the individual alternatives, it illustrates a more comprehensive approach for future consideration.

Table 6: Outcomes Comparison Matrix of Policy Alternatives

Alternative	Effectiveness: increase fiber rich foods	Effectiveness: reduce barriers	Equity	Feasibility
Alternative 1: Fiber as Meal Pattern Dietary Specification	Moderate-High	Moderate	Moderate	Moderate-High
Alternative 2: Strengthen Existing Meal Pattern Requirements for Whole Grains, Fruits, Legumes, and Vegetables	Moderate-High	Moderate-High	Moderate	Low-Moderate

ADDITIONAL CONSIDERATIONS

Additional Supportive Measures of Interest

Although the primary purpose of this white paper is to discuss improving children's access to high-quality sources of dietary fiber, there are two additional measures that complement this discussion: making fiber a research priority and giving children more time to eat.

USDA School Meal Fiber Study

USDA has conducted various studies inquiring into the acceptability of school meals and meal quality improvements resulting from the Healthy Hunger-Free Kids Act. For example, in the 2016-2017 Child Nutrition Program Operations Study II³⁷ researchers found that 70% of school nutrition operators often served whole vegetables at lunch. However, although it is helpful to know that schools are offering fiber-rich vegetables, there is limited current research on whether students are meeting the recommended fiber amounts, as quantified by the DGA. To assess dietary fiber availability and consumption in school meal programs, USDA could conduct a study to determine the extent of how well the current component-based menu planning standards support adequate fiber intake per the DGA. A study could offer clearer insight into gaps and opportunities for the USDA School Nutrition Programs to address in the future through measures such as a fiber minimum or enhancing current components to support intake of higher fiber foods. Furthermore, the Dietary Specifications Assessment Tool (DSAT),³⁸ the risk assessment tool used to determine if a school requires a high-risk menu review during an Administrative Review, does not include questions regarding risk practices to determine if adequate fiber is offered. By investigating fiber access in school meals, the USDA may find that updating the DSAT to include language around how often fresh fruit and vegetables, 100% whole grain-rich foods, and beans/legumes are served weekly could be beneficial.

Adequate Time to Eat

As noted within both policy alternative sections, there is currently no federal minimum requirement for time to eat. Consequently, it may be a challenge for children to consume foods high in fiber, such as raw vegetables, even if they were adequately available. Recent research indicates that students who have less than 20-minute lunch periods are less likely to both choose and consume fruits and vegetables.^{39,40} It is not uncommon for schools to have less than a 20-minute lunch period.⁴¹ This window of time is not only to eat, but also to walk to the cafeteria, stand in line, pay for lunch, pick up the food and find a seat, and socialize with friends. Support for adequate meal times is growing, as evidenced by proposed federal legislation, including the Healthy Meal Time Act.⁴² The CDC and the American Academy of Pediatrics currently recommend that students have a minimum of 20 minutes of seat time to consume the meals, which means lunch periods would need to be longer than 20 minutes to account for the time involved in purchasing a lunch, as outlined above.⁴³

BALANCED'S RECOMMENDATIONS

Balanced's Recommendations

Placing high-fiber foods front and center in the menu planning process by adding a minimum fiber requirement in alignment with the DGA and IOM would be the most effective way to boost students' access to nutritious, fiber-rich meals. As discussed throughout this paper, it is evident that fiber needs to be prioritized to ensure children have access to adequate nutritious foods while at school. A minimum fiber requirement for school breakfast and lunch would allow program operators flexibility in menu planning while also safeguarding the health of children by ensuring that an adequate amount of dietary fiber is offered during the school day. This option is more effective and feasible compared to updating the current meal pattern components. A minimum breakfast and lunch fiber requirement is straightforward, and the program change would minimize confusion for local program operators. Although updating the whole grain, vegetable, and fruit components would provide a more specific menu planning roadmap, it would also reduce local menu planning flexibility and could cause greater confusion due to the ongoing recent policy changes, including pandemic waivers and the transitional meal pattern rules. Thus, a minimum dietary fiber requirement provides food service operators the autonomy to meet fiber requirements through foods that fit local level needs and tastes.

In addition to creating a minimum fiber requirement, we recommend that this policy be coupled with additional supportive measures including a clarification of allowable types of dietary fiber, establishing a USDA study on fiber, and creating a minimum seat time requirement during school meals. As discussed earlier, it is imperative to clarify that only the fiber from foods that have naturally occurring fiber should count toward the required amount. This will avoid the displacement of nutrient-dense foods, such as fruits and vegetables, with foods of minimal nutritional value that have fiber added through fortification.

Furthermore, it would be prudent for the USDA to conduct a study on fiber in school meals to identify any additional gaps in meeting the fiber needs of students. Researchers could assess State Agency Administrative Review reports to determine the frequency of school meal service and menu planning findings related to fiber, including inadequate or missing amounts of fruits, vegetables, bean/legume sub-group, whole grains, and fruit juice exceeding the 50% weekly allowance. Finally, taking the step to establish a minimum seat time of at least 20 minutes would afford students adequate time to consume their fiber-rich school meals.

Placing high-fiber foods front and center in the menu planning process by adding a minimum fiber requirement in alignment with the DGA and IOM would be the most effective way to boost students' access to nutritious, fiber-rich meals.

BALANCED'S RECOMMENDATIONS

Conclusion

School meals frequently fall short in dietary fiber, perpetuating the near-universal prevalence of fiber inadequacy among children. Nutrient-dense foods high in fiber, such as beans/legumes, 100% whole grains, and fruits and vegetables, should be prioritized in school meals to support the health of students of all ages. Foods high in dietary fiber play an essential role in children's health and development. Establishing a minimum breakfast and lunch fiber requirement in alignment with the DGA and IOM will improve student access to high-fiber meals and create a realistic and measurable goal for school food service operators. There will need to be an implementation period to ensure that school meal fiber requirements align with the DGA and that schools have time to plan for procurement and menu changes. Menu-planning and nutrient analysis software companies used by school food service operators are already prepared to track fiber in school meals and can streamline this transition. Complementary measures should also be explored to support adequate fiber in schools, including further investigation by the USDA through a dietary fiber study and the establishment of federal legislation for minimum seat time during meals to allow adequate time to eat. Ultimately, prioritizing fiber in school meals will result in breakfast and lunch menus that better support children's health and development.



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