

Social Determinants of Health: Healthy School Meals for All, Updated 2026

Community Preventive Services Task Force Finding and Rationale Statement Ratified July 2022

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CPSTF Finding and Rationale Statement

Context

Food and nutrition security is an established social determinant of health (CDC 2022, Serchen et al. 2022). It exists when people have consistent physical, social, and economic access to affordable foods and beverages that promote health and prevent adverse health outcomes (CDC 2022, Mozaffarian et al. 2021). Families from historically disadvantaged racial and ethnic populations and populations with lower incomes often lack access to affordable nutritious foods (CDC 2020). In 2020, 14.8% of households with children in the United States experienced food insecurity, and rates were even higher for those below 185% of the federal poverty level (33.7%) and Black or African American (27.3%) and Hispanic or Latino (21.8%) households (Coleman-Jensen et al. 2021). Children experiencing food insecurity are at higher risk of poor physical and mental health, obesity, increased hospitalizations, poor academic performance, and behavioral problems (Au et al. 2019, Cook et al. 2006, McIntyre et al. 2013, Shankar et al. 2017).

The National School Lunch Program (NSLP) and the School Breakfast Program (SBP) — two key U.S. Department of Agriculture (USDA) meal programs — operate in public and non-profit private schools, and residential child-care centers (USDA 2021, 2022a). Studies have shown these programs reduce food insecurity (Ralston et al. 2017). Children from households experiencing food insecurity receive significantly more of their daily energy from school meals than children from households that are not experiencing food insecurity (Forrestal et al. 2021). Studies have also shown that school meals provide the best diet quality of major U.S. food sources among children and improve the nutritional quality of students' diets (Fox et al. 2019, Liu et al. 2021). School meals are not linked with increases in obesity and have been associated with decreases in obesity among children from households with lower incomes (Kenney et al. 2020). Studies have also shown a favorable association between SBP and school attendance and academic performance (County Health Rankings & Roadmaps 2019).

NSLP and SBP have the potential to benefit millions of students in the United States, many of them from households with lower incomes (National Center for Education Statistics 2021, 2022). Estimates indicate more than half of students in U.S. public schools are eligible for free or reduced-price lunches (NCES 2021). In schools that offer NSLP and SBP, however, it is estimated that only 79% of students from households experiencing food insecurity participate in NSLP and only 38% participate in SBP (Forrestal et al. 2021).

The traditional payment model under which NSLP and SBP operate requires students to apply and meet certain income-based eligibility requirements to receive free or reduced-price meals (). Students who do not apply or meet these requirements must pay full price for their meals (USDA 2021, 2022a). This system presents economic, administrative, and language barriers that may make it more difficult for students from households with lower incomes to participate. Families with low to moderate monthly incomes undergo income fluctuations that cross the eligibility threshold for reduced-price lunches an average of five times a year (Newman 2006). The certification process for free or reduced-price meals also presents barriers, as errors on applications or in administrative procedures may lead to eligible students being denied benefits (Milfort et al. 2021). In the 2017-18 school year, an estimated 34 percent of students who were denied free or reduced-price meals were actually eligible to receive them (Milfort et al. 2021). Another issue is families with limited English proficiency may be unaware of the availability of free or reduced-price meals and may have difficulties with the application process if there are not translation services or forms available in their primary language (USDA 2016a, 2016b).

The traditional payment model also presents social barriers to participation. Students who are unable to pay for school meals may be denied nutritious meals and face stigmatization due to what is commonly referred to as “lunch shaming” practices. In some schools, students who have unpaid meal debt are identified with a wristband or hand stamp and receive an alternate meal of minimal nutritional value or no meal at all (Fleischhacker et al. 2020).

Intervention Definition

Healthy School Meals for All offers free, nutritious meals (i.e., breakfast, lunch, or both) to all students in a qualifying school, regardless of household income. It augments the traditional model of the U.S. Department of Agriculture’s National School Lunch Program (NSLP) and School Breakfast Program (SBP) which uses household income-based requirements to determine eligibility for free and reduced-price meals. The intervention aims to do the following:

- Improve access to NSLP and SBP for students from households with lower incomes by removing economic, administrative, language, and social barriers that may limit their participation
- Increase participation in NSLP and SBP overall to improve diet quality and promote health and well-being for all students

Policy Context

Healthy School Meals for All is implemented through policies at federal, state, and local levels (Table 1). Federal policies are authorized by Congress and administered by the USDA (USDA 2014, 2019, 2022b). The Community Eligibility Provision, the most widely used federal policy, allows schools and school districts to offer Healthy School Meals for All if at least 40% of enrolled students are directly certified for free meals based on their participation in other means-tested programs, such as the Supplemental Assistance Program, Temporary Assistance for Needy Families, or Food Distribution Program on Indian Reservations (Billings et al. 2020, National Archives 2022, USDA 2019).

Some cities and states have policies that authorize Healthy School Meals for All in their jurisdictions. Qualifying criteria vary by location and have changed over time (Food Research & Action Center 2022, New York City Department of Education 2022).

In response to the COVID-19 pandemic, Congress granted the USDA authority to establish nationwide waivers that support Healthy School Meals for All in all schools operating NSLP and SBP. These waivers were implemented in March 2020 and scheduled to expire in September 2022 (USDA 2022b).

Table 1. Healthy School Meals for All Policies

Policy	School Eligibility Requirements*	Start Date	End Date
USDA Provision 1 [https://www.fns.usda.gov/cn/provisions-1-2-and-3]	≥ 80% of enrolled students eligible to receive free or reduced-price meals	1980	Ongoing
USDA Provisions 2 and 3 [https://www.fns.usda.gov/cn/provisions-1-2-and-3]	None, but schools must pay for free meals given to students not covered through federal reimbursements	Provision 2: 1980 Provision 3: 1995	Ongoing

Policy	School Eligibility Requirements*	Start Date	End Date
USDA Community Eligibility Provision (CEP) [https://www.fns.usda.gov/cn/community-eligibility-provision]	≥ 40% of enrolled students directly certified for free school meals based on their participation in other means-tested assistance programs, such as the SNAP, TANF, or FDIPIR	Selected states: 2011-2014 Nationwide: 2014	Ongoing
USDA nationwide waivers in response to the COVID-19 pandemic [https://www.fns.usda.gov/fns-disaster-assistance/fns-responds-covid-19/child-nutrition-covid-19-waivers]	Must participate in NSLP and/or SBP	March 2020	September 2022
City or state-wide policies	Varies	Varies	Varies

*To implement Healthy School Meals for All, a school must participate in NSLP and/or SBP.

FDPIR= Food Distribution Program on Indian Reservations

SNAP=Supplemental Nutrition Assistance Program

TANF=Temporary Assistance for Needy Families

CPSTF Finding (July 2022)

The Community Preventive Services Task Force (CPSTF) recommends Healthy School Meals for All based on strong evidence of effectiveness in increasing student participation in the U.S. Department of Agriculture’s National School Lunch Program (NSLP) and School Breakfast Program (SBP) and sufficient evidence of effectiveness in reducing school absenteeism. In the broader literature, participation in NSLP and SBP is associated with reduced food insecurity, improved nutritional quality of students’ diets, and improved academic outcomes (County Health Rankings & Roadmaps 2019, Fox et al. 2019, Liu et al. 2021, Ralston et al. 2017).

Healthy School Meals for All is expected to advance health equity in the United States by removing barriers to consistent access to free and healthy foods for students from households with lower incomes. Healthy School Meals for All is often implemented in schools in which a large proportion of enrolled students are from households with lower incomes (Billings et al. 2020, National Archives 2022, USDA 2019), and most of the studies included in the systematic review evaluated outcomes for this population.

Rationale

Basis of Finding

The CPSTF recommendation is based on evidence from a systematic review of 14 studies. Studies were identified from a published systematic review (Cohen et al. 2021a, 11 studies from 13 publications, search period through December 2020) and an updated search that used the same search terms (3 studies, search period January to December 2021).

Studies included in the review compared Healthy School Meal for All to the traditional model of the NSLP and SBP that used household income-based requirements to determine eligibility for free and reduced-price meals. The median study duration was 30 months (interquartile interval [IQI]: 21 to 51 months).

To assess intervention effectiveness, a team of specialists in systematic review methods and subject matter experts synthesized outcomes for school meal participation (breakfast, lunch, or both); school attendance (i.e., days present, days absent); academic performance (i.e., math, reading, science test scores); dietary intake and meal patterns (i.e., breakfast skipping, breakfast dietary intake, full-day dietary intake); and food security (i.e., household food security status).

Evidence from the included studies showed Healthy School Meals for All increased participation in the NSLP and SBP and reduced school absenteeism (Table 2). Studies did not show consistent or meaningful improvement in academic performance. There were not enough studies to determine whether Healthy School Meals for All improved dietary quality, meal patterns, or food security.

Table 2. Summary of Findings for Healthy School Meals for All

Outcome	Number of Studies	Summary Effect Estimates	Direction of Effect
Meal participation: Overall	9	Absolute difference: Median increase of 4.5 pct pts (IQI: 3.6 to 8.2 pct pts, 7 studies) Relative difference Median increase of 8.5% (IQI: 7.5% to 16.8%, 7 studies) 2 studies provided narrative results that were favorable and statistically significant	Favors the intervention
Meal participation: Breakfast	6	Absolute difference: Median increase of 4.6 pct pts (IQI: 3.6 to 15.5 pct pts, 5 studies) Relative difference Median increase of 11.0% (IQI: 9.0% to 54.2%, 5 studies) 1 study provided narrative results that were favorable and statistically significant	Favors the intervention

Outcome	Number of Studies	Summary Effect Estimates	Direction of Effect
Meal participation: Lunch	7	Absolute difference: Median increase of 4.3 pct pts (IQI: 3.6 to 5.4 pct pts, 5 studies) Relative difference Median increase of 7.7% (IQI: 6.1% to 8.3%, 5 studies) 2 studies provided narrative results that were favorable and statistically significant	Favors the intervention
School attendance: Overall	7	2 studies favorable and statistically significant, 3 studies favorable, 1 study unfavorable and statistically significant, 1 study no change	Inconsistent results
School attendance: Days present in school	6	2 studies favorable and statistically significant, 2 studies favorable, 1 study unfavorable and statistically significant, 1 study no change	Inconsistent results
School attendance: Days absent from school	3	2 studies favorable and statistically significant, 1 study favorable	Favors the intervention
Academic performance: Overall	7	5 studies no change, 2 studies mixed results	Inconsistent results
Academic Performance: Math test scores	7	5 studies no change, 2 studies mixed results	Inconsistent results
Academic Performance: Reading test scores	7	7 studies no change	No change
Academic Performance: Science test scores	2	1 study favorable, 1 study no change	Inconsistent results
Dietary Intake: Overall	1	1 study mixed results across study outcomes	Not enough studies to determine
Dietary Intake: Breakfast skipping	1	1 study no change	Not enough studies to determine

Outcome	Number of Studies	Summary Effect Estimates	Direction of Effect
Dietary Intake: Breakfast dietary intake	1	1 study favorable and statistically significant	Not enough studies to determine
Dietary Intake: Full-day dietary intake	1	1 study no change	Not enough studies to determine
Food Security: Household food security status	1	1 study no change	Not enough studies to determine

IQI: interquartile interval

pct pts: percentage points

Applicability and Generalizability Issues

Intervention Settings

The CPSTF finding is applicable to elementary, middle, and high schools that implement the NSLP and/or the SBP in urban, suburban, and rural settings in the United States.

All studies were conducted in the United States (14 studies). Five were implemented in multiple U.S. regions and the remainder were distributed across the Western (1 study), Midwestern (2 studies), Northeastern (3 studies), and Southern (3 studies) regions as defined by the U.S. Census Bureau.

Studies were implemented in elementary schools (5 studies), middle schools (1 study), a combination of elementary and middle schools (4 studies), or a combination of elementary, middle, and high schools (4 studies). No studies were conducted exclusively in high schools. One study found similar increases in meal participation and reductions in absenteeism among students in elementary and middle schools. Studies were conducted in urban (3 studies) or a mix of urban, suburban, and rural (11 studies) areas. One study found similar reductions in absenteeism among students in rural and urban areas.

Population Characteristics

The CPSTF finding is applicable to students regardless of gender, race and ethnicity, or household income level.

Seven studies provided data on gender and reported a similar distribution of females and males (median 48.8% female). Two studies found similar changes in school attendance for males and females. The thirteen studies that reported race and ethnicity of participants had a higher percentage of students who self-identified as Hispanic or Latino or as Black or African American compared with U.S. population estimates. Studies included participants who self-identified as Hispanic or Latino (median 28.0%; 10 studies), Black or African American (median 25.2%; 11 studies), White (median 21.4%; 8 studies), Asian (3.3%; 5 studies), or other race/ethnicity (median 10.9%; 4 studies). In one study including 9,583 schools, 28.9% of schools reported Hispanic students made up at least 75% of the population. One study found that although meal participation increased among Hispanic or Latino students, the increase was lower than that of the total sample.

Most of the data came from students from households with lower incomes. Across thirteen studies, a median of 63.3% of students came from households that either had incomes below 185% of the federal poverty level, or were eligible for

free or reduced-price school meals or other federal assistance programs. Two studies stratified intervention effects on meal participation by the proportion of students in a school who qualified for free meals. They found increased participation across schools with the greatest increases reported for schools where fewer than 40% of students qualified for free meals. Eight studies stratified meal participation by whether students qualified for free or reduced-price meals. They found increased participation among all students with the greatest increases reported for students who were not eligible for free or reduced-price meals. Six studies stratified school attendance by whether students qualified for free or reduced-price meals and found similar changes for all students.

Intervention Characteristics

The CPSTF finding is applicable to interventions that offered free breakfast, lunch, or both. All studies reported which meals were offered for free during the study evaluation period. These included breakfast and lunch (8 studies), breakfast only (4 studies), or lunch only (2 studies).

The CPSTF finding is applicable to interventions regardless of the policy through which they were implemented (see Table 1). Evaluated interventions were implemented through the Community Eligibility Provision (at least 40% of students eligible for specific means-tested programs; 8 studies); Provision 2 (no eligibility requirements but schools cover added cost; 1 study); or a city-wide policy (1 study). In one study, interventions were supported by either Provision 1 (at least 80% of students eligible to receive free or reduced-price meals), Provision 2 (no eligibility requirements but schools cover added cost), Provision 3 (no eligibility requirements but schools cover added cost), or the Community Eligibility Provision (at least 40% of students eligible for specific means-tested programs). Three studies did not report this information.

Data Quality Issues

Study designs included randomized control trials (1 study), pre-post with concurrent comparison groups (11 studies), a retrospective cohort (1 study), and a single group pre-post (1 study).

Study risk of bias was assessed using an adapted Newcastle-Ottawa Scale (Cohen et al. 2021a). All included studies had a low risk of bias; studies deemed to have a high or very high risk of bias (9 studies) were excluded from the review. The most common bias identified was for sampling issues (not having a representative intervention or comparison group; 4 studies).

Other Benefits and Harms

CPSTF considered potential additional benefits and harms from exposure to Healthy School Meals for All. CPSTF postulates potential benefits of the intervention could include the following: the elimination of stigma associated with receiving free or reduced-price meals; the elimination of “lunch shaming” school practices for students who are unable to pay for school meals; a reduction in administrative costs associated with distributing and collecting applications for free and reduced-price meals; and a reduction in overall school meal costs due to economies of scale.

CPSTF postulates a potential harm of the intervention could be increased obesity; however, two studies included in the review found no negative impact (Andreyeva et al. 2021, Schwartz et al. 2020). CPSTF also postulates increased plate waste (i.e., the quantity of edible portions of food served that is uneaten) as a potential harm, but none of the included studies evaluated the impact of the intervention on plate waste (Buzby et al. 2002).

Considerations for Implementation

The following considerations for implementation are drawn from studies included in the existing evidence review, the broader literature, and expert opinion.

Strategies to improve school meal consumption and reduce plate waste

A published systematic review of 96 studies (Cohen et al. 2021b) identified the following strategies as effective in improving school meal consumption and reducing plate waste:

- Offering more menu choices
- Adapting recipes to improve the palatability and cultural appropriateness of foods
- Providing pre-sliced fruits
- Rewarding students who try fruits and vegetables
- Enabling sufficient time to eat by extending the lunch period
- Limiting access to competitive foods during the school day

Strategies to improve participation in school breakfast programs

Participation in school breakfast programs tends to be lower than in school lunch programs (USDA 2022c). Implementing alternative breakfast models may boost participation (Bernstein et al. 2004; Larson et al. 2018). One study included in the review found breakfast participation was substantially higher when breakfast was served in the classroom rather than in the school cafeteria (Bernstein et al. 2004). Other examples of alternative models include grab-and-go breakfast, second chance breakfast (e.g., breakfast offered during morning break or recess), and breakfast on the bus (USDA 2016c).

Strategies to address schools' loss of free and reduced-price meals data

When schools implement Healthy School Meals for All, they stop collecting household income data to assess students' eligibility for free and reduced-price meals. Schools have historically used these data to justify eligibility for other needs-based educational initiatives such as Title I funding. Schools may use alternative data sources to assess the income level of enrolled students to qualify for these initiatives. The following guidance is available for schools electing the Community Eligibility Provision to support Healthy School Meals for All:

- [Updated Title I Guidance for Schools Electing Community Eligibility](https://www.fns.usda.gov/cn/updated-title-i-guidance-schools-electing-community-eligibility) [https://www.fns.usda.gov/cn/updated-title-i-guidance-schools-electing-community-eligibility]
- [Updated E-rate Guidance for Schools Electing Community Eligibility](https://www.fns.usda.gov/cn/updated-e-rate-guidance-schools-electing-community-eligibility#:~:text=Updated%20Guidance&text=The%20new%20rules%20require%20school,by%20the%20district's%20total%20enrollment.) [https://www.fns.usda.gov/cn/updated-e-rate-guidance-schools-electing-community-eligibility#:~:text=Updated%20Guidance&text=The%20new%20rules%20require%20school,by%20the%20district's%20total%20enrollment.]

Implementation resources

The following site provides information about the benefits of U.S. school meal programs and a resource list:

- [CDC Healthy Schools: School Meals](https://www.cdc.gov/healthyschools/npao/schoolmeals.htm) [https://www.cdc.gov/healthyschools/npao/schoolmeals.htm]

The following resources provide guidance and tools for implementation of Healthy School Meals for All using the Community Eligibility Provision:

- [USDA Community Eligibility Provision Resource Center](https://www.fns.usda.gov/cn/community-eligibility-provision-resource-center) [https://www.fns.usda.gov/cn/community-eligibility-provision-resource-center]
- [USDA Community Eligibility Provision Planning and Implementation Guidance](https://www.fns.usda.gov/cn/fall-2016-cep-planning-and-implementation-guidance) [https://www.fns.usda.gov/cn/fall-2016-cep-planning-and-implementation-guidance]
- [Community Eligibility Provision: Alternative Breakfast Models](https://fns-prod.azureedge.us/sites/default/files/cn/cep_increasingbfast.pdf) [https://fns-prod.azureedge.us/sites/default/files/cn/cep_increasingbfast.pdf]

Evidence Gaps

CPSTF identified several areas that have limited information. Additional research and evaluation could help answer the following questions and fill remaining gaps in the evidence base.

CPSTF identified the following questions as priorities for research and evaluation:

- What is the impact of Healthy School Meals for All on dietary intake and household food security?
- What are the barriers to participation in Healthy School Meals for All for students from households with lower incomes? Which strategies effectively address these barriers?

Remaining questions for research and evaluation identified in this review include:

- How does the effectiveness of Healthy School Meals for All vary between high schools and elementary and middle schools?
- How did the USDA nationwide waivers issued during the COVID-19 pandemic affect meal participation and academic outcomes? In response to the COVID-19 pandemic, Congress granted the USDA authority to establish nationwide waivers to support Healthy School Meals for All schools operating NSLP and SBP.
- What is the impact of Healthy School Meals for All on plate waste?

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USDA. Child nutrition tables. Published 2022c. Accessed June 22, 2022. www.fns.usda.gov/pd/child-nutrition-tables.

Disclaimer

The findings and conclusions on this page are those of the Community Preventive Services Task Force and do not necessarily represent those of CDC. Task Force evidence-based recommendations are not mandates for compliance or spending. Instead, they provide information and options for decision makers and stakeholders to consider when determining which programs, services, and policies best meet the needs, preferences, available resources, and constraints of their constituents.

Document last updated July 30, 2026

Appendices of Supporting Documents

Social Determinants of Health: Healthy School Meals for All

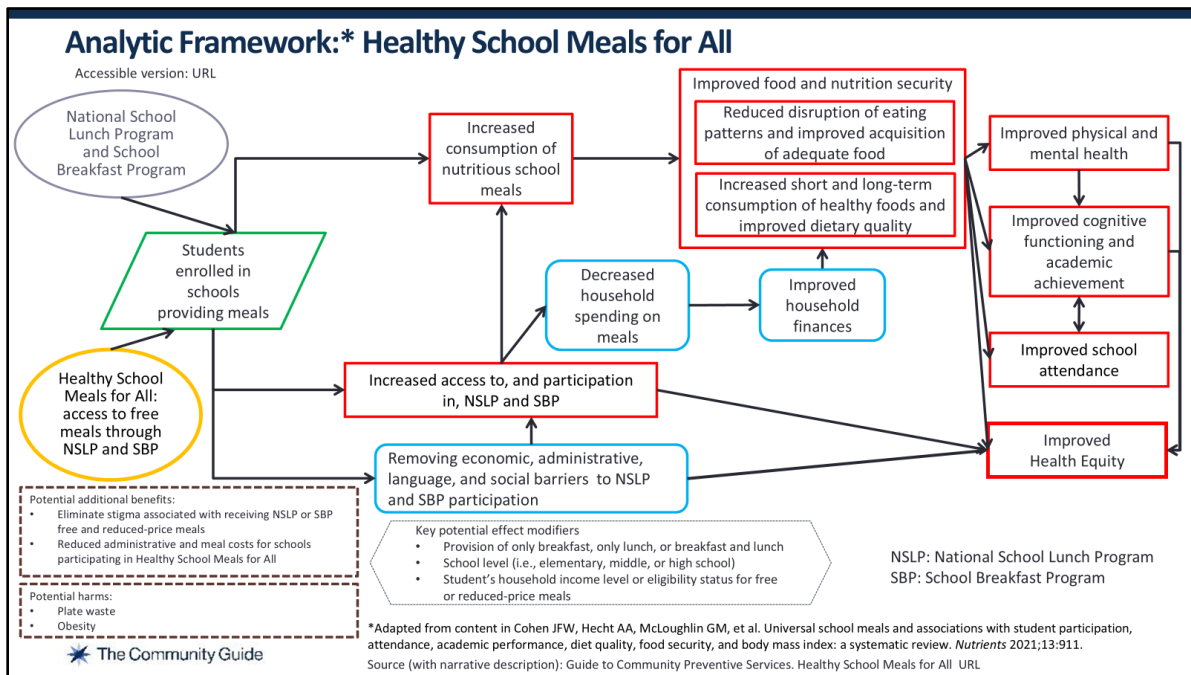
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Appendix A

Analytic Framework (Effectiveness Review)

Social Determinants of Health: Healthy School Meals for All



Analytic Framework Text Description

The analytic framework depicts postulated pathways through which Healthy School Meals for All increase access to, and participation in, the National School Lunch Program (NSLP) and School Breakfast Program (SBP). Healthy School Meals for All may improve dietary, physical and mental health, and academic outcomes for all students in a participating school. Because the NSLP and SBP serve as the foundation for Healthy School Meals for All interventions, we start by describing outcomes associated with participation in these existing meal programs. Meals through the NSLP and SBP are provided to students that participate in these programs. Participation in the NSLP and SBP leads to increased consumption of nutritious school meals which may lead to improved food and nutrition security including reduced disruption of eating patterns, improved acquisition of adequate food, and increased short- and long- term consumption of healthy foods and improved dietary quality. This may lead to improvements in physical and mental health, cognitive functioning and academic achievement, and school attendance. All these outcomes may improve health equity.

Healthy School Meals for All increases access to, and participation in, the NSLP and the SBP by making meals free to all students enrolled in a school regardless of household income. Healthy School Meals for All may also improve access to NSLP and SBP for students from households with lower incomes by removing economic, administrative, language, and social barriers that may limit their participation. This may improve health equity. Healthy School Meals for All may lead to more students participating in NSLP and SBP which may lead to

Icons in Community Guide Analytic Frameworks	
Icon	Interpretation
	Intervention
	Outcomes considered for conclusions on effectiveness and recommendations regarding use
	Other intermediate outcomes/variables (not considered for conclusions on effectiveness and recommendations regarding use)
	Population
	Key potential effect modifiers (affecting causal relationships)
	Additional benefits/Potential harms/Disparities
	Unidirectional block arrows are applied between intervention and population icons
	Unidirectional arrows for causal relationships
	Bidirectional arrows show feedback loops

The Community Guide

postulated outcomes described above. Programs may also lead to decreased household spending on meals which may lead to improved household finances, further contributing to the outcomes described above.

Key potential effect modifiers include whether breakfast, lunch, or both are provided; school level (i.e., elementary, middle, or high school); and student's household income level or eligibility status for free or reduced-price meals.

Potential additional benefits include eliminating stigma associated with receiving free or reduced-priced meals and reduced administrative and meal costs for participating schools. Potential harms include plate waste and obesity.

Appendix B

Search Strategy (Effectiveness Review): Social Determinants of Health: Healthy School Meals for All

The CPSTF recommendation is based on a systematic review of 14 studies (published through 2021). The review combined 11 studies of Healthy School Meals for All from a published systematic review (Cohen et al. 2021; search period through December 2020) with 3 studies identified in an updated search that used the same search terms (search period January to December 2021).

Databases searched for the Cohen et al. 2021 review included PubMed, Education Resources Information Center (ERIC), Thomson Reuters Web of Science, and Academic Search Ultimate. The databases for the updated search included PubMed, ERIC, Scopus, and Academic Search Complete.

Database: PubMed

((((((((((universal school meals[Title/Abstract]) OR ("community eligibility provision"[Title/Abstract])) OR ("universal free meal"[Title/Abstract])) OR ("universal free breakfast"[Title/Abstract])) OR ("universal free school breakfast program"[Title/Abstract])) OR ("free lunch"[Title/Abstract])) OR ("free breakfast")) OR ("meal reimbursement"[Title/Abstract])) OR ("meal programs"[Title/Abstract])) OR ("school meal programs"[Title/Abstract])) OR (reduced[Title/Abstract] AND price[Title/Abstract] AND "co pay"[Title/Abstract])) OR ("Meals"[Majr])) AND (Students OR Schools) OR (access[Title/Abstract] OR poverty[Title/Abstract] OR hunger)[Title/Abstract] AND (lunch[Title/Abstract] OR breakfast)[Title/Abstract] AND (school*[Title/Abstract] OR student*)[Title/Abstract]

Database: Scopus

(TITLE-ABS-KEY ("universal school meals" OR "community eligibility provision" OR "universal free meal*" OR "universal free lunch" OR "universal free breakfast" OR "universal free breakfast program" OR "school meal provision" OR "free lunch*" OR "free breakfast" OR "meal reimbursement" OR "reduced-price co-pay" OR "reduced-price copay" OR "school meal reimbursement" OR "healthy school meals for all")) AND (TITLE-ABS-KEY (student* OR school*)) AND PUBYEAR > 2020

Database: ERIC

noft("universal school meals" OR "community eligibility provision" OR "universal free meal*" OR "universal free lunch" OR "universal free breakfast" OR "universal free breakfast program" OR "school meal provision" OR "free lunch*" OR "free breakfast" OR "meal reimbursement" OR "reduced-price co-pay" OR "reduced-price copay" OR "school meal reimbursement" OR "healthy school meals for all") AND noft((student* OR school*))

Peer reviewed

Limits: 2021

Database: Academic Search Complete

S1 TI (("universal school meals" OR "community eligibility provision" OR "universal free meal*" OR "universal free lunch" OR "universal free breakfast" OR "universal free breakfast program" OR "school meal provision" OR

"free lunch*" OR "free breakfast" OR "meal reimbursement" OR "reduced-price co-pay" OR "reduced-price copay" OR "school meal reimbursement" OR "healthy school meals for all")) AND AB (("universal school meals" OR "community eligibility provision" OR "universal free meal*" OR "universal free lunch" OR "universal free breakfast" OR "universal free breakfast program" OR "school meal provision" OR "free lunch*" OR "free breakfast" OR "meal reimbursement" OR "reduced-price co-pay" OR "reduced-price copay" OR "school meal reimbursement" OR "healthy school meals for all"))

S2 TI (student* OR school*) OR AB (student* OR school*)

S3 S1 AND S2

S4 S1 AND S2 Limiters - Scholarly (Peer Reviewed) Journals

S5 S1 AND S2 Limiters - Scholarly (Peer Reviewed) Journals; Published Date: 20210101-20211231

Appendix C
Included Studies (Effectiveness Review):
Social Determinants of Health: Healthy School Meals for All

Andreyeva T, Sun X. Universal school meals in the US: what can we learn from the Community Eligibility Provision? *Nutrients* 2021;13(8).

Bartfeld JS, Berger L, Men F. Universal access to free school meals through the Community Eligibility Provision is associated with better attendance for low-income elementary school students in Wisconsin. *Journal of the Academy of Nutrition and Dietetics* 2020;120(2):210-18.

Bartfeld JS, Berger L, Men F, et al. Access to the School Breakfast Program is associated with higher attendance and test scores among elementary school students. *Journal of Nutrition* 2019;149(2):336-43.

Bernstein LS, McLaughlin JE, Crepinsek MK, et al. Evaluation of the School Breakfast Program Pilot Project: final report, *Nutrition Assistance Program Report Series*, No. CN-04-SBP, Project Officer: Anita Singh. Alexandria, VA: U.S. Department of Agriculture, Food and Nutrition Service, Office of Analysis, Nutrition, and Evaluation; 2004.

Gordanier J, Ozturk O, Williams B, et al. Free lunch for all! The effect of the Community Eligibility Provision on academic outcomes. *Economics of Education Review* 2020;77:101999.

Leos-Urbel J, Schwartz AE, Weinstein M, et al. Not just for poor kids: the impact of universal free school breakfast on meal participation and student outcomes. *Economics of Education Review* 2013;36:88-107.

Logan CW, Patty C, Harvill EL, et al. Community Eligibility Provision Evaluation. Project Officer: John R. Endahl. Prepared by Abt Associates for the U.S. Department of Agriculture, Food and Nutrition Service, 2014.

Pokorney PE, Chandran A, Long MW. Impact of the Community Eligibility Provision on meal counts and participation in Pennsylvania and Maryland National School Lunch Programs. *Public Health Nutrition* 2019;22(17):3281-7.

Ribar DC, Haldeman LA. Changes in meal participation, attendance, and test scores associated with the availability of Universal Free School Breakfasts. *Social Service Review* 2013;87(2):354-85.

Ruffini K. Universal access to free school meals and student achievement evidence from the Community Eligibility Provision. *Journal of Human Resources* 2022;57(3):776-820.

Schneider KR, Oslund J, Liu T. Impact of the Community Eligibility Provision program on school meal participation in Texas. *Public Health Nutrition* 2021;24(18):6534-42.

Schwartz AE, Rothbart MW. Let them eat lunch: the impact of universal free meals on student performance. *Journal of Policy Analysis and Management* 2020;39(2):376-410.

Tan ML, Laraia B, Madsen KA, et al. Community Eligibility Provision and school meal participation among student subgroups. *Journal of School Health* 2020;90(10):802-11.

Turner L, Guthrie JF, Ralston K. Community eligibility and other provisions for universal free meals at school: impact on student breakfast and lunch participation in California public schools. *Translational Behavioral Medicine* 2019;9(5):931-41.

Papers Providing Additional Information for Already Included Studies

Crepinsek MK, Singh A, Bernstein LS, et al. Dietary effects of universal-free school breakfast: findings from the evaluation of the school breakfast program pilot project. *Journal of the American Dietetic Association* 2006;106(11):1796-803.

McLaughlin JE, Bernstein LS, Crepinsek MK, et al. Evaluation of the School Breakfast Program Pilot Project: findings from the first year of implementation. Alexandria, VA: U.S. Department of Agriculture, Food and Nutrition Service, Office of Analysis, Nutrition, and Evaluation; 2002.

Appendix D

Summary Evidence Table (Effectiveness Review): Social Determinants of Health: Healthy School Meals for All

This table outlines information from the studies included in the Community Guide systematic review of Healthy School Meals for All. It details study quality, population and intervention characteristics, and study outcomes considered in this review. Complete references for each study can be found in the Included Studies section of the review summary.

Abbreviations Used in This Document:

- Study design:
 - RCT: randomized controlled trial
- Measurement and analysis terms:
 - CI: confidence interval
 - NR: not reported
 - NS: not significant
 - Pct pts: percentage points
 - SD: standard deviation
- Other terms
 - CDC: Centers for Disease Control and Prevention
 - CEP: Community Eligibility Provision
 - FPL: federal poverty level
 - FRPM: free and reduced-price meals
 - HSMA: Healthy School Meals for All
 - K: kindergarten
 - ISP: identified student percentage
 - LEA: lead education agency
 - NOS: Newcastle-Ottawa Scale
 - NSLP: National School Lunch Program
 - SBP: School Breakfast Program
 - SNAP: Supplemental Nutrition Assistance Program
 - SY: school year
 - TANF: Temporary Assistance for Needy Families
 - US: United States
 - USDA: United States Department of Agriculture

Outcomes Reported in This Review:

- Meal participation (breakfast and lunch)
- School attendance (days present in schools, days absent in school)
- Academic performance (math, reading, and science test scores)
- Dietary intake and meal patterns (breakfast skipping, breakfast dietary intake, full-day dietary intake)
- Food security (household food security status)

Notes:

- **Intervention:** The intervention offers free, nutritious meals (i.e., breakfast, lunch, or both) to all students in a qualifying school, regardless of household income.
- **Comparison:** All included studies compared HSMA to the traditional model of the USDA's NSLP and SBP which uses household income-based requirements to determine eligibility for FRPM.
- **Suitability of design:** Includes three categories: greatest, moderate, or least suitable design. [Read more](#)
- **Risk of bias assessment:** Performed using the NOS adapted by Cohen et al. 2021. Studies were assessed to have low risk of bias, high risk of bias, or very high risk of bias. Studies with high or very high risk of bias were excluded from the review.
- **Sample population:** Reported as number of schools evaluated, number of students in study schools, and/or number of student-year observations.
- **Rounding:** Final effect estimates greater than zero are rounded to the nearest tenth; estimates less than zero are rounded to the nearest hundredth.

Study	Intervention Characteristics	Population Characteristics	Results
Author, Year Andreyeva et al. 2021 Location US: 41 states Study design Pre-post with comparison group Suitability of design Greatest Risk of bias Low risk of bias (NOS=9 points) Outcomes reported Meal participation School attendance Academic performance Food security Evaluation duration 12-72 months	Setting School level: Elementary School grades: K to 5 School type: Public and private Dates for HSMA implementation 2010-2016 SYs Geographic scale Mix of urban, suburban, and rural; 34.4% suburban and 13.4% rural Provision for HSMA CEP Free meals offered during evaluation period Breakfast and lunch	Eligibility criteria for inclusion in evaluation Intervention: Schools that were part of the Early Childhood Longitudinal Study and enrolled in kindergarten during the 2010-2011 SY Comparison: Schools that were not participating in CEP for the school year being analyzed Total sample population Schools evaluated: 700 Students in study schools: 2,500 Student-year observations: 12,750 Demographics Age: NR Sex: 48.8% females; 51.2% males Race/Ethnicity: 24.5% White 23.4% Black; 38.2% Hispanic Households with lower incomes: 61.5% household income below 200% of FPL	Meal participation Outcome measure: Percentage of students participating in school lunch program Results: Relative change: +9.3%; p<.01 School attendance Outcome measure: Percentage of students attending school on an average day Results: Absolute difference: +0.24 pct pts; p<.01 Academic performance Outcome measure: Math, reading, and science test scores Results: No change in math, reading, or science test scores Food security Outcome measure: Percentage of students living in households that experienced food security, low food security, and very low food security Results: Relative change: - Food security: -1.3% (CI: -3.5, 0.9) - Low food security: +1.1% (CI: -0.8, 3.1) - Very low food security: +0.1% (CI: -1.3, 1.4)
Author, Year Bartfeld et al. 2019 Location US: Wisconsin Study design Pre-post with comparison group Suitability of design Greatest Risk of bias	Setting School level: Elementary School grades: 1-5 for school attendance; 3-5 for academic performance School type: Public Dates for HSMA implementation 2009-2014 SYs Geographic scale Mix of urban, suburban, and rural	Eligibility criteria for inclusion in evaluation Public schools in Wisconsin except for schools in the Milwaukee Public School District. Comparison: Schools that implemented the SBP but not HSMA from 2008-2009 SY through 2013-2014 SY. Total sample population <i>School attendance</i> Schools evaluated: 1,007 Students in study schools: 481,799 Student-year observations: 1,217,396 <i>Academic performance</i>	School attendance <i>Days present</i> Outcome measure: Average percentage of days students were present Results: Absolute difference: +.24 pct pts or +43% of a day; p<.05 <i>Days absent</i> Outcome measure: Percentage of students with low attendance (i.e., absent more than 5% of the school year or more than 10 days) Results: Absolute difference: -3.5 pct pts; p<.01 Academic performance

Study	Intervention Characteristics	Population Characteristics	Results						
Low risk of bias (NOS=9 points) Outcomes reported School attendance Academic performance Evaluation duration 12-60 months	Provision for HSMA Not specified Free meals offered during evaluation period Breakfast	Schools evaluated: 883 Students in study schools: 248,328 Student-year observations: 463,558 Demographics Age: NR Sex: 48.6% females; 41.2% males Race/Ethnicity: 78.5% White; 5.3% Black; 3.3% Asian; 1.7% Native American; 9.5% Hispanic Households with lower incomes: 31.7% received SNAP in last 3 years	Outcome measure: Math and reading test scores Results: Absolute difference - Math: +.03 SD; NS - Reading: +.01 SD; NS						
Author, Year Bartfeld et al. 2020 Location US: Wisconsin Study design Pre-post with comparison group Suitability of design Greatest Risk of bias Low risk of bias (NOS=9 points) Outcomes reported School attendance Evaluation duration 12-24 months	Setting School level: Elementary School grades: 1-5 School type: Public Dates for HSMA implementation 2014-2016 SYs Geographic scale Mix of urban, suburban, and rural Provision for HSMA CEP Free meals offered during evaluation period Breakfast and lunch	Eligibility criteria for inclusion in evaluation: Intervention: Schools that implemented CEP in 2014-2015 SY or 2015-2016 SY or both, with an ISP of at least 40%. Comparison: Schools that were eligible to implement CEP as of 2014-15 SY but did not. Schools that introduced CEP in the second implementation year were excluded as of that year and contributed only a single year of follow up data. Total sample population Schools evaluated: 145 Students in study schools: NR Student-year observations: 91,126 Demographics: Age: NR Sex: NR Race/Ethnicity: 47.3% Nonwhite persons Households with lower incomes: 68.9% household income below 185% FPL or participation in SNAP	School attendance <i>Days present</i> Outcome measure: Average percentage of days students were present Results: Absolute difference: +0.32 pct pts or +58% of a day; NS <i>Days absent</i> Outcome measure: Proportion of students with low attendance (i.e., absent more than 5% of the school year or more than 10 days) Results: Absolute difference: -3.5 pct pts; p<0.05						
Author, Year Bernstein et al. 2004 Location US: Boise, ID	Setting School level: Elementary School grades: 2-6 School type: Public	Eligibility criteria for inclusion in evaluation Intervention: Districts that were broadly representative of all districts participating in the SBP.	Meal participation Outcome measure: Percentage of students participating in school breakfast Results: <table><tr><td></td><td>Intervention</td><td>Control</td></tr><tr><td>Pre</td><td>18.9%</td><td>19.1%</td></tr></table>		Intervention	Control	Pre	18.9%	19.1%
	Intervention	Control							
Pre	18.9%	19.1%							

Study	Intervention Characteristics	Population Characteristics	Results																											
Columbiana, AL Gulfport, MS Phoenix, AZ Santa Rosa, CA Wichita, KS Study Design Group RCT Suitability of Design Greatest Risk of bias Low risk of bias (NOS = 9 points) Outcomes reported Meal participation School attendance Academic performance Dietary intake and meal patterns Evaluation duration 12-36 months	Dates for HSMA implementation 2000-2003 SYs Geographic scale Urban: 4 locations Boise, ID; Santa Rosa, CA; Phoenix, AR; Wichita, KS Mixed urban, suburban, rural: 2 locations Gulfport, MS; Columbiana; AL Provision for HSMA Not specified Free meals offered during evaluation period Breakfast	Comparison: Schools in the same district randomly assigned to offer the traditional SBP which provides free or reduced-price breakfasts to eligible students from households with lower incomes. Total sample population Schools evaluated: 153 Students in study schools: 79,458 Student-year observations: NR Demographics Mean age: 9.8 years Sex: 48.0% male; 52% female Race/Ethnicity: 64% White; 11% African American; 17% Hispanic Households with lower incomes: 18% <\$20,000/year; 49% eligible for FRPM	Post 36.3% 21.1% Absolute difference: +15.4 pct pts; p<0.01 Relative change: +74.3% School attendance Outcome measure: Average percentage of days students were present Results: <table><tr><td></td><td>Intervention</td><td>Control</td></tr><tr><td>Pre</td><td>93.9%</td><td>94.1%</td></tr><tr><td>Post</td><td>93.2%</td><td>92.9%</td></tr></table> Absolute difference: +0.50 pct pts; NS Relative change: +90% of a day; NS Academic performance Outcome measure: Math and reading achievement reported as normal curve equivalent scores at school level Results: <i>Math:</i> <table><tr><td></td><td>Intervention</td><td>Control</td></tr><tr><td>Pre</td><td>53.6</td><td>53.3</td></tr><tr><td>Post</td><td>52.4</td><td>51.6</td></tr></table> Absolute difference: +0.50 pct pts; NS <i>Reading:</i> <table><tr><td></td><td>Intervention</td><td>Control</td></tr><tr><td>Pre</td><td>55.1</td><td>55.1</td></tr><tr><td>Post</td><td>49.9</td><td>49.6</td></tr></table> Absolute difference: +0.30 pct pts; NS Relative change: NR Dietary intake and meal patterns Outcome measure: Proportion of students who skipped breakfast Results: No change Outcome measure: Proportion of students who consumed a nutritionally substantive breakfast Results: Intervention: 80% Comparison: 76%		Intervention	Control	Pre	93.9%	94.1%	Post	93.2%	92.9%		Intervention	Control	Pre	53.6	53.3	Post	52.4	51.6		Intervention	Control	Pre	55.1	55.1	Post	49.9	49.6
	Intervention	Control																												
Pre	93.9%	94.1%																												
Post	93.2%	92.9%																												
	Intervention	Control																												
Pre	53.6	53.3																												
Post	52.4	51.6																												
	Intervention	Control																												
Pre	55.1	55.1																												
Post	49.9	49.6																												

Study	Intervention Characteristics	Population Characteristics	Results
			Absolute difference: +4.0 pct pts; $p < .01$ Outcome measure: Student full-day dietary intake measured using a 24-hour dietary recall Results: Overall no change in students' full-day dietary intake
Author, Year Gordanier et al. 2020 Location US: South Carolina Study Design Pre-post with comparison group Suitability of Design Greatest Risk of bias Low risk of bias (NOS = 9 points) Outcomes reported Meal participation School attendance Academic performance Evaluation duration 12-24 months	Setting School level: Elementary and middle School grades: 3-8 School type: Public Dates for HSMA implementation 2014-2016 SYs Geographic scale Mix of urban, suburban and rural; 55.8% urban Provision for HSMA CEP Free meals offered during evaluation period Lunch	Eligibility criteria for inclusion in evaluation Intervention: Schools that implemented CEP in 2014-2015 SY and/or 2015-2016 SY and had an ISP of at least 40% or belonged to a district in which the ISP was at least 40%. Comparison: Schools that did not implement CEP during the 2014-2015 SY or 2015-2016 SY. Total sample population Schools: 780 Students in study schools: 332,761 Student-year observations: 670,392 Demographics Mean age: NR Sex: 48.8% female; 51.2% male Race/Ethnicity: 53.5% White; 35.4% African American; 8.4% Hispanic; 2.1% Asian; 0.6% American Indian/Alaska Native Households with lower incomes: 62.3% received TANF, SNAP, or free or reduced-price lunches	Meal participation Outcome measure: Average daily percentage of students participating in the school lunch program Results: Absolute difference: +4.9 pct pts; $p < 0.01$ Relative change: +7.7% School attendance Outcome measure: Average number of days student was absent Results: Absolute difference: Elementary school: -23.1% of a day; $p < 0.05$ Middle school: -42.1% of a day; NS Academic performance Outcome measure: Math and reading tests Results: Absolute difference Math/elementary school: +0.06 SD; $p < 0.01$ Math/middle school: +0.01 SD; NS Reading/elementary school: +0.02 SD; NS Reading/middle school: +0.01 SD; NS
Author, Year Leos-Urbel et al. 2013 Location US: New York City, NY Study design Single group pre-post	Setting School level: Elementary and middle School grades: 3-8 School type: Public Dates for HSMA implementation 2003-2004 SY	Eligibility criteria for inclusion in evaluation: Intervention: New York City made school breakfast free for all elementary and middle school students regardless of income, replacing traditional breakfast programs funded through SBP Comparison: Same schools before the policy change	Meal participation Outcome measure: Daily uptake as measured by number of meals/ (number of students x school days) Results: Students who previously paid full price for breakfast Absolute difference: Pre: 11 meals per student per year Post: +6 meals per student per year Relative change: +55%

Study	Intervention Characteristics	Population Characteristics	Results																		
Suitability of design Least Risk of bias Low risk of bias (NOS = 8 points) Outcomes reported Meal participation Evaluation duration 12 months	Geographic scale Urban Provision for HSMA NYC policy change Free meals offered during evaluation period Breakfast	Total sample population Schools evaluated: 668 Students in study schools: 552,400 Student-year observations: NR Demographics Mean age: NR Sex: NR Race/Ethnicity 17.8% White; 32.3% African American; 35.7% Hispanic; 14.0% Asian Household with lower incomes: 71.3% eligible for free meals; 9.4% eligible for reduced-price meals	Students who previously paid reduced price for breakfast Absolute difference: Pre: 16 meals per student per year Post: +5.5 meals per student per year Relative change: +33% Students who were previously eligible for free breakfast Absolute change: Pre: 37 meals per student per year Post: +6 meals per student per year Relative change: +15%																		
Author, Year Logan et al. 2014 Location US: Illinois Kentucky Michigan Ohio New York West Virginia Study design Pre-post with comparison group Suitability of design Greatest Risk of bias Low risk of bias (NOS = 7 points) Outcomes reported Meal participation Evaluation duration	Setting School level: Elementary, middle, high School grades: K-12 School type: Public Dates for HSMA implementation 2011-2012 SY 2012-2013 SY Geographic scale Mix of urban, suburban and rural; 32.1% urban Provision for HSMA CEP Free meals offered during evaluation period Breakfast and lunch	Eligibility criteria for inclusion in evaluation Intervention: At least one school in the LEA was participating in CEP in 2011-2012 SY or 2012-2013 SY Comparison: LEAs that did not adopt CEP but were similar to LEAs who did. Total sample population Schools: 7,257 Students in study schools: NR Student-year observations: NR Demographics Mean age: NR; 50.6% elementary; 23.2% middle; 23.4% high school students Sex: NR Race/Ethnicity: 31.9% African American; 7.4% Hispanic Households with lower incomes: 73.2% eligible for FRPM	Meal participation Outcome measure: Average daily participation Results: Breakfast <table><tr><td></td><td>Intervention</td><td>Control</td></tr><tr><td>Pre</td><td>46.2%</td><td>38.3%</td></tr><tr><td>Post</td><td>52.3%</td><td>40.7%</td></tr></table> Absolute difference: +3.6 pct pts; p<0.01 Relative change: +9.4% Lunch <table><tr><td></td><td>Intervention</td><td>Control</td></tr><tr><td>Pre</td><td>72.4%</td><td>68.5%</td></tr><tr><td>Post</td><td>76.3%</td><td>68.9%</td></tr></table> Absolute difference: +3.5 pct pts; p<0.01 Relative difference: +5.2%		Intervention	Control	Pre	46.2%	38.3%	Post	52.3%	40.7%		Intervention	Control	Pre	72.4%	68.5%	Post	76.3%	68.9%
	Intervention	Control																			
Pre	46.2%	38.3%																			
Post	52.3%	40.7%																			
	Intervention	Control																			
Pre	72.4%	68.5%																			
Post	76.3%	68.9%																			

Study	Intervention Characteristics	Population Characteristics	Results
12-24 months			
Author, Year Pokorney et al. 2019 Location US: Pennsylvania Study design Pre-post with comparison group Suitability of design Greatest Risk of bias Low (NOS = 8 points) Outcomes reported Meal participation Evaluation duration 12 months	Setting School level: Elementary, middle, high School grades: K-12 School type: Public Dates for HSMA Implementation 2014-2015 SY Geographic scale Urban Provision for HSMA CEP Free meals offered during evaluation period Lunch	Eligibility criteria for inclusion in evaluation Intervention: Public schools in Pennsylvania who implemented CEP in 2014-15 SY and made meal count data publicly available in SY2013-14 and SY2014-15 Comparison: Public schools in Pennsylvania who did not implement CEP in 2014-2015 SY and made meal count data publicly available in SY2013-14 and SY2014-15 Total sample population Schools evaluated: 1,762 Students in study schools: NR Student-year observations: NR Demographics Mean age: NR Sex: NR Race/Ethnicity: NR Households with lower incomes: 63.3% eligible FRPM	Meal participation Outcome measure: Mean number of meals served per student per year Results: Absolute difference: +3.6 pct pts Relative change: 8.0%
Author, Year Ribar et al. 2013 Location US: Guilford County, NC Study design Pre-post with comparison group Suitability of design Greatest Risk of bias Low risk of bias (NOS = 8 points)	Setting School level: Elementary School grades: 1-5 School type: Public Dates for HSMA Implementation 2008-2009 SY Geographic Scale Urban Provision for HSMA NR Free meals offered during evaluation period	Eligibility criteria for inclusion in evaluation Intervention: Schools that changed breakfast program from SBP to free breakfast for all students Comparison: Schools without changes to the SBP, matched to intervention schools. Total sample population Schools evaluated: 6 Students in study schools: 987 Student-year observations: NR Demographics Mean age: NR Sex: 48.2% female; 51.8% male	Meal participation Outcome measure: Average number of breakfasts served per year per student Results: Absolute difference: +16.4 pct pts; p<0.05. School Attendance Outcome measure: Average percentage of days students were present Results: Absolute difference: -0.3 pct pts; p>0.05. Academic performance Outcome measure: Proportion of students proficient on math, reading, and science tests Results: Absolute difference:

Study	Intervention Characteristics	Population Characteristics	Results
Outcomes reported Meal participation School attendance Academic performance Evaluation duration 12 months	Breakfast	Race/Ethnicity 55.7% African American; 20.2% Hispanic Households with lower incomes: 76.5% eligible free meals; 8.5% eligible reduced-price meals	- Math proficiency: +1.4 pct pts; NS - Math standardized score: +0.045 SD; NS - Reading proficiency: +0.6 pct pts; NS - Reading standardized score: +0.029 SD; NS - Science proficiency: +6.8 pct pts; p<0.05 - Science standardized score: +0.740 SD; NS
Author, Year Ruffini 2021 Location US: Georgia Illinois Kentucky New York Maryland West Virginia Study design Pre-post with comparison group Suitability of design Greatest Risk of bias Low risk of bias (NOS = 9 points) Outcomes reported Meal participation Academic performance Evaluation duration 24-48 months	Setting School level: Elementary and middle School grades: 3-8 School type: Public Dates for HSMA Implementation 2012-2017 SY Geographic scale Mix of urban, suburban and rural; 15.5% urban Provision for HSMA CEP Free meals offered during evaluation period Breakfast and lunch	Eligibility criteria for inclusion in evaluation Intervention: Districts that had at least one school implementing CEP between 2012-2017 SY Comparison: Districts that did not have at least one school implementing CEP between 2012-2017 SY Total sample population: Schools evaluated: NR Students in study schools: NR Student-Year observations: 18,800-20,000 Demographics: Mean age: NR Sex: NR Race/Ethnicity: 22.5% African American; 16.7% Hispanic Households with lower incomes: 58.6% eligible FRPM	Meal participation Outcome measure: Number of breakfasts or lunches served per student per year Results: Breakfast: Absolute difference: +19.9 breakfasts; p<0.01 Relative change: 37.8% Lunch: Absolute difference: +13.2 lunches; p<0.01 Relative change: 11.8%; p<.01 Academic achievement Outcome measure: Math and reading test scores Results Absolute difference Math: +0.00 SD; NS Reading: +0.01 SD; NS
Author, Year Schneider et al. 2021	Setting School level: Elementary, middle, and high	Eligibility criteria for inclusion in evaluation	Meal participation Outcome measure: Monthly uptake; number of meals served divided by total enrollment

Study	Intervention Characteristics	Population Characteristics	Results																		
Location US: Texas Study design Pre-post with comparison group Suitability of design Greatest Risk of bias Low risk of bias (NOS = 9 points) Outcomes reported Meal participation Evaluation duration 12-60 months	School grades: K-12 School type: Public Dates for HSMA implementation 2014-2015 SY 2018-2019 SY Geographic scale Mix of urban, suburban and rural Provision for HSMA CEP Free meals offered during evaluation period Breakfast and lunch	Intervention: CEP is available to an individual school, group of schools, or entire district, with an ISP of at least 40% Comparison: Schools without CEP who opted into CEP during the study period Total sample population Schools evaluated: 2,797 Students in study schools: NR Student-Year observations: 16,103 Demographics Mean age: NR Sex: NR Race/Ethnicity: 15.4% White; 13.2% African American; 64.4% Hispanic; 1.4% Asian; 0.10% Native Hawaiian/Pacific Islander; 1.2% multi-racial Households with lower incomes: 79.6% eligible FRPM	Results: Breakfast: <table><tr><td></td><td>Intervention</td><td>Control</td></tr><tr><td>Pre</td><td>53.7%</td><td>47.6%</td></tr><tr><td>Post</td><td>57.5%</td><td>46.0%</td></tr></table> Absolute difference: +4.6 pct pts; p<0.001 Relative change: +11.0% Lunch: <table><tr><td></td><td>Intervention</td><td>Control</td></tr><tr><td>Pre</td><td>74.2%</td><td>47.6%</td></tr><tr><td>Post</td><td>72.2%</td><td>68.6%</td></tr></table> Absolute difference: +4.3 pct pts; p<0.001 Relative change: +7.0%		Intervention	Control	Pre	53.7%	47.6%	Post	57.5%	46.0%		Intervention	Control	Pre	74.2%	47.6%	Post	72.2%	68.6%
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Author, Year Schwartz et al. 2020 Location US: New York City, NY Study design Pre-post with comparison group Suitability of design Greatest Risk of bias Low risk of bias (NOS = 8 points) Outcomes reported Meal participation School attendance	Setting School level: Middle School grades: 6-8 School type: Public Dates for HSMA implementation 2010-2011 SY 2012-2013 SY Geographic Scale Urban Provision for HSMA Provision 2 Free meals offered during evaluation period Lunch (added to free breakfast, which was already being offered)	Eligibility criteria for inclusion in evaluation Intervention: HSMA expanded in NYC in 2010-2011 SY, and extended to all freestanding middle schools in September 2014; analysis done with schools that ever-implemented HSMA under Provision 2 during 2010-2013 SY Comparison: Schools in NYC not having HSMA at any time during the study period Total sample population Schools: NR Students in study schools: 155,496 Student-Year observations: 318,637 Demographics Mean age: NR Sex: 50.5% female; 49.5% male Race/Ethnicity: 12.1% White; 25.8% African American; 42.6% Hispanic; 19.5% Asian	Meal Participation Outcome measure: Number of lunch transactions divided by the number of school days in the year Results: Absolute difference: Poor students: +5.4 pct pts; p<0.01 Non-poor students: +11.0 pct pts; p<0.05 School attendance Outcome measure: Attendance rate Results: Absolute difference: -0.04SD; NS Academic performance Outcome measure: Math and reading test scores Results: Absolute difference: Math: +0.04 SD; p<0.01 Reading: +0.03 SD; p<0.01																		

Study	Intervention Characteristics	Population Characteristics	Results									
Academic performance Evaluation duration 12-36 months		Households with lower incomes: 92.4% eligible FRPM										
Author, Year Tan et al. 2020 Location US: Nationwide Study design Retrospective cohort Suitability of design Moderate Risk of bias Low risk of bias (NOS = 7 points) Outcomes reported Meal participation Evaluation duration 12-36 months	Setting School level: Elementary, middle School grades: K – 8; 35.1% early elementary (K-2); 30.6% late elementary (3-5); 34.3% middle (6-8) School type Public Dates for HSMA implementation 2011-2015 SY Geographic Scale Mix of urban, suburban and rural; 43.7% urban, 32.1% suburban, 24.2% rural Provision for HSMA CEP Free meals offered during evaluation period: Breakfast and lunch	Eligibility criteria for inclusion in evaluation Intervention: Schools that adopted CEP during or prior to the year of data collection. Comparison: Similar schools without the option of CEP. Total sample population Schools evaluated: 198 Students in study schools: 2,305 Student-Year observations: NR Demographics Mean age: 9.5 Sex: 52.4% female; 47.6% male Race/Ethnicity: 18.2% White; 25.2% African American; 52.5% Hispanic; 4.2% Other Household with lower incomes: 57.1% receive WIC or SNAP	Meal participation Outcome measure: Percentage of students who ate school meal one or more days a week. Results: Breakfast: Absolute difference FRPM eligible: +4.9 pct pts Nearly FRPM eligible: +10.3 pct pts Full price: +34.7 pct pts Lunch: Absolute difference FRPM eligible: +1.2 pct pts Nearly FRPM eligible: +11.2 pct pts Full price: +23.4 pct pts									
Author, Year Turner et al. 2019 Location US: California Study design Pre-post with comparison group	Setting: School level: Elementary, middle, and high school School grades: K–12 School type: Public Dates for HSMA implementation 2013-2014 SY 2016-2017 SY	Eligibility criteria for inclusion in evaluation Intervention: Eligibility for each specific provision was in accordance with the provision's guidelines; Provision 1 available to schools with at least 80% students eligible for FRPM; CEP and Provisions 2 and 3 available to all schools Comparison: Schools without CEP who eventually opted into CEP during the study period	Meal participation Outcome measure: Monthly uptake; total meals served each month divided by total number of students and number of operating days Results: Breakfast: <table><tr><td></td><td>Intervention</td><td>Control</td></tr><tr><td>Pre</td><td>41.1%</td><td>38.8%</td></tr><tr><td>Post</td><td>44.6%</td><td>38.7%</td></tr></table>		Intervention	Control	Pre	41.1%	38.8%	Post	44.6%	38.7%
	Intervention	Control										
Pre	41.1%	38.8%										
Post	44.6%	38.7%										

Study	Intervention Characteristics	Population Characteristics	Results									
Suitability of design Greatest	Geographic scale Mix of urban, suburban and rural; 19.8% rural; 79.2% urban or suburban	Total sample population Schools: 9,930 Students in study schools: 963,410 Student-Year observations: NR	Absolute difference: +3.5 pct pts; p<0.001 Relative change: +8.5%									
Risk of bias Low risk (NOS = 9 points)	Provision for HSMA: Provisions 1,2,3, or CEP	Demographics Mean age: NR Sex: NR Race/Ethnicity: 28.9% of schools with ≥75% students identified as Hispanic; 69.5% of schools with <75% students identified as Hispanic Households with lower incomes: 41.3% of schools with >75% students eligible for FRPM	Lunch: <table><thead><tr><th></th><th>Intervention</th><th>Control</th></tr></thead><tbody><tr><td>Pre</td><td>68.6%</td><td>67.9%</td></tr><tr><td>Post</td><td>73.9%</td><td>67.4%</td></tr></tbody></table> Absolute difference: +5.8 pct pts; p<0.001 Relative change: +8.5%		Intervention	Control	Pre	68.6%	67.9%	Post	73.9%	67.4%
	Intervention	Control										
Pre	68.6%	67.9%										
Post	73.9%	67.4%										
Outcomes reported Meal participation	Free meals offered during evaluation period Breakfast and lunch											
Evaluation duration 12-24 months												