Supplemental Table S1. Summary of School Meal Provisions in the United States[1]

Program Type	Description and Eligibility	Administrative Procedures and Reimbursement
CEP	Schools provide free meals to all students regardless of income (universal free meals). Schools (or groups of schools) are eligible to participate if ≥ 40% of students are directly certified as eligible are eligible for free meals.	Students are directly certified (identified) for free school meals through a process that compares the students enrolled in the school with those currently participating in means-tested programs such as SNAP, Medicaid (in selected states), TANF cash assistance, the Food Distribution Program on Indian Reservations (FDPIR), or based on lists of other categorically eligible individuals maintained by school districts, such as foster care. No new eligibility determinations are needed for four consecutive years. No school meal fees are collected and federal reimbursement is based on the percentage of students meeting the direct certification criteria (i.e., "Identified Student Percentage" [ISP]). Reimbursement for meals served equals the ISP multiplied by 1.6).
ERP	Schools provide free meals to students who qualify for free and reduced-price meals but still collect full price meal fees from other students.	School districts process applications and determine eligibility for free and reduced-price meals each school year. Meal fees are collected only for full-price students (reduced-price copays are eliminated) and federal reimbursement is calculated based on the number of free, reduced-price, and full-price meals served. States and/or school district are responsible for the difference in cost for the reduced-price meals not covered by the federal reimbursement rates (which otherwise would have been paid for by the students eligible for reduced-price meals).
Provision 1	Schools can provide free meals to all students, but are not required to (optional universal free meals). Schools are eligible to participate if ≥ 80% of students are eligible for free or reduced-price meals.	School districts conduct free/reduced-priced meal certification from student households every two years (versus annually under the standard school meal program). Schools record numbers of meals served by eligibility type, which is used at the basis for federal reimbursement.
Provision 2	Schools provide free meals to all students regardless of income (universal free meals). There is no minimum percent-eligible requirement for a school to participate.	Schools or districts process applications and determine eligibility for free and reduced-price meals in the first year (base year) of a 4-year period. In the subsequent 3 years, there are no new eligibility determinations. No school meal fees are collected and federal reimbursement is calculated by applying the percentages of free, reduced-price, and full-price meals served during the corresponding month of the base year to the total meal count for the claiming month.
Provision 3	Schools provide free meals to all students regardless of income (universal free meals). There is no minimum percent-eligible requirement for a school to participate.	Schools or districts process applications and determine eligibility for free and reduced-price meals in the year (base year) *preceding* the beginning of the 4-year period. During those four years, there are no new eligibility determinations. No school meal fees are collected and federal reimbursement is calculated based on the number of free, reduced-price, and full price meals served during the base year. In the following years, school food authorities receive the same level of cash subsidies and commodity assistance as they did in the base year, with adjustments for changes in enrollment, number of operating days, and inflation.
Standard (means-tested)	Schools provide free, reduced-price, or full price meals to students based on household income (Free: household income < 130% of the federal poverty level. Reduced-Price: 130-185% of the federal poverty level; Full price: >185% of the federal poverty level).	School districts process household applications and determine student eligibility for free and reduced-price meals each school year (students can also be directly certified for free meals). Meal fees are collected for reduced-price and full-price meals and federal reimbursement is calculated based on the number of free, reduced-price, and full price meals served.

[1]Adapted from Brown et al. 2009 [1]
CEP= Community Eligibility Provision
ERP= Elimination of Reduced-Price Fees Program
SNAP=Supplemental Nutrition Assistance Program (formerly known as food stamps)
TANF= Temporary Assistance for Needy Families

Supplemental Table S2. Quality Assessment for Cross-Sectional Studies based on the Newcastle Ottawa Quality Assessment Form[2]

	Selection				Comparability	Outcome			
Author	Representative Sample[1] (+)	Sample Size Justified[2] (+)	Ascertainment of exposure/ risk factor[3] (++)	Non-respondents[4] (+)	Comparability of subjects in different outcome groups; Confounding factors controlled[5] (++)	Assessment of outcome[6] (++)	Statistical Test[7] (+)	Total Score (max 10)	Risk of Bias[8]
United States									
Adams et al. 2020 [3]	+	+	++	+	++	++	+	10	Low
Dykstra et al. 2016 [4]		+	++			+	+	5	High
Gross et al. 2019 [5]		+	++		++	+	+	6	High
Khan et al. 2011 [6]		+	++			+		4	High
Poblacion et al. 2017 [7]	+	+	++	+		+	+	7	Low
Soldavini et al. 2019 [8]	+	+	++	+	++	++	+	10	Low
Taylor et al. 2020 [9]	+		++					3	Very High
Other OECD Countries									
Asakura et al. 2017 [10]	+	+	++			+		5	High
Gatenby 2011 [11]			++			+		3	Very High
Yamaguchi et al. 2018 [12]	+	+	++		++	+	+	8	Low

OECD= Organization for Economic Co-Operation and Development

[1] **Representative sample**: Evidence the sample is representative of target population (+) *versus* convenience sample or no description.

[2] **Sample size justified**: Justification provided or satisfactory sample size (>100 participants) (+) *versus* no information provided or not satisfactory (<100 participants).

[3] **Ascertainment of exposure/risk factor**: Objective assessment (++), validated non-objective measure (+), *versus* non-objective and non-validated measure.

[4] **Non-respondents**: Proportion of target population recruited attained pre-specified target or basic summary of non-respondent characteristics in sampling frame provided (+) *versus* unsatisfactory recruitment rate or no summary data on non-respondents or no information provided.

[5] **Comparability of subjects in different outcome groups; Confounding factors controlled**: Comparability of subjects in different outcome groups on the basis of design/analyses or analyses adjusted for relevant predictors/risk factors/confounders (++) *versus* information not provided or analyses not adjusted for all relevant confounders/risk factors.

[6] **Assessment of outcome**: Objective assessment (++), validated non-objective measure (+), *versus* non-objective and non-validated measure.

[7] **Statistical test**: Statistical tests used to analyse the data clearly described and appropriate and measures of association presented include confidence intervals and/or probability level (p value) (+) versus statistical tests not appropriate, not described, or incomplete

[8] Total score for the Newcastle–Ottawa Scale (NOS) for assessing the quality of non-randomized studies is attributed to a following categories: very high risk of bias (0–3 NOS points and/or no statistical analyses conducted), high risk of bias (4–6 NOS points), and low risk of bias (7–10 NOS points)

Supplemental Table S3. Quality Assessment of Cohort and Quasi-experimental Studies based on the Newcastle Ottawa Quality Assessment Form [13]

	Selection				Comparability	Outcome				
Author	Representative exposed group[1] (+)	Representative non-exposed group[2] (+)	Ascertainment of exposure[3] (+)	Outcome of interest measured at baseline[4] (+)	Comparability of groups; Confounding factors controlled[5] (++)	Assessment of outcome[6] (+)	Adequate follow-up length; ≥1 SY[7] (+)	Adequate subjects retained to follow-up[8] (+)	Total Score (max 9)	Risk of Bias[9]
United States										
Bartfeld et al. 2019 [14]	+	+	+	+	++	+	+	+	9	Low
Bartfeld et al. 2020[15]	+	+	+	+	++	+	+	+	9	Low
Bernstein et al. 2004 [16]	+	+	+	+	++	+	+	+	9	Low
Brown 2009 [1]			+	+			+	N/A	3	Very High
Crepinsek et al. 2006 [17]	+	+	+		++	+	+		7	Low
Gordanier et al. 2020 [18]	+	+	+	+	++	+	+	+	9	Low
Kleinman et al. 2002 [19]			+	+		+		+	4	High
Leos-Urbel et al. 2013 [20]	+		+	+	++	+	+	+	8	Low
Logan et al. 2014 [21]		+	+	+	++		+	+	7	Low
McLaughlin et al. 2002 [22]	+	+	+	+ (only for participation, attendance, academic performance)	++	+	+ (only for participation, attendance, academic performance)	+ (only for participation, attendance, academic performance)	6/9[10]	High/ Low[10]

Pokorney et al. 2019 [23]	+	+	+	+	+	+	+	+	8	Low
Ribar et al. 2013 [24]		+	+	+	++	+	+	+	8	Low
Rivas 1994 [25]			+	+	No statistical analyses		+	+	4	Very High
Robinson 1994 [26]			+	+	No statistical analyses		+		3	Very High
Schwartz et al. 2020 [27]	+		+	+	++	+	+	+	8	Low
Tan et al. 2020 [28]	+	+	+		++	+	+	N/A	7	Low
Turner et al. 2019 [29]	+	+	+	+	++	+	+	+	9	Low
Wahlstrom et al. 1999 [30]		+	+	+	No statistical analyses	+	+	+	6	Very High
Other OECD Countries										
Andersen et al. 2014 [31]	+	+	+	+	++	+		+	8	Low
Ask et al. 2006 [32]			+	+				+	3	Very High
Ask et al. 2010 [33]			+	+				+	3	Very High
Bartelink et al. 2019[34]	+	+	+	+	++	+	+	+	9	Low
Dalma et al. 2020 [35]	+	+	+	+	++	+			7	Low
Holford 2015 [36]	+	+	+	+	+	+	+	+	8	Low
IlløKken et al. 2017 [37]			+	+		+		+	4	High
Jenkins et al. 2015 [38]	+	+	+	+		+	+		6	High

Laursen et al. 2015 [39]	+	+	+	+	++	+		+	8	Low
MacLardie et al. 2008 [40]	+		+	+	No statistical analyses	+		+	5	Very High
Mhurchu et al. 2012 [41]		+	+	+	++	+		+	7	Low
Moore et al. 2014 [42]	+	+	+	+		+	+		6	High
Munday et al. 2017 [43]			+	+				+	3	Very High
Murphy et al. 2011[44]	+	+	+	+	+	+	+		7	High
Petralia et al. 2016 [45]	+		+	+	+	+			5	High
Sabinsky et al. 2018 [46]	+	+	+	+	++	+		+	8	Low
Spence et al. 2020 [47]			+	+	+	+	+		5	High
Vik et al. 2019 (BMC Public Health) [48]		+	+	+	+	+	+	+	7	Low
Vik et al. 2019 (BMC Res Notes) [49]		+	+	+	+	+		+	7	Low

OECD= Organization for Economic Co-Operation and Development

[1] **Representative exposed group**: Evidence the sample in the exposed group is representative of target population (+) *versus* convenience sample or no description.

[2] **Representative non-exposed group**: Evidence the sample in the non-exposed group is drawn from the same community as the exposed group (+) *versus* drawn from a different source or no description.

[3] ***Ascertainment of exposure/risk factor**: Objective assessment (++), validated non-objective measure (+), *versus* non-objective and non-validated measure.

[4] ***Outcome of interest measured at baseline**: Baseline measurements collected (+) *versus* no baseline assessments.

[5] ***Comparability of groups; Confounding factors controlled**: Comparability of subjects in different outcome groups and analyses adjusted for relevant predictors/risk factors/confounders (++), adjusted for some but not all relevant confounders or statistical analyses did not account for clustered design (+), *versus* information not provided or analyses not adjusted for relevant confounders/risk factors.

[6] ***Assessment of outcome**: Objective assessment (++), validated non-objective measure (+), *versus* non-objective and non-validated measure.

[7] **Adequate follow-up length; ≥1 SY**: Participants are followed-up for at least one school year (+) *versus* follow-up is less than one school year

[8] **Adequate subjects retained to follow-up**: Loss to follow-up was ≤15% (+) *versus* >15% loss to follow-up among participants

[9] Total score for the Newcastle–Ottawa Scale (NOS) for assessing the quality of cohort studies is attributed to a following categories: very high risk of bias (0–3 NOS points and/or no statistical analyses conducted), high risk of bias (4–6 NOS points), and low risk of bias (7–9 NOS points)
[10]Total Score/Risk of Bias for McLaughlin et al was 6 (high) for diet, BMI, and finances, and 9 (low) for participation, attendance, and academic performance.
*Denotes minimally modified from the original NOS for assessing the quality of cohort studies

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