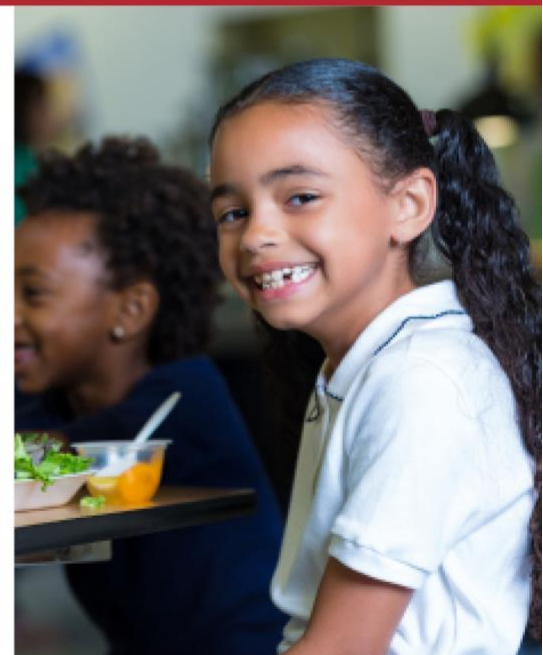


Indicators of Diet Quality, Nutrition, and Health for Americans by Program Participation Status, 2011–2016: NSLP Report



Appendix C. Indicators of Health and Nutrition Status



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Indicators of Diet Quality, Nutrition, and Health for Americans by Program Participation Status, 2011–2016:

Appendix C. Indicators of Health and Nutrition Status



June 2022

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Appendix C. Indicators of Health and Nutrition Status

Table C.1. Body Mass Index of NSLP Participants and Nonparticipants by Age and Gender

Subgroup	All School Children		All NSLP Participants		Income-Eligible NSLP Participants		Income-Eligible Nonparticipants		Higher Income NSLP Participants		Higher Income Nonparticipants	
	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
All Children 5–18 Years Old												
Both genders												
<i>Sample size</i>	2,715	–	920	–	660	–	1,035	–	237	–	685	–
Underweight	3.3	(0.34)	2.7	(0.51)	2.8	(0.67)	2.4	(0.48)	3.1	(0.99)	4.8	(0.80)
Normal weight	59.9	(0.95)	58.6	(1.74)	55.7	(2.16)	58.0	(1.54)	61.0	(3.18)	62.9	(1.86)
Overweight	17.1	(0.73)	15.4	(1.27)	15.0	(1.58)	18.5	(1.21)	17.7	(2.46)	17.4	(1.46)
Obese	19.8	(0.77)	23.3	(1.51)	26.5	(1.95)	21.2 *	(1.27)	18.2	(2.56)	14.9	(1.38)
Boys												
<i>Sample size</i>	1,351	–	475	–	331	–	511	–	129	–	334	–
Underweight	2.9	(0.46)	2.7	(0.69)	3.9	(0.98)	2.9	(0.76)	0.4	(0.55)	2.9 *	(0.93)
Normal weight	58.0	(1.36)	57.9	(2.33)	54.7	(2.93)	59.3	(2.18)	62.4	(4.26)	57.4	(2.73)
Overweight	17.7	(1.05)	15.0	(1.68)	14.4	(2.07)	16.6	(1.65)	17.8	(3.33)	20.8	(2.23)
Obese	21.4	(1.13)	24.4	(2.04)	27.1	(2.62)	21.2	(1.80)	19.4	(3.53)	19.0	(2.17)
Girls												
<i>Sample size</i>	1,364	–	445	–	329	–	524	–	108	–	351	–
Underweight	3.6	(0.49)	2.7	(0.76)	1.7	(0.92)	1.8	(0.56)	5.9	(1.94)	6.8	(1.33)
Normal weight	61.8	(1.33)	59.3	(2.61)	56.7	(3.17)	56.5	(2.17)	59.5	(4.75)	68.6	(2.50)
Overweight	16.5	(1.02)	15.9	(1.92)	15.7	(2.39)	20.5	(1.77)	17.6	(3.62)	14.0	(1.88)
Obese	18.0	(1.05)	22.1	(2.22)	25.9	(2.89)	21.2	(1.79)	16.9	(3.70)	10.6	(1.67)

Subgroup	All School Children		All NSLP Participants		Income-Eligible NSLP Participants		Income-Eligible Nonparticipants		Higher Income NSLP Participants		Higher Income Nonparticipants	
	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
5–8 Years Old												
Both genders												
<i>Sample size</i>	850	–	339	–	254	–	296	–	78	–	197	–
Underweight	4.4	(0.70)	4.4	(1.10)	3.0	(1.09)	0.7 *	(0.48)	8.7	(3.04)	8.7	(2.04)
Normal weight	59.4	(1.69)	59.7	(2.68)	60.4	(3.09)	58.5	(2.87)	56.8	(5.65)	60.4	(3.50)
Overweight	15.7	(1.25)	13.3	(1.86)	13.2	(2.15)	17.6	(2.22)	12.8	(3.76)	17.2	(2.68)
Obese	20.4	(1.38)	22.6	(2.28)	23.4	(2.68)	23.2	(2.47)	21.7	(4.71)	13.8	(2.42)
Boys												
<i>Sample size</i>	433	–	162	–	119	–	157	–	39	–	109	–
Underweight	2.5	(0.75)	2.2	(1.15)	3.7	(1.74)	0.6	(0.63)	0.0	(0.00)	4.7 *	(2.04)
Normal weight	58.8	(2.37)	59.1	(3.88)	56.6	(4.56)	61.6	(3.89)	61.6	(7.89)	56.1	(4.78)
Overweight	17.8	(1.84)	16.8	(2.95)	14.8	(3.27)	16.3	(2.96)	20.1	(6.50)	20.9	(3.91)
Obese	20.9	(1.96)	22.0	(3.26)	24.9	(3.98)	21.5	(3.29)	18.3	(6.27)	18.3	(3.72)
Girls												
<i>Sample size</i>	417	–	177	–	135	–	139	–	39	–	88	–
Underweight	6.4	(1.20)	6.8	(1.90)	2.3	(1.30)	0.7	(0.73)	17.9	(6.21)	12.8	(3.59)
Normal weight	60.1	(2.40)	60.3	(3.69)	64.3	(4.14)	55.2	(4.23)	51.7	(8.11)	64.8	(5.12)
Overweight	13.6	(1.68)	9.6	(2.22)	11.4	(2.75)	19.0	(3.34)	5.3	(3.63)	13.2	(3.63)
Obese	19.9	(1.96)	23.3	(3.19)	21.9	(3.57)	25.1	(3.69)	25.2	(7.04)	9.1 *	(3.08)
9–13 Years Old												
Both genders												
<i>Sample size</i>	1,067	–	386	–	283	–	380	–	94	–	274	–
Underweight	3.6	(0.57)	3.3	(0.90)	3.9	(1.14)	4.0	(1.01)	2.0	(1.47)	3.5	(1.02)
Normal weight	58.1	(1.51)	52.8	(2.54)	54.6	(2.95)	56.0	(2.56)	50.8	(5.22)	65.3 *	(2.92)
Overweight	18.4	(1.19)	19.4	(2.01)	15.7	(2.17)	15.8	(1.87)	28.7	(4.71)	20.0	(2.46)
Obese	19.9	(1.23)	24.5	(2.18)	25.9	(2.61)	24.3	(2.21)	18.5	(4.01)	11.1	(1.92)

Subgroup	All School Children		All NSLP Participants		Income-Eligible NSLP Participants		Income-Eligible Nonparticipants		Higher Income NSLP Participants		Higher Income Nonparticipants	
	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Boys												
<i>Sample size</i>	512	–	198	–	141	–	181	–	51	–	121	–
Underweight	3.2	(0.78)	5.7	(1.65)	7.6	(2.24)	4.2	(1.49)	1.2	(1.56)	0.0	(0.00)
Normal weight	56.6	(2.19)	48.9	(3.56)	48.8	(4.22)	55.8	(3.70)	52.3	(7.06)	64.5	(4.37)
Overweight	18.4	(1.71)	16.6	(2.65)	14.4	(2.97)	13.0	(2.50)	23.7	(6.01)	24.9	(3.95)
Obese	21.8	(1.83)	28.8	(3.23)	29.2	(3.84)	27.0	(3.31)	22.7	(5.93)	10.6	(2.81)
Girls												
<i>Sample size</i>	555	–	188	–	142	–	199	–	43	–	153	–
Underweight	4.0	(0.83)	0.8	(0.63)	0.0	(0.00)	3.7 **	(1.34)	2.7	(2.52)	7.2	(2.09)
Normal weight	59.7	(2.08)	56.8	(3.62)	60.7	(4.11)	56.1	(3.53)	49.1	(7.71)	66.2 *	(3.84)
Overweight	18.4	(1.65)	22.4	(3.05)	16.9	(3.16)	18.8	(2.78)	34.0	(7.31)	15.0 *	(2.90)
Obese	17.9	(1.63)	20.0	(2.93)	22.4	(3.51)	21.4	(2.91)	14.1	(5.36)	11.6	(2.60)
14–18 Years Old												
Both genders												
<i>Sample size</i>	798	–	195	–	123	–	359	–	65	–	214	–
Underweight	2.0	(0.50)	0.9	(0.71)	1.6	(1.21)	2.1	(0.77)	0.0	(0.00)	3.1 *	(1.20)
Normal weight	61.8	(1.72)	63.3	(3.51)	53.1	(4.55)	59.5	(2.60)	74.0	(5.60)	62.4	(3.25)
Overweight	17.0	(1.33)	13.3	(2.48)	15.8	(3.36)	21.7	(2.18)	10.8	(3.99)	15.2	(2.47)
Obese	19.1	(1.39)	22.6	(3.05)	29.4	(4.19)	16.7 **	(1.97)	15.2	(4.55)	19.4	(2.68)
Boys												
<i>Sample size</i>	406	–	115	–	71	–	173	–	39	–	104	–
Underweight	2.8	(0.82)	0.3	(0.49)	0.5	(0.86)	3.5	(1.40)	0.0	(0.00)	4.3 *	(2.00)
Normal weight	58.8	(2.45)	65.7	(4.45)	58.9	(5.88)	60.9	(3.72)	72.6	(7.23)	51.5 *	(4.92)
Overweight	17.0	(1.87)	12.1	(3.05)	14.0	(4.15)	20.2	(3.06)	10.4	(4.96)	16.7	(3.68)
Obese	21.3	(2.04)	21.9	(3.88)	26.6	(5.28)	15.4	(2.75)	17.0	(6.09)	27.4	(4.40)

Subgroup	All School Children		All NSLP Participants		Income-Eligible NSLP Participants		Income-Eligible Nonparticipants		Higher Income NSLP Participants		Higher Income Nonparticipants	
	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Girls												
Sample size	392	—	80	—	52	—	186	—	26	—	110	—
Underweight	1.2	(0.56)	1.5	(1.36)	2.8	(2.31)	0.6	(0.59)	0.0	(0.00)	1.8	(1.27)
Normal weight	65.0	(2.41)	60.9	(5.49)	47.1	(6.99)	57.9	(3.63)	75.4	(8.61)	73.8	(4.21)
Overweight	17.0	(1.90)	14.5	(3.96)	17.7	(5.35)	23.3	(3.11)	11.2	(6.31)	13.5	(3.27)
Obese	16.8	(1.89)	23.2	(4.75)	32.4	(6.55)	18.1 *	(2.83)	13.4	(6.80)	10.9	(2.98)

Notes: “All school children” includes children with missing NSLP participation or income. “All NSLP participants” includes children with missing income. Estimates are based on the day 1 dietary recall. Body mass index (BMI)-for-age categories are defined as: underweight if BMI-for-age is < the 5th percentile in the Centers for Disease Control and Prevention BMI-for-age growth chart; healthy weight if BMI-for-age is ≥ the 5th and < the 85th percentiles; overweight if BMI-for-age is ≥ the 85th and < the 95th percentiles; and obese if BMI-for-age is ≥ the 95th percentile. Estimates are weighted to account for differential probabilities of selection, nonresponse to survey instruments, and differences between the final sample and the U.S. civilian noninstitutionalized population to ensure different age distributions of NSLP participants and nonparticipants are accounted for. Significant differences in estimates are noted by * $p < .05$, ** $p < .01$, or *** $p < .001$. Differences were tested using two-sample t -tests comparing NSLP participants with nonparticipants within income and age groups. NSLP participants are identified as school children likely to have received a reimbursable school lunch on the intake day (see appendix A).

— Denotes not applicable

Source: National Health and Nutrition Examination Survey (NHANES) 2011–2016 body measures data. Sample includes NHANES children aged 5–18 years with complete day 1 dietary recall, weight, and height data; where day 1 recall was on a weekday, who attend a school that serves lunch, and who did not eat all lunch foods at home on the day of dietary recall.

Table C.2. Blood Pressure Status of NSLP Participants and Nonparticipants by Age and Gender

Subgroup	All School Children		All NSLP Participants		Income-Eligible NSLP Participants		Income-Eligible Nonparticipants		Higher Income NSLP Participants		Higher Income Nonparticipants	
	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
All Children 8–18 Years Old												
Both genders												
<i>Sample size</i>	2,061	–	659	–	468	–	806	–	174	–	533	–
Normal	88.2	(0.73)	88.9	(1.32)	87.3	(1.74)	86.0	(1.24)	92.1	(2.06)	89.3	(1.38)
Elevated	7.5	(0.60)	7.5	(1.15)	8.8	(1.55)	9.9	(1.07)	5.5	(1.76)	6.2	(1.08)
Hypertension stage 1	4.1	(0.44)	3.3	(0.68)	3.5	(0.79)	3.7	(0.67)	2.4	(1.17)	4.6	(0.91)
Hypertension stage 2	0.3	(0.12)	0.3	(0.21)	0.5	(0.31)	0.5	(0.26)	0.1	(0.20)	0.0	(0.00)
Hypertensive crisis	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)
Boys												
<i>Sample size</i>	1,024	–	348	–	239	–	399	–	98	–	249	–
Normal	86.3	(1.10)	87.3	(1.92)	87.0	(2.41)	82.5	(1.93)	88.6	(3.31)	89.2	(2.01)
Elevated	8.4	(0.90)	8.4	(1.62)	8.3	(2.05)	13.2	(1.73)	8.2	(2.87)	5.1	(1.44)
Hypertension stage 1	4.7	(0.68)	3.7	(1.08)	3.8	(1.26)	3.4	(0.91)	3.0	(1.86)	5.6	(1.50)
Hypertension stage 2	0.5	(0.24)	0.7	(0.41)	0.9	(0.61)	1.0	(0.51)	0.2	(0.39)	0.0	(0.00)
Hypertensive crisis	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)
Girls												
<i>Sample size</i>	1,037	–	311	–	229	–	407	–	76	–	284	–
Normal	90.1	(0.94)	90.6	(1.80)	87.6	(2.51)	89.6	(1.54)	95.8	(2.41)	89.3 *	(1.88)
Elevated	6.5	(0.79)	6.6	(1.63)	9.3	(2.35)	6.5	(1.25)	2.5	(1.98)	7.2	(1.62)
Hypertension stage 1	3.4	(0.53)	2.8	(0.81)	3.1	(0.94)	3.9	(0.99)	1.7	(1.40)	3.5	(1.00)
Hypertension stage 2	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)
Hypertensive crisis	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)

Subgroup	All School Children		All NSLP Participants		Income-Eligible NSLP Participants		Income-Eligible Nonparticipants		Higher Income NSLP Participants		Higher Income Nonparticipants	
	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
8 Years Old												
Both genders												
<i>Sample size</i>	216	–	81	–	65	–	75	–	15	–	54	–
Normal	91.3	(1.95)	90.4	(3.21)	86.3	(4.23)	85.3	(4.67)	100.0	(0.00)	95.3	(2.92)
Elevated	3.7	(1.32)	4.0	(2.14)	5.5	(2.77)	8.2	(3.74)	0.0	(0.00)	1.2	(1.49)
Hypertension stage 1	5.0	(1.51)	5.6	(2.54)	8.2	(3.42)	6.5	(3.25)	0.0	(0.00)	3.5	(2.53)
Hypertension stage 2	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)
Hypertensive crisis	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)
Boys												
<i>Sample size</i>	120	–	39	–	31	–	51	–	8	–	28	–
Normal	94.7	(2.05)	95.6	(3.32)	91.9	(4.99)	93.5	(3.49)	100.0	(0.00)	95.3	(4.06)
Elevated	1.2	(1.00)	1.0	(1.60)	1.8	(2.44)	2.3	(2.12)	0.0	(0.00)	0.0	(0.00)
Hypertension stage 1	4.1	(1.81)	3.4	(2.94)	6.3	(4.44)	4.2	(2.84)	0.0	(0.00)	4.7	(4.06)
Hypertension stage 2	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)
Hypertensive crisis	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)
Girls												
<i>Sample size</i>	96	–	42	–	34	–	24	–	7	–	26	–
Normal	87.7	(3.37)	85.0	(5.58)	80.6	(6.89)	76.7	(8.82)	100.0	(0.00)	95.4	(4.20)
Elevated	6.2	(2.48)	7.2	(4.04)	9.3	(5.06)	14.4	(7.31)	0.0	(0.00)	2.4	(3.04)
Hypertension stage 1	6.1	(2.45)	7.8	(4.19)	10.1	(5.25)	9.0	(5.95)	0.0	(0.00)	2.3	(2.98)
Hypertension stage 2	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)
Hypertensive crisis	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)

Subgroup	All School Children		All NSLP Participants		Income-Eligible NSLP Participants		Income-Eligible Nonparticipants		Higher Income NSLP Participants		Higher Income Nonparticipants	
	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
9–13 Years Old												
Both genders												
<i>Sample size</i>	1,052	–	382	–	279	–	374	–	94	–	269	–
Normal	89.5	(0.95)	90.1	(1.53)	89.0	(1.88)	86.1	(1.80)	93.8	(2.51)	91.2	(1.72)
Elevated	6.1	(0.75)	5.4	(1.16)	5.3	(1.35)	9.8 *	(1.56)	4.3	(2.07)	4.1	(1.24)
Hypertension stage 1	4.1	(0.61)	3.9	(0.99)	4.8	(1.28)	4.1	(1.02)	1.8	(1.40)	4.7	(1.25)
Hypertension stage 2	0.2	(0.16)	0.6	(0.41)	0.8	(0.56)	0.0	(0.00)	0.2	(0.45)	0.0	(0.00)
Hypertensive crisis	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)
Boys												
<i>Sample size</i>	501	–	194	–	137	–	177	–	51	–	118	–
Normal	89.5	(1.37)	89.3	(2.22)	88.9	(2.69)	84.3	(2.74)	92.7	(3.68)	92.9	(2.37)
Elevated	7.2	(1.15)	6.1	(1.72)	4.8	(1.83)	12.3 *	(2.48)	6.5	(3.49)	4.8	(1.97)
Hypertension stage 1	2.9	(0.75)	3.3	(1.29)	4.6	(1.79)	3.4	(1.36)	0.4	(0.88)	2.3	(1.39)
Hypertension stage 2	0.5	(0.31)	1.3	(0.81)	1.7	(1.10)	0.0	(0.00)	0.4	(0.88)	0.0	(0.00)
Hypertensive crisis	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)
Girls												
<i>Sample size</i>	551	–	188	–	142	–	197	–	43	–	151	–
Normal	89.5	(1.31)	90.9	(2.11)	89.1	(2.62)	88.0	(2.32)	94.9	(3.40)	89.5	(2.50)
Elevated	5.1	(0.94)	4.7	(1.55)	5.9	(1.98)	7.2	(1.85)	1.9	(2.13)	3.4	(1.47)
Hypertension stage 1	5.5	(0.97)	4.4	(1.51)	5.0	(1.84)	4.8	(1.53)	3.2	(2.71)	7.1	(2.10)
Hypertension stage 2	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)
Hypertensive crisis	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)
14–18 Years Old												
Both genders												
<i>Sample size</i>	793	–	196	–	124	–	357	–	65	–	210	–
Normal	86.3	(1.21)	87.5	(2.34)	85.8	(3.16)	86.0	(1.83)	89.0	(3.72)	86.2	(2.39)
Elevated	9.5	(1.04)	10.1	(2.16)	12.6	(3.03)	10.3	(1.61)	7.6	(3.21)	9.1	(1.97)
Hypertension stage 1	3.8	(0.67)	2.3	(1.00)	1.4	(0.98)	2.7	(0.87)	3.4	(2.13)	4.7	(1.47)
Hypertension stage 2	0.4	(0.22)	0.1	(0.23)	0.2	(0.39)	1.0	(0.56)	0.0	(0.00)	0.0	(0.00)
Hypertensive crisis	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)

Subgroup	All School Children		All NSLP Participants		Income-Eligible NSLP Participants		Income-Eligible Nonparticipants		Higher Income NSLP Participants		Higher Income Nonparticipants	
	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Boys												
<i>Sample size</i>	403	–	115	–	71	–	171	–	39	–	103	–
Normal	81.8	(1.92)	83.8	(3.45)	84.2	(4.36)	78.7	(3.14)	82.5	(6.16)	84.6	(3.58)
Elevated	10.9	(1.56)	11.9	(3.03)	12.8	(3.99)	16.0	(2.81)	11.4	(5.15)	6.4	(2.43)
Hypertension stage 1	6.5	(1.23)	4.1	(1.87)	2.6	(1.92)	3.3	(1.36)	6.1	(3.88)	9.0	(2.83)
Hypertension stage 2	0.7	(0.42)	0.2	(0.44)	0.4	(0.77)	2.0	(1.08)	0.0	(0.00)	0.0	(0.00)
Hypertensive crisis	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)
Girls												
<i>Sample size</i>	390	–	81	–	53	–	186	–	26	–	107	–
Normal	91.1	(1.44)	91.5	(3.12)	87.5	(4.59)	93.6	(1.80)	95.8	(4.01)	88.0	(3.16)
Elevated	8.0	(1.38)	8.3	(3.08)	12.5	(4.59)	4.2	(1.48)	3.6	(3.73)	11.8	(3.14)
Hypertension stage 1	0.9	(0.48)	0.3	(0.58)	0.0	(0.00)	2.1 *	(1.06)	0.6	(1.53)	0.2	(0.43)
Hypertension stage 2	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)
Hypertensive crisis	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)

Notes: “All school children” includes children with missing NSLP participation or income. “All NSLP participants” includes children with missing income. Estimates are based on the day 1 dietary recall. For 8- to 12-year-old children, blood pressure categories are defined according to the American Academy of Pediatrics guidelines: elevated blood pressure if blood pressure for age-sex-height is $\geq$ 90th percentile and $<$ 95th percentile or 120/80 to 95th percentile (whichever is lower); hypertension stage 1 if blood pressure for age-sex-height is $\geq$ 95th percentile to $<$ 95th percentile +12 millimeters of mercury (mmHg), or 130/89 mmHg (whichever is lower); and hypertension stage 2 if blood pressure for age-sex-height is $\geq$ 95th percentile +12 mmHg, or 140/90 mmHg (whichever is lower). For children 13+ years old and adults, blood pressure categories are defined according to the American Heart Association guidelines: normal if systolic is $<$ 120 mmHg and diastolic is $<$ 80 mmHg, elevated if systolic is 120–129 mmHg and diastolic is $<$ 80 mmHg; hypertension stage 1 if systolic is 130–139 mmHg and diastolic is 80–89 mmHg; hypertension stage 2 if systolic is 140+ mmHg and diastolic is 90+ mmHg; and hypertensive crisis if systolic is $>$ 180 mmHg and diastolic is $<$ 120 mmHg. Estimates are weighted to account for differential probabilities of selection, nonresponse to survey instruments, and differences between the final sample and the U.S. civilian noninstitutionalized population to ensure different age distributions of NSLP participants and nonparticipants are accounted for. Significant differences in estimates are noted by * $p < .05$, ** $p < .01$, or *** $p < .001$. Differences were tested using two-sample t -tests comparing NSLP participants with nonparticipants within income and age groups. NSLP participants are identified as school children likely to have received a reimbursable school lunch on the intake day (see appendix A).

– Denotes not applicable

Source: National Health and Nutrition Examination Survey (NHANES) 2011–2016 blood pressure data. Sample includes NHANES children aged 8–18 years with complete day 1 dietary recall and blood pressure data; where day 1 recall was on a weekday, who attend a school that serves lunch, and who did not eat all lunch foods at home on the day of dietary recall.

Table C.3. High-Density Lipoprotein Status of NSLP Participants and Nonparticipants by Age and Gender

Subgroup	All School Children		All NSLP Participants		Income-Eligible NSLP Participants		Income-Eligible Nonparticipants		Higher Income NSLP Participants		Higher Income Nonparticipants	
	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
All Children 6–18 Years Old												
Both genders												
<i>Sample size</i>	2,220	–	760	–	539	–	861	–	200	–	536	–
Normal	72.8	(0.94)	68.7	(1.79)	69.3	(2.22)	72.4	(1.51)	66.6	(3.29)	77.3 **	(1.75)
Borderline low	15.8	(0.78)	18.9	(1.51)	17.2	(1.74)	16.6	(1.27)	22.5	(3.01)	12.6 **	(1.42)
Lower than recommended	11.4	(0.69)	12.4	(1.31)	13.4	(1.70)	11.0	(1.06)	10.9	(2.14)	10.1	(1.31)
Boys												
<i>Sample size</i>	1,124	–	403	–	278	–	428	–	112	–	263	–
Normal	68.6	(1.39)	64.7	(2.51)	65.6	(3.10)	67.6	(2.22)	64.4	(4.59)	72.9	(2.59)
Borderline low	18.5	(1.18)	21.6	(2.17)	23.0	(2.80)	17.3	(1.82)	21.1	(3.90)	17.3	(2.31)
Lower than recommended	12.9	(1.02)	13.6	(1.85)	11.5	(2.07)	15.1	(1.73)	14.5	(3.39)	9.9	(1.83)
Girls												
<i>Sample size</i>	1,096	–	357	–	261	–	433	–	88	–	273	–
Normal	77.2	(1.28)	72.9	(2.56)	73.3	(3.17)	77.3	(2.02)	68.9	(4.73)	82.0 *	(2.36)
Borderline low	13.0	(1.01)	16.0	(2.08)	11.2	(2.02)	15.9	(1.77)	24.0	(4.61)	7.6 ***	(1.63)
Lower than recommended	9.8	(0.92)	11.0	(1.85)	15.5	(2.74)	6.7 **	(1.21)	7.1	(2.57)	10.3	(1.87)
6–8 Years Old												
Both genders												
<i>Sample size</i>	558	–	236	–	174	–	193	–	56	–	118	–
Normal	78.0	(1.75)	76.9	(2.73)	78.4	(3.13)	80.2	(2.85)	75.5	(5.63)	79.5	(3.65)
Borderline low	14.7	(1.50)	15.0	(2.31)	11.4	(2.42)	13.1	(2.42)	20.6	(5.36)	14.8	(3.17)
Lower than recommended	7.3	(1.10)	8.1	(1.79)	10.2	(2.31)	6.7	(1.81)	3.9	(2.56)	5.8	(2.17)
Boys												
<i>Sample size</i>	296	–	121	–	88	–	102	–	30	–	68	–
Normal	75.8	(2.49)	71.4	(4.12)	75.7	(4.60)	87.2 *	(3.32)	65.0	(8.86)	72.1	(5.48)
Borderline low	16.4	(2.15)	20.0	(3.65)	14.3	(3.75)	6.6	(2.47)	28.2	(8.36)	21.5	(5.02)
Lower than recommended	7.8	(1.56)	8.6	(2.55)	10.0	(3.22)	6.2	(2.40)	6.7	(4.65)	6.3	(2.98)

Subgroup	All School Children		All NSLP Participants		Income-Eligible NSLP Participants		Income-Eligible Nonparticipants		Higher Income NSLP Participants		Higher Income Nonparticipants	
	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Girls												
<i>Sample size</i>	262	–	115	–	86	–	91	–	26	–	50	–
Normal	80.2	(2.47)	82.5	(3.56)	81.2	(4.24)	72.9	(4.69)	86.4	(6.85)	87.1	(4.79)
Borderline low	13.1	(2.09)	9.8	(2.79)	8.5	(3.02)	20.0 *	(4.21)	12.6	(6.63)	7.7	(3.82)
Lower than recommended	6.7	(1.55)	7.7	(2.49)	10.3	(3.30)	7.2	(2.72)	1.0	(1.97)	5.2	(3.16)
9–13 Years Old												
<i>Sample size</i>	924	–	340	–	251	–	330	–	80	–	229	–
Normal	75.6	(1.42)	67.3	(2.55)	70.1	(2.90)	71.7	(2.46)	59.9	(5.38)	87.2 ***	(2.14)
Borderline low	14.6	(1.16)	21.0	(2.21)	18.6	(2.47)	16.3	(2.04)	28.0	(5.05)	7.3 ***	(1.73)
Lower than recommended	9.8	(0.98)	11.7	(1.75)	11.3	(2.01)	12.1	(1.77)	12.1	(3.71)	5.4	(1.40)
Boys												
<i>Sample size</i>	451	–	175	–	125	–	164	–	44	–	101	–
Normal	76.1	(2.01)	68.8	(3.51)	68.5	(4.17)	64.6	(3.75)	72.9	(6.78)	92.7 **	(2.59)
Borderline low	13.7	(1.62)	19.6	(3.01)	19.2	(3.54)	16.5	(2.90)	19.9	(6.09)	6.2 *	(2.41)
Lower than recommended	10.1	(1.42)	11.5	(2.42)	12.3	(2.95)	18.9	(3.07)	7.2	(3.93)	1.1	(1.03)
Girls												
<i>Sample size</i>	473	–	165	–	126	–	166	–	36	–	128	–
Normal	75.0	(1.99)	65.7	(3.71)	71.8	(4.02)	79.1	(3.17)	46.4	(8.43)	81.5 ***	(3.45)
Borderline low	15.4	(1.66)	22.5	(3.26)	17.9	(3.43)	16.1	(2.86)	36.4	(8.13)	8.5 **	(2.48)
Lower than recommended	9.6	(1.35)	11.9	(2.52)	10.3	(2.72)	4.8	(1.67)	17.2	(6.38)	10.0	(2.66)
14–18 Years Old												
Both genders												
<i>Sample size</i>	738	–	184	–	114	–	338	–	64	–	189	–
Normal	67.3	(1.69)	65.5	(3.47)	63.5	(4.52)	68.6	(2.50)	68.0	(5.69)	66.7	(3.33)
Borderline low	17.6	(1.38)	19.1	(2.86)	19.2	(3.43)	18.9	(2.14)	18.3	(4.99)	16.3	(2.64)
Lower than recommended	15.1	(1.32)	15.4	(2.66)	17.3	(3.61)	12.4	(1.81)	13.7	(3.80)	17.0	(2.75)

Subgroup	All School Children		All NSLP Participants		Income-Eligible NSLP Participants		Income-Eligible Nonparticipants		Higher Income NSLP Participants		Higher Income Nonparticipants	
	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Boys												
Sample size	377	–	107	–	65	–	162	–	38	–	94	–
Normal	57.5	(2.55)	57.1	(4.81)	57.1	(6.19)	59.5	(3.87)	56.0	(8.16)	54.3	(5.17)
Borderline low	24.2	(2.21)	24.5	(4.17)	31.4	(5.80)	24.1	(3.37)	18.2	(6.34)	25.4	(4.52)
Lower than recommended	18.3	(1.99)	18.5	(3.77)	11.5	(3.98)	16.4	(2.92)	25.8	(7.20)	20.2	(4.17)
Girls												
Sample size	361	–	77	–	49	–	176	–	26	–	95	–
Normal	77.7	(2.20)	74.4	(5.00)	70.3	(6.60)	78.2	(3.12)	80.6	(7.90)	79.7	(4.15)
Borderline low	10.5	(1.62)	13.4	(3.91)	6.3	(3.50)	13.5	(2.58)	18.5	(7.76)	6.7	(2.58)
Lower than recommended	11.8	(1.70)	12.2	(3.75)	23.4	(6.11)	8.3 *	(2.08)	0.9	(1.87)	13.6 **	(3.54)

Notes: “All school children” includes children with missing NSLP participation or income. “All NSLP participants” includes children with missing income. Estimates are based on the day 1 dietary recall. For children, high-density lipoprotein (HDL) levels are defined according to National Heart, Lung, and Blood Institute guidelines: normal if HDL is > 45 mg/dL, borderline low is 40-45 mg/dL, and lower than recommended if HDL is < 40 mg/dL. Estimates are weighted to account for differential probabilities of selection, nonresponse to survey instruments, and differences between the final sample and the U.S. civilian noninstitutionalized population to ensure different age distributions of NSLP participants and nonparticipants are accounted for. Significant differences in estimates are noted by * $p < .05$, ** $p < .01$, or *** $p < .001$. Differences were tested using two-sample t -tests comparing NSLP participants with nonparticipants within income and age groups. NSLP participants are identified as school children likely to have received a reimbursable school lunch on the intake day (see appendix A).

– Denotes not applicable

Source: National Health and Nutrition Examination Survey (NHANES) 2011–2016 blood biomarker data. Sample includes NHANES children aged 6–18 years with complete day 1 dietary recall and blood biomarker data; where day 1 recall was on a weekday, who attend a school that serves lunch, and who did not eat all lunch foods at home on the day of dietary recall.

Table C.4. Low-Density Lipoprotein Status of NSLP Participants and Nonparticipants by Age and Gender

Subgroup	All School Children		All NSLP Participants		Income-Eligible NSLP Participants		Income-Eligible Nonparticipants		Higher Income NSLP Participants		Higher Income Nonparticipants	
	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
All Children 12–18 Years Old												
Both genders												
<i>Sample size</i>	497	–	139	–	91	–	228	–	41	–	113	–
Normal	80.6	(1.78)	75.0	(3.81)	66.7	(5.10)	83.7 **	(2.37)	92.3	(4.16)	79.9 *	(3.85)
Borderline high	15.9	(1.66)	21.5	(3.60)	28.7	(4.95)	10.0 ***	(2.00)	7.7	(4.16)	19.8 *	(3.83)
Higher than recommended	3.5	(0.79)	3.6	(1.68)	4.6	(2.44)	6.3	(1.48)	0.0	(0.00)	0.3	(0.48)
Boys												
<i>Sample size</i>	242	–	78	–	52	–	108	–	22	–	51	–
Normal	79.9	(2.60)	80.0	(4.68)	76.1	(6.15)	82.4	(3.63)	87.6	(7.29)	74.8	(6.11)
Borderline high	18.0	(2.50)	18.2	(4.54)	22.8	(6.04)	13.5	(3.26)	12.4	(7.29)	25.2	(6.11)
Higher than recommended	2.1	(0.92)	1.8	(1.44)	1.1	(1.59)	4.1	(1.92)	0.0	(0.00)	0.0	(0.00)
Girls												
<i>Sample size</i>	255	–	61	–	39	–	120	–	19	–	62	–
Normal	81.3	(2.42)	69.6	(6.06)	56.8	(8.23)	85.1 **	(3.02)	97.2	(3.75)	85.2 *	(4.61)
Borderline high	13.7	(2.17)	24.9	(5.64)	34.9	(7.93)	6.3 ***	(2.24)	2.8	(3.75)	14.1	(4.53)
Higher than recommended	5.0	(1.29)	5.4	(3.09)	8.4	(4.72)	8.6	(2.26)	0.0	(0.00)	0.6	(0.99)
12–13 Years Old												
Both genders												
<i>Sample size</i>	158	–	51	–	34	–	66	–	13	–	38	–
Normal	78.5	(3.25)	74.9	(6.23)	69.3	(8.28)	67.8	(5.85)	95.0	(6.63)	95.0	(3.41)
Borderline high	13.7	(2.75)	23.0	(6.03)	30.7	(8.28)	15.8	(4.58)	5.0	(6.63)	4.5	(3.24)
Higher than recommended	7.8	(2.09)	2.1	(1.90)	0.0	(0.00)	16.4 ***	(4.27)	0.0	(0.00)	0.6	(1.18)
Boys												
<i>Sample size</i>	77	–	29	–	20	–	30	–	7	–	18	–
Normal	83.8	(4.23)	81.1	(7.40)	74.2	(10.03)	71.0	(8.43)	100.0	(0.00)	100.0	(0.00)
Borderline high	13.0	(3.86)	14.9	(6.72)	25.8	(10.03)	23.8	(7.91)	0.0	(0.00)	0.0	(0.00)
Higher than recommended	3.2	(2.01)	4.0	(3.71)	0.0	(0.00)	5.2	(4.13)	0.0	(0.00)	0.0	(0.00)

Subgroup	All School Children		All NSLP Participants		Income-Eligible NSLP Participants		Income-Eligible Nonparticipants		Higher Income NSLP Participants		Higher Income Nonparticipants	
	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Girls												
Sample size	81	—	22	—	14	—	36	—	6	—	20	—
Normal	73.0	(4.97)	68.4	(10.14)	64.0	(13.31)	64.4	(8.09)	89.7	(13.57)	89.7	(6.97)
Borderline high	14.4	(3.92)	31.6	(10.14)	36.0	(13.31)	7.4 *	(4.42)	10.3	(13.57)	9.2	(6.62)
Higher than recommended	12.7	(3.72)	0.0	(0.00)	0.0	(0.00)	28.2 ***	(7.61)	0.0	(0.00)	1.1	(2.42)
14–18 Years Old												
Both genders												
Sample size	339	—	88	—	57	—	162	—	28	—	75	—
Normal	81.4	(2.12)	75.0	(4.69)	65.7	(6.30)	89.8 ***	(2.41)	91.3	(5.16)	74.1 *	(5.16)
Borderline high	16.7	(2.04)	20.9	(4.41)	27.9	(6.06)	7.8 **	(2.13)	8.7	(5.16)	25.7 *	(5.14)
Higher than recommended	1.9	(0.74)	4.1	(2.20)	6.4	(3.37)	2.4	(1.23)	0.0	(0.00)	0.2	(0.49)
Boys												
Sample size	165	—	49	—	32	—	78	—	15	—	33	—
Normal	78.4	(3.21)	79.6	(5.82)	76.7	(7.59)	86.8	(3.86)	83.0	(10.05)	65.2	(8.42)
Borderline high	19.9	(3.12)	19.4	(5.71)	21.7	(7.41)	9.6	(3.36)	17.0	(10.05)	34.8	(8.42)
Higher than recommended	1.7	(1.01)	1.0	(1.41)	1.5	(2.19)	3.6	(2.13)	0.0	(0.00)	0.0	(0.00)
Girls												
Sample size	174	—	39	—	25	—	84	—	13	—	42	—
Normal	84.5	(2.75)	70.1	(7.43)	54.0	(10.17)	93.0 ***	(2.81)	100.0	(0.00)	83.5 **	(5.79)
Borderline high	13.4	(2.59)	22.4	(6.76)	34.5	(9.70)	5.9 **	(2.59)	0.0	(0.00)	16.0 **	(5.73)
Higher than recommended	2.1	(1.08)	7.5	(4.28)	11.6	(6.53)	1.1	(1.15)	0.0	(0.00)	0.4	(1.01)

Notes: “All school children” includes children with missing NSLP participation or income. “All NSLP participants” includes children with missing income. Estimates are based on the day 1 dietary recall. Low-density lipoprotein (LDL) levels are defined according to National Heart, Lung, and Blood Institute guidelines: normal if LDL is < 110 mg/dL, borderline high is 110-129 mg/dL, and higher than recommended if LDL is ≥ 130 mg/dL. Estimates are weighted to account for differential probabilities of selection, nonresponse to survey instruments, and differences between the final sample and the U.S. civilian noninstitutionalized population to ensure different age distributions of NSLP participants and nonparticipants are accounted for. Significant differences in estimates are noted by * $p < .05$, ** $p < .01$, or *** $p < .001$. Differences were tested using two-sample t -tests comparing NSLP participants with nonparticipants within income and age groups. NSLP participants are identified as school children likely to have received a reimbursable school lunch on the intake day (see appendix A).

— Denotes not applicable

Source: National Health and Nutrition Examination Survey (NHANES) 2011–2016 blood biomarker data. Sample includes NHANES children aged 12–18 years with complete day 1 dietary recall and blood biomarker data; where day 1 recall was on a weekday, who attend a school that serves lunch, and who did not eat all lunch foods at home on the day of dietary recall.

Table C.5. Triglyceride Status of NSLP Participants and Nonparticipants by Age and Gender

Subgroup	All School Children		All NSLP Participants		Income-Eligible NSLP Participants		Income-Eligible Nonparticipants		Higher Income NSLP Participants		Higher Income Nonparticipants	
	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
All Children 12–18 Years Old												
Both genders												
<i>Sample size</i>	497	–	139	–	91	–	228	–	41	–	113	–
Normal	78.3	(1.85)	74.0	(3.86)	68.9	(5.07)	76.8	(2.82)	82.0	(6.32)	84.9	(3.28)
Borderline high	16.3	(1.66)	18.1	(3.36)	20.2	(4.32)	16.9	(2.46)	15.7	(5.92)	14.1	(3.22)
High	5.4	(1.01)	7.9	(2.24)	10.9	(3.21)	6.4	(1.64)	2.3	(2.43)	0.9	(0.88)
Boys												
<i>Sample size</i>	242	–	78	–	52	–	108	–	22	–	51	–
Normal	79.2	(2.63)	74.8	(5.06)	68.7	(6.66)	78.5	(3.98)	82.8	(8.46)	84.7	(5.25)
Borderline high	15.0	(2.32)	16.7	(4.28)	17.7	(5.32)	12.8	(3.20)	17.2	(8.46)	14.9	(5.20)
High	5.8	(1.51)	8.5	(3.32)	13.7	(5.04)	8.6	(2.71)	0.0	(0.00)	0.4	(0.93)
Girls												
<i>Sample size</i>	255	–	61	–	39	–	120	–	19	–	62	–
Normal	77.3	(2.60)	73.2	(5.87)	69.3	(7.69)	74.9	(3.98)	81.2	(9.44)	85.1	(3.85)
Borderline high	17.7	(2.39)	19.6	(5.22)	22.8	(6.86)	21.1	(3.75)	14.2	(8.29)	13.3	(3.69)
High	5.1	(1.34)	7.2	(3.00)	8.0	(3.91)	4.0	(1.78)	4.7	(4.99)	1.5	(1.53)
12–13 Years Old												
Both genders												
<i>Sample size</i>	158	–	51	–	34	–	66	–	13	–	38	–
Normal	74.5	(3.44)	76.2	(6.07)	70.2	(8.01)	76.3	(5.24)	86.2	(10.29)	74.8	(6.49)
Borderline high	17.7	(3.02)	11.4	(4.02)	14.0	(5.23)	13.9	(4.00)	8.8	(7.87)	23.5	(6.43)
High	7.8	(2.13)	12.5	(4.78)	15.8	(6.61)	9.8	(3.79)	5.0	(6.63)	1.7	(2.04)
Boys												
<i>Sample size</i>	77	–	29	–	20	–	30	–	7	–	18	–
Normal	80.7	(4.52)	72.5	(8.44)	63.5	(11.05)	82.1	(7.11)	82.8	(15.39)	92.0	(6.57)
Borderline high	13.1	(3.87)	22.2	(7.86)	27.3	(10.23)	4.0 *	(3.64)	17.2	(15.39)	8.0	(6.57)
High	6.1	(2.75)	5.3	(4.23)	9.2	(6.63)	13.9	(6.42)	0.0	(0.00)	0.0	(0.00)

Subgroup	All School Children		All NSLP Participants		Income-Eligible NSLP Participants		Income-Eligible Nonparticipants		Higher Income NSLP Participants		Higher Income Nonparticipants	
	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Girls												
<i>Sample size</i>	81	–	22	–	14	–	36	–	6	–	20	–
Normal	67.9	(5.22)	80.0	(8.72)	77.3	(11.62)	70.2	(7.73)	89.7	(13.57)	56.8	(11.36)
Borderline high	22.6	(4.67)	0.0	(0.00)	0.0	(0.00)	24.2 ***	(7.24)	0.0	(0.00)	39.8 ***	(11.23)
High	9.6	(3.29)	20.0	(8.72)	22.7	(11.62)	5.6	(3.87)	10.3	(13.57)	3.4	(4.17)
14–18 Years Old												
Both genders												
<i>Sample size</i>	339	–	88	–	57	–	162	–	28	–	75	–
Normal	79.7	(2.19)	73.2	(4.80)	68.5	(6.30)	76.9	(3.34)	80.4	(7.80)	88.8	(3.80)
Borderline high	15.8	(1.99)	20.7	(4.38)	22.5	(5.62)	18.0	(3.03)	18.4	(7.61)	10.6	(3.71)
High	4.5	(1.14)	6.2	(2.51)	9.0	(3.65)	5.0	(1.75)	1.2	(2.21)	0.7	(0.94)
Boys												
<i>Sample size</i>	165	–	49	–	32	–	78	–	15	–	33	–
Normal	78.7	(3.20)	75.6	(6.20)	70.6	(8.18)	77.2	(4.78)	82.8	(10.10)	81.9	(6.80)
Borderline high	15.7	(2.84)	14.6	(5.10)	14.0	(6.24)	16.2	(4.20)	17.2	(10.10)	17.5	(6.72)
High	5.7	(1.80)	9.8	(4.29)	15.4	(6.47)	6.7	(2.84)	0.0	(0.00)	0.5	(1.28)
Girls												
<i>Sample size</i>	174	–	39	–	25	–	84	–	13	–	42	–
Normal	80.8	(2.99)	70.6	(7.39)	66.2	(9.66)	76.7	(4.64)	77.9	(11.98)	95.9	(3.08)
Borderline high	15.8	(2.77)	27.1	(7.21)	31.5	(9.48)	19.9	(4.39)	19.6	(11.45)	3.3	(2.77)
High	3.3	(1.37)	2.4	(2.48)	2.4	(3.10)	3.3	(1.97)	2.5	(4.55)	0.8	(1.39)

Notes: “All school children” includes children with missing NSLP participation or income. “All NSLP participants” includes children with missing income. Estimates are based on the day 1 dietary recall. For individuals 10–19 years old, triglyceride (TG) levels are defined according to National Heart, Lung, and Blood Institute guidelines: normal if TG is < 90 mg/dL, borderline high if TG is 90–129 mg/dL, and high if TG is ≥ 130 mg/dL. Estimates are weighted to account for differential probabilities of selection, nonresponse to survey instruments, and differences between the final sample and the U.S. civilian noninstitutionalized population to ensure different age distributions of NSLP participants and nonparticipants are accounted for. Significant differences in estimates are noted by * $p < .05$, ** $p < .01$, or *** $p < .001$. Differences were tested using two-sample t -tests comparing NSLP participants with nonparticipants within income and age groups. NSLP participants are identified as school children likely to have received a reimbursable school lunch on the intake day (see appendix A).

– Denotes not applicable

Source: National Health and Nutrition Examination Survey (NHANES) 2011–2016 blood biomarker data. Sample includes NHANES children aged 12–18 years with complete day 1 dietary recall and blood biomarker data; where day 1 recall was on a weekday, who attend a school that serves lunch, and who did not eat all lunch foods at home on the day of dietary recall.

Table C.6. Blood Glucose Status of NSLP Participants and Nonparticipants by Age and Gender

Subgroup	All School Children		All NSLP Participants		Income-Eligible NSLP Participants		Income-Eligible Nonparticipants		Higher Income NSLP Participants		Higher Income Nonparticipants	
	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
All Children 12–18 Years Old												
Both genders												
<i>Sample size</i>	514	–	145	–	96	–	236	–	42	–	116	–
Normal	80.1	(1.70)	77.1	(3.35)	85.4	(3.50)	81.9	(2.53)	61.7	(7.04)	81.8 *	(3.53)
Prediabetes	18.7	(1.69)	21.7	(3.34)	14.1	(3.44)	18.1	(2.53)	35.9	(7.21)	15.7 *	(3.47)
Diabetes	1.2	(0.45)	1.2	(0.77)	0.5	(0.73)	0.0	(0.00)	2.3	(1.98)	2.6	(1.32)
Boys												
<i>Sample size</i>	249	–	82	–	55	–	111	–	23	–	51	–
Normal	70.3	(2.84)	66.8	(5.11)	78.3	(5.59)	76.0	(4.09)	45.3	(10.35)	68.5	(6.47)
Prediabetes	27.3	(2.81)	30.9	(5.07)	20.8	(5.47)	24.0	(4.09)	50.1	(10.78)	26.5	(6.34)
Diabetes	2.3	(0.87)	2.3	(1.51)	0.9	(1.42)	0.0	(0.00)	4.6	(3.86)	5.0	(2.57)
Girls												
<i>Sample size</i>	265	–	63	–	41	–	125	–	19	–	65	–
Normal	90.4	(1.80)	87.9	(4.29)	92.9	(4.11)	88.0	(2.90)	78.9	(9.49)	95.7	(2.49)
Prediabetes	9.6	(1.80)	12.1	(4.29)	7.1	(4.11)	12.0	(2.90)	21.1	(9.49)	4.3	(2.49)
Diabetes	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)
12–13 Years Old												
Both genders												
<i>Sample size</i>	168	–	55	–	37	–	70	–	14	–	40	–
Normal	70.6	(3.37)	68.3	(5.32)	78.2	(6.48)	79.6	(4.96)	57.2	(7.13)	71.1	(6.87)
Prediabetes	25.4	(3.29)	28.5	(5.34)	21.8	(6.48)	20.4	(4.96)	34.3	(9.08)	19.6	(6.43)
Diabetes	4.0	(1.54)	3.2	(2.22)	0.0	(0.00)	0.0	(0.00)	8.5	(7.19)	9.3	(4.78)
Boys												
<i>Sample size</i>	81	–	32	–	22	–	31	–	8	–	18	–
Normal	55.5	(5.56)	45.1	(8.94)	66.1	(10.33)	76.6	(7.73)	16.3	(13.95)	51.5	(12.12)
Prediabetes	36.6	(5.39)	48.7	(8.98)	33.9	(10.33)	23.4	(7.73)	67.1	(17.75)	30.3	(11.15)
Diabetes	7.9	(3.02)	6.2	(4.34)	0.0	(0.00)	0.0	(0.00)	16.6	(14.06)	18.2	(9.36)

Subgroup	All School Children		All NSLP Participants		Income-Eligible NSLP Participants		Income-Eligible Nonparticipants		Higher Income NSLP Participants		Higher Income Nonparticipants	
	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Girls												
<i>Sample size</i>	87	–	23	–	15	–	39	–	6	–	22	–
Normal	86.4	(3.70)	92.6	(5.57)	90.9	(7.70)	82.9	(6.11)	100.0	(0.00)	91.5	(6.07)
Prediabetes	13.6	(3.70)	7.4	(5.57)	9.1	(7.70)	17.1	(6.11)	0.0	(0.00)	8.5	(6.07)
Diabetes	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)
14–18 Years Old												
Both genders												
<i>Sample size</i>	346	–	90	–	59	–	166	–	28	–	76	–
Normal	83.7	(1.97)	80.5	(4.16)	88.2	(4.15)	82.7	(2.94)	63.4	(9.33)	85.8 *	(4.12)
Prediabetes	16.2	(1.96)	19.1	(4.13)	11.2	(4.07)	17.3	(2.94)	36.6	(9.33)	14.2 *	(4.12)
Diabetes	0.1	(0.20)	0.4	(0.66)	0.6	(1.01)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)
Boys												
<i>Sample size</i>	168	–	50	–	33	–	80	–	15	–	33	–
Normal	76.0	(3.31)	75.1	(6.18)	83.0	(6.65)	75.8	(4.82)	56.3	(13.25)	75.0	(7.65)
Prediabetes	23.8	(3.30)	24.1	(6.11)	15.8	(6.45)	24.2	(4.82)	43.7	(13.25)	25.0	(7.65)
Diabetes	0.2	(0.38)	0.8	(1.28)	1.2	(1.96)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)
Girls												
<i>Sample size</i>	178	–	40	–	26	–	86	–	13	–	43	–
Normal	91.9	(2.05)	86.2	(5.53)	93.7	(4.85)	90.0	(3.25)	70.9	(13.11)	97.2 *	(2.54)
Prediabetes	8.1	(2.05)	13.8	(5.53)	6.3	(4.85)	10.0	(3.25)	29.1	(13.11)	2.8 *	(2.54)
Diabetes	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)	0.0	(0.00)

Notes: “All school children” includes children with missing NSLP participation or income. “All NSLP participants” includes children with missing income. Estimates are based on the day 1 dietary recall. Fasting plasma glucose levels are defined according to Centers for Disease Control and Prevention guidelines: normal if < 100 mg/dL, prediabetes if 100–125 mg/dL, and diabetes if > 125 mg/dL. Estimates are weighted to account for differential probabilities of selection, nonresponse to survey instruments, and differences between the final sample and the U.S. civilian noninstitutionalized population to ensure different age distributions of NSLP participants and nonparticipants are accounted for. Significant differences in estimates are noted by * $p < .05$, ** $p < .01$, or *** $p < .001$. Differences were tested using two-sample t -tests comparing NSLP participants with nonparticipants within income and age groups. NSLP participants are identified as school children likely to have received a reimbursable school lunch on the intake day (see appendix A).

– Denotes not applicable

Source: National Health and Nutrition Examination Survey (NHANES) 2011–2016 blood biomarker data. Sample includes NHANES children aged 12–18 years with complete day 1 dietary recall and blood biomarker data; where day 1 recall was on a weekday, who attend a school that serves lunch, and who did not eat all lunch foods at home on the day of dietary recall.

Table C.7. Hemoglobin Status of NSLP Participants and Nonparticipants by Age and Gender

Subgroup	All School Children		All NSLP Participants		Income-Eligible NSLP Participants		Income-Eligible Nonparticipants		Higher Income NSLP Participants		Higher Income Nonparticipants	
	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
All Children 5–18 Years Old												
Both genders												
<i>Sample size</i>	2,376	–	823	–	588	–	917	–	214	–	571	–
Normal	94.9	(0.45)	95.5	(0.82)	94.6	(1.06)	93.0	(0.82)	97.9	(1.11)	96.6	(0.75)
Low	5.1	(0.45)	4.5	(0.82)	5.4	(1.06)	7.0	(0.82)	2.1	(1.11)	3.4	(0.75)
Boys												
<i>Sample size</i>	1,197	–	433	–	299	–	452	–	121	–	282	–
Normal	97.3	(0.46)	98.1	(0.67)	97.8	(0.82)	95.9	(0.93)	98.8	(1.05)	98.0	(0.83)
Low	2.7	(0.46)	1.9	(0.67)	2.2	(0.82)	4.1	(0.93)	1.2	(1.05)	2.0	(0.83)
Girls												
<i>Sample size</i>	1,179	–	390	–	289	–	465	–	93	–	289	–
Normal	92.4	(0.80)	92.7	(1.52)	91.2	(2.00)	90.1	(1.37)	97.0	(1.98)	95.2	(1.28)
Low	7.6	(0.80)	7.3	(1.52)	8.8	(2.00)	9.9	(1.37)	3.0	(1.98)	4.8	(1.28)
5–8 Years Old												
Both genders												
<i>Sample size</i>	685	–	279	–	210	–	244	–	63	–	149	–
Normal	94.2	(0.89)	94.8	(1.33)	93.1	(1.75)	92.2	(1.72)	99.6	(0.85)	97.0	(1.35)
Low	5.8	(0.89)	5.2	(1.33)	6.9	(1.75)	7.8	(1.72)	0.4	(0.85)	3.0	(1.35)
Boys												
<i>Sample size</i>	355	–	140	–	103	–	126	–	34	–	84	–
Normal	94.2	(1.24)	96.2	(1.62)	94.4	(2.27)	92.9	(2.30)	99.5	(1.19)	95.0	(2.38)
Low	5.8	(1.24)	3.8	(1.62)	5.6	(2.27)	7.1	(2.30)	0.5	(1.19)	5.0	(2.38)
Girls												
<i>Sample size</i>	330	–	139	–	107	–	118	–	29	–	65	–
Normal	94.3	(1.28)	93.4	(2.12)	91.8	(2.66)	91.6	(2.57)	99.6	(1.23)	99.1	(1.19)
Low	5.7	(1.28)	6.6	(2.12)	8.2	(2.66)	8.4	(2.57)	0.4	(1.23)	0.9	(1.19)

Subgroup	All School Children		All NSLP Participants		Income-Eligible NSLP Participants		Income-Eligible Nonparticipants		Higher Income NSLP Participants		Higher Income Nonparticipants	
	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
9–13 Years Old												
Both genders												
<i>Sample size</i>	943	–	353	–	258	–	333	–	86	–	232	–
Normal	97.7	(0.49)	97.8	(0.78)	97.2	(1.01)	96.0	(1.08)	99.1	(1.06)	98.8	(0.70)
Low	2.3	(0.49)	2.2	(0.78)	2.8	(1.01)	4.0	(1.08)	0.9	(1.06)	1.2	(0.70)
Boys												
<i>Sample size</i>	460	–	182	–	128	–	163	–	48	–	104	–
Normal	98.3	(0.60)	99.2	(0.67)	99.1	(0.85)	95.8	(1.58)	99.4	(1.14)	99.3	(0.83)
Low	1.7	(0.60)	0.8	(0.67)	0.9	(0.85)	4.2	(1.58)	0.6	(1.14)	0.7	(0.83)
Girls												
<i>Sample size</i>	483	–	171	–	130	–	170	–	38	–	128	–
Normal	97.0	(0.78)	96.4	(1.43)	95.3	(1.86)	96.2	(1.47)	98.8	(1.80)	98.3	(1.13)
Low	3.0	(0.78)	3.6	(1.43)	4.7	(1.86)	3.8	(1.47)	1.2	(1.80)	1.7	(1.13)
14–18 Years Old												
Both genders												
<i>Sample size</i>	748	–	191	–	120	–	340	–	65	–	190	–
Normal	92.8	(0.92)	93.7	(1.84)	93.1	(2.38)	90.8	(1.48)	95.5	(2.74)	94.2	(1.64)
Low	7.2	(0.92)	6.3	(1.84)	6.9	(2.38)	9.2	(1.48)	4.5	(2.74)	5.8	(1.64)
Boys												
<i>Sample size</i>	382	–	111	–	68	–	163	–	39	–	94	–
Normal	98.5	(0.62)	98.4	(1.20)	99.0	(1.19)	98.1	(1.06)	97.6	(2.47)	98.9	(1.10)
Low	1.5	(0.62)	1.6	(1.20)	1.0	(1.19)	1.9	(1.06)	2.4	(2.47)	1.1	(1.10)

Subgroup	All School Children		All NSLP Participants		Income-Eligible NSLP Participants		Income-Eligible Nonparticipants		Higher Income NSLP Participants		Higher Income Nonparticipants	
	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Girls												
Sample size	366	–	80	–	52	–	177	–	26	–	96	–
Normal	86.7	(1.78)	88.8	(3.55)	86.9	(4.72)	83.1	(2.82)	93.3	(4.99)	89.3	(3.17)
Low	13.3	(1.78)	11.2	(3.55)	13.1	(4.72)	16.9	(2.82)	6.7	(4.99)	10.7	(3.17)

Notes: “All school children” includes children with missing NSLP participation or income. “All NSLP participants” includes children with missing income. Estimates are based on the day 1 dietary recall. For children 5–11 years old, hemoglobin levels are defined according to World Health Organization guidelines: normal if ≥ 115 grams per liter (g/L), and low if < 115 g/L. For children 12–14 years old, hemoglobin levels are defined as: normal if ≥ 120 g/L and low if < 120 g/L. For nonpregnant women 15 years old or older, hemoglobin levels are defined as: normal if ≥ 120 g/L and low if < 120 g/L. For men 15 years old or older, hemoglobin levels are defined as: normal if ≥ 130 g/L and low if < 130 g/L. Estimates are weighted to account for differential probabilities of selection, nonresponse to survey instruments, and differences between the final sample and the U.S. civilian noninstitutionalized population to ensure different age distributions of NSLP participants and nonparticipants are accounted for. Significant differences in estimates are noted by * $p < .05$, ** $p < .01$, or *** $p < .001$. Differences were tested using two-sample t -tests comparing NSLP participants with nonparticipants within income and age groups. NSLP participants are identified as school children likely to have received a reimbursable school lunch on the intake day (see appendix A).

– Denotes not applicable

Source: National Health and Nutrition Examination Survey (NHANES) 2011–2016 body measures data. Sample includes NHANES children aged 5–18 years with complete day 1 dietary recall data, where day 1 recall was on a weekday, who attend a school that serves lunch, and who did not eat all lunch foods at home on the day of dietary recall and blood biomarker data; where day 1 recall was on a weekday, who attend a school that serves lunch, and who did not eat all lunch foods at home on the day of dietary recall.

Table C.8. Vitamin D Status of NSLP Participants and Nonparticipants by Age and Gender

Subgroup	All School Children		All NSLP Participants		Income-Eligible NSLP Participants		Income-Eligible Nonparticipants		Higher Income NSLP Participants		Higher Income Nonparticipants	
	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
All Children 5–18 Years Old												
Both genders												
<i>Sample size</i>	1,565	–	612	–	446	–	564	–	150	–	354	–
Adequate	79.3	(1.03)	80.3	(1.71)	75.9	(2.24)	72.2	(1.84)	88.5	(2.66)	87.2	(1.73)
Inadequate	17.2	(0.96)	17.4	(1.62)	21.4	(2.12)	22.0	(1.72)	10.3	(2.54)	10.3	(1.60)
Associated with deficiency	3.5	(0.48)	2.3	(0.68)	2.7	(0.94)	5.8 *	(0.97)	1.2	(0.93)	2.5	(0.84)
Boys												
<i>Sample size</i>	794	–	325	–	230	–	273	–	85	–	178	–
Adequate	80.3	(1.42)	81.5	(2.27)	78.4	(2.95)	73.0	(2.65)	87.6	(3.60)	85.3	(2.59)
Inadequate	16.2	(1.33)	17.4	(2.22)	21.1	(2.92)	21.6	(2.48)	11.9	(3.54)	10.3	(2.28)
Associated with deficiency	3.5	(0.68)	1.1	(0.61)	0.5	(0.48)	5.4 ***	(1.39)	0.5	(0.84)	4.4 *	(1.57)
Girls												
<i>Sample size</i>	771	–	287	–	216	–	291	–	65	–	176	–
Adequate	78.3	(1.49)	79.1	(2.57)	73.3	(3.39)	71.4	(2.53)	89.6	(3.93)	89.2	(2.28)
Inadequate	18.2	(1.40)	17.4	(2.36)	21.8	(3.09)	22.5	(2.39)	8.6	(3.64)	10.2	(2.23)
Associated with deficiency	3.5	(0.68)	3.5	(1.24)	4.9 u	(1.85)	6.1	(1.37)	1.9	(1.68)	0.5	(0.53)
5–8 Years Old												
Both genders												
<i>Sample size</i>	458	–	214	–	166	–	153	–	43	–	85	–
Adequate	90.0	(1.41)	89.3	(2.11)	86.0	(2.69)	85.6	(2.83)	98.4	(2.03)	97.3	(1.80)
Inadequate	9.2	(1.36)	10.2	(2.06)	13.2	(2.61)	12.4	(2.67)	1.6	(2.03)	2.7	(1.80)
Associated with deficiency	0.7	(0.39)	0.5	(0.49)	0.8	(0.68)	2.0	(1.14)	0.0	(0.00)	0.0	(0.00)

Subgroup	All School Children		All NSLP Participants		Income-Eligible NSLP Participants		Income-Eligible Nonparticipants		Higher Income NSLP Participants		Higher Income Nonparticipants	
	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Boys												
<i>Sample size</i>	246	–	113	–	86	–	77	–	24	–	53	–
Adequate	90.4	(1.88)	94.1	(2.23)	91.2	(3.07)	80.0 *	(4.59)	99.3	(1.73)	96.8	(2.43)
Inadequate	8.3	(1.76)	5.1	(2.08)	7.5	(2.86)	16.2	(4.23)	0.7	(1.73)	3.2	(2.43)
Associated with deficiency	1.3	(0.72)	0.8	(0.85)	1.3	(1.22)	3.8	(2.18)	0.0	(0.00)	0.0	(0.00)
Girls												
<i>Sample size</i>	212	–	101	–	80	–	76	–	19	–	32	–
Adequate	89.6	(2.10)	84.3	(3.64)	80.5	(4.46)	91.3 *	(3.25)	97.4	(3.73)	97.7	(2.67)
Inadequate	10.3	(2.09)	15.5	(3.62)	19.2	(4.43)	8.5	(3.22)	2.6	(3.73)	2.3	(2.67)
Associated with deficiency	0.2	(0.27)	0.2	(0.46)	0.3	(0.59)	0.2	(0.50)	0.0	(0.00)	0.0	(0.00)
9–13 Years Old												
Both genders												
<i>Sample size</i>	626	–	259	–	190	–	202	–	62	–	149	–
Adequate	79.7	(1.60)	75.2	(2.68)	71.7	(3.26)	74.7	(3.04)	85.7	(4.52)	88.8	(2.58)
Inadequate	17.4	(1.51)	21.8	(2.57)	25.7	(3.18)	20.6	(2.83)	12.4	(4.25)	10.0	(2.44)
Associated with deficiency	2.8	(0.66)	3.0	(1.05)	2.6	(1.11)	4.7	(1.49)	1.9	(1.78)	1.1	(0.91)
Boys												
<i>Sample size</i>	303	–	129	–	91	–	101	–	33	–	64	–
Adequate	83.7	(2.13)	78.7	(3.62)	76.8	(4.45)	80.8	(3.94)	87.3	(5.89)	91.6	(3.50)
Inadequate	14.6	(2.03)	20.3	(3.56)	23.2	(4.45)	15.8	(3.65)	12.7	(5.89)	7.0	(3.21)
Associated with deficiency	1.7	(0.75)	1.0	(0.88)	0.0	(0.00)	3.4	(1.81)	0.0	(0.00)	1.5	(1.52)
Girls												
<i>Sample size</i>	323	–	130	–	99	–	101	–	29	–	85	–
Adequate	75.6	(2.39)	71.5	(3.97)	66.3	(4.78)	68.3	(4.65)	84.1	(6.90)	86.0	(3.79)
Inadequate	20.4	(2.25)	23.4	(3.73)	28.3	(4.55)	25.6	(4.37)	12.0	(6.14)	13.3	(3.70)
Associated with deficiency	4.0	(1.09)	5.1	(1.93)	5.4	(2.28)	6.1	(2.39)	3.9	(3.64)	0.8	(0.95)

Subgroup	All School Children		All NSLP Participants		Income-Eligible NSLP Participants		Income-Eligible Nonparticipants		Higher Income NSLP Participants		Higher Income Nonparticipants	
	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
14–18 Years Old												
Both genders												
<i>Sample size</i>	481	–	139	–	90	–	209	–	45	–	120	–
Adequate	70.9	(2.07)	78.5	(3.51)	72.5	(4.80)	59.9 *	(3.43)	83.8	(5.55)	78.1	(3.75)
Inadequate	22.9	(1.92)	18.6	(3.28)	23.5	(4.46)	30.6	(3.23)	14.8	(5.33)	16.1	(3.38)
Associated with deficiency	6.2	(1.10)	2.9	(1.51)	4.1	(2.24)	9.6	(2.05)	1.4	(1.85)	5.8	(2.11)
Boys												
<i>Sample size</i>	245	–	83	–	53	–	95	–	28	–	61	–
Adequate	69.5	(2.95)	74.9	(4.79)	70.4	(6.33)	60.3	(5.05)	79.0	(7.83)	70.7	(5.88)
Inadequate	23.7	(2.72)	23.8	(4.70)	29.2	(6.31)	31.2	(4.78)	19.5	(7.63)	18.8	(5.04)
Associated with deficiency	6.7	(1.61)	1.4	(1.28)	0.5	(0.93)	8.6 **	(2.89)	1.4	(2.28)	10.6 *	(3.97)
Girls												
<i>Sample size</i>	236	–	56	–	37	–	114	–	17	–	59	–
Adequate	72.4	(2.92)	82.3	(5.15)	74.7	(7.24)	59.5	(4.62)	88.8	(7.87)	85.9	(4.57)
Inadequate	22.0	(2.70)	13.2	(4.56)	17.4	(6.32)	29.9	(4.31)	9.8	(7.42)	13.4	(4.47)
Associated with deficiency	5.6	(1.50)	4.5	(2.79)	7.9	(4.49)	10.6	(2.90)	1.4	(2.94)	0.7	(1.12)

Notes: “All school children” includes children with missing NSLP participation or income. “All NSLP participants” includes children with missing income. Serum 25-hydroxyvitamin D levels are defined according to the Institute of Medicine: adequate if ≥ 50 and < 125 nanomoles per liter (nmol/L), inadequate if ≥ 30 to < 50 nmol/L, and associated with deficiency if < 30 nmol/L. Estimates are weighted to account for differential probabilities of selection, nonresponse to survey instruments, and differences between the final sample and the U.S. civilian noninstitutionalized population to ensure different age distributions of NSLP participants and nonparticipants are accounted for. Significant differences in estimates are noted by * $p < .05$, ** $p < .01$, or *** $p < .001$. Differences were tested using two-sample *t*-tests comparing NSLP participants with nonparticipants within income and age groups. NSLP participants are identified as school children likely to have received a reimbursable school lunch on the intake day (see appendix A).

– Denotes not applicable

Source: National Health and Nutrition Examination Survey (NHANES) 2011–2014 body measures data. Sample includes NHANES children aged 5–18 years with complete day 1 dietary recall data, where day 1 recall was on a weekday, who attend a school that serves lunch, and who did not eat all lunch foods at home on the day of dietary recall and blood biomarker data; where day 1 recall was on a weekday, who attend a school that serves lunch, and who did not eat all lunch foods at home on the day of dietary recall.

Table C.9. Iodine Status of NSLP Participants and Nonparticipants by Age and Gender

Subgroup	All School Children		All NSLP Participants		Income-Eligible NSLP Participants		Income-Eligible Nonparticipants		Higher Income NSLP Participants		Higher Income Nonparticipants	
	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
All Children 6–18 Years Old												
Both genders												
<i>Sample size</i>	820	–	282	–	193	–	324	–	70	–	198	–
Adequate	72.1	(1.63)	80.3	(2.52)	82.0	(3.16)	71.1 **	(2.57)	73.9	(4.96)	65.2	(3.62)
Inadequate	27.9	(1.63)	19.7	(2.52)	18.0	(3.16)	28.9 **	(2.57)	26.1	(4.96)	34.8	(3.62)
Boys												
<i>Sample size</i>	393	–	147	–	97	–	155	–	41	–	84	–
Adequate	74.3	(2.33)	77.9	(3.74)	82.0	(4.47)	78.3	(3.52)	67.8	(6.83)	66.2	(5.62)
Inadequate	25.7	(2.33)	22.1	(3.74)	18.0	(4.47)	21.7	(3.52)	32.2	(6.83)	33.8	(5.62)
Girls												
<i>Sample size</i>	427	–	135	–	96	–	169	–	29	–	114	–
Adequate	69.7	(2.27)	82.8	(3.36)	82.0	(4.46)	63.6 **	(3.76)	80.3	(7.22)	64.1	(4.51)
Inadequate	30.3	(2.27)	17.2	(3.36)	18.0	(4.46)	36.4 **	(3.76)	19.7	(7.22)	35.9	(4.51)
6–8 Years Old												
Both genders												
<i>Sample size</i>	225	–	87	–	62	–	92	–	11	–	49	–
Adequate	76.9	(2.81)	85.0	(3.85)	79.0	(5.28)	72.1	(4.51)	94.1	(9.11)	75.4	(6.49)
Inadequate	23.1	(2.81)	15.0	(3.85)	21.0	(5.28)	27.9	(4.51)	5.9	(9.11)	24.6	(6.49)
Boys												
<i>Sample size</i>	118	–	42	–	29	–	47	–	7	–	31	–
Adequate	82.0	(3.55)	87.9	(5.10)	73.8	(8.31)	85.5	(5.19)	99.1	(3.75)	75.0 **	(7.91)
Inadequate	18.0	(3.55)	12.1	(5.10)	26.2	(8.31)	14.5	(5.19)	0.9	(3.75)	25.0 **	(7.91)
Girls												
<i>Sample size</i>	107	–	45	–	33	–	45	–	4	–	18	–
Adequate	71.5	(4.39)	82.0	(5.79)	84.4	(6.41)	58.1 **	(7.44)	88.8	(18.18)	75.9	(10.38)
Inadequate	28.5	(4.39)	18.0	(5.79)	15.6	(6.41)	41.9 **	(7.44)	11.2	(18.18)	24.1	(10.38)

Subgroup	All School Children		All NSLP Participants		Income-Eligible NSLP Participants		Income-Eligible Nonparticipants		Higher Income NSLP Participants		Higher Income Nonparticipants	
	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
9–13 Years Old												
Both genders												
<i>Sample size</i>	353	–	129	–	93	–	133	–	33	–	82	–
Adequate	75.2	(2.29)	80.2	(3.53)	84.0	(3.80)	74.9	(3.76)	62.4	(8.72)	70.3	(5.30)
Inadequate	24.8	(2.29)	19.8	(3.53)	16.0	(3.80)	25.1	(3.76)	37.6	(8.72)	29.7	(5.30)
Boys												
<i>Sample size</i>	168	–	68	–	48	–	65	–	18	–	31	–
Adequate	79.2	(3.14)	83.7	(4.51)	89.6	(4.45)	79.6	(5.04)	62.8	(11.73)	70.7	(8.31)
Inadequate	20.8	(3.14)	16.3	(4.51)	10.4	(4.45)	20.4	(5.04)	37.2	(11.73)	29.3	(8.31)
Girls												
<i>Sample size</i>	185	–	61	–	45	–	68	–	15	–	51	–
Adequate	71.0	(3.35)	76.4	(5.48)	78.2	(6.23)	69.9	(5.60)	62.1	(12.97)	69.9	(6.48)
Inadequate	29.0	(3.35)	23.6	(5.48)	21.8	(6.23)	30.1	(5.60)	37.9	(12.97)	30.1	(6.48)
14–18 Years Old												
Both genders												
<i>Sample size</i>	242	–	66	–	38	–	99	–	26	–	67	–
Adequate	66.4	(3.08)	77.7	(4.93)	81.7	(6.42)	67.0	(4.75)	73.6	(7.78)	54.6	(6.65)
Inadequate	33.6	(3.08)	22.3	(4.93)	18.3	(6.42)	33.0	(4.75)	26.4	(7.78)	45.4	(6.65)
Boys												
<i>Sample size</i>	107	–	37	–	20	–	43	–	16	–	22	–
Adequate	65.4	(4.62)	66.7	(7.86)	79.3	(9.29)	73.1	(6.84)	55.1	(12.84)	57.2	(10.80)
Inadequate	34.6	(4.62)	33.3	(7.86)	20.7	(9.29)	26.9	(6.84)	44.9	(12.84)	42.8	(10.80)

Subgroup	All School Children		All NSLP Participants		Income-Eligible NSLP Participants		Income-Eligible Nonparticipants		Higher Income NSLP Participants		Higher Income Nonparticipants	
	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error	Percent	Standard Error
Girls												
<i>Sample size</i>	135	–	29	–	18	–	56	–	10	–	45	–
Adequate	67.4	(4.05)	89.4	(5.82)	84.3	(8.83)	60.6 *	(6.59)	93.0	(8.48)	51.9 ***	(7.53)
Inadequate	32.6	(4.05)	10.6	(5.82)	15.7	(8.83)	39.4 *	(6.59)	7.0	(8.48)	48.1 ***	(7.53)

Notes: “All school children” includes children with missing NSLP participation or income. “All NSLP participants” includes children with missing income. Estimates are based on the day 1 dietary recall. Urinary iodine concentrations are defined according to the World Health Organization: adequate if ≥ 100 micrograms per liter (mcg/L) and inadequate if < 100 mcg/L. Values are age adjusted to account for the different age distributions of NSLP participants and nonparticipants. Estimates are weighted to account for differential probabilities of selection, nonresponse to survey instruments, and differences between the final sample and the U.S. civilian noninstitutionalized population to ensure different age distributions of NSLP participants and nonparticipants are accounted for. Significant differences in estimates are noted by * $p < .05$, ** $p < .01$, or *** $p < .001$. Differences were tested using two-sample t-tests comparing NSLP participants with nonparticipants within income and age groups. NSLP participants are identified as school children likely to have received a reimbursable school lunch on the intake day (see appendix A).

– Denotes not applicable

Source: National Health and Nutrition Examination Survey (NHANES) 2011–2016 blood biomarker data. Sample includes NHANES children aged 6–18 years with complete day 1 dietary recall and blood biomarker data; where day 1 recall was on a weekday, who attend a school that serves lunch, and who did not eat all lunch foods at home on the day of dietary recall.