

APPENDIX A

BACKGROUND INFORMATION ON SCHOOL MEALS IN SY 2009- 2010

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Table A.1. Income- Eligibility Guidelines for Free and Reduced- Price Meals: July 2009 to June 2010

Household Size	Federal Poverty Guidelines	Reduced- Price Meals (185% of poverty)	Free Meals (130% of poverty)
	Annual Income (\$)	Annual Income (\$)	Annual Income (\$)
48 Contiguous States, District of Columbia, Guam and Territories			
1	10,830	20,036	14,079
2	14,570	26,955	18,941
3	18,310	33,874	23,803
4	22,050	40,793	28,665
5	25,790	47,712	33,527
6	29,530	54,631	38,389
7	33,270	61,550	43,251
8	37,010	68,469	48,113
For each additional family member, add	3,740	6,919	4,862
Alaska			
1	13,530	25,031	17,589
2	18,210	33,689	23,673
3	22,890	42,347	29,757
4	27,570	51,005	35,841
5	32,250	59,663	41,925
6	36,930	68,321	48,009
7	41,610	76,979	54,093
8	46,290	85,637	60,177
For each additional family member, add	4,680	8,658	6,084
Hawaii			
1	12,460	23,051	16,198
2	16,760	31,006	21,788
3	21,060	38,961	27,378
4	25,360	46,916	32,968
5	29,660	54,871	38,558
6	33,960	62,826	44,148
7	38,260	70,781	49,738
8	42,560	78,736	55,328
For each additional family member, add	4,300	7,955	5,590

Source: "Child Nutrition Programs—Income Eligibility Guidelines." *Federal Register*, vol. 74, no. 58, March 27, 2009, p. 13412.

Available at <http://www.fns.usda.gov/cnd/Governance/notices/iegs/IEGs09-10.pdf>. Accessed March 1, 2012.

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MENU PLANNING IN THE NATIONAL SCHOOL LUNCH PROGRAM

The National School Lunch Act mandates that school meals "safeguard the health and well-being of the Nation's children". Participating schools must serve lunches that are consistent with the applicable recommendations of the most recent Dietary Guidelines for Americans including: eat a variety of foods; choose a diet with plenty of grain products, vegetables and fruits; choose a diet moderate in sugars and salt; and choose a diet with 30% or less of calories from fat and less than 10% of calories from saturated fat. In addition, lunches must provide, on average over each school week, at least 1/3 of the daily Recommended Dietary Allowances for protein, iron, calcium, and vitamins A and C. To provide local food service professionals with flexibility, there are four menu planning approaches to plan healthful and appealing meals. Schools choose one of the approaches below. The choice of what specific foods are served and how they are prepared and presented are made by local schools.

The Traditional Food-Based Menu Planning Approach

Under the Traditional Food-Based Menu Planning Approach, schools must comply with specific component and quantity requirements by offering five food items from four food components. These components are: meat/meat alternate, vegetables and/or fruits, grains/breads, and milk. Minimum portion sizes are established by ages and grade groups.

(See chart on following page)

TRADITIONAL FOOD-BASED MENU PLANNING APPROACH—MEAL PATTERN FOR LUNCHES					
FOOD COMPONENTS AND FOOD ITEMS	MINIMUM QUANTITIES				RECOMMENDED QUANTITIES
	GROUP I AGES 1-2 PRESCHOOL	GROUP II AGES 3-4 PRESCHOOL	GROUP III, AGES 5-8 GRADES K-3	GROUP IV AGES 9 AND OLDER GRADES 4-12	GROUP V AGES 12 AND OLDER GRADES 7-12
Milk (as a beverage)	6 fluid ounces	6 fluid ounces	8 fluid ounces	8 fluid ounces	8 fluid ounces
Meat or Meat Alternate (quantity of the edible portion as served):					
Lean meat, poultry, or fish	1 ounce	1½ ounces	1½ ounces	2 ounces	3 ounces
Alternate Protein Products ¹	1 ounce	1½ ounces	1½ ounces	2 ounces	3 ounces
Cheese	1 ounce	1½ ounces	1½ ounces	2 ounces	3 ounces
Large egg	½	¾	¾	1	1½
Cooked dry beans or peas	¼ cup	3/8 cup	3/8 cup	½ cup	¾ cup
Peanut butter or other nut or seed butters	2 tablespoons	3 tablespoons	3 tablespoons	4 tablespoons	6 tablespoons
Yogurt, plain or flavored, unsweetened or sweetened	4 ounces or ½ cup	6 ounces or ¾ cup	6 ounces or ¾ cup	8 ounces or 1 cup	12 ounces or 1½ cups
The following may be used to meet no more than 50% of the requirement and must be used in combination with any of the above: Peanuts, soynuts, tree nuts, or seeds, as listed in program guidance, or an equivalent quantity of any combination of the above meat/meat alternate (1 ounce of nuts/seeds=1 ounce of cooked lean meat, poultry, or fish)	½ ounce =50%	¾ ounce =50%	¾ ounce =50%	1 ounce =50%	1½ ounces =50%
Vegetable or Fruit: 2 or more servings of vegetables, fruits or both	½ cup	½ cup	½ cup	¾ cup	¾ cup
Grains/Breads: (servings per week): Must be enriched or whole grain. A serving is a slice of bread or an equivalent serving of biscuits, rolls, etc., or ½ cup of cooked rice, macaroni, noodles, other pasta products or cereal grains	5 servings per week ² -- minimum of ½ serving per day	8 servings per week ² -- minimum of 1 serving per day	8 servings per week ² -- minimum of 1 serving per day	8 servings per week ² -- minimum of 1 serving per day	10 servings per week ² -- minimum of 1 serving per day

¹ Must meet the requirements in appendix A of 7 CFR 210.

² For the purposes of this table, a week equals five days.

The Traditional Food-Based Menu Planning Approach is designed to meet nutritional standards set forth in program regulations.

The Enhanced Food-Based Menu Planning Approach

The Enhanced Food-Based Menu Planning Approach is a variation of the Traditional Menu Planning Approach. It is designed to increase calories from low-fat food sources in order to meet the Dietary Guidelines. The five food components are retained, but the component quantities for the weekly servings of vegetables and fruits and grains/breads are increased.

ENHANCED FOOD-BASED MENU PLANNING APPROACH-MEAL PATTERN FOR LUNCHES					
FOOD COMPONENTS AND FOOD ITEMS	MINIMUM REQUIREMENTS				OPTION FOR
	AGES 1-2	PRESCHOOL	GRADES K-6	GRADES 7-12	GRADES K-3
Milk (as a beverage)	6 fluid ounces	6 fluid ounces	8 fluid ounces	8 fluid ounces	8 fluid ounces
Meat or Meat Alternate (quantity of the edible portion as served):					
Lean meat, poultry, or fish	1 ounce	1½ ounces	2 ounces	2 ounces	1½ ounces
Alternate protein products ¹	1 ounce	1½ ounces	2 ounces	2 ounces	1½ ounces
Cheese	1 ounce	1½ ounces	2 ounces	2 ounces	1½ ounces
Large egg	½	¾	1	1	¾
Cooked dry beans or peas	¼ cup	3/8 cup	½ cup	½ cup	3/8 cup
Peanut butter or other nut or seed butters	2 tablespoons	3 tablespoons	4 tablespoons	4 tablespoons	3 tablespoons
Yogurt, plain or flavored, unsweetened or sweetened	4 ounces or ½ cup	6 ounces or ¾ cup	8 ounces or 1 cup	8 ounces or 1 cup	6 ounces or ¾ cup
The following may be used to meet no more than 50% of the requirement and must be used in combination with any of the above: Peanuts, soynuts, tree nuts, or seeds, as listed in program guidance, or an equivalent quantity of any combination of the above meat/meat alternate (1 ounce of nuts/seeds equals 1 ounce of cooked lean meat, poultry or fish).	½ ounce =50%	¾ ounce =50%	1 ounce =50%	1 ounce =50%	¾ ounce =50%
Vegetable or Fruit: 2 or more servings of vegetables, fruits or both	½ cup	½ cup	¾ cup plus an extra ½ cup over a week ²	1 cup	¾ cup
Grains/Breads(servings per week): Must be enriched or whole grain. A serving is a slice of bread or an equivalent serving of biscuits, rolls, etc., or ½ cup of cooked rice, macaroni, noodles, other pasta products or cereal grains	5 servings per week ² – minimum of ½ serving per day	8 servings per week ² – minimum of 1 serving per day	12 servings per week ² – minimum of 1 serving per day ³	15 servings per week ² – minimum of 1 serving per day ³	10 servings per week ² – minimum of 1 serving per day ³

¹ Must meet the requirements in appendix A of 7 CFR 210.

² For the purposes of this table, a week equals five days.

³ Up to one grains/breads serving per day may be a dessert.

The Enhanced Food Based Menu Planning Approach is designed to meet the nutritional standards set forth in program regulations.

The Nutrient Standard Menu Planning Approach

Nutrient Standard Menu Planning (sometimes called “NuMenus”) is a computer based menu planning system that uses approved computer software to analyze the specific nutrient content of menu items automatically while menus are being planned. It is designed to assist menu planners in choosing food items that create nutritious meals and meet the nutrient standards.

The Assisted Nutrient Standard Menu Planning Approach

Assisted Nutrient Standard Menu Planning (sometimes called “Assisted NuMenus”) is a variation of Nutrient Standard Menu Planning. It is for schools that lack the technical resources to conduct nutrient analysis themselves. Instead, schools have an outside source, such as another school district, State agency or a consultant, plan and analyze a menu based on local needs and preferences. The outside source also provides schools with recipes and product specifications to support the menus. The menus and analyses are periodically updated to reflect any changes in the menu or student selection patterns.

Here are the required minimums for nutrients and calories for these nutrient standard menu planning approaches:

MINIMUM NUTRIENT AND CALORIE LEVELS FOR SCHOOL LUNCHES NUTRIENT STANDARD MENU PLANNING APPROACHES (SCHOOL WEEK AVERAGES)				
NUTRIENTS AND ENERGY ALLOWANCES	MINIMUM REQUIREMENTS			OPTIONAL
	Preschool	Grades K-6	Grades 7-12	Grades K-3
Energy allowances (calories)	517	664	825	633
Total fat (as a percentage of actual total food energy)	¹	^{1, 2}	²	^{1, 2}
Saturated fat (as a percentage of actual total food energy)	¹	^{1, 3}	³	^{1, 3}
RDA for protein (g)	7	10	16	9
RDA for calcium (mg)	267	286	400	267
RDA for iron (mg)	3.3	3.5	4.5	3.3
RDA for Vitamin A (RE)	150	224	300	200
RDA for Vitamin C (mg)	14	15	18	15

¹ The Dietary Guidelines recommend that after 2 years of age “...children should gradually adopt a diet that, by about 5 years of age, contains no more than 30 percent of calories from fat.”

² Not to exceed 30 percent over a school week

³ Less than 10 percent over a school week

Alternate Menu Planning Approach

This menu planning approach allows states and school districts to develop their own innovative approaches to menu planning, subject to the guidelines established in our regulations. These guidelines protect the nutritional and fiscal integrity of the program.

September 1, 2000



MENU PLANNING IN THE SCHOOL BREAKFAST PROGRAM

School meals are intended to "safeguard the health and well-being of the Nation's children." Participating schools must serve breakfasts that are consistent with the applicable recommendations of the most recent Dietary Guidelines for Americans including: eat a variety of foods; choose a diet with plenty of grain products, vegetables and fruits; choose a diet moderate in sugars and salt; and choose a diet with 30% or less of calories from fat and less than 10% of calories from saturated fat. In addition, breakfasts must provide, on average over each school week, at least 1/4th of the daily Recommended Dietary Allowances for protein, iron, calcium, and vitamins A and C. To provide local food service professionals with flexibility, there are five menu planning approaches to plan healthful and appealing meals. Schools choose one of the approaches below. The choice of what specific foods are served and how they are prepared and presented are made by local schools.

The Traditional Food-Based Menu Planning Approach

Under the Traditional Food-Based Menu Planning Approach, schools must comply with specific component and quantity requirements by offering four food items from the following food components: vegetables and/or fruits; milk; and two servings of meat/meat alternate, two servings of grains/breads OR one serving of each of these components. Minimum portion sizes are established by ages and grade groups.

(See chart on following page)

TRADITIONAL FOOD-BASED MENU PLANNING APPROACH-MEAL PATTERN FOR BREAKFASTS			
FOOD COMPONENTS AND FOOD ITEMS	AGES 1-2	AGES 3,4 AND 5	GRADES K-12
MILK (fluid) (as a beverage, on cereal or both)	4 fluid ounces	6 fluid ounces	8 fluid ounces
JUICE/FRUIT/VEGETABLE: Fruit and/or vegetable; or full-strength fruit juice or vegetable juice	¼ cup	½ cup	½ cup
SELECT ONE SERVING FROM EACH OF THE FOLLOWING COMPONENTS, TWO FROM ONE COMPONENT, OR AN EQUIVALENT COMBINATION:			
GRAINS/BREADS :			
Whole-grain or enriched bread	½ slice	½ slice	1 slice
Whole-grain or enriched biscuit, roll, muffin, etc.	½ serving	½ serving	1 serving
Whole-grain, enriched or fortified cereal	¼ cup or 1/3 ounce	1/3 cup or ½ ounce	¾ cup or 1 ounce
MEAT OR MEAT ALTERNATES:			
Meat/poultry or fish	½ ounce	½ ounce	1 ounce
Alternate protein products ¹	½ ounce	½ ounce	1 ounce
Cheese	½ ounce	½ ounce	1 ounce
Large egg	½	½	½
Peanut butter or other nut or seed butters	1 tablespoon	1 tablespoon	2 tablespoons
Cooked dry beans and peas	2 tablespoons	2 tablespoons	4 tablespoons
Nuts and/or seeds (as listed in program guidance) ²	½ ounce	½ ounce	1 ounce
Yogurt, plain or flavored, unsweetened or sweetened	2 ounces or ¼ cup	2 ounces or ¼ cup	4 ounces or ½ cup

¹ Must meet the requirements in appendix A of 7 CFR 210.

² No more than 1 ounce of nuts and/or seeds may be served in any one breakfast.

The Traditional Food-Based Menu Planning Approach is designed to meet nutritional standards set forth in program regulations.

The Enhanced Food-Based Menu Planning Approach

The Enhanced Food-Based Menu Planning Approach uses the same meal pattern and age groups as the Traditional Food-Based Menu Planning Approach. The only difference is the addition of an optional age/grade group was added for grades 7-12 to better meet the needs of children in that crucial growth period by adding low fat calories from additional servings of grains/breads.

ENHANCED FOOD-BASED MENU PLANNING APPROACH-MEAL PATTERN FOR BREAKFASTS				
FOOD COMPONENTS AND FOOD ITEMS	REQUIRED FOR			OPTION FOR
	AGES 1-2	PRESCHOOL	GRADES K-12	GRADES 7-12
Milk (fluid) (as a beverage, on cereal or both)	4 fluid ounces	6 fluid ounces	8 fluid ounces	8 fluid ounces
JUICE/FRUIT/VEGETABLE: Fruit and/or vegetable; or full-strength fruit juice or vegetable juice	¼ cup	½ cup	½ cup	½ cup
SELECT ONE SERVING FROM EACH OF THE FOLLOWING COMPONENTS, TWO FROM ONE COMPONENT OR AN EQUIVALENT COMBINATION:				
GRAINS/BREADS:				
Whole-grain or enriched bread	½ slice	½ slice	1 slice	1 slice
Whole-grain or enriched biscuit, roll, muffin, etc.	½ serving	½ serving	1 serving	1 serving
Whole-grain, enriched or fortified cereal	¼ cup or 1/3 ounce	1/3 cup or ½ ounce	¾ cup or 1 ounce	¾ cup or 1 ounce plus an additional serving of one of the Grains/Breads above.
MEAT OR MEAT ALTERNATES:				
Meat/poultry or fish	½ ounce	½ ounce	1 ounce	1 ounce
Alternate protein products ¹	½ ounce	½ ounce	1 ounce	1 ounce
Cheese	½ ounce	½ ounce	1 ounce	1 ounce
Large egg	½	½	½	½
Peanut butter or other nut or seed butters	1 tablespoon	1 tablespoon	2 tablespoons	2 tablespoons
Cooked dry beans and peas	2 tablespoons	2 tablespoons	4 tablespoons	4 tablespoons
Nuts and/or seeds (as listed in program guidance) ²	½ ounce	½ ounce	1 ounce	1 ounce
Yogurt, plain or flavored, unsweetened or sweetened	2 ounces or ¼ cup	2 ounces or ¼ cup	4 ounces or ½ cup	4 ounces or ½ cup

¹ Must meet the requirements in appendix A of 7 CFR 210.

² No more than 1 ounce of nuts and/or seeds may be served in any one breakfast.

The Enhanced Food Based Menu Planning Approach is designed to meet the nutritional standards set forth in program regulations.

The Nutrient Standard Menu Planning Approach

Nutrient Standard Menu Planning (sometimes called “NuMenus”) is a computer based menu planning system that uses approved computer software to analyze the specific nutrient content of menu items automatically while menus are being planned. It is designed to assist menu planners in choosing food items that create nutritious meals and meet the nutrient standards.

The Assisted Nutrient Standard Menu Planning

Assisted Nutrient Standard Menu Planning (sometimes called “Assisted NuMenus”) is a variation of Nutrient Standard Menu Planning. It is for schools that lack the technical resources to conduct nutrient analysis themselves. Instead, schools have an outside source, such as another school district, State agency or a consultant, plan and analyze a menu based on local needs and preferences. The outside source also provides schools with recipes and product specifications to support the menus. The menus and analyses are periodically updated to reflect any changes in the menu or student selection patterns.

Here are the required minimums for nutrients and calories for these nutrient standard menu planning approaches:

MINIMUM NUTRIENT AND CALORIE LEVELS FOR SCHOOL BREAKFASTS NUTRIENT STANDARD MENU PLANNING APPROACHES (SCHOOL WEEK AVERAGES)			
NUTRIENTS AND ENERGY ALLOWANCES	MINIMUM REQUIREMENTS		OPTIONAL
	PRESCHOOL	GRADES K-12	GRADES 7-12
Energy allowances (calories)	388	554	618
Total fat (as a percentage of actual total food energy)	¹	^{1,2}	²
Saturated fat (as a percentage of actual total food energy)	1	^{1,3}	³
RDA for protein (g)	5	10	12
RDA for calcium (mg)	200	257	300
RDA for iron (mg)	2.5	3	3.4
RDA for Vitamin A (RE)	113	197	225
RDA for Vitamin C (mg)	11	13	14

¹ The Dietary Guidelines recommend that after 2 years of age “...children should gradually adopt a diet that, by about 5 years of age, contains no more than 30 percent of calories from fat.”

² Not to exceed 30 percent over a school week

³ Less than 10 percent over a school week

Any Reasonable Menu Planning Approach

This menu planning approach allows states and school districts to develop their own innovative approaches to menu planning, subject to the guidelines established in our regulations. These guidelines protect the nutritional and fiscal integrity of the program.



The Facts

Let's Move! is a comprehensive initiative, launched by the First Lady, dedicated to solving the problem of childhood obesity in a generation so that kids born today will grow up healthier and able to pursue their dreams. This is an ambitious goal. But it can be done.

Combining comprehensive strategies with common sense, *Let's Move!* is about putting children on the path to a healthy future starting with their earliest months and years and continuing throughout their lives. Giving parents helpful information and fostering environments that support healthy choices. Providing healthier foods in our schools. Ensuring that every community has access to healthy, affordable food. And, helping kids become more physically active.

The Issue

Over the past three decades, childhood obesity rates in America have tripled. Today, almost one in every three children in our nation is overweight or obese. The numbers are even higher in African American and Hispanic communities where nearly 40% of the children are overweight or obese. Rates are estimated to be even higher in American Indian/Alaska Native communities. If we don't solve this problem, one third of all children born in 2000 or later will suffer from diabetes at some point in their lives. Many others will face chronic obesity-related health problems like heart disease, high blood pressure, cancer and asthma.



“In the end, as First Lady, this isn't just a policy issue for me. This is a passion. This is my mission. I am determined to work with folks across this country to change the way a generation of kids thinks about food and physical activity.”

—First Lady Michelle Obama

Mrs. Obama began a national conversation about the health of America's children when she broke ground on the White House Kitchen Garden with students from a local elementary school in Washington, DC. Through the garden, she began a discussion with kids about nutrition and the role food plays in living a healthy life. That discussion grew into the Let's Move! initiative, which was launched by the First Lady in February, 2010.



“All Americans, especially young people, should be leading active, healthy lifestyles. We want everyone — regardless of age, background or ability — to get moving, eat right and stay fit for life.”

—Drew Brees, Quarterback, New Orleans Saints, Co-Chair, President’s Council on Fitness, Sports & Nutrition

Find out more
www.letsmove.gov
Learn more about how your family can make healthier choices and get moving. Find tips on healthy eating. Discover fun activities you and your family can do together. Read the latest *Let’s Move!* news. Sign up for our newsletter, and see what else you can do to fight childhood obesity in your community, or schools.

Additional resources
www.fitness.gov
www.presidentschallenge.org



The Solution

Encourage kids to eat healthier and move more. When children combine physical activity with healthy eating in their daily routine, they help prevent a range of chronic diseases, including heart disease, cancer and stroke—the three leading causes of death. Along with decreasing obesity risk, physical activity helps to control weight, build lean muscle, reduce fat and promote strong bone, muscle and joint development. Physical activity has also been shown to improve academic performance including better grades, test scores, classroom behavior, attention, and concentration. And, of course, healthy eating gives kids the proper nutrition they need to stay energized, active, and maintain a healthy weight.

Let’s Get Moving

Get kids moving and make healthier choices for your children

- Children need 60 minutes of active and vigorous play each day
- Serve fruit or veggies with every meal
- Substitute water or low-fat milk for sweetened beverages
- Pick a vegetable they like and find different, tasty ways to prepare it
- Substitute healthier ingredients such as whole wheat pasta, and lean meats in their favorite recipes
- Eat meals as a family

Earn a Presidential Active Lifestyle Award (PALA)

- When you and your kids commit to an activity five days a week for six weeks—like walking to school together, riding bicycles or taking the stairs instead of the elevator—you can each get an award from President Obama! To join visit: **www.presidentschallenge.org**

Get everyone in your family screened for obesity

- Make sure every family member gets their Body Mass Index (BMI) checked when they go in for a check-up

Support a community garden

- Find a place to grow a garden with your kids—at school, church or in an empty lot—so they can learn to eat what they grow

Help build a community playground

- Work with your community and other organizations to build a playground so that kids have a place to get 60 minutes of physical activity a day

APPENDIX B

SUPPLEMENTAL TABLES FOR CHAPTERS 1, 2 AND 3

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TABLES

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Table B.1. Characteristics of Public National School Lunch Program Schools

Characteristic	Percentage of Schools		
	Elementary Schools	Middle Schools	High Schools
School Size			
Small (fewer than 500 students)	61.6	36.4	39.0
Medium (500 to 999 students)	38.0	45.9	23.7
Large (1,000 or more students)	0.4	17.7	37.3
Urbanicity			
Urban	29.1	28.0	22.5
Suburban	46.4	47.8	44.8
Rural	24.5	24.3	32.7
District Child Poverty Rate			
Low (less than 30 percent)	67.7	66.6	64.2
Higher (30 percent or more)	32.3	33.4	35.8
FNS Region			
Northeast	11.9	8.1	12.6
Mid-Atlantic	9.0	8.4	10.5
Southeast	14.0	20.2	14.5
Midwest	18.3	23.9	20.4
Southwest	15.9	14.0	14.2
Mountain Plains	11.9	10.6	14.9
Western	19.0	14.8	13.0
Number of Schools	318	287	279

Source: School Nutrition Dietary Assessment–IV, Menu Survey, school year 2009–2010. Tabulations prepared by Mathematica Policy Research are weighted to be representative of all public schools offering the National School Lunch Program.

FNS = Food and Nutrition Service.

Table B.2. Grade Spans in National School Lunch Program Schools

School Type/Grade Span	Number of Sample Schools (Unweighted)	Number of Schools (Weighted)	Percentage of Schools (Weighted)
Elementary Schools	318	51,475	100.0
Pre-K – 1	1	133	0.3
Pre-K – 2	5	745	1.5
Pre-K – 3	3	617	1.2
Pre-K – 4	6	822	1.6
Pre-K – 5	42	8,056	15.7
Pre-K – 6	18	2,630	5.1
Pre-K – 7	1	44	0.1
Pre-K – 8	8	1,424	2.8
Pre-K – 11	1	494	1.0
Pre-K – 12	3	1,037	2.0
K – 1	1	195	0.4
K – 2	6	804	1.6
K – 3	8	1,547	3.0
K – 4	19	2,903	5.6
K – 5	100	15,436	30.0
K – 6	36	5,858	11.4
K – 7	3	307	0.6
K – 8	20	3,074	6.9
K – 12	6	1,373	2.7
1 – 2	2	202	0.4
1 – 3	1	155	0.3
1 – 4	2	398	0.8
1 – 5	3	273	0.5
1 – 6	1	240	0.5
1 – 8	1	48	0.1
2 – 3	3	428	0.8
2 – 4	1	239	0.5
3 – 5	6	653	1.3
3 – 6	1	95	0.2
3 – 8	1	19	<0.1
4 – 5	3	266	0.5
4 – 6	4	700	1.4
5 – 6	1	63	0.1
5 – 7	1	195	0.4
Middle Schools	287	14,830	100.0
4 – 8	6	323	2.2
5 – 8	24	1,765	11.9
5 – 12	1	15	0.1
6 only	1	49	0.3
6 – 8	194	9,996	67.4
7 – 8	48	2,190	14.8
7 – 9	9	328	2.2
8 only	3	75	0.5
8 – 9	1	87	0.6
High Schools	279	17,084	100.0
6 – 12	14	834	4.9
7 – 12	14	1,652	9.7
8 – 12	1	130	0.8
9 – 12	237	13,934	81.6
10 – 12	13	534	3.1
Number of Schools	884	83,389	100.0

Source: School Nutrition Dietary Assessment-IV, Menu Survey, school year 2009–2010. Tabulations prepared by Mathematica Policy Research are weighted to be representative of all public schools offering the National School Lunch Program.

Table B.3. Regression Model of Decision to Purchase a Paid School Lunch (Average Student Participation Rate)

	Elementary Schools	Middle Schools	High Schools	All Schools
ln(Cost of Paid Lunch) ^a	-0.16** (0.06)	-0.22* (0.08)	-0.05 (0.09)	-0.16** (0.06)
Alternative Food Sources				
A La Carte	0.00 (0.04)	-0.17 (0.09)	0.02 (0.09)	0.01 (0.04)
Vending Machine	-0.01 (0.04)	-0.00 (0.04)	-0.01 (0.04)	-0.01 (0.03)
Other Source	0.00 (0.04)	0.04 (0.04)	-0.06 (0.04)	-0.01 (0.03)
Healthy Food Choices				
French Fries are not offered	-0.01 (0.02)	-0.04 (0.04)	-0.04 (0.04)	-0.02 (0.02)
Only skim or 1% milk is offered	0.00 (0.03)	0.07* (0.03)	0.01 (0.03)	0.01 (0.02)
Cold cereal is offered every day	-0.01 (0.02)	0.02 (0.03)	0.02 (0.03)	0.00 (0.02)
School Enrollment				
Small (less than 500) (reference group)	n.a.	n.a.	n.a.	n.a.
Medium (between 500 and 1,000)	0.01 (0.02)	-0.10* (0.04)	-0.08 (0.05)	-0.01 (0.02)
Large (more than 1,000)	-0.08* (0.04)	-0.01 (0.05)	-0.13** (0.05)	-0.07* (0.03)
Other School Characteristics				
High Poverty	0.02 (0.03)	-0.04 (0.04)	-0.01 (0.05)	0.00 (0.03)
Meals Prepared Off Site	-0.05 (0.03)	0.04 (0.05)	-0.12* (0.05)	-0.05* (0.02)
Elementary School (reference group)	n.a.	n.a.	n.a.	n.a.
Middle School	n.a.	n.a.	n.a.	-0.04 (0.03)
High School	n.a.	n.a.	n.a.	-0.19** (0.03)
Region				
Mid-Atlantic (reference group)	n.a.	n.a.	n.a.	n.a.
Northeast	-0.07 (0.04)	-0.10 (0.06)	-0.14* (0.06)	-0.09** (0.04)
Southeast	-0.01 (0.05)	-0.06 (0.06)	-0.14** (0.05)	-0.05 (0.03)
Midwest	-0.01 (0.04)	-0.06 (0.07)	-0.13* (0.05)	-0.03 (0.04)
Mountain Plain	0.03 (0.05)	-0.03 (0.07)	-0.10 (0.06)	0.00 (0.04)
Southwest	-0.03 (0.05)	-0.04 (0.06)	-0.35** (0.05)	-0.08* (0.04)
West	-0.13** (0.05)	-0.30** (0.06)	-0.35** (0.05)	-0.19** (0.04)

Table B.3. (continued)

	Elementary Schools	Middle Schools	High Schools	All Schools
Intercept	0.69** (0.07)	0.90** (0.11)	0.61** (0.10)	0.71** (0.06)
Number of Schools	255	241	230	726

Source: School Nutrition Dietary Assessment-IV, school year 2009–2010. Tabulations prepared by Mathematica Policy Research are weighted to be representative of all public schools offering the National School Lunch Program.

Notes: Participation is measured as the ratio of the average daily number of paid meals served to the number of students not eligible for free or reduced-price meal benefits (and therefore “eligible” for paid meals). Standard errors are shown in parentheses.

Control variables included alternative food sources (a la carte, vending machines, school store or snack bar), healthy meal options (french fries not served, only 1% or skim milk offered, cereal served every day), school enrollment, offsite meal preparation, poverty status, and region.

The analysis included only schools that served paid lunches. Paid meal participation rates could not be calculated for schools that lacked information on the number of students approved for free and reduced-price meal benefits or for schools that had conflicting data on enrollment and student eligibility for meal benefits. Eighty-eight schools were excluded from the analysis because of missing/conflicting data.

^aTo convert coefficients to elasticities, multiply by 0.0953.

* $p < 0.05$; ** $p < 0.01$.

Table B.4. Regression Model of Decision to Purchase a Paid School Breakfast (Average Student Participation Rate)

	Elementary Schools	Middle Schools	High Schools	All Schools
ln(Cost of Paid Breakfast) ^a	-0.06 (0.03)	-0.06** (0.02)	-0.03 (0.02)	-0.05* (0.02)
Alternative Food Sources				
A La Carte	0.02 (0.03)	0.04** (0.01)	0.03 (0.02)	0.02 (0.02)
Vending Machine	0.02 (0.03)	-0.03* (0.01)	-0.01 (0.01)	0.00 (0.02)
Other Sources	-0.01 (0.02)	0.01 (0.01)	-0.02 (0.01)	-0.01 (0.01)
Healthy Food Choices				
French Fries are not Offered	0.02 (0.02)	-0.01 (0.01)	0.01 (0.01)	0.02 (0.02)
Only Skim or 1% Milk is Offered	0.01 (0.02)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)
Cold cereal is Offered Every Day	-0.01 (0.02)	0.00 (0.01)	0.00 (0.01)	-0.01 (0.01)
School Enrollment				
Small (less than 500) (reference group)	n.a.	n.a.	n.a.	n.a.
Medium (between 500 and 1,000)	0.00 (0.02)	-0.04** (0.01)	-0.04** (0.02)	-0.02 (0.01)
Large (more than 1,000)	-0.12** (0.04)	-0.04** (0.01)	-0.06** (0.02)	-0.03** (0.01)
Other School Characteristics				
High Poverty	0.09** (0.03)	0.01 (0.01)	0.00 (0.01)	0.06** (0.02)
Meals Prepared Off Site	-0.06** (0.02)	0.00 (0.01)	-0.02 (0.02)	-0.05** (0.01)
Elementary School (Reference Group)	n.a.	n.a.	n.a.	n.a.
Middle School	n.a.	n.a.	n.a.	-0.06** (0.01)
High School	n.a.	n.a.	n.a.	-0.07** (0.01)
Region				
Mid-Atlantic (Reference Group)	n.a.	n.a.	n.a.	n.a.
Northeast	-0.12** (0.04)	-0.02 (0.01)	-0.04 (0.02)	-0.09** (0.03)
Southeast	-0.12** (0.04)	0.00 (0.01)	0.00 (0.02)	-0.07* (0.03)
Midwest	-0.12** (0.04)	-0.03* (0.01)	-0.05** (0.01)	-0.08** (0.02)
Mountain Plain	-0.05 (0.05)	-0.02 (0.02)	-0.01 (0.02)	-0.03 (0.03)
Southwest	-0.11* (0.04)	0.00 (0.02)	-0.02 (0.02)	-0.07* (0.03)
West	-0.11** (0.04)	-0.02 (0.01)	-0.04 (0.02)	-0.07** (0.03)

Table B.4. (continued)

	Elementary Schools	Middle Schools	High Schools	All Schools
Intercept	0.20** (0.04)	0.08** (0.02)	0.07* (0.03)	0.17** (0.03)
Number of Schools	209	209	202	620

Source: School Nutrition Dietary Assessment-IV, school year 2009–2010. Tabulations prepared by Mathematica Policy Research are weighted to be representative of all public schools offering the National School Lunch Program.

Notes: Participation is measured as the ratio of the average daily number of paid meals served to the number of students not eligible for free or reduced-price meal benefits (and therefore “eligible” for paid meals). Standard errors are shown in parentheses.

Control variables included alternative food sources (a la carte, vending machines, school store or snack bar), healthy meal options (french fries not served, only 1% or skim milk offered, cereal served every day), school enrollment, offsite meal preparation, poverty status, and region.

The analysis included only schools that served paid breakfasts. Paid meal participation rates could not be calculated for schools that lacked information on the number of students approved for free and reduced-price meal benefits or for schools that had conflicting data on enrollment and student eligibility for meal benefits. Fifty-two schools were excluded from the analysis because of missing/conflicting data.

^aTo convert coefficients to elasticities, multiply by 0.0953.

* $p < 0.05$; ** $p < 0.01$.

Table B.5. Menu-Planning Systems Used in SY 2009–2010 by School Type

Menu Planning Method	Percentage of Schools			
	Elementary Schools	Middle Schools	High Schools	All Schools
Traditional Food-Based	52.7	52.0	55.9	53.3
Enhanced Food-Based	19.0	20.0	20.3	19.5
Nutrient-Based	28.3	28.0	23.7	27.3
Number of Schools	315	284	277	876

Source: School Nutrition Dietary Assessment–IV, SFA Director Survey, school year 2009–2010. Tabulations prepared by Mathematica Policy Research, Inc. are weighted to be representative of all public schools offering the National School Lunch Program.

Notes: Nutrient-based menu planning includes both nutrient standard menu planning (NSMP) and assisted nutrient standard menu planning (ANSMP).

Six schools (about 1 percent of the weighted sample) reportedly used an “other reasonable approach” to plan menus. Based on the descriptions provided and information available from school district websites, we categorized these approaches into one of the main menu-planning systems.

SY = School year.

Table B.6. Prices Charged for Components of Reimbursable Lunches when Purchased A la Carte

Menu Item	Price Charged (\$)															
	Elementary Schools				Middle Schools				High Schools				All Schools			
	Mean	Mode	Minimum	Maximum	Mean	Mode	Minimum	Maximum	Mean	Mode	Minimum	Maximum	Mean	Mode	Minimum	Maximum
Entrée salad	1.79	2.00	0.75	4.00	1.91	2.00	0.50	4.00	2.00	2.00	0.50	4.00	1.88	2.00	0.50	4.00
Sandwich, hot dog, hamburger, cheeseburger	1.52	1.50	0.75	2.75	1.64	1.50	0.50	3.50	1.63	1.50	0.50	3.00	1.58	1.50	0.50	3.50
Pizza	1.51	1.50	0.75	2.75	1.64	1.50	0.50	3.00	1.64	1.50	0.50	3.00	1.57	1.50	0.50	3.00
Chicken nuggets, strips, patties	1.51	1.50	0.25	2.75	1.61	2.00	0.50	2.85	1.62	1.50	0.50	3.00	1.56	1.50	0.25	3.00
Burritos, other Mexican entrées	1.46	1.50	0.50	2.75	1.60	1.50	0.50	3.00	1.59	1.50	0.50	3.00	1.53	1.50	0.50	3.00
Nachos	1.49	1.50	0.60	2.60	1.55	1.50	0.50	2.85	1.53	1.50	0.50	2.75	1.52	1.50	0.50	2.85
French fries	0.68	0.50	0.25	1.60	0.83	0.50	0.25	2.00	0.88	0.75	0.25	2.25	0.78	0.50	0.25	2.25
Side salad	0.75	0.50	0.25	2.60	0.77	0.50	0.25	2.60	0.81	0.50	0.25	2.60	0.77	0.50	0.25	2.60
Desserts	0.58	0.50	0.25	1.75	0.56	0.50	0.25	1.25	0.60	0.50	0.25	1.50	0.58	0.50	0.25	1.75
Vegetable other than French fries	0.57	0.50	0.25	1.20	0.57	0.50	0.20	1.20	0.60	0.50	0.25	1.25	0.58	0.50	0.20	1.25
Fruit	0.52	0.50	0.25	1.00	0.55	0.50	0.25	1.00	0.52	0.50	0.25	1.00	0.53	0.50	0.25	1.00
100% juice	0.48	0.50	0.25	1.50	0.54	0.50	0.10	1.75	0.60	0.50	0.25	1.50	0.52	0.50	0.10	1.75
Milk	0.43	0.50	0.25	0.75	0.44	0.50	0.25	1.00	0.43	0.50	0.25	0.83	0.43	0.50	0.25	1.00
Roll, bread, other grain item	0.40	0.50	0.10	1.00	0.41	0.50	0.10	1.00	0.42	0.50	0.10	2.00	0.41	0.50	0.10	2.00
Number of Schools	258				269				251				778			

Source: School Nutrition Dietary Assessment-IV, Foodservice Manager Survey, school year 2009-2010. Tabulations prepared by Mathematica Policy Research are weighted to be representative of all public schools offering the National School Lunch Program.

Notes: Table includes only schools that had a la carte sales at lunch and allowed students to purchase components of reimbursable lunches on an a la carte basis.

APPENDIX C
SUPPLEMENTAL TABLES FOR CHAPTER 4

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TABLES

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Table C.1. Food Grouping System

Major Food Group	Minor Food Group	Examples
Milk	Whole, unflavored	Whole milk with no added flavoring
	Whole, flavored	Whole chocolate or strawberry milk
	2%, unflavored	2% milk with no added flavoring
	2%, flavored	2% chocolate or strawberry milk
	1%, unflavored	1% milk with no added flavoring
	1%, flavored	1% chocolate or strawberry milk
	Skim, unflavored	Skim milk with no added flavoring
	Skim, flavored	Nonfat chocolate or strawberry milk
	Other milk beverages	Milkshakes, cocoa made with milk, powdered breakfast drink made with milk, soy milk, milk based smoothies
Fruits	Fresh	Any fresh fruit including apples, oranges, bananas, strawberries, and self-serve fruit bars
	Canned, sweetened	Any canned fruit in light, medium or heavy syrup, or juice-packed, including peaches, pears, fruit cocktail
	Canned, unsweetened	Any canned fruit water-packed or drained, including peaches, pears, fruit cocktail
	Frozen	Any frozen fruit, including strawberries, blueberries, peaches, cherries
	Dried	Any dried fruit, including raisins, cranberries, apples, pineapple and apricots
	Citrus fruit juice, 100%	Orange juice, cranberry juice, juice blend with citrus, including calcium fortified juice
	Non-citrus fruit juice, 100%	Apple juice, grape juice, juice blends, including vitamin C fortified juice
Vegetables	Cooked, starchy	Potatoes, french fries, tater tots, corn, green peas, lima beans
	Cooked, dark green	Cooked broccoli, spinach, collards, kale
	Cooked, orange	Cooked carrots, sweet potatoes, winter squash
	Cooked, legumes	Pinto beans, kidney beans, black beans, bean soups
	Cooked, other	String beans, cauliflower, asparagus, tomatoes, onions, okra, summer squash, peppers, mixed vegetables, vegetable soups
	Raw, dark green	Raw spinach, romaine, broccoli
	Raw, orange	Raw carrots
	Raw, starchy	Raw jicama
	Raw, other	Raw green or red peppers, cabbage, cauliflower, summer squash, celery, tomatoes, cucumbers, side salads, and side salad bars
Combination Entrees	Entree food bars	Self-serve salad bars, sandwich or deli bars, nacho or taco bars, pasta bars, potato bars
	Prepackaged meals	Bag lunches and pre-plated meals
	Hamburger, similar beef/pork sandwiches	Hamburgers, sloppy joes, steak sandwiches, BBQ beef, pork or rib sandwiches, and meatball subs
	Cheeseburger, similar beef/pork sandwiches	Cheeseburgers, steak and cheese sandwiches, meatball and cheese subs, and rib sandwiches with cheese
	Hot dog, corn dog, similar sausage sandwiches	Hot dog on a bun, sausage on a bun, corn dogs, and pancake-on-a-stick

Table C.1 (continued)

Major	Minor	Examples
	Sandwiches with breaded/fried meat, poultry, or fish	Chicken patty, breaded beef or pork patty, breaded fish patty sandwiches and BLT sandwiches
	Sandwiches with plain meat, poultry, or fish	Turkey, ham, turkey ham, grilled chicken, and roast beef sandwiches
	Sandwiches with mayonnaise-based poultry, egg, or tuna salads	Chicken, egg, and tuna salad sandwiches
	Sandwich with meat substitute and/or vegetables	Burgers with vegetarian patties, vegetable only sandwiches, vegetable sandwiches with hummus
	Sandwiches with only cheese	Grilled cheese, cheese and vegetable sandwiches, cheese sandwiches, and Uncrustables
	Peanut butter sandwiches	Peanut butter and jelly sandwiches, Peanut butter and fluff sandwiches, and Uncrustables
	Breakfast sandwiches	Sandwiches with sausage, ham, cheese or egg on bagels, biscuits or english muffins
	Breakfast burritos	Burrito with eggs, cheese, sausage or bacon
	Pizza with meat	Sausage, pepperoni, chicken and breakfast pizzas
	Pizza without meat	Cheese pizzas and vegetable pizzas
	Pizza pockets, pizza sticks and calzones with meat	Calzones, pizza pockets and pizza sticks with pepperoni and cheese
	Pizza pockets, pizza sticks and calzones without meat	Calzones with cheese, pizza sticks without meat, cheese breadsticks, mozzarella sticks
	Mixtures with grain, meat/meat alternate and/or vegetables	Chicken, turkey, beef, pork with rice or noodles, Spaghetti with sauce, lasagna, macaroni and cheese, and ravioli
	Other mixtures with meat, grain, and/or vegetables	Stir-fry with chicken, beef, pork or tofu, egg rolls, chili, and baked potato with cheese and meat
	Mexican-style entrees	Burritos, tacos, nachos, quesadillas, fajitas, and enchiladas
	Entree salads	Chef salads, chicken caesar salad, taco salad, salads with tuna or chicken salad
	Parfaits	Parfaits with yogurt, fruit, and granola
Meat/Meat Alternates	Chicken and turkey, breaded or fried	Chicken nuggets, patties, tenders, poppers, and fried chicken
	Chicken and turkey, plain (not breaded or fried)	Grilled chicken, chicken fajita strips, roasted chicken breast and roasted turkey
	Chicken and turkey with sauce, gravy, or mayonnaise	Chicken or turkey salad, BBQ chicken, teriyaki chicken, turkey or chicken with gravy
	Fish and shellfish, breaded or fried	Fish sticks, nuggets or patties, and shrimp poppers
	Fish and shellfish with sauce, gravy, or mayonnaise	Tuna salad
	Meat, breaded or fried	Chicken fried steak, breaded beef patty, breaded pork patty, breaded veal patty
	Meat, plain (not breaded or fried)	Ground beef, beef patty, pork chops, ham, pork roast, meatloaf, beef and pork rib patties
	Meat with sauce, gravy, or mayonnaise	Salisbury steak, beef with gravy, beef stroganoff, beef barbeque, meatballs, sweet and sour pork, and sausage with gravy
	Sausage, frankfurters and cold cuts	Sausage patties/links, hot dogs, bologna, ham, and turkey ham
	Nuts, nut butters, seeds	Peanut butter, sunflower seeds, almonds, nuts

Table C.1 (continued)

Major	Minor	Examples
	Other protein, cheese	Regular and low /reduced fat cheese, cottage cheese, and cheese sauce
	Other protein, eggs	Omelets, hard boiled, scrambled and fried eggs
	Other protein, meat substitutes, hummus and legumes	Meatless chicken nuggets, hummus, refried beans, black beans, and chili
	Yogurt	Fruited or plain yogurt, nonfat, low-fat and regular
Grains/Breads	Breads, rolls, bagels, and other plain breads	White, wheat or whole grain bread, pita bread, bagels, English muffins, soft pretzels, tortillas
	Cold cereal, sweetened ^a	Any type of sweetened cold cereal: Honey Nut Cheerios, Golden Grahams, Lucky Charms, Cinnamon Toast Crunch
	Cold cereal, unsweetened	Any type of unsweetened cold cereal: Rice Krispies, Corn Flakes, Kix, Cheerios
	Hot cereal	Any type of cooked hot cereal, including oatmeal, grits, cream of wheat
	Crackers and pretzels (hard)	Saltines, wheat crackers, graham crackers, hard pretzels
	Biscuits and cornbread	Biscuits, croissants, cornbread, hush puppies, stuffing
	Corn/tortilla chips	Corn chips, tortilla chips, taco shells
	Bread or bread alternates with added fat	Buttered toast, buttered biscuit, bagel with cream cheese, garlic bread
	Muffins (excluding English muffins), sweet/quick breads	Blueberry muffins, chocolate chip muffins, wheat muffins, bran muffins, pumpkin bread
	Pancakes, waffles, French toast	Pancakes, waffles, French toast , waffle sticks, French toast sticks
	Rice	White, yellow or brown rice, rice pilaf, rice with vegetables, flavored rice not included in a combination entrée
	Pasta	Noodles, macaroni, and spaghetti not included in a combination entrée; pasta salad; macaroni and cheese as a side dish
	Other bread/grain	Egg rolls, cheese filled breadsticks
	Pastries ^b	Cinnamon buns, toaster pastries, donuts, fruit strudels, turnovers, and Danishes
	Granola bars and breakfast bars ^b	Cereal bars with fruit filling, granola bars, Milk 'N Cereal Bars
Desserts	Cake	Donuts, churros, cheesecake, coffee cake, cinnamon rolls, fried dough
	Cookies	Chocolate chip, oatmeal, sugar cookies, reduced fat cookies, whole wheat cookies, Rice Krispies treats
	Brownies	Brownies with and without icing
	Fruit cobblers and crisps	Cobblers, crisps, turnovers, strudel, and pie
	Granola bars and breakfast bars	Cereal bars with fruit filling, granola bars
	Desserts containing fruit or fruit juice	Fruit juice bars, gelatin with fruit, fruit sorbet
	Dairy based desserts	Pudding, ice cream, ice cream bars, yogurt
	Parfaits	Parfaits with yogurt, fruit, and granola
	Other desserts	Gelatin without fruit, ice pops, slushies, fruit snacks, candy

Table C.1 (continued)

Major	Minor	Examples
Other	Fruit drinks/ades (not 100% juice)	Lemonade, fruit punch, orange drinks, sports drinks
	Non-vegetable/non-entree soups	Chicken noodle soup, clam chowder, chicken vegetable soup, beef vegetable soup
	Snack foods	Potato chips, trail mix, nuts, seeds, and popcorn
	Bacon	Bacon, turkey bacon, Canadian bacon
	Bottled water	Plain spring or mineral water
Accompaniments	Fat-free or low-fat condiments and toppings	BBQ sauce, ketchup, mustard, syrup, jelly, sugar, salsa, pickles, vegetable items used as toppings and fat-free, low-fat or light condiments
	Higher fat condiments and toppings	Mayonnaise, tartar sauce, cheese sauce, chili, gravies, cheese, butter, margarine, cream cheese, sour cream (includes reduced fat cheese)
	Fat-free, low-fat, reduced fat, low or reduced calorie salad dressings	Fat-free, low-fat, reduced or low-calorie ranch, Italian, French, honey mustard or Caesar dressing
	Regular salad dressings	Ranch, Italian, honey mustard, French, and Caesar dressing
	Condiment or 'fixins' bar	Self-serve condiment, toppings, or 'fixins' bars

^aA cereal was classified as sweetened if it contained 21.3 grams of sugar or more per 100 gram serving—the current criterion for cereals allowed under the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC).

^bCinnamon buns, toaster pastries, donuts, breakfast bars, and granola bars are included as a grain/bread at breakfast.

Table C.2. Availability of Self-Serve Food Bars in National School Lunch Program Lunches, by Menu-Planning System

	Percentage of Schools				
	Traditional Food-Based	Enhanced Food-Based	All Food-Based	Nutrient-Based	All Schools
Any Self-Serve Food Bar					
At least once per week	21 ^a	36	25	33 ^y	27
Every day	14 ^a	29	18	26 ^y	21
Any Salad Bar					
At least once per week	18	29	21	29 ^y	23
Every day	13	23	15	20	17
Side Salad Bar					
At least once per week	13	24	16	24 ^y	18
Every day	9	19	12	18 ^y	13
Entree Salad Bar					
At least once per week	6	6~	6	5~	6
Every day	4	5~	4	<3	3
Sandwich/Deli Bar					
At least once per week	4	9	5	8	6
Every day	<3	8	4	4~	4
Other Entree Food Bars^a					
At least once per week	5	7~	6	7	6
Every day	<3	<3	<3	<3	<3
Number of Schools	454	171	625	259	884

Source: School Nutrition Dietary Assessment-IV, Menu Survey, school year 2009–2010. Tabulations prepared by Mathematica Policy Research are weighted to be representative of all public schools offering the National School Lunch Program.

Note: None of the differences between enhanced food-based and nutrient-based are significantly different from zero.

^a Includes baked potato bars, nacho or taco bars, and Italian/pasta bars.

^aDifference between traditional food-based and enhanced food-based is significantly different from zero at the .05 level.

^yDifference between traditional food-based and nutrient-based is significantly different from zero at the .05 level.

~ Point estimate is considered less precise than estimates that are not flagged because the sample size is small or the coefficient of variation is large. The rules used in flagging estimates are described in Chapter 1. When these rules are applied, percentages close to 0 or 100 are often flagged. In this table, flagged percentages between 0 and 3 percent are displayed as <3 and flagged percentages between 97 and 100 percent are displayed as >97.

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Table C.3. Foods Offered in National School Lunch Program Lunches, by Menu-Planning System

	Percentage of Daily Lunch Menus				
	Traditional Food-Based	Enhanced Food-Based	All Food-Based	Nutrient-Based	All Schools
Milk	99 ^a	>97	99	>97	100
Unflavored	98	>97	99	>97	99
1% fat	71	70	71	81	73
Skim or nonfat	47	53	48	43	47
2% fat	32	43 ^B	35	18 ^Y	30
Flavored	96	92	95	97	96
1% fat	64	65	64	61	63
Skim or nonfat	39	32	37	45	39
2% fat	5	3	4	<3 ^Y	3
Vegetables	94	96	95	96	95
Vegetables, cooked	78	72	77	74	76
Starchy vegetables	51	48	50	51	50
French fries/similar potato products ^b	25	23	24	26	25
Corn	17	14	16	15	16
White potatoes	14	13	14	15	14
Green peas	5	7	6	4	5
Other vegetables	26	28	26	23	25
String beans	15	15	15	12	14
Mixtures and blends	10	12 ^B	10	6 ^Y	9
Legumes ^c	10	7	9	12	10
Dark green vegetables (mainly broccoli)	9	7	8	10	9
Orange vegetables (mainly carrots)	7	6	7	5	6
Vegetables, raw	53	61	55	71 ^Y	59
Other vegetables	44	53	46	58 ^Y	50
Side salads	26	24	25	32	27
Side salad bars	11 ^a	21	13	20 ^Y	15
Mixtures	7	5	6	4 ^Y	6
Celery	3	6	4	7 ^Y	5
Orange vegetables (carrots)	16	17	17	27 ^Y	19
Fruits and Juices	90	87	90	85	88
Any fruit ^d	87	85	87	82	85
Canned fruit ^e	60	63	61	56	60
Peaches	21	20	21	18	20
Applesauce	20	18	19	15	18
Unsweetened	16	14	15	10 ^Y	14
Sweetened	4	5	4	5	4
Pears	14	17	15	15	15
Fruit cocktail	16	20 ^B	17	12	15
Pineapple	11	14	12	10	12
Mandarin oranges	4	5	5	4	4
Fresh fruit	58	56	58	63	59
Apple	38	36	38	43	39
Orange	27	23 ^B	26	36 ^Y	29
Banana	16	15	15	18	16
Pear	7	7	7	9	8

Table C.3 (continued)

	Percentage of Daily Lunch Menus				
	Traditional Food-Based	Enhanced Food-Based	All Food-Based	Nutrient-Based	All Schools
100% Fruit juice	27	25	26	30	27
Non-citrus juice	18	20	18	26	20
Apple juice	15	16	15	23	17
Grape juice	4	5	4	5	4
Fruit juice blend	3	4	4	7	4
Citrus juice (mainly orange)	19	15	18	20	18
Frozen fruit ^f	5	3	4	3	4
Combination Entrees	92	93 ^β	92	97 ^γ	94
Sandwiches with plain meat or poultry	30	30	30	33	30
Entree salads (chef's salads)	26	35	29	35	30
Pizza	27	30	28	37 ^γ	30
Pizza without meat	19	22	20	26 ^γ	21
Pizza with meat	16	20 ^β	17	29 ^γ	20
Peanut butter sandwiches	29	27	28	28	28
Sandwiches with breaded/fried meat, poultry, or fish	19	18	19	26 ^γ	21
Mexican-style entrees (burritos, tacos, nachos)	16	18 ^β	16	32 ^γ	21
Hamburgers, similar beef/pork sandwiches	17	15	17	18	17
Cheeseburgers, similar beef/pork sandwiches	15	13 ^β	15	24 ^γ	17
Mixtures with meat, grain and/or vegetables (spaghetti, lasagna, macaroni and cheese)	14	13 ^β	14	19 ^γ	15
Hot dog, corn dog, similar sausage sandwiches	12	15	13	16	14
Self-serve salad bars and other food bars	9	13	10	10	10
Sandwiches with cheese only	9	9	9	10	9
Bag lunches and pre-plated meals	10 ^α	5	8	9	9
Pizza pocket, pizza sticks, calzone (with or without meat)	7	8	7	7	7
Sandwiches with mayonnaise-based poultry or tuna salads	7	7	7	4	6
Other mixtures with meat, and/or vegetables (chili, chicken parmesan, stir-fry without rice)	5	5	5	7	6
Separate Grains/Breads^g	60 ^α	73 ^β	64	60	63
Breads, rolls, bagels, and other plain breads	31	39 ^β	33	25	31
Crackers and pretzels	19	27	21	25	22
Rice	10	12	10	12	11
Pasta	5	9	6	6	6
Corn/tortilla chips	5	3	4	5	4
Biscuits, cornbread	5	5	5	3	4

Table C.3 (continued)

	Percentage of Daily Lunch Menus				
	Traditional Food-Based	Enhanced Food-Based	All Food-Based	Nutrient-Based	All Schools
Meats/Meat Alternates^h	41	47	43	46	43
Breaded/fried chicken nuggets, patties, similar products	17	17 ^β	17	23 ^γ	19
Meat (plain or breaded/fried beef, pork)	9	10	9	7	9
Yogurt	5 ^α	15	8	9	8
Low fat or fat-free	4	12	6	9	7
Other meat alternates ⁱ	5	12	7	7	7
Plain (not breaded or fried) chicken and turkey	5	4	4	4	4
Other Menu Items	28	27 ^β	28	43 ^γ	32
Cookies, cakes, brownies	9	10 ^β	9	17 ^γ	12
Dessert items that contain fruit or juice (fruit juice bars, fruited gelatin)	7	5	7	7	7
Dairy-based desserts (ice cream, pudding)	3	4	4	5	4
Snack foods (popcorn, potato chips, trail mix)	4	4 ^β	4	10 ^γ	5
Number of Daily Menus	2,175	813	2,988	1,242	4,230
Number of Schools	454	171	625	259	884

Source: School Nutrition Dietary Assessment-IV, Menu Survey, school year 2009–2010. Tabulations prepared by Mathematica Policy Research are weighted to be representative of all public schools offering the National School Lunch Program.

Notes: Table is limited to minor food groups offered in at least five percent of menus, overall, or for one or more menu planning systems. This is why, for example, whole milk does not appear in the table. The table does not account for individual food items offered as part of food bars, bag lunches, or pre-plated meals.

^a One school that used traditional food-based menu planning offered a pre-plated meal every day. The meal included fluid milk, but the milk was not coded separately.

^b Includes both oven-baked and deep-fried products.

^c Legumes were coded as vegetables or meat alternates, depending on how they were used in the menu. Most legumes were offered as vegetables.

^d Includes canned, fresh, frozen, or dried fruit.

^e With the exception of applesauce, the majority of canned fruit was sweetened.

^f Includes frozen strawberries, blueberries, and peaches.

^g Grains and breads not included in combination entrees or served solely with a specific menu item.

^h Meats and meat alternates not included in combination entrees.

ⁱ Includes cheese, peanut butter, nuts, eggs, hummus, legumes, and meat substitutes.

^α Difference between traditional and enhanced food-based is significantly different from zero at the .05 level.

^β Difference between enhanced food-based and nutrient-based is significantly different from zero at the .05 level.

^γ Difference between traditional food-based and nutrient-based is significantly different from zero at the .05 level.

~ Point estimate is considered less precise than estimates that are not flagged because the sample size is small or the coefficient of variation is large. The rules used in flagging estimates are described in Chapter 1. When these rules are applied, percentages close to 0 or 100 are often flagged. In this table, flagged percentages between 0 and 3 percent are displayed as <3 and flagged percentages between 97 and 100 percent are displayed as >97.

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Table C.4. Availability of Fresh Fruits and Vegetables in National School Lunch Program Lunches, by Menu-Planning System

	Percentage of Schools				
	Traditional Food- Based	Enhanced Food- Based	All Food- Based	Nutrient- Based	All Schools
Number of Days Any Fresh Fruits or Vegetables Were Offered					
None	<3	<3	<3	<3	<3
1 to 2	9	10	9	4~	8
3 to 4	25	24	24	22	24
5	65	65	65	74	68
<i>Mean number of days offered</i>	4	4	4	5	4
<i>Median number of days offered</i>	4	4	4	4	4
Number of Days Any Fresh Vegetables (Served Raw or in Cooked Form) Were Offered^a					
None	<3	<3	<3	<3	<3
1 to 2	11	6~	10	3 ^y ~	8
3 to 4	27	24	26	20	24
5	61	70	63	77 ^y	67
<i>Mean number of days offered</i>	4	4	4	5	4
<i>Median number of days offered</i>	4	4	4	4	4
Number of Days Any Raw Fresh Vegetables Were Offered^a					
None	5 ^a	<3	4	<3 ^y	3
1 to 2	31	19	28	15 ^y	24
3 to 4	24	27	25	22	24
5	41	52	44	62 ^y	49
<i>Mean number of days offered</i>	3	4	4	4	4
<i>Median number of days offered</i>	3	4	4	4	4
Number of Days Any Cooked Fresh Vegetables Were Offered^a					
None	6	<3	5	<3 ^y	3
1 to 2	31	34	32	24	30
3 to 4	34	37	35	48 ^y	39
5	29	26	28	28	28
<i>Mean number of days offered</i>	3	3	3	4	3
<i>Median number of days offered</i>	3	3	3	3	3
Number of Days Any Fresh Fruits Were Offered^b					
None	12	19	14	12	14
1 to 2	33	35	33	20 ^y	30
3 to 4	18	14	17	23	19
5	37	32	36	44	38
<i>Mean number of days offered</i>	3	3	3	3	3
<i>Median number of days offered</i>	3	2	2	4	3
Number of Schools	359	130	489	207	696

Source: School Nutrition Dietary Assessment-IV, Menu Survey, school year 2009–2010. Tabulations prepared by Mathematica Policy Research are weighted to be representative of all public schools offering the National School Lunch Program.

Note: Includes only schools that provided menu information for five days.

^aExcludes canned and frozen vegetables.

Table C.4 (*continued*)

^bExcludes canned, frozen, and dried fruits and fruit juices.

^aDifference between traditional and enhanced food-based is significantly different from zero at the .05 level.

^bDifference between enhanced food-based and nutrient-based is significantly different from zero at the .05 level.

^cDifference between traditional food-based and nutrient-based is significantly different from zero at the .05 level.

~ Point estimate is considered less precise than estimates that are not flagged because the sample size is small or the coefficient of variation is large. The rules used in flagging estimates are described in Chapter 1. When these rules are applied, percentages close to 0 or 100 are often flagged. In this table, flagged percentages between 0 and 3 percent are displayed as <3 and flagged percentages between 97 and 100 percent are displayed as >97.

Table C.5. Choice and Variety in School Breakfast Program Breakfasts, by Menu-Planning System

	Percentage of Daily Breakfast Menus				
	Traditional Food-Based	Enhanced Food-Based	All Food-Based	Nutrient-Based	All Schools
Number of Types of Milk Offered per Day					
No more than 1	15	11	14	17	15
2	34	35	35	39	36
3	27	34	29	29	29
4 or more	24	21	23	15	21
<i>Median number of different items per day</i>	2	2	2	2	2
<i>Median number of different items per week^a</i>	2	3	2	2	2
Number of Fruits/Vegetables/100% Juices Offered per Day^b					
No more than 1	39	28	36	25 ^y	33
2	23	25	23	24	23
3	18	25	20	24	21
4	12	12	12	11	11
5 or more	8	11	9	16 ^y	11
<i>Median number of different items per day</i>	1	2	2	2	2
<i>Median number of different items per week^a</i>	3	3	3	4	4
Number of Separate Grains/Breads Offered per Day^c					
No more than 1	34	27	32	26	30
2	32	28	31	32	31
3	18	20	19	22	19
4	9	9	9	11	10
5 or more	7	16	9	9	9
<i>Median number of different items per day</i>	2	2	2	2	2
<i>Median number of different items per week^a</i>	5	4	4	5	5
Number of Separate Meats/Meat Alternates Offered per Day^d					
None	60	53	58	61	59
1	30	32	31	30	31
2 or more	10	15	11	9	11
<i>Median number of different items per day</i>	0	0	0	0	0
<i>Median number of different items per week^a</i>	1	1	1	1	1
Number of Combination Entrees Offered per Day					
None	63	55	61	54 ^y	59
1	29	31	29	34	31
2 or more	8 ^a	14	10	12	10
<i>Median number of different items per day</i>	0	0	0	0	0
<i>Median number of different items per week^a</i>	1	1	1	1	1
Number of Side Items Offered per Day					
No more than 2	n.a.	n.a.	n.a.	4	n.a.
3 to 4	n.a.	n.a.	n.a.	25	n.a.
5 to 6	n.a.	n.a.	n.a.	26	n.a.
7 to 8	n.a.	n.a.	n.a.	23	n.a.
9 or more	n.a.	n.a.	n.a.	22	n.a.
<i>Median number of different items per day</i>	n.a.	n.a.	n.a.	6	n.a.
<i>Median number of different items per week^a</i>	n.a.	n.a.	n.a.	13	n.a.
Number of Daily Menus	1,877	751	2,628	1,197	3,825
Number of Schools	396	159	555	248	803

Source: School Nutrition Dietary Assessment-IV, Menu Survey, school year 2009–2010. Tabulations prepared by Mathematica Policy Research are weighted to be representative of all public schools offering the National School Lunch Program.

Table C.5 (*continued*)

Notes: Differences between medians were not tested for statistical significance. None of the differences between enhanced and nutrient-based are significantly different from zero.

^aIncludes only schools that provided menu information for five days.

^bFruits and vegetables not included in combination entrees.

^cGrains and breads not included in combination entrees. All varieties of cold cereal were counted as one grain/bread choice.

^dMeats and meat alternates not included in combination entrees.

^eDifference between traditional and enhanced is significantly different from zero at the .05 level.

^fDifference between traditional and nutrient-based is significantly different from zero at the .05 level.

n.a. = not applicable.

Table C.6. Foods Offered in School Breakfast Program Breakfasts, by Menu-Planning System

	Percentage of Daily Breakfast Menus				
	Traditional Food-Based	Enhanced Food-Based	All Food-Based	Nutrient-Based	All Schools
Milk	>97	>97	>97	>97	>97
Unflavored	>97	>97	>97	>97	>97
1% fat	68	71	69	80 ^V	72
Skim or nonfat	42	44	42	41	42
2% fat	35	42 ^B	37	17 ^V	31
Flavored	74	75	74	78	75
1% fat	51	52	51	49	50
Skim or nonfat	29	27	28	34	30
Fruits and 100% Fruit Juices	97	97	97	98	97
100% Fruit juice	87	92 ^B	88	81	86
Citrus juice	61 ^A	73	65	65	65
Orange juice	59 ^A	71	62	65	63
Fruit juice blend	5	6	5	<3 ^V	4
Non-citrus juice	64	69	65	62	64
Apple juice	54	57	55	54	55
Grape juice	24 ^A	39 ^B	28	18	25
Fruit juice blend	9	5 ^B	8	13	10
Any fruit ^a	45 ^A	47	46	66 ^V	51
Fresh fruit	35	35 ^B	35	50 ^V	39
Apple	21	21 ^B	21	32 ^V	24
Orange	15	14	14	22	17
Banana	11	13	12	18 ^V	14
Canned fruit ^b	14	16 ^B	15	28 ^V	19
Peaches and pears	8	7 ^B	8	15 ^V	10
Applesauce	4	5	4	6	5
Vegetables	2	<3 ^B	2	7 ^V	3
Hash browns, potato puffs, french fries ^c	2	<3 ^B	2	6 ^V	3
Separate Grains/Breads^d	91	93	92	96 ^V	93
Cold cereal	69	79	72	85 ^V	76
Sweetened	62	73	65	74 ^V	68
Unsweetened	29	33	30	42 ^V	33
Pastries	23	28	24	29	25
Cinnamon buns	7	11	9	16 ^V	11
Toaster pastries	9	14	11	8	10
Donuts	7	7	7	9	8
Strudels, turnovers, Danishes	3	3	3	2	3
Breads, rolls, bagels, other plain breads	23	30	25	20	24
Muffins (excludes English muffins), sweet/quick breads	20	24	21	23	22
Pancakes, waffles, French toast	18	23	20	24 ^V	21
Buttered toast, bagels with cream cheese	19	16	18	21	19
Crackers (mainly graham)	16	19	17	17	17
Biscuits, cornbread	11	12	11	9	11
Grain and fruit cereal bars, granola bars	8	8	8	12	9
Hot cereal	7	5	7	6	6

Table C.6 (continued)

	Percentage of Daily Breakfast Menus				
	Traditional Food-Based	Enhanced Food-Based	All Food-Based	Nutrient-Based	All Schools
Meats/Meat Alternates^e	40	47	42	39	41
Yogurt	17 ^a	29 ^b	21	16	19
Low fat or fat-free	12 ^a	25 ^b	16	15	15
Regular	5	4	5	2 ^y	4
Sausage	12	12	12	12	12
Eggs	9	10	9	10	9
Cheese	6	8	7	5	6
Breaded chicken patties and nuggets	4	4	4	<3 ^y	3
Combination Entrees	37	45	39	47 ^y	41
Breakfast sandwiches ^f	13	18	14	15	15
Pizza (all types)	9	15	11	12	11
Sausage with pancake, corn dog, similar products	7	9	7	8	7
Breakfast burritos	5	6	5	8 ^y	6
Peanut butter sandwiches	4	5	4	5	4
Number of Daily Menus	1,877	751	2,628	1,197	3,825
Number of Schools	396	159	555	248	803

Source: School Nutrition Dietary Assessment Study-IV, Menu Survey, school year 2009–2010. Tabulations prepared by Mathematica Policy Research are weighted to be representative of all public schools offering the National School Lunch Program.

Note: Table includes only schools that participate in the School Breakfast Program. Table is limited to food groups offered in at least five percent of menus, overall, or for one or more school types. This is why, for example, whole milk does not appear in the table. The table does not account for individual food items offered as part of food bars or bagged/pre-plated meals.

^aIncludes canned, fresh, frozen, and dried fruit.

^bWith the exception of applesauce, the majority of canned fruit was sweetened.

^cIncludes both oven-baked and deep-fried products.

^dGrains and breads not included in combination entrees or served solely with a specific menu item.

^eMeats and meat alternates not included in combination entrees.

^fIncludes sandwiches with egg, cheese, sausage, ham or other types of meat on a biscuit, English muffin, bagel, or croissant.

^aDifference between traditional and enhanced food-based is significantly different from zero at the .05 level.

^bDifference between enhanced food-based and nutrient-based is significantly different from zero at the .05 level.

^yDifference between traditional food-based and nutrient-based is significantly different from zero at the .05 level.

~ Point estimate is considered less precise than estimates that are not flagged because the sample size is small or the coefficient of variation is large. The rules used in flagging estimates are described in Chapter 1. When these rules are applied, percentages close to 0 or 100 are often flagged. In this table, flagged percentages between 0 and 3 percent are displayed as <3 and flagged percentages between 97 and 100 percent are displayed as >97.

APPENDIX D

METHODS USED IN ANALYSIS OF THE NUTRIENT AND FOOD GROUP CONTENT OF SCHOOL MEALS AND AFTERSCHOOL SNACKS

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TABLES

D.1	Example of Weighting Factors For Unweighted and Weighted Nutrient and Food Group Analysis of National School Lunch Program Menus	D-7
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This appendix describes how the calorie, nutrient, and food group content of NSLP lunches, SBP breakfasts, and afterschool snacks was measured for the analyses presented in Chapters 5 through 12 of this report. To permit comparison with previous SNDA studies, these procedures replicated as closely as possible those used in the previous studies (SNDA-I through SNDA-III) (Burghardt et al. 1993; Fox et al. 2001; Gordon et al. 2007).

The data used to assess the calorie, nutrient, and food group content of reimbursable meals and snacks were obtained from a menu survey that was completed by FSMs in participating schools. The menu survey collected detailed information (for a five-day school week) about the foods and beverages offered in school meals. Details about how these data were processed to generate nutrient and food group estimates is provided in Volume II, Chapter 4 of this report. This appendix describes how the variables created from the menu survey data were analyzed. Variables for each daily menu included the type of meal/snack, the total number of meals/snacks served, and, for each food and beverage, a USDA food code, food name/description, portion size and number of reimbursable portions served. The USDA Food and Nutrient Database for Dietary Studies (FNDDS; version 3.0) provided the calorie and nutrient values (USDA, Agricultural Research Service, 2008), and the MyPyramid Equivalents Database for USDA Survey Foods, 2003–2004, (MPED; version 2.0) provided the number of equivalents for food groups (Bowman et al. 2008). All nutrients and dietary components targeted in the SMI nutrition standards were analyzed: calories, protein, vitamins A and C, calcium, iron, total fat, and saturated fat. Levels of cholesterol, sodium, and dietary fiber were also assessed. The five main food groups in the USDA Food Patterns—vegetables, fruits, grains, dairy foods, and protein foods—were analyzed, in addition to whole grains and five vegetable subgroups. Oils and calories from solid fats and added sugars were also included.

A. Computing the Average Nutrient and Food Group Content of Meals and Snacks Offered

Estimates of the nutrient and food group content of school meals *offered* to students are based on an *unweighted* nutrient analysis. Because of differences in the basic structure of the meals, the unweighted analysis procedures differed somewhat for schools using food-based versus nutrient-based menu-planning systems,¹ and for breakfasts versus lunches. Each variation of the basic methodology is described in the sections that follow.

1. Schools Using Food-Based Menu Planning

For schools using the traditional or enhanced food-based menu-planning systems, the unweighted analysis assumed that every child takes one average serving of each meal component, including any non-creditable items served with those foods (for example, salad dressing or other toppings).² For lunches, this included the following:

- An average serving of milk

¹ For example, nutrient-based menu planning did not require that all meal components included in the food-based meal pattern be offered.

² Meal patterns for the two food-based menu planning systems required the same main meal components; differences relate only to the amounts of fruits and vegetables and grains/breads required.

- One average entrée or meat/meat alternate
- An average number of servings of fruit and/or vegetables, based on the number students were *allowed* to take
- An average serving of grain or bread, if offered separately from entrees
- An average serving of desserts or other extra items (if offered)
- An average serving of unlinked accompaniments (if offered)

In SNDA-IV, we used a modified approach for determining the number of fruit/vegetable servings to include in the unweighted analysis for each school in order to better reflect school practice in this area. In SNDA-II and SNDA-III, the number of fruits and vegetables was based on the average number of servings reported during the menu survey week. Reported servings are likely to underestimate the actual number of fruits and/or vegetables offered to students, especially in schools that use the OVS option. For this reason, the SNDA-IV analysis was based on FSM reports about the number of fruit/vegetable servings students were allowed to take in NSLP lunches (this information was collected in the FSM survey).³

For breakfasts in schools using the traditional or enhanced food-based menu-planning systems, the unweighted analysis assumed:

- An average serving of milk
- An average serving of fruit, juice, and/or vegetables
- Two average servings of grains/breads and/or meat/meat alternates
- An average serving of unlinked accompaniments (if offered)

In principle, computing an unweighted average is a fairly straightforward process. However, the computation is preceded by a complex data preparation process. Weighting factors must be applied to appropriately account for multiple offerings within meal component groups, to link menu items offered together but reported separately (such as salad and salad dressings), and to avoid double-counting menu items that include foods from more than one meal component group (for example, salad bars that include both meat or meat alternates and vegetables). Computing the weighting factors for the unweighted analysis of NSLP lunches involved six steps:

- **Step 1: Assign menu items to meal component groups.** All menu items were assigned to one of the meal component groups used in the unweighted analysis. For schools using food-based menu planning, these included milk, fruit/vegetables, grains/breads, combination entrees, meat/meat alternates, desserts and other extras, salad dressings, and accompaniments (toppings, condiments, and spreads).

³ We assessed differences between results of two different estimation approaches and found that the differences were small and had no material effect on any substantive findings. Appendix K includes tables that present results for both the SNDA-IV and SNDA-III methods (Tables K.1 and K.1a, respectively).

- **Step 2: Assign weights to major meal component groups.** Initially, equal weight was given to each option within a meal component group, using a base of 300 (representing 300 reimbursable meals).⁴ For example, if four types of milk were offered, each type was assigned a weight of 75 ($300 \div 4 = 75$). For fruits and vegetables, the base of 300 was multiplied by the number of fruit/vegetables students were allowed to take (as reported by FSMs) and divided by the number of fruit/vegetable choices on each menu day. For example, if a school allowed students to take three fruit/vegetable servings and offered six different fruit/vegetable choices on a menu day, each would be assigned a weight of 150 ($300 * 3 = 900$; $900 \div 6 = 150$).
- **Step 3: Assign weights to grains/breads served with meat/meat alternates or entrees.** Menu items that were “linked” to (served with but reported separately from) other foods were assigned the same weight as the food with which they were served. Common examples include a roll served with chicken nuggets, crackers served with a chef’s salad, and rice served with stir-fried chicken and vegetables. If it appeared that a grain/bread was “unlinked” (available to all students), it was assigned the full base weight of 300.
- **Step 4: Assign weights to salad dressings.** The weights assigned to salad dressings were based on the weights assigned to salads (excluding salad bars) so that the unweighted analysis would include one average serving of dressing for each salad. An average serving of salad dressing was included during the coding of self-serve salad bars, so these bars were not considered in assigning weights to salad dressing.
- **Step 5: Assign weights to accompaniments.** The unweighted analysis assumed one average serving of unlinked accompaniments (such as shredded cheese, sour cream, ketchup and margarine) that were not served exclusively with another menu item. Unlinked accompaniments were assigned weights using a base weight of 300 divided by the number of “unlinked” items. For example, for ketchup, mayonnaise, and mustard offered on a menu with hamburgers, cheeseburgers, turkey sandwiches, and French fries, the accompaniments were considered “unlinked” and each received a weight of 100 ($300 \div 3$).

Accompaniments were linked in the data file to the items they were served with if there was a clear indication that the accompaniment was served exclusively with a specific menu item (for example, a burrito served with salsa and sour cream or chicken nuggets served with barbeque sauce). These items were assigned the weight already assigned to the main item to which it was linked. For example, if barbeque sauce was included in a menu in which the three entrees (and their weights) were pizza (100), chicken nuggets (100), and a ham sandwich (100) and the barbecue sauce was linked to the chicken nuggets, the weight for the barbecue sauce would be 100 – the same weight as the chicken nuggets. However, if it appeared that students were offered a choice between linked accompaniments (different amounts of each were served), weights were assigned so that one average serving of accompaniments would be included with the main food item.

⁴ In SNDA-II, a base of 1,000 was used; however, USDA guidance suggests using a base of 300 which is divisible by all numbers up to six (USDA/FNS n.d.) <http://www.fns.usda.gov/tn/resources/nutrientanalysis.html>.

- **Step 6: Adjust weights to account for salad bars, food bars, pre-plated meals, and bag lunches.** Weighting factors were adjusted to account for multi-component menu entrée choices to ensure that meal components would not be double counted in the unweighted analysis. For example, if a bag lunch included a sandwich, carrot sticks, and a brownie, it was coded as an entrée and assigned a weight accordingly (Steps 1 and 2). However, because the bag lunch also included a fruit/vegetable and dessert serving, the weight assigned to the bag lunch was subtracted from the total weights for those meal component groups. The weights for individual fruit/vegetable and dessert items not part of the bag lunch, and any linked items, were then recalculated (Steps 2 through 5).⁵

An additional step was required in assigning weighting factors for breakfast menus. At breakfast, food-based meal pattern requirements call for two servings of grains/breads, two servings of meat/meat alternate, or one serving of each. Many schools offer single breakfast items that fulfill this requirement—usually two or more grains/breads or a combination of grain/bread and meat/meat alternate (for example, a 2 oz. bagel; egg and cheese on English muffin; or biscuit with sausage). Based on portion size, each grain/bread, meat/meat alternate, and entrée item was assigned a “meat/grain” serving equivalent (either one or two). This ensured that weights were assigned to breakfast menus such that the “average” breakfast included two average servings of grain/bread and/or meat/meat alternate.⁶

2. Schools Using Nutrient-Based Menu Planning

Schools using nutrient-based menu planning were required to offer three items in a reimbursable lunch: milk, an entrée, and at least one side (for example, fruits, vegetables, grains/breads, or desserts). At breakfast, milk and at least two sides were required. Individual schools could decide how many sides a student could take, and some specified the particular groups of sides required or the maximum number of selections allowed per group. For SNDA-IV, this information was collected from foodservice managers and used for assigning weights to foods in the unweighted analysis.

The majority of schools using nutrient-based menu planning allowed students to select any type of food to provide the allowable number of sides (81 percent at lunch and 68 percent at breakfast) and did not divide sides into specific groups (for example, fruits and vegetables, grains/breads, desserts). About three-quarters of schools at lunch and breakfast (73 percent at lunch; 79 percent at breakfast) set a maximum for the number of sides allowed, either as a group or by type of sides group.

After incorporating the school-specific information on the number and types of sides offered, the process for computing unweighted averages for schools using a nutrient-based menu-planning system was similar to that described in Steps 1 through 6 for schools using a food-based system. That is, weighting factors were assigned to choices within each relevant meal component group,

⁵ Appendix E (Exhibit E.5) of the final report for SNDA-II provides an example of the adjustments described in Step 6 (Fox et al. 2001).

⁶ USDA menu planning guidance was used to define meat/grain equivalents (USDA/FNS 1998).

with the appropriate adjustments made to prevent double-counting. For schools using nutrient-based menu planning, the average lunch as *offered* consisted of:

- An average serving of milk
- One average entrée or meat/meat alternate
- At least one average serving of a non-milk, non-entrée item side (number of servings based on school policy)
- An average serving of unlinked accompaniments (if offered)

For breakfasts in school using nutrient-based menu planning, the average breakfast as *offered* included the following:

- An average serving of milk
- At least two average sides (which could include a “breakfast entrée”; actual number of sides determined by school policy)
- An average serving of unlinked accompaniments (if offered)

3. Computing Unweighted Nutrients and Food Groups

After all menu items were assigned weighting factors, calorie, nutrient, and food group values were computed for each item offered on daily menus (calories, nutrients, and food group equivalents in one portion multiplied by assigned offer weight). Nutrient and food group values were totaled within each menu, and the resulting total was then divided by the base weight of 300. To obtain the overall average nutrient and food group content of the meals as *offered*, daily totals were averaged across the week (five days or, for some schools, three or four days).

B. Computing the Average Nutrient and Food Group Content of School Meals Served

Estimation of the nutrient and food group content of meals *served* to students involves a *weighted* analysis, which takes into account the number and types of foods actually served to students. The analysis gives greater weight to the nutrient and food group equivalent values of foods that students select more frequently. A weighted analysis requires information on the actual number of portions served of each menu item available in the reimbursable meals. It can sometimes be difficult for schools to provide this information, in part because reimbursable items can also be sold a la carte and to adults. Thus, in SNDA-IV, as in all previous SNDA studies, servings data were sometimes estimated by school foodservice staff.

The procedures for the weighted nutrient analysis were the same regardless if the school used a food-based or nutrient-based menu-planning system, for both breakfast and lunch menus. The menu survey data file included information on the total number of reimbursable meals served for each daily menu, the number of portions of each menu item included in those meals, and the nutrient and food group content of one portion of each item. Computing a weighted average of the calorie, nutrient, and food group content of a reimbursable meal involved three steps:

- **Step 1.** For each menu item, the total number of portions served to students was multiplied by the amount of calories, nutrients, and food group equivalents in one portion.
- **Step 2.** The total calories, nutrients, and food group equivalents served were then summed across all foods within a daily menu. For example, the total amount of vitamin A was calculated as the sum of vitamin A in 200 cartons of one percent milk, 50 cartons of skim milk, 250 chicken sandwiches, 100 slices of pizza, 150 salads, and so on.
- **Step 3.** The resulting sum was then divided by the total number of reimbursable meals served to determine the nutrient and food group content of the average meal *served* to (or selected by) students.

As for the unweighted nutrient analysis, to determine the overall average for each school, daily calorie, nutrient, and food group values were averaged across the week.

C. Comparison of Assumptions for Weighted and Unweighted Nutrient and Food Group Analyses

Table D.1 illustrates weighting factors for a weighted and unweighted analysis of a sample NSLP lunch menu. For the weighted analysis, the actual number of portions served and the total number of reimbursable meals were used to create a “serving weight,” which determined the nutrient and food group contribution from each item on the menu. For the unweighted analysis, “offer weights” were calculated, as described above, and are shown for both a school that uses food-based menu planning and a school that uses nutrient-standard menu planning.

The unweighted analysis for both menu-planning systems assumed one entrée and one serving of milk for each student (even though the number of portions served indicates that not all students that received a reimbursable lunch took milk). Thus, offer weights were calculated as 60 for entrees and 100 for each type of milk (base of 300 divided by number of options offered).

For schools using food-based menu planning, as described in section A, offer weights for fruit/vegetables depended on the number of servings students were allowed to take—in the case shown in Table D.1, it was three servings, as reported by the FSM. The fruit/vegetable offer weight was calculated with a base of 300 meals, multiplied by the three allowed servings, and then divided by the four fruit/vegetable menu items offered ($900 \div 4$). A full weight of 300 was assigned to both the dinner roll and the brownie, as each was the only food offered within its respective meal component group (grain/bread and dessert/other, respectively). The nacho chips, butter, and Italian dressing were given the same offer weight as the item each was linked to. Finally, the offer weights for unlinked accompaniments were split evenly between the three condiments – ketchup, mustard, and taco sauce ($300 \div 3$).

Schools using nutrient-based menu planning did not differentiate between types of sides, but did limit students to a maximum of three sides per lunch. Consequently, the offer weight for orange juice, peaches, French fries, side salad, dinner roll, and brownie was calculated as 300 multiplied by three sides per meal, divided by the six side options on the menu ($900 \div 6$). Foods linked to any of the sides, like the salad dressing and butter, all received the same offer weight as the side (150). The rules for assigning offer weights to unlinked accompaniments for the nutrient-based lunch were the same as the food-based lunch.

Table D.1. Example of Weighting Factors For Unweighted and Weighted Nutrient and Food Group Analysis of National School Lunch Program Menus

	Weighted Analysis	Unweighted Analysis	
		Food-based Menu Planning ^a	Nutrient-based Menu Planning ^b
Number of Reimbursable Meals	550	300	300
	Number of Portions Served/Offered		
Menu Item			
1% Milk	255	100	100
Skim Milk	25	100	100
2% Chocolate Milk	195	100	100
Hamburger	85	60	60
Taco	40	60	60
Cheese Pizza	250	60	60
Beef and Bean Burrito	50	60	60
Chicken Patty Sandwich	125	60	60
Orange Juice	435	225	150
Canned Peaches	295	225	150
French Fries	525	225	150
Side Salad	300	225	150
Dinner Roll (not linked to entrée)	315	300	150
Nacho Chips (linked to taco)	40	60	60
Brownie	350	300	150
Ketchup	225	100	100
Mustard	75	100	100
Butter (linked to roll)	250	300	150
Taco Sauce	100	100	100
Italian Dressing (linked to salad)	325	225	150

Note: Information on actual number of portions served for weighted analysis (serving weights) was provided by school foodservice managers. Weighting factors assumed for the unweighted analysis (offer weights) were assigned by Mathematica staff assuming an equal distribution across menu items within the same meal component group (milks, entrees, fruit/vegetables, breads/grains, desserts/other, and condiments).

^aOffer weights for fruit/vegetables were based on the assumption that students could take three servings of fruit/vegetables (as reported by the foodservice manager). Thus, the base number of meals for fruit/vegetable weights was 3 times 300, or 900 meals.

^bOffer weights assumed that students were allowed to take up to three sides, of any type, per meal (as reported by the foodservice manager). The base for computing weights for sides was then 3 times 300, or 900 meals. Sides included the fruit and vegetables, breads/grains, and desserts.

D. Assessing the Percentage of Schools Meeting SMI Nutrition Standards and Other Relevant Recommendations

A key outcome for the analyses of NSLP lunches and SBP breakfasts *offered* and *served* was to assess the proportion of schools with average meals that satisfied the SMI nutrition standards (the standards that were in place at the time SNDA-IV data were collected) and other relevant nutrition recommendations. As described in Chapters 5 and 7 of this report (Tables 5.1 and 7.1), the SMI standards specify quantitative goals for (1) calories, protein, and key vitamins and minerals—which, at the time of this report, were based on the 1989 RDAs; and (2) total fat and saturated fat, which

incorporate the 1995 *Dietary Guidelines* recommendations (USDA and HHS 1995). Meal-specific benchmarks assume one-third of the 1989 RDAs for lunch and one-fourth for breakfast.

The SMI standards do not include specific quantitative goals for sodium, cholesterol, or fiber, but regulations encourage a “reduction” of sodium and cholesterol content and an “increase” in dietary fiber content. For SNDA-IV, benchmarks based on the 2010 *Dietary Guidelines* (USDA and HHS 2010) were used to assess the sodium, cholesterol, and dietary fiber content of school meals. In addition, an additional standard for fat content was used, based on the 2010 *Dietary Guidelines* recommendation for school-age children. It is important to note that schools were not required to meet these standards at the time data were collected.

The analysis also included an assessment of the proportion of schools that met all of the SMI standards, as well as different combinations of SMI standards and other benchmarks. The combinations included in the analysis were developed in consultation with FNS staff, and some were designed to provide insight into how school meals *offered* and *served* in SY 2009–2010 compared to potential new requirements for school meals that were under consideration at the time this report was prepared.

1. Calories and Target Nutrients

The SMI minimum requirements for calories and key nutrients in NSLP and SBP meals are 33 percent of RDA and 25 percent of RDA, respectively. One methodological issue that arises in assessing the percentage of schools whose average meals meet these standards is defining the specific RDA values to use for each school since the 1989 RDAs differ for children of different ages. SMI regulations and technical guidance provide RDA-based standards for menu planning and for State agencies conducting a nutrient analysis of school meals as part of an SMI review. For schools using food-based menu planning, separate RDA-based standards for NSLP lunches are provided for various meal pattern grade groups (K through 3, K through 6, 4 through 12, and 7 through 12).⁷ Schools using nutrient-based menu planning have the option of using the RDA-based standards provided for specific age or grade groups or customizing their standards to the ages of children in the school, using USDA-approved nutrient standard menu-planning software. In assessing compliance with nutrition standards, SMI reviewers are required to use the standards for the same age/grade group(s) the SFA or school has used to plan its menus. This information, however, was not available for the analysis of meals *offered* and *served* in SNDA-IV.

Following the approach used in SNDA-II and SNDA-III, the RDA-based standards used in the SNDA-IV menu analyses were customized for each school, based on the range of grades participating in the NSLP and SBP. The resulting RDA standards for schools with grade spans that encompassed more than one RDA age/gender group (1 to 3 years, 4 to 6 years, 7 to 10 years, 11 to 14 years, and 15 to 18 years) reflect the proportion of each RDA age group in that school, with equal weight given to each group. For example, the RDA standard used for an elementary school comprised of students in kindergarten (mainly 5-year olds) through grade 5 (mainly 10-year olds) is a

⁷ Because the age groups for which 1989 RDAs were established do not correspond exactly to USDA meal pattern grade groups, the RDA-based standards were derived by weighting the values for relevant age groups. For schools with a broad range of grades, regulations require that standards for at least two grade or age groups be used when planning and analyzing lunch menus. For breakfast, standards for all schools are based on RDAs for grades K through 12.

weighted average of the 1989 RDAs for the 4-to-6 and 7-to-10 age groups. The RDA standard for this school would be customized as follows: [(RDA for 4-to-6 year olds * 2/6) + (RDA for 7-to-10 year olds * 4/6)].

In addition to ensuring comparability with SNDA-II and SNDA-III, the customized approach to establishing specific RDA-based standards offers two other important features: (1) it provides the most accurate assessment of how well the meals *offered* and *served* meet the nutritional needs of the children in the school⁸ and (2) it allows all schools' menus to be assessed with a common method. Still, it is important to recognize that the approach may yield slightly different results than those from an SMI review for an individual school.

To facilitate interpretation of results from analyses of the percentage of schools that *offered/served* meals that satisfied the RDA-based standards, the minimum standards for NSLP lunches for grade spans K through 6 and 7 through 12, and for SBP breakfasts, for K through 12, are shown in Table D.2.⁹ These values approximate the RDA-based standards that would have been used by SMI reviewers for the vast majority of schools in the SNDA-IV sample. Taking into account the flexibility allowed schools with only one grade outside the established ranges, 87 percent of elementary schools fell into the K through 6 range, and 89 percent of middle schools and 100 percent of high schools had grades exclusively in the 7 to 12 range. Thus, the likelihood that results from SNDA-IV and SMI review comparisons with RDA-based standards would differ is limited to only a small share of schools.

Table D.2. Minimum Calorie and Nutrient Levels for National School Lunch Program Lunches and School Breakfast Program Breakfasts

	NSLP Lunches		SBP Breakfasts
	Grades K-6	Grades 7-12	Grades K-12
Calories	664	825	554
Protein (g)	10	16	10
Vitamin A (RE)	224	300	197
Vitamin C (mg)	15	18	13
Calcium (mg)	286	400	257
Iron (mg)	3.5	4.5	3.0

Source: SMI regulations for NSLP and SBP menus planned under the nutrient-standard or enhanced food-based menu-planning systems (7 CFR Parts 210 and 220; Office of the Federal Register 2004). Required nutrient levels for menus planned under the traditional food-based system are specified for grades K-3 and 4-12 (not shown), with grades 7-12 optional for lunch.

Note: Calorie and nutrient targets are based on one-third of the 1989 *Recommended Dietary Allowances* (RDAs) for specified grade groups at lunch and one-fourth of the 1989 RDA at breakfast (National Research Council 1989).

RE = Retinol equivalent; NSLP = National School Lunch Program; SBP = School Breakfast Program.

⁸ In addition, the approach is consistent with USDA menu planning guidance for schools using nutrient-based menu planning.

⁹ Specific standards for all age/grade groups using in NSLP menu planning can be found in program regulations or "Nutrient Analysis Protocols: How to Analyze Menus for USDA's School Meals Programs." (USDA/FNS n.d.) <http://www.fns.usda.gov/tn/resources/nutrientanalysis.html>.

Note that under the current regulations, secondary schools are permitted to plan and serve breakfasts that meet less-stringent criteria than the customized RDA-based standards used in SNDA-IV analyses. (The minimum RDA-based nutrition standards for the SBP are defined for all children in grades K through 12.) Supplemental analyses conducted for SNDA-II found that when minimum SBP nutrition standards were used as a benchmark, the percentage of secondary schools that met the RDA-based standards was greater and, for some nutrients, the percentage of elementary schools was lower than that observed using customized RDA standards (Fox et al., 2001; Exhibit B.3).

The average and distribution of nutrients per 1,000 calories in NSLP lunches and SBP breakfasts *offered* and *served* were also compared to DRIs per 1,000 calories. The per-1,000-calorie reference standards were based on RDAs, AIs, ULs, and 2010 *Dietary Guidelines* recommendations. The DRI age groups are 4 to 8 years, 9 to 13 years, and 14 to 18 years. A weighted calorie level was used for each age group, assuming a moderately active level of physical activity (IOM 2010). The following calorie levels were assumed for each age/gender subgroup: 1,700 calories for males and females 4 to 8 years, 1,900 calories for males and females 9 to 13 years, 2,600 calories for males 14 to 18 years, and 2,000 calories for females 14 to 18 years. These comparisons can be found in Appendix E (Tables E.17 to E.24) and Appendix G (Tables G.17 to G.24).

2. Fat and Saturated Fat

Assessing the proportion of schools with average meals that satisfy the SMI standards for fat and saturated fat was straightforward. The 1995 *Dietary Guidelines* goals of no more than 30 percent of calories from total fat and less than 10 percent of calories from saturated fat apply to all individuals over the age of two, so there was no need to “weight” the standards. The 2010 *Dietary Guidelines* recommendation for fat has been adjusted from no more than 30 percent of calories from total fat to a range of 25 – 35 percent of calories (AMDR); thus, NSLP lunches and SBP breakfast were also compared to this updated benchmark. The *Dietary Guidelines* recommendation for saturated fat has not changed and is therefore the same as the SMI standard. Results of SNDA-IV analyses pertaining to calories from total fat and saturated fat (using the SMI standards) are consistent with those that would be obtained from an SMI review.

3. Cholesterol, Sodium, and Dietary Fiber

Standards based on the 2010 *Dietary Guidelines* were used to assess the cholesterol, sodium, and dietary fiber content of the school meals. For NSLP lunches and SBP breakfasts, weekly averages for each school were compared to one-third and one-fourth, respectively, of the recommended daily limits for sodium and cholesterol. The standard for assessing cholesterol (less than 300 mg) has not changed since the SNDA-I study was conducted. However, the sodium standard used in SNDA-IV is based on the 2010 *Dietary Guidelines* recommendation (less than 2,300 mg per day) and is slightly lower than the benchmark used in previous SNDA studies, which was based on a recommendation of less than 2,400 mg per day. The fiber benchmark is based on a density standard of 14 grams of dietary fiber per 1,000 calories and is higher than the reference standards used in previous SNDA studies.

E. Assessing the Potential Contributions of Reimbursable Meals to USDA Food Patterns

An appropriate and important addition to SNDA-IV is the assessment of food group content of NSLP lunches and SBP breakfasts and how the meals compare to USDA Food Patterns. The analysis examined the average amounts (equivalents) of each food group provided in schools meals in comparison to USDA Food Patterns for a range of age/gender groups and calorie levels appropriate to each school level. The appropriate USDA Food Pattern for any individual depends on calorie requirements, which are determined by age, sex, and activity level. The 12 different USDA Food Patterns, which range from 1,000 calories to 3,200 calories, are designed to meet the needs of healthy individuals 2 years of age and older. To assess the potential contribution of school meals to recommended dietary patterns, USDA Food Patterns for 1,800, 2,000, and 2,400 calories were used as reference standards for elementary schools, middle schools, and high schools, respectively. These are the calorie levels used by the IOM in developing recommendations for revised nutrition standards for school meals (IOM 2010). The USDA Food Patterns for these three calorie levels are shown in Table D.3.

Table D.3. USDA Food Patterns Used to Assess Potential Contributions of School Meals to Recommended Dietary Patterns

	Elementary Schools	Middle Schools	High Schools
Calories	1,800	2,000	2,400
Vegetables (cups/day)	2.5	2.5	3
Dark green (cups/week)	1.5	1.5	2
Red and orange (cups/week)	5.5	5.5	6
Legumes (cups/week)	1.5	1.5	2
Starchy (cups/week)	5	5	6
Other (cups/week)	4	4	5
Fruits (cups)	1.5	2	2
Grains (oz)	6	6	8
Whole grains (oz)	3	3	4
Dairy (cups)	3	3	3
Protein Foods (oz)	5	5.5	6.5
Oils (tsp)	5	6	7
Calories from Solid Fats and Added Sugars (maximum limit)	160	260	330

Source: U.S. Department of Agriculture and U.S. Department of Health and Human Services 2010, Appendix 7, and www.Choosemyplate.com.

Note: Unless otherwise noted, recommendations are average daily amounts. Recommended food group amounts are reported in cup or ounce (oz) equivalents. See U.S. Department of Agriculture and U.S. Department of Health and Human Services 2010, Appendix 7, or www.Choosemyplate.com for information about quantity equivalents for each food group.

cup = cup equivalents; oz = ounce equivalents; tsp = teaspoons.