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**Early Childhood
and Child Care
Study**

**Nutritional Assessment
of the CACFP:
Final Report
Volume II**

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TABLE OF CONTENTS

	<u>Page</u>
List of Exhibits	iii
Acknowledgments	xiii
Executive Summary	xv
Chapter One: Introduction	1-1
Study Background	1-1
Overview of the CACFP	1-1
Organization and Structure of Child Care Sites	1-2
Study Objectives	1-5
Organization of This Report	1-7
Chapter Two: Study Methodology	2-1
Study Design and Data Collection	2-1
Nutrients and Nutrient Standards	2-4
Overview of the Analyses	2-9
Chapter Three: Meals and Snacks Offered by CACFP Providers	3-1
Breakfasts Offered	3-3
Lunches Offered	3-17
Snacks Offered	3-36
All Meals and Snacks Offered	3-43
Chapter Four: Meals and Snacks Consumed by CACFP Participants	4-1
Breakfasts Consumed	4-3
Lunches Consumed	4-13
Snacks Consumed	4-23
All Meals and Snacks Consumed	4-29
Chapter Five: Nutrition Knowledge and Food Service Practices	5-1
Data Sources	5-1
Nutrition Knowledge of CACFP Food Preparers	5-2
Food Service Practices	5-10
Appendix A Methodology Used in Determining the Nutrient Content of Meals and Snacks Offered and Consumed	A-1
Meals and Snacks Offered	A-1
Meals and Snacks Consumed	A-18

TABLE OF CONTENTS
(continued)

		<u>Page</u>
Appendix B	Detailed Tables on Meals and Snacks Offered by CACFP Providers	B-1
Appendix C	Detailed Tables on Meals and Snacks Consumed by CACFP Participants	C-1
Appendix D	Study Design	D-1
	Stage 1: Selection of States	D-3
	Stage 2: Selection of Sponsors	D-4
	Stage 3: Selection of Child Care Providers	D-4
	Stage 4: Selection of Children and Families	D-5
Appendix E	Weighting Methodology	E-1
	Sponsor Weights	E-2
	Provider and Menu Weights	E-3
	Weights for On-site Observations	E-4
Appendix F	Study Implementation	F-1
	Summary	F-1
	Instrumentation	F-4
	Study Implementation	F-6
	Disposition of the Study Sample	F-12
	Followup Survey of Nonresponders	F-21
Appendix G	Reference Tables for Approximate Confidence Intervals	G-1
Appendix H	Reliability of Visual Estimation of Food Intake	H-1
	Methodology	H-1
	Results	H-4
	Conclusions	H-12

LIST OF EXHIBITS

		<u>Page</u>
Exhibit 1	Nutrient Standards Used in the Early Childhood and Child Care Study	xxi
Exhibit 1.1	CACFP Meal Pattern Requirements for Children	1-3
Exhibit 2.1	Research Objective, Data Collection Strategy, and Sample	2-2
Exhibit 2.2	Nutrient Standards Used in the Early Childhood and Child Care Study	2-7
Exhibit 3.1	CACFP Providers Tend to Offer a Fixed Breakfast Menu Each Day but Do Vary Menu Items Over the Course of a Week	3-5
Exhibit 3.2	Foods Most Commonly Offered in CACFP Breakfasts	3-6
Exhibit 3.3	Breakfasts Offered by CACFP Providers Supply More Than One-fourth of the RDA, Except for Energy	3-9
Exhibit 3.4	With the Exception of Energy, Most Providers Offer Breakfasts That Provide at Least One-fourth or More of the RDA	3-10
Exhibit 3.5	Breakfasts Offered by CACFP Providers Are Largely Consistent with <i>Dietary Guidelines</i> and NRC Recommendations	3-12
Exhibit 3.6	With the Exception of Saturated Fat, Most Providers Offer Breakfasts That Meet <i>Dietary Guidelines</i> and NRC Recommendations	3-14
Exhibit 3.7	Sources of Energy and Nutrients in CACFP Breakfasts: Relative Contribution of CACFP Meal Components	3-15
Exhibit 3.8	CACFP Providers Tend to Offer a Fixed Lunch Menu Each Day but Do Vary Menu Items Over the Course of a Week	3-18
Exhibit 3.9	Foods Most Commonly Offered in CACFP Lunches	3-20
Exhibit 3.10	Lunches Offered by CACFP Providers Supply More Than One-third of the RDA, Except for Energy and Iron	3-23

LIST OF EXHIBITS
(continued)

		<u>Page</u>
Exhibit 3.11	With the Exception of Energy and Iron, Most Providers Offer Lunches That Provide at Least One-third of the RDA	3-25
Exhibit 3.12	Lunches Offered by CACFP Providers Are Not Consistent with <i>Dietary Guidelines</i> and NRC Recommendations	3-26
Exhibit 3.13	With the Exception of Cholesterol, Few Providers Offer Lunches That Meet <i>Dietary Guidelines</i> and NRC Recommendations	3-28
Exhibit 3.14	Low-Fat Lunches Are Somewhat Lower in Total Energy Than Other Lunches but Provide Comparable Amounts of Key Nutrients	3-30
Exhibit 3.15	Providers That Offer Low-Fat Lunches Tend to Offer Certain Foods More Often Than Providers That Offer Higher-Fat Lunches	3-32
Exhibit 3.16	Sources of Energy and Nutrients in CACFP Lunches: Relative Contribution of CACFP Meal Components	3-35
Exhibit 3.17	The Afternoon Snack is, by Far, the Most Commonly Offered CACFP Snack	3-37
Exhibit 3.18	Foods Most Commonly Offered in CACFP Morning Snacks	3-39
Exhibit 3.19	Foods Most Commonly Offered in CACFP Afternoon Snacks	3-40
Exhibit 3.20	Snacks Offered by CACFP Providers Supply More Than 10 Percent of the RDA for Energy and Comparable or Greater Percentages of the RDA for Key Nutrients	3-42
Exhibit 3.21	Most CACFP Providers Offer Breakfast and Lunch with One or Two Snacks	3-45
Exhibit 3.22	The Full Complement of Meals and Snacks Offered by Most CACFP Providers Supplies More Than One-half of the RDA for Energy and Substantially More Than Two-thirds of the RDA for Key Nutrients	3-47
Exhibit 3.23	The Meal and Snack Combinations Offered by Most CACFP Providers Meet or Approximate <i>Dietary Guidelines</i> and NRC Recommendations, with the Exception of the Percentage of	

LIST OF EXHIBITS
(continued)

		<u>Page</u>
	Energy from Saturated Fat	3-49
Exhibit 4.1	More Than 80 Percent of CACFP Participants Take Breakfasts That Include All Required Meal Components	4-4
Exhibit 4.2	CACFP Participants Consume About Three-quarters of the Portions of Food Taken at Breakfast	4-6
Exhibit 4.3	CACFP Participants Actually Consume About Three-quarters of the Energy and Nutrients Available in the Breakfasts They Take	4-7
Exhibit 4.4	Breakfasts Consumed by CACFP Participants Provide More Than One-fourth of the RDA, Except for Energy and Iron	4-8
Exhibit 4.5	Breakfasts Consumed by CACFP Participants Five Years of Age and Older Are Largely Consistent with <i>Dietary Guidelines</i> and NRC Recommendations	4-10
Exhibit 4.6	More Than 80 Percent of CACFP Participants Take Lunches That Include All Required Meal Components	4-14
Exhibit 4.7	With the Exception of Vegetables, CACFP Participants Consume More Than 70 Percent of the Portions of Food Taken at Lunch	4-15
Exhibit 4.8	CACFP Participants Actually Consume About Three-quarters of the Energy and Nutrients Available in the Lunches They Take	4-17
Exhibit 4.9	Lunches Consumed by CACFP Participants Provide One-third or More of the RDA, Except for Energy and Iron	4-18
Exhibit 4.10	Lunches Consumed by CACFP Participants Five Years of Age and Older Meet Recommendations for Cholesterol and Sodium Intake but Do Not Meet Recommendations for the Percentage of Energy From Fat, Saturated Fat, or Carbohydrate	4-20
Exhibit 4.11	More Than 80 Percent of CACFP Participants Take Snacks That Include All Required Components	4-24
Exhibit 4.12	CACFP Participants Consume 80 Percent or More of the Portions of Food Taken at Snack	4-26
Exhibit 4.13	CACFP Participants Actually Consume More Than 80 Percent of the Energy and Nutrients Available in the Snacks They Take	4-27

LIST OF EXHIBITS
(continued)

		<u>Page</u>
Exhibit 4.14	Snacks Consumed by CACFP Participants Provide About 10 Percent of the RDA for Energy and Comparable or Greater Percentages of the RDA for All Key Nutrients	4-28
Exhibit 4.15	Most Children in Care Four to Eight Hours per Day Consume at Least Two CACFP Meals and/or Snacks	4-30
Exhibit 4.16	CACFP Meals and Snacks Consumed by Children in Care Four to Eight Hours per Day Make Substantial Contributions to Daily Nutrient Needs	4-31
Exhibit 4.17	CACFP Meals and Snacks Consumed by Five-Year-Old Children in Care Four to Eight Hours per Day Meet Recommendations for Total Fat, Carbohydrate, and Cholesterol but Not for Saturated Fat, Protein, or Sodium	4-33
Exhibit 4.18	Most Children in Care Eight or More Hours per Day Receive Breakfast, Lunch, and One or Two Snacks	4-34
Exhibit 4.19	CACFP Meals and Snacks Consumed by Children in Care Eight or More Hours per Day Provide 50 to 100 Percent of Children's Energy and Nutrient Needs	4-36
Exhibit 4.20	With the Exception of Cholesterol, CACFP Meals and Snacks Consumed by Five-Year-Old Children in Care Eight or More Hours per Day Do Not Meet Recommendations	4-37
Exhibit 5.1	CACFP Food Preparers Have a Reasonably High Level of Nutrition Knowledge	5-4
Exhibit 5.2	CACFP Food Preparers Are Familiar with the Food Guide Pyramid But Have Some Misconceptions About the Nutrient Content of Foods	5-5
Exhibit 5.3	CACFP Food Preparers Know a Lot About How to Implement the <i>Dietary Guidelines</i>	5-8
Exhibit 5.4	According to Food Preparers, CACFP Providers are Implementing Many Food Service Practices That Are Consistent with the <i>Dietary Guidelines</i>	5-12

LIST OF EXHIBITS
(continued)

		<u>Page</u>
Exhibit 5.5	Food Preparers with Food Purchasing Responsibility Make Good Use of Nutrition Labels	5-15
Exhibit 5.6	Food Preparers Give Paramount Consideration to Needs of Children, Sugar Content of Foods, and Sanitation Considerations When Making Food Purchasing Decisions	5-16
Exhibit A.1	Food Groups Used in Determining Average Portions Offered	A-4
Exhibit A.2	Meal-Specific Adjustment Ratios for Each Age Group	A-5
Exhibit A.3	Average Portions Offered by Age Group and Meal	A-7
Exhibit A.4	Food Codes Used for Food Group Analyses	A-20
Exhibit B.1	Percentage of Providers Offering CACFP Breakfast by Hours of Operation	B-1
Exhibit B.2	Mean Energy and Nutrient Content of CACFP Breakfasts Offered by Age Group	B-2
Exhibit B.3	Mean Percentage of RDAs Provided in CACFP Breakfasts Offered by Age Group	B-4
Exhibit B.4	Percentage of Providers Offering CACFP Breakfasts That Provide One-fourth or More of the RDA for Energy and Key Nutrients by Age Group	B-6
Exhibit B.5	Mean Macronutrient, Cholesterol, and Sodium Content of CACFP Breakfasts Offered by Age Group	B-7
Exhibit B.6	Distribution of Macronutrients, Cholesterol, and Sodium in Breakfasts Offered to Five- to Ten-Year-Olds	B-9
Exhibit B.7	Sources of Energy and Nutrients in CACFP Breakfasts	B-10
Exhibit B.8	Mean Energy and Nutrient Content of CACFP Lunches Offered by Age Group	B-11
Exhibit B.9	Mean Percentages of RDAs Provided in CACFP Lunches Offered by Age Group	B-13

LIST OF EXHIBITS
(continued)

		<u>Page</u>
Exhibit B.10	Percentage of Providers Offering CACFP Lunches That Provide One-third or More of the RDA for Energy and Key Nutrients by Age Group	B-15
Exhibit B.11	Mean Macronutrient, Cholesterol, and Sodium Content of CACFP Lunches Offered by Age Group	B-16
Exhibit B.12	Distribution of Macronutrients, Cholesterol, and Sodium in Lunches Offered to Five- to Ten-Year-Olds	B-18
Exhibit B.13	Mean Energy and Nutrient Content of CACFP Lunches with Varying Levels of Energy from Fat	B-19
Exhibit B.14	Sources of Energy and Nutrients in CACFP Lunches	B-20
Exhibit B.15	Mean Energy and Nutrient Content of CACFP Morning Snacks Offered by Age Group	B-22
Exhibit B.16	Mean Percentage of RDAs Provided in CACFP Morning Snacks Offered by Age Group	B-23
Exhibit B.17	Mean Energy and Nutrient Content of CACFP Afternoon Snacks Offered by Age Group	B-25
Exhibit B.18	Mean Percentage of RDAs Provided in CACFP Afternoon Snacks Offered by Age Group	B-26
Exhibit B.19	Mean Energy and Nutrient Content of Most Common Meal Combinations Offered by Age Group: All Providers	B-28
Exhibit B.20	Mean Energy and Nutrient Content of Most Common Meal Combinations Offered by Age Group: Family Day Care Homes	B-30
Exhibit B.21	Mean Energy and Nutrient Content of Most Common Meal Combinations Offered by Age Group: Head Start Centers	B-32
Exhibit B.22	Mean Energy and Nutrient Content of Most Common Meal Combinations Offered by Age Group: Child Care Centers	B-34
Exhibit B.23	Mean Energy and Nutrient Content of Most Common Meal Combinations Offered by Age Group: All Centers	B-36

LIST OF EXHIBITS
(continued)

		<u>Page</u>
Exhibit B.24	Mean Percentage of RDAs Provided in Most Common Meal and Snack Combinations Offered by Age Group: All Providers	B-38
Exhibit B.25	Mean Percentage of RDAs Provided in Most Common Meal and Snack Combinations Offered by Age Group: Family Day Care Homes	B-40
Exhibit B.26	Mean Percentage of RDAs Provided in Most Common Meal and Snack Combinations Offered by Age Group: Head Start Centers	B-42
Exhibit B.27	Mean Percentage of RDAs Provided in Most Common Meal and Snack Combinations Offered by Age Group: Child Care Centers	B-44
Exhibit B.28	Mean Percentage of RDAs Provided in Most Common Meal and Snack Combinations Offered by Age Group: All Centers	B-46
Exhibit B.29	Mean Macronutrient, Cholesterol, and Sodium Content of Most Common Meal Combinations Offered by Age Group: All Providers	B-48
Exhibit B.30	Mean Macronutrient, Cholesterol, and Sodium Content of Most Common Meal Combinations Offered by Age Group: Family Day Care Homes	B-50
Exhibit B.31	Mean Macronutrient, Cholesterol, and Sodium Content of Most Common Meal Combinations Offered by Age Group: Head Start Centers	B-52
Exhibit B.32	Mean Macronutrient, Cholesterol, and Sodium Content of Most Common Meal Combinations Offered by Age Group: Child Care Centers	B-54
Exhibit B.33	Mean Macronutrient, Cholesterol, and Sodium Content of Most Common Meal Combinations Offered by Age Group: All Centers	B-56
Exhibit C.1	Mean Portion Sizes of CACFP Breakfast Foods Taken by Children	C-1
Exhibit C.2	Mean Percentage of Breakfast Portions Consumed by Age Group	C-2

LIST OF EXHIBITS
(continued)

		<u>Page</u>
Exhibit C.3	Mean Percentage of Available Breakfast Nutrients Actually Consumed	C-3
Exhibit C.4	Mean Energy and Nutrient Intake from CACFP Breakfasts Consumed by Age Group	C-5
Exhibit C.5	Mean Percentage of RDAs Provided in CACFP Breakfasts Consumed by Age Group	C-7
Exhibit C.6	Mean Macronutrient, Cholesterol, and Sodium Content of CACFP Breakfasts Consumed by Age Group	C-9
Exhibit C.7	Mean Portion Sizes of CACFP Lunch Foods Taken by Children	C-11
Exhibit C.8	Mean Percentage of Lunch Portions Consumed by Age Group	C-12
Exhibit C.9	Mean Percentage of Available Lunch Nutrients Actually Consumed	C-14
Exhibit C.10	Mean Energy and Nutrient Intake from CACFP Lunches Consumed by Age Group	C-16
Exhibit C.11	Mean Percentage of RDAs Provided in CACFP Lunches Consumed by Age Group	C-18
Exhibit C.12	Mean Macronutrient, Cholesterol, and Sodium Content of CACFP Lunches Consumed by Age Group	C-20
Exhibit C.13	Mean Percentage of Available Morning Snack Nutrients Actually Consumed	C-22
Exhibit C.14	Mean Percentage of Available Afternoon Snack Nutrients Actually Consumed	C-23
Exhibit C.15	Mean Energy and Nutrient Intake from CACFP Morning Snacks by Age Group	C-24
Exhibit C.16	Mean Percentages of RDAs Provided in CACFP Morning Snacks Consumed by Age Group	C-25
Exhibit C.17	Mean Energy and Nutrient Intake from CACFP Afternoon Snacks by Age Group	C-27

LIST OF EXHIBITS
(continued)

		<u>Page</u>
Exhibit C.18	Mean Percentage of RDAs Provided in CACFP Afternoon Snacks Consumed by Age Group	C-28
Exhibit C.19	Mean Energy and Nutrient Intake from All CACFP Meals and Snacks Consumed by Children in Care Four to Eight Hours per Day by Age Group	C-30
Exhibit C.20	Mean Percentages of RDAs Provided in All Meals and Snacks Consumed by Children in Care Four to Eight Hours per Day by Age Group	C-32
Exhibit C.21	Mean Macronutrient, Cholesterol, and Sodium Content of All CACFP Meals and Snacks Consumed by Children in Care Four to Eight Hours per Day by Age Group	C-34
Exhibit C.22	Mean Energy and Nutrient Intake from All CACFP Meals and Snacks Consumed by Children in Care Eight or More Hours per Day by Age Group	C-36
Exhibit C.23	Mean Percentage of the RDA Provided in All Meals and Snacks Consumed by Children in Care Eight or More Hours per Day by Age Group	C-38
Exhibit C.24	Mean Macronutrient, Cholesterol, and Sodium Content of All Meals and Snacks Consumed by Children in Care Eight or More Hours per Day by Age Group	C-40
Exhibit D.1	Overview of Study Design	D-2
Exhibit D.2	States Included in Study Sample by FCS Region	D-3
Exhibit F.1	Data Collection Strategy by Study Objective	F-2
Exhibit F.2	Sample Disposition: Family Day Care Home Sponsors, Providers, and Children	F-14
Exhibit F.3	Sample Disposition: Head Start Center Sponsors, Providers, and Children	F-17
Exhibit F.4	Sample Disposition: Child Care Center Sponsors, Providers, and Children	F-20

LIST OF EXHIBITS
(continued)

		<u>Page</u>
Exhibit F.5	Response Rates for Sponsors, Providers, and Children	F-22
Exhibit F.6	Sample Size, Number of Completed Interviews, and Response Rates	F-25
Exhibit G.1a	Confidence Intervals for Proportions Based on a Sample from Children in FDCHs	G-3
Exhibit G.1b	Confidence Intervals for Proportions Based on a Sample from Children in Head Start Centers	G-4
Exhibit G.1c	Confidence Intervals for Proportions Based on a Sample from Children in Child Care Centers	G-5
Exhibit G.2a	Confidence Intervals for Proportions Based on a Sample from FDCH Providers	G-6
Exhibit G.2b	Confidence Intervals for Proportions Based on a Sample from Head Start Centers	G-7
Exhibit G.2c	Confidence Intervals for Proportions Based on a Sample from Child Care Centers	G-8
Exhibit G.3a	Confidence Intervals for Proportions Based on a Sample from FDCH Sponsors	G-9
Exhibit G.3b	Confidence Intervals for Proportions Based on a Sample from Head Start Sponsors	G-10
Exhibit G.3c	Confidence Intervals for Proportions Based on a Sample from Child Care Center Sponsors	G-11
Exhibit H.1	“Gold Standard” and Validators’ Estimates of the Nutrient Content of Foods	H-5
Exhibit H.2	Correlations Between “Gold Standard” and Validators' Observations of Nutrient Content of Foods	H-7
Exhibit H.3	Differences Between Field Observers’ and Validators’ Estimates of Nutrient Intake	H-9
Exhibit H.4	Correlations Between Validator and Field Observer Estimates of Nutrient Intake	H-10
Exhibit H.5	Regression Results Predicting Overall Absolute Differences	

LIST OF EXHIBITS
(continued)

Page

Between Validator and Observer Estimates of Nutrient Intake H-11

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Frederic B. Glantz
Project Director
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Executive Summary

This report presents findings from the Early Childhood and Child Care Study, a study carried out by Abt Associates Inc. of Cambridge, Massachusetts, under contract to the Food and Consumer Service (FCS) of the United States Department of Agriculture (USDA). The study describes the institutions and children that participate in the Child and Adult Care Food Program (CACFP). It also describes the nutrient content of meals and snacks offered under the program and the contribution of CACFP meals and snacks to the daily energy and nutrient needs of participating children. Information for the study was collected from nationally representative samples of sponsoring agencies, participating child care sites, and children. Data for the study were collected between January and June, 1995.

This is the second of two volumes of the final study report. This volume focuses on the nutrient content of meals and snacks offered by participating child care sites, the meals and snacks consumed by children receiving child care in those sites. Volume I (a separate document) provides a descriptive profile of child care sites participating in the CACFP and the children receiving care in those sites.

THE CHILD AND ADULT CARE FOOD PROGRAM

The Child and Adult Care Food Program (CACFP) is a Federal program that provides meals and snacks in child and adult day care facilities. The child care component of the CACFP provides Federal funds for meals and snacks served to children in nonresidential day care facilities. These include family and group day care homes (homes), Head Start centers, and some child care centers. In fiscal year 1995, the program served an average of 2.4 million children daily at a cost of \$1.5 billion. Forty-two percent of these children were served through homes; 58 percent through centers.

This report describes meals and snacks *offered* by child care sites participating in the CACFP (CACFP providers) as well as meals and snacks *consumed* by children receiving care in those sites (CACFP participants). Information on the average nutrient content of CACFP meals are compared to the *Recommended Dietary Allowances* (RDAs), which establish benchmarks for average daily intake of energy and key nutrients by age group and gender, and to recommendations included in the *Dietary Guidelines for Americans* and the National Research Council's (NRC) *Diet and Health* report. The *Dietary Guidelines* and NRC recommendations address intake of fats, carbohydrate, and protein, as well as sodium and cholesterol, and are applied only to older children (five- to ten-year-olds). It must be emphasized that these standards are used only to facilitate interpretation of the data; *CACFP providers are not required to meet these or any other nutrient standards.*

MEALS AND SNACKS OFFERED BY CACFP PROVIDERS

Breakfasts and Lunches

- The average nutrient content of CACFP breakfasts and lunches, as offered, meets or exceeds all of the RDA standards used in this study (one-fourth of the RDA for breakfasts and one-third for lunches), except for energy (breakfasts and lunches) and iron (lunches).
- **Breakfasts** offered to children five years of age and older supply 23 percent of total energy as fat, a level that is consistent with recommendations that no more than 30 percent of total energy come from fat. The average proportion of energy from carbohydrate (64%) is also consistent with recommendations, as are average amounts of cholesterol (51 mg) and sodium (445 mg).
- **Breakfasts** are *not* consistent with the recommendation for the percentage of energy from saturated fat (11% percent compared to the recommendation of less than 10%). The actual amount of saturated fat in CACFP breakfasts is not excessive, however, compared to the amount of saturated fat allowable in a meal that provides one-fourth of the RDA for energy and less than 10 percent of the energy as saturated fat. The reason CACFP breakfasts do not meet the saturated fat recommendation has more to do with the limited amount of energy provided than with an excessive amount of saturated fat. In fact, if the average energy content of CACFP breakfasts were increased by about 70 calories for five-year-olds and 55 calories for six- to ten-year-olds, by offering more carbohydrate-rich foods such as juices, fruit, and low-fat breads and bread alternates, there would be no need to reduce actual saturated fat content.
- **Lunches** offered to children five years of age and older do *not* meet recommendations for the percentage of energy from fat, saturated fat, or carbohydrate. The average percentage of energy from fat is 35 percent; the recommended level is no more than 30 percent. The average percentage of energy from saturated fat is 14 percent, a level which exceeds the recommendation of less than 10 percent, and the average percentage of energy from carbohydrate is 47 percent, compared to the recommendation of 55 percent or more.
- The average cholesterol content of CACFP **lunches** is consistent with the recommended level (65 mg compared to the recommended range of 100 mg or less). The average sodium content, however, does *not* meet the recommendation (919 mg compared to the recommended range of 800 mg or less).

Snacks

- Both morning and afternoon snacks offered in the CACFP supply more than 10 percent of the RDA for energy and comparable or greater percentages of the RDA for key nutrients. Snacks are especially rich in vitamin C, providing one-third (afternoon snacks) to 40 percent (morning snacks) of the RDA.

All Meals and Snacks Offered

- The full complement of meals and snacks offered by most CACFP providers supplies more than one-half of the RDA for energy and substantially more than two-thirds of the RDA for all key nutrients.
- The combinations of meals and snacks most commonly offered in the CACFP provide an average of 30 to 31 percent of energy from fat, levels which approximate the recommendation of 30 percent or less. Likewise, the percentage of energy from carbohydrate, 55 to 56 percent, is consistent with recommendations.
- The percentage of energy from saturated fat in the most common meal and snack combinations (13%) is *not* consistent with the recommended level of less than 10 percent.
- To be consistent with recommendations for cholesterol and sodium intake, meals and snacks should make equivalent contributions to recommended intakes of energy, cholesterol, and sodium. The most common meal and snack combinations offered in the CACFP meet this standard for cholesterol but not for sodium.

MEALS AND SNACKS CONSUMED BY PARTICIPATING CHILDREN

The nutrient profile of meals and snacks actually consumed by participating children may differ from the meals and snacks offered by providers. For example, children may decline one or more of the foods offered; children may select portions that differ from the average portion; or children may waste (not consume) some of the food they take. Thus to gain a full understanding of the contributions CACFP meals and snacks actually make to children's daily energy and nutrient needs, it is important to examine CACFP meals and snacks *as actually consumed* by children.

Breakfasts and Lunches

- Children generally select portions of food that are equivalent to, or greater than, the minimum portion sizes specified in CACFP meal pattern requirements. Children generally consume between 70 and 75 percent of the portions of food taken at breakfast and lunch. Different types of food are consumed in approximately equal proportions at breakfast. At lunch, the average proportion of milk consumed is substantially higher (83%) and the average proportion of vegetables consumed is substantially lower (59%) than other foods.
- Children's average nutrient intake from CACFP breakfasts and lunches meets or exceeds all of the RDA standards used in this study (one-fourth of the RDA for breakfast and one-third of the RDA for lunch), except for energy and iron.
- On average, 24 percent of the energy in **breakfasts** consumed by CACFP participants five years of age and older comes from fat, a level that is consistent with recommendation of no more than 30 percent. Carbohydrate intake is also consistent with recommendations, as are intakes of cholesterol and sodium.

- The average percentage of energy from saturated fat in CACFP **breakfasts** consumed by children (11%) does *not* meet the recommendation of less than 10 percent. This finding is not surprising because, as discussed above, breakfasts *offered* by CACFP providers do not meet the recommendation for energy from saturated fat. As noted above, however, the reason that CACFP breakfasts, both as offered to and consumed by children five and older, do not meet recommendations for the percentage of energy from saturated fat has more to do with the limited energy contribution of CACFP breakfasts than with excessive amounts of saturated fat, per se.
- The average percentage of energy from fat (35%) and carbohydrate (46%) in **lunches** consumed by CACFP participants five years of age and older is not consistent with recommendations (no more than 30% and 55% or more, respectively). It is important to note that the reason CACFP lunches, as consumed, do not meet the recommendation for the percentage of energy from fat has more to do with the fact that lunches provide a limited amount of energy, specifically energy from carbohydrate, than with excessive amounts of fat.
- The average percentage of energy from saturated fat in CACFP **lunches** consumed by children five years and older does not meet the recommendation (15%, compared to the recommendation of less than 10%). The limited energy contribution of CACFP lunches does not explain this finding. Lunches consumed by children, like the lunches offered by providers, supply more saturated fat (total amount as well as a percentage of total energy) than recommended.
- Achieving the desired balance in sources of food energy in CACFP lunches, that is, increasing consumption of energy from carbohydrate while, at the same time, decreasing consumption of saturated fat may be difficult in light of the fact that children do not consume all of the foods presently taken at lunch. Because young children's appetites are self-limiting, it may be more reasonable to offset calories from fat consumed at lunch with carbohydrate calories in a snack that precedes or follows lunch.
- Lunches consumed by CACFP participants five years of age and older meet recommendations for cholesterol and sodium intake.

Snacks

- On average, children consume approximately 80 percent or more of the portions of food taken at snack. The mean rate of consumption is consistently higher for morning snacks. Snacks consumed by CACFP participants provide, on average, about 10 percent or more of the RDA for energy and comparable or greater percentages of the RDA for key nutrients.

All Meals and Snacks Consumed

Because the number of CACFP meals and snacks available to children is influenced by the amount of time spent in care, findings are summarized separately for children in care *at least* four but *less than* eight hours per day (children in part-day care) and for children in care eight or more hours per day (children in full-day care).¹

Children in Care Four to Eight Hours per Day

- Most children in part-day care consume at least two CACFP meals and/or snacks while in care. The most common meal and snack combinations are: lunch and one snack (24% of all children), breakfast, lunch, and one snack (25% of children), and breakfast and lunch (23% of children). About 18 percent of part-day children receive only one meal or snack. This is particularly true among part-day children attending child care centers, where 36 percent of part-day children receive only one meal or snack.
- On a typical day, children in care at least four but less than eight hours per day consume, from CACFP meals and snacks, an average of about one-third of the RDA for energy and iron and about one-half of the RDA for calcium. Intakes of other nutrients are substantially higher, averaging 108 percent of the RDA for protein, 80 percent of the RDA for vitamin A, and 86 percent of the RDA for vitamin C.
- Mean intakes among children receiving part-day care in child care centers are lower than children receiving part-day care in homes and Head Start centers. This is consistent with the fact that 23 percent of part-day children in centers receive only one snack and another 13 percent receive only breakfast or lunch.
- The average nutrient intake of five-year-olds in part-day care meets recommendations for the percentage of energy from fat (29% compared to the recommendation of no more than 30%) and carbohydrate (56% compared to the recommendation of at least 55%), but does not meet the recommendation for the percentage of energy from saturated fat (12% compared to the recommendation of less than 10%).

¹School-age-children (six-to-ten year olds) are excluded from these tabulations because most of these children are in care before and/or after school and their patterns of consumption differ substantially from other children in care.

- Cumulative intake of sodium and cholesterol from all CACFP meals and snacks is evaluated with respect to the cumulative contribution to the RDA for energy. Ideally, relative contributions to recommended daily intakes of energy, cholesterol, and sodium should be comparable. Five-year-olds in part-day care consume, on average, 31 percent of the RDA for energy from CACFP meals and snacks. These meals and snacks also contribute 22 percent of the suggested daily limit of cholesterol, an acceptable level in light of the mean contribution to recommended energy intake. Mean contribution to the suggested daily limit for sodium intake is 35 percent, a level which is somewhat high because it exceeds the contribution to recommended daily energy intake.

Children in Care Eight or More Hours per Day

- Three-quarters of children in care eight or more hours per day (full-day care) consume breakfast, lunch, and one or two snacks while in care. Another 19 percent of children consume lunch and one or two snacks, while another four percent consume breakfast and lunch. None of the children in full-day care receive only one meal or snack.
- The total complement of meals and snacks consumed by children in care eight or more hours per day provides an average of about one-half of the RDA for energy and iron. Intake of calcium from CACFP meals and snacks approximates, on average, three-quarters of the RDA. Average intakes of protein, vitamin A, and vitamin C exceed 100 percent of the RDA.
- On average, the total complement of meals and snacks consumed by five-year-old children in full-day care provides 32 percent of energy from fat (recommendation is no more than 30%), 14 percent of energy from saturated fat (recommendation is less than 10%), and 53 percent of energy for carbohydrate (recommendation is at least 55%).
- Five-year-old children in full-day care consume an average of 49 percent of the RDA for energy and 33 percent of the suggested daily limit for cholesterol. By contrast, sodium intake from CACFP meals and snacks contributes 52 percent of the suggested daily limit for sodium, a level which is somewhat high in comparison to the contribution to recommended daily energy intake.

Exhibit 1

Nutrient Standards Used in the Early Childhood and Child Care Study

National School Lunch Program and School Breakfast Program

- One-fourth of the RDA for breakfast
- One-third of the RDA for lunch

Dietary Guidelines for Americans¹

- Limit intake of total fat to no more than 30 percent of total calories
- Limit intake of saturated fat to less than 10 percent of total calories

National Research Council's *Diet and Health Report*¹

- Increase intake of carbohydrate to at least 55 percent of total calories
 - Limit cholesterol intake to 2,400 mg or less per day
 - Limit sodium intake to 300 mg or less per day
-

¹Applied only to meals offered to and consumed by children five years of age and older.

Chapter One

Introduction

STUDY BACKGROUND

The Early Childhood and Child Care Study was carried out by Abt Associates Inc. of Cambridge, Massachusetts, under contract to the Food and Consumer Service (FCS) of the United States Department of Agriculture (USDA). The study describes the institutions and children that participate in the Child and Adult Care Food Program (CACFP). It also describes the nutrient content of meals and snacks offered under the program and the contribution of CACFP meals and snacks to the daily energy and nutrient needs of participating children. Information for the study was collected from nationally representative samples of sponsoring agencies, participating child care sites, and children. Data for the study were collected between January and June, 1995.

This is the second of two volumes of the final study report. This volume focuses on the nutrient content of meals and snacks offered by participating child care sites and the meals and snacks consumed by children receiving child care in those sites. Volume I (a separate document) provides a descriptive profile of child care sites participating in the CACFP and the children receiving care in those sites.

OVERVIEW OF THE CACFP

The CACFP is a Federal program that provides meals and snacks in child and adult day care facilities. The Early Childhood and Child Care Study focused on the child care component of the CACFP which provides Federal funds for meals and snacks served to children in non-residential day care facilities. Eligibility is limited to children age 12 and under; however, an exception is made for children of migrant workers and children with disabilities, who may participate through ages 15 and 18, respectively. Participating sites, which include family and group day care homes (homes), some child care centers, and all Head Start centers, may receive reimbursement for breakfasts, lunches, suppers, and snacks served to children in care. Reimbursement is limited to a maximum of two meals and one snack or one meal and two snacks. During the period of time this study was conducted, centers could

receive reimbursement for an additional meal or snack for children in care eight or more hours per day.¹ On an average day in 1995, 2.3 million children received CACFP meals and/or snacks.

CACFP Meal Pattern Requirements

The goal of the CACFP is to provide nutritious meals and snacks to children in child care programs. To this end, USDA has established minimum requirements for the meals and snacks offered by participating child care providers (CACFP providers). These meal pattern requirements are designed to ensure that meals and snacks are nutritionally well-balanced, supplying the kinds and amounts of food required to meet childrens' daily energy and nutrient needs. The meal pattern specifies foods (meal components) to be offered at each meal and snack as well as minimum portion sizes for children of different ages [infants (less than 12 months); one and two years; three to five years; and six to twelve years]. Meal component requirements are summarized in Exhibit 1.1.

In addition to the meal pattern, USDA provides CACFP providers with a variety of guidance materials to assist menu planners in using meal pattern requirements to plan meals that are appealing and age appropriate as well as nutritious.

ORGANIZATION AND STRUCTURE OF CHILD CARE SITES

The CACFP is administered in two fundamentally different child care settings: homes and child care centers (including Head Start centers). Homes are small. They usually consist of one provider caring for six to eight children in his or her own home.² The typical center, on the other hand, enrolls between 50 and 100 children. Homes are shorter lived than centers. In addition, homes tend to offer more hours of care and are more likely than centers to be open on weekends. Because of the differences between homes and centers, the CACFP applies

¹The Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (P.L. 104-193) mandated several changes to CACFP regulations. These changes include a reduction in the number of meals that CACFP centers may claim for reimbursement to a maximum of two meals and one snack or one meal and two snacks, regardless of the length of time a child is in attendance.

²Some homes are larger and are called group day care homes.

Exhibit 1.1

CACFP Meal Pattern Requirements for Children

	Children 1 and 2 Years	Children 3–5 Years	Children 6–12 Years
Breakfast			
Milk, fluid	1/2 cup	3/4 cup	1 cup
Juice or fruit or vegetable	1/4 cup	1/2 cup	1/2 cup
Bread and/or cereal, Enriched or whole grain bread	1/2 slice	1/2 slice	1 slice
Cereal: Cold dry	1/4 cup ¹	1/3 cup ²	3/4 cup ³
or Hot cooked	1/4 cup	1/4 cup	1/2 cup
Midmorning or midafternoon snack (supplement)			
(Select 2 of these 4 components)			
Milk, fluid	1/2 cup	1/2 cup	1 cup
Meat or meat alternate ⁴	1/2 oz.	1/2 oz.	1 oz.
Juice or fruit or vegetable	1/2 cup	1/2 cup	3/4 cup
Bread and/or cereal, Enriched or whole grain bread	1/2 slice	1/2 slice	1 slice
Cereal: Cold dry	1/4 cup ¹	1/3 cup ²	3/4 cup ³
or Hot cooked	1/4 cup	1/4 cup	1/2 cup
Lunch or Supper			
Milk, fluid	1/2 cup	3/4 cup	1 cup
Meat or meat alternate			
Meat, poultry, or fish, cooked (lean meat without bone)	1 oz	1 1/2 oz.	2 oz.
Cheese	1 oz.	1 1/2 oz.	2 oz.
Egg	1	1	1
Cooked dry beans and peas	1/4 cup	3/8 cup	1/2 cup
Peanut butter or other nut or seed butters	2 Tbsp.	3 Tbsp.	4 Tbsp.
Nuts and/or seeds	1/2 oz. ⁵	3/4 oz. ⁵	1 oz. ⁵
Vegetable and/or fruit (two or more)	1/4 cup	1/2 cup	3/4 cup
Bread or bread alternate, Enriched or whole grain	1/2 slice	1/2 slice	1 slice

¹1/4 cup (volume) or 1/3 ounce (weight), whichever is less.

²1/3 cup (volume) or 1/2 ounce (weight), whichever is less.

³3/4 cup (volume) or 1 ounce (weight), whichever is less.

⁴Yogurt may be used as a meat/meat alternate for snacks only. May serve 4 ounces (weight) or 1/2 cup (volume) of plain or sweetened and flavored yogurt to fulfill the equivalent of 1 ounce of the meat/meat alternate component. For younger children, 2 ounces (weight) or 1/2 cup (volume) may fulfill the equivalent of 1 ounce of the meat/meat alternate requirement.

⁵This portion may meet only one-half of the total serving of the meat/meat alternate requirement for lunch or supper. Nuts or seeds must be combined with another meat/meat alternate to fulfill the requirement. For determining combinations, 1 ounce of nuts or seeds is equal to 1 ounce of cooked lean meat, poultry, or fish.

CAUTION: Children under 5 are at the highest risk of choking. USDA recommends that any nuts and/or seeds be served to them in a prepared food and be ground or finely chopped.

different rules for reimbursement and administration, as well as different criteria for participation, to the two types of providers. These differences are described in the following sections.

Centers

Licensed centers, both public and private, are eligible to participate in the CACFP if they are nonprofit institutions. For-profit institutions are also eligible to participate if they receive compensation for child care under Title XX of the Social Security Act for at least 25 percent of the children enrolled or 25 percent of their licensed capacity, whichever is less. Centers may participate in the CACFP independently or under the aegis of a nonprofit agency that assumes administrative responsibility for the centers it sponsors (sponsored centers).

Centers receive three different categories of reimbursement for the meals and snacks they serve, depending on children's family income. Meals and snacks served to children from families with income at or below 130 percent of poverty are reimbursed at the “free” (highest) rate; meals and snacks served to children from families with income between 130 percent and 185 percent of poverty are reimbursed at the “reduced-price” (somewhat lower) rate; and meals served to children from families with income above 185 percent of poverty are reimbursed at the “paid” (lowest) rate.³

Differences Between Child Care Centers and Head Start Centers

Although child care centers and Head Start centers are equivalent with regard to CACFP eligibility and administration, the two types of centers differ in several other important characteristics. Child care centers typically operate year round, provide full-day care to working parents, and serve several different age groups. Head Start centers, on the other hand, typically follow school calendars and offer part-day programs for low-income preschool children. Moreover, Head Start programs do not provide child care per se. Rather, these programs are best viewed as preschool programs intended to promote social competence and improve the emotional and cognitive development of low-income children. While most Head Start centers provide only part-day programs of this nature, some centers may combine traditional part-day Head Start programs with full-day and/or before- and after-school

³This nomenclature is adapted from the National School Lunch Program which uses a comparable three-level reimbursement structure.

child care programs. Head Start centers are required by their grantor agency, the U.S. Department of Health and Human Services, to participate in the CACFP.

Homes

To participate in the CACFP, homes must meet State licensing requirements, where these are imposed, or be approved by a Federal, State, or local agency. In addition, homes must be sponsored by an organization that assumes responsibility for ensuring compliance with Federal and State regulations and that acts as a conduit for meal reimbursements.

Organizations that sponsor homes for the CACFP are reimbursed separately for their administrative costs, based on the number of homes sponsored each month. During the time period that this study was conducted, family day care providers were reimbursed at a flat rate for each meal or snack served. No income eligibility criteria were applied to children receiving meals, however, such a criterion was applied to the provider's own children. Meals served to the provider's own children were reimbursable only if the provider's income did not exceed 185 percent of the poverty threshold.⁴

STUDY OBJECTIVES

Program participation and costs have increased markedly since the last national study of the CACFP was conducted in 1986. The number of Federally subsidized meals and snacks served in the program has increased from 678 million in Fiscal Year (FY) 1986 to 1.5 billion in FY 1995. Most of this growth has occurred in the family day care component of the program. During this same time period, the cost of the program has increased from \$689 million (FY 1986; in constant 1995 dollars)⁵ to \$1.5 billion (FY 1995), an increase of 117 percent. The dramatic increase in the size and cost of the

⁴The Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (P.L. 104-193) changed the reimbursement structure for homes, effective July 1, 1997. A two-tiered structure was established with a higher level of reimbursement (tier I) for meals and snacks served to children enrolled in day care homes located in low-income areas, i.e., areas identified, through the use of census or elementary school data, as areas in which at least 50 percent of children come from households with income at or below 185 percent of the poverty threshold. Tier I rates are also paid for meals and snacks served by low-income providers, i.e., providers whose personal household income is at or below 185 percent of poverty. Homes that do not meet tier I area- or provider-eligibility criteria are classified as tier II homes and receive a lower (tier II) level of reimbursement. Tier II homes may elect to have their sponsor perform means tests to identify individual children whose household income is at or below 185 percent of poverty; meals and snacks served to these children would be reimbursable at tier I rates. Meals and snacks served to a provider's own children continue to be reimbursable (at tier I rates) only if the provider's income is at or below 185 percent of poverty.

⁵The Consumer Price Index (CPI) was used to inflate 1986 costs to 1995 dollars. Program costs were \$496 million in 1986 dollars.

program over the past decade dictates a need for updated information on program operations, providers, and participants.

The 1986 study of the CACFP did not include an in-depth assessment of the nutrient content of meals and snacks offered by CACFP providers or consumed by CACFP participants (children). Nor did it include an assessment of food service practices used in implementing the CACFP. Indeed, these aspects of the CACFP have not been studied in depth since the early 1980s. Given the increased public health focus on the relationship between dietary intake and health status, there is an obvious need for updated information on the nutritional characteristics of CACFP meals and snacks. There is also a need for information on the level of nutrition knowledge possessed by the individuals responsible for preparing meals and snacks in the CACFP, as well as the practices used in planning, preparing, and serving CACFP meals and snacks. Such information can be useful in identifying and addressing technical assistance and training needs.

The Early Childhood and Child Care Study was designed to fill these information gaps. The study has the following specific objectives:

- to describe the food and nutrient content of meals and snacks *offered* by CACFP providers (child care sites);
- to describe the nutrient content of meals and snacks *consumed* by CACFP participants (children) while in care;
- to assess the nutrition knowledge of individuals with primary responsibility for preparing CACFP meals and snacks (food preparers);
- to assess the extent to which desirable food service practices are used in implementing the CACFP;
- to describe the characteristics of participating children and their families; and
- to describe CACFP program characteristics.

The first four objectives are addressed in this volume of the report; the two remaining objectives are addressed in Volume I.

ORGANIZATION OF THIS REPORT

The remainder of this volume is organized as follows:

- Chapter Two presents an overview of the study design and the methodology used to address research objectives related to the characteristics of CACFP meals and snacks;
- Chapter Three describes meals and snacks *offered* by CACFP providers;
- Chapter Four describes meals and snacks *consumed* by participating children; and
- Chapter Five describes the nutrition knowledge of CACFP food preparers as well as the extent to which desirable food service practices are used in procuring and preparing foods for CACFP meals and snacks.

Detailed appendices provide additional information on the methodology used in collecting and analyzing information on meals and snacks offered and consumed as well as supplementary exhibits. Also included are appendices that summarize study design, development of sample weights, and study implementation.

Chapter Two

Study Methodology

This chapter provides an overview of the methodology used to assess the food and nutrient content of meals and snacks offered by CACFP providers and the nutrient content of meals and snacks consumed by CACFP participants (children). The first section provides a brief description of study design and data collection methods. The second section identifies the nutrients examined in the study and the standards used to assess nutritional quality. The final section provides an overview of the two major analyses discussed in this report: analyses of meals and snacks *offered* and meals and snacks *consumed*.

STUDY DESIGN AND DATA COLLECTION

Data were collected from CACFP *providers* (child care sites participating in the CACFP) as well as from CACFP *participants* (children receiving care and consuming meals and snacks in participating child care sites). Data collected from providers were used to describe the food and nutrient content of meals and snacks *offered* in the CACFP; data collected from children were used to describe the nutrient contributions of CACFP meals and snacks actually *consumed* by children in care.¹ The following sections describe the types of data collected, the data collection methodologies used, and the analytic samples. This information is summarized in Exhibit 2.1.

Data from CACFP Providers

All sampled CACFP providers were asked to complete a Menu Survey which requested detailed information on the foods included in meals and snacks offered during a specified five-day period

¹Data were also collected from parents to assess children's nutrient intake outside of child care. However, because response rates for this portion of the study were unacceptably low (see Appendix F), these data are not presented in this report.

(referred to as the target week).² Respondents were asked to list *all* foods offered, including foods

Exhibit 2.1

Research Objective, Data Collection Strategy, and Sample

Research Objective	Data Collection Strategy	Sample
Describe the food and nutrient content of meals and snacks <i>offered</i> by CACFP providers	Mail survey of CACFP providers to collect information on foods included in all meals and snacks offered during a specified five-day period	1,962 CACFP providers ¹
Describe the nutrient content of meals and snacks <i>consumed</i> by participating children	Observation of all meals and snacks consumed by sampled children while in child care on two nonconsecutive days	1,347 children receiving child care in CACFP sites ²

¹Sample size varies for different meals and snacks because all providers do not offer all meals and snacks.

²The number of children observed varies for each meal and snack because children do not necessarily consume all meals and snacks and because sampled children may have been observed on one day or two days.

that may not have contributed to satisfying the CACFP meal pattern (e.g., cakes, sweetened beverages, or snack chips), and to record the following information for each food item: food name; a detailed description (a brochure that outlined the types of descriptive information required for different types of food was included in the survey packet); brand name; preparation; and recipes (when applicable and readily available). Respondents were also asked to indicate the age groups of children to whom each food was offered, recognizing that some foods may not be offered to some groups of children, for example, peanuts or whole grapes may not be offered to toddlers because these foods present an increased risk of choking. The standard CACFP age groups (one- and two-year-olds; three- to five-year-olds; and six- to twelve-year-olds) were used in reporting this information.

²To obtain a reasonable assessment of nutrient content, it is necessary to examine meals offered over a period of time rather than a single meal or a single day's offerings. The National Research Council (NRC) recommends that group feeding programs plan menus so that nutrient standards are met over a five- to ten-day period. A sample five-day period, equivalent to one school week, is routinely used in assessing USDA's Child Nutrition programs.

The Menu Survey did not request information on the size of portions offered because a pretest revealed that most respondents had difficulty describing portions in sufficient detail. Most respondents in the pretest either left the portion-size column blank or recorded very general descriptions such as “one glass” (rather than six fluid ounces) or “one bowl” (rather than one cup).

The Menu Survey was prepared in an easy-to-use booklet format with a separate section for each day and subsections for each potential meal and snack. Detailed instructions were included for each form. Survey materials were mailed to respondents several weeks prior to the specified target week. A toll-free “help” number was provided and respondents were encouraged to call with any questions or problems. Several followup calls were made to each respondent to ensure receipt and completion of survey materials and to provide assistance as needed. A total of 1,962 providers submitted complete Menu Surveys (response rate of 87 percent).³ All surveys were completed between January and June, 1995.

Data from Children

On-site observations of CACFP meal service were conducted in a subsample of homes and centers. Trained field staff conducted two separate observations two days apart (Monday and Thursday or Tuesday and Friday). Observations were conducted during the target week (i.e., the same week covered in the Menu Survey). Each day, staff observed all meals and snacks offered to and consumed by sampled children (maximum of six children per site). To facilitate observations, all children observed in a center or home were seated together.

Before each meal and snack, observers weighed and measured five reference portions of each food to be offered. Then, using visual estimation techniques, observers recorded the total amount of each food received by each sampled child, including second helpings, as well as the total amount of each

³Includes five days of data for most sites. However, because some centers and homes do not operate five days per week or were closed for one or more days during the target week, 26 percent of sites provided data for only four days and 3 percent of sites provided data for three days. Most of these sites are Head Start centers that operate four days per week.

food that was left over (i.e., not consumed by the child). Observations were completed for a total of 1,347 children between the ages of one and ten years.⁴

(Additional information on the visual estimation technique used and the reliability of visual estimates is provided in appendices A and H).

Response rates for this portion of the study were relatively low. The primary problem was not being able to reach parents prior to the target week in order to obtain permission to observe their children. Although permission was received and observations were scheduled for 80 percent of the eligible sample of children in homes, the same was true for only 58 percent of the eligible sample of children in Head Start centers and 60 percent of the eligible sample in child care centers. The difficulty encountered in successfully connecting with parents during the recruiting phase of the study effectively capped the overall response rate for the child observations.

Completion of the planned two days of observation for sampled children was further compromised by absenteeism. Some children scheduled to be observed were not in care on one or both observation days. In homes, 91 percent of the children scheduled for observations were observed on one of the scheduled days; only 67 percent, however, were observed on both scheduled days. In Head Start centers the figures were 95 percent and 72 percent, respectively, and in child care centers, 90 percent and 73 percent, respectively.

It is important to point out, however, that the rate of absenteeism does not influence the effective response rates for the child observations. Since the analysis of data on meals and snacks consumed while in care is intended to describe *children in care on a typical day*, not all children *enrolled* in care, children who were selected into the sample but absent on one or both observation days were not considered nonrespondents for purposes of constructing sample weights for this analysis. Rather, they were considered outside of scope.

⁴Observations were actually completed for a total of 1,388 infants and children. Twenty-nine infants (less than one year of age) are excluded from the analyses presented in this report, however, because they do not consume discrete meals and snacks. (Data were summarized in an internal memo). Likewise, four children over the age of ten are excluded because of the limited size of this group sample. Finally, eight children between the ages of one and ten are excluded because of incomplete information on food intake and/or missing age information.

NUTRIENTS AND NUTRIENT STANDARDS

Nutrients and food components examined in this study include those identified as priorities for public health monitoring by the Joint Nutrition Monitoring Evaluation Committee (JNMEC) of the U.S. Departments of Health and Human Services and Agriculture (1995) and/or targeted by USDA in ongoing efforts to improve the nutritional quality of meals offered in the National School Lunch Program and the School Breakfast Program (7CFR, parts 210 and 220).⁵ These include:

- Food energy
- Total fat
- Saturated fat
- Carbohydrate
- Protein
- Vitamin A
- Vitamin C
- Calcium
- Iron
- Cholesterol
- Sodium

Defining Nutrient Standards

CACFP regulations and guidance materials provide broad standards for meals and snacks offered under the program, however, *specific nutrient-based standards have not been established for CACFP meals and snacks*. Therefore, for the purposes of this study, it was necessary to define a set of nutrient standards that could be used in evaluating the relative nutritional quality of meals and snacks offered and consumed. Such standards were identified for breakfast and lunch, drawing from three sources:

- standards used for other Child Nutrition programs (7CFR, Parts 210 and 220);
- the *Dietary Guidelines for Americans* (U.S. Departments of Health and Human Services and Agriculture, 1995); and
- the National Research Council's (1989b) *Diet and Health* report.

Standards were not defined for snacks because snacks are considered to be supplementary feedings that, on an individual basis, are not expected to make major contributions to children's daily nutrient intake. Likewise, standards were not defined for the total complement of meals and snacks offered

⁵Tabulations were also prepared for thiamin, riboflavin, niacin, vitamin B₆, folate, vitamin B₁₂, phosphorus, magnesium, zinc, and dietary fiber. These data were summarized for FCS staff in an internal memo.

or consumed. Without specific expectations regarding the contribution of snacks, it was not possible to define standards for the cumulative contribution of all meals and snacks consumed.⁶

The standards used in this study are summarized in Exhibit 2.2 and the rationale for their selection is discussed in the following sections. The reader is cautioned to bear in mind the fact that all standards are used strictly to facilitate interpretation of the data presented in this report; ***CACFP meals and snacks are not required to meet these, nor any other, nutrient-based standards.***

⁶Head Start performance standards require that children in part-day programs receive a total of at least one-third of the RDA from all meals and snacks and that children in full-day programs receive one-half to two-thirds of the RDA, depending on the length of the program. These are not USDA-endorsed standards, however, and therefore do not apply to non-Head Start CACFP providers.

Exhibit 2.2

Nutrient Standards Used in the Early Childhood and Child Care Study

Nutrient	Standard	Source
<p>Nutrients with established Recommended Dietary Allowances (RDAs)¹</p> <p>Food energy, protein, vitamin A, vitamin C, calcium, and iron</p>	<p>Breakfast: One-fourth of the RDA</p> <p>Lunch: One-third of the RDA</p>	<p>National School Lunch Program²</p> <p>School Breakfast Program³</p>
<p>Other nutrients and dietary components</p> <p>Total fat</p> <p>Saturated fat</p> <p>Carbohydrate</p> <p>Protein</p> <p>Cholesterol</p> <p>Sodium</p>	<p><i>Only for children five years of age and older:</i></p> <p>Breakfast and Lunch: ≤ 30% of total energy</p> <p>< 10% of total energy</p> <p>≥ 55% of total energy</p> <p>≤ 15% of total energy</p> <p>Breakfast: ≤ 75 mg⁷</p> <p>Lunch: ≤ 100 mg⁸</p> <p>Breakfast: ≤ 600 mg⁷</p> <p>Lunch: ≤ 800 mg⁸</p>	<p><i>Dietary Guidelines for Americans</i>⁴</p> <p>National Research Council⁵</p> <p><i>Dietary Guidelines for Americans</i>⁴</p> <p>National Research Council⁵</p> <p>National Research Council⁵</p> <p>National Research Council^{5,6}</p> <p>National Research Council⁵</p> <p>National Research Council⁵</p>

¹National Research Council (1989a). *Recommended Dietary Allowances*, 10th edition. Washington, D.C.: National Academy Press.

²7CFR, Part 210.

³7CFR, Part 220.

⁴U.S. Departments of Health and Human Services and Agriculture (1995). *Nutrition and Your Health: Dietary Guidelines for Americans*, fourth edition. Washington, DC: U.S. Government Printing Office.

⁵National Research Council (1989b). *Diet and Health: Implications for Reducing Chronic Disease Risk*. Washington DC: National Academy Press.

⁶The National Research Council's *Diet and Health* report recommends a maximum protein intake equivalent to less than twice the RDA. To achieve recommended levels of calories from fat and carbohydrate, the percentage of total calories from protein needs to be in this range.

⁷One-fourth of suggested daily limits of 300 mg of cholesterol and 2,400 mg of sodium.

⁸One-third of suggested daily limits of 300 mg of cholesterol and 2,400 mg of sodium.

Recommended Dietary Allowances. The *Recommended Dietary Allowances* (RDAs), developed by the Food and Nutrition Board (FNB) of the National Research Council (NRC) (1989a), are the accepted standards for assessing the adequacy of nutrient intake among population groups. RDAs are defined as:

the levels of intake of essential nutrients that, on the basis of scientific knowledge, are judged by the FNB to be adequate to meet the known nutrient needs of practically all healthy persons (National Research Council, 1989b).

Separate RDAs are established for a variety of population groups based on age and/or gender.

The RDAs are traditionally used to both plan for and assess the relative nutrient contribution of meals provided in USDA Child Nutrition programs. Indeed, Federal regulations stipulate that lunches offered in the National School Lunch Program (NSLP) must provide, on average, one-third of the RDA (7CFR, Part 210). Breakfasts offered in the School Breakfast Program (SBP) must provide an average of one-fourth of the RDA (7CFR, Part 220). Head Start programs are also required to follow these standards (45CFR, Part 1304). These standards have been applied in this study to assess food energy, as well as protein, vitamin A, vitamin C, calcium, and iron (all examined nutrients that have established RDAs).

The Dietary Guidelines for Americans and NRC Diet and Health Recommendations. Several important nutrients and dietary components are not addressed by the RDAs. Specifically, the RDAs do not provide recommendations for intake of fat, carbohydrate, cholesterol, or sodium. Recommendations for these nutrients and dietary components are provided in the *Dietary Guidelines for Americans*, issued jointly by the U.S. Departments of Health and Human Services and Agriculture (1995), and/or in the NRC's *Diet and Health* report (1989b). The *Dietary*

Guidelines provide specific recommendations for fat and saturated fat intake, expressed as a percentage of total energy intake. The NRC *Diet and Health* report mirrors the *Dietary Guidelines* recommendations and also includes specific recommendations for intake of carbohydrate and protein, as a percentage of total energy intake, as well as suggestions for cholesterol and sodium intake.

While the dietary recommendations included in both the *Dietary Guidelines* and the NRC's *Diet and Health* report are generally considered appropriate for all healthy persons two years of age and older, the most recent edition of the *Dietary Guidelines* indicates that the specific recommendations for the percentage of energy from fat and saturated fat apply only to children *five years of age and older* (U.S. Departments of Health and Human Services and Agriculture, 1995). It is recommended that children between the ages of two and five be offered gradually diminishing amounts of fat so that, *at about five years of age*, children are consuming a diet that contains no more than 30 percent of calories (energy) from fat and less than 10 percent from saturated fat. The *Diet and Health* report describes a similar phased-in approach to dietary modification culminating at about age five. In keeping with these recommendations, quantified standards for the percentage of energy from the various energy-supplying nutrients, or macronutrients (fat, saturated fat, protein, and carbohydrate), are applied in this study only to meals offered to and consumed by children five years of age and older.⁷ Findings for younger children are summarized in detailed appendix exhibits. The text includes comment on trends across age groups, for example, the extent to which there is evidence of a gradual decline in the amount of energy from fat offered to increasingly older children.

Neither the *Dietary Guidelines* nor the *Diet and Health* report suggest restrictions on application of recommendations for sodium and cholesterol intake to young children. In theory, therefore, these recommendations are applicable to all healthy children two years of age and older. There is some debate, however, about whether recommendations for cholesterol and sodium intake should be adjusted for use with very young children to account for their substantially decreased energy intake. [The *Dietary Guidelines* assume a reference adult diet of 2,000 calories per day; the energy RDAs for the majority of children served by the CACFP are 1,300 calories (one- and two-year-olds and

⁷While the above-mentioned comments on recommendations appropriate for children do not specifically address the percentage of energy from carbohydrate and protein, shifts in the percentage of energy from fat necessarily affect energy from carbohydrate and protein.

three-year-olds) and 1,800 calories (four- to six-year-olds)]. Although the rationale for age-adjusted standards makes intuitive sense, there is no scientific consensus on the issue and specific age-adjusted standards have not been established. Therefore, a compromise approach has been used in this study. Quantified standards for cholesterol and sodium, like those for the percentage of energy from the various macronutrients, have been applied only to the oldest children, that is, to meals offered to and consumed by children age five and above. The interested reader will find results for younger children in detailed appendix exhibits.

OVERVIEW OF THE ANALYSES

This section provides an overview of the nutrient analyses: how they were conducted and how the results are presented in this report. The analysis of meals and snacks *offered* is presented first, followed by a discussion of the analysis of meals and snacks *consumed*. In both cases, the discussion is limited to a general description of the analytic approach; the reader is referred to Appendix A for more comprehensive details. The section concludes with a description of how data are presented in the report.

Meals and Snacks Offered by CACFP Providers

Analyses of the nutrient content of meals and snacks offered in the CACFP are based on average portion size estimates determined from the observation of children receiving CACFP meals and snacks rather than assuming the minimum portion sizes specified in meal pattern requirements. This approach provides a more accurate portrayal of what is actually being offered to children in the CACFP, particularly in a family-style meal service setting. Data suggest that the average portions taken at CACFP meals and snacks are generally equivalent to or greater than the minimum portion sizes specified in the CACFP meal pattern (Exhibits C.1 and C.7).

The minimum daily meal pattern requirements and the associated portion sizes for meals and snacks offered by CACFP providers are designed to ensure that meals and snacks are well-balanced and thus supply the kinds and amounts of food required to help children meet their energy and nutrient needs. Because the observed portion sizes were generally at least as large, and sometimes much greater, than the minimum required portion sizes, the nutrient profile of CACFP meals and snacks presented in this

report will generally exceed the nutrient profile that would result if minimum portion sizes were assumed.

The methodology used to determine the average nutrient content of meals and snacks offered by CACFP providers involved six distinct steps. First, because providers were not asked to report information on the size of portions offered (see preceding description of the Menu Survey), data from the observations of children receiving CACFP meals and snacks (discussed above) were used to develop estimates of *average portions offered* for 74 different types of food reported in the Menu Surveys. Separate estimates were developed for each of five age groups (one- and two-year-olds, three-year-olds, four-year-olds, five-year-olds, and six- to ten-year-olds) and, depending on the meals and snacks in which a food was offered, for up to three different meal types (breakfast, lunch/supper, and snacks).⁸

Once the portion size estimates had been developed, the second step in the process was to assign a portion size, by age group and meal/snack, to every food reported in the Menu Survey. The methodology used in estimating average portions and assigning portion sizes to menus is described in detail in Appendix A.

The third step in the process was to compute the nutrient (and energy) content of each portion of food and then tabulate the total for each daily meal or snack by adding together nutrients for all foods and beverages offered.⁹

Next, a weekly average was computed for each provider by adding together the energy and nutrients for each day and then dividing by five (or, for the sites that operated fewer than five days, by four or three). Separate tabulations were completed—for each age group served—for CACFP breakfasts,

⁸Age groups used in this report differ from the standard CACFP age groups (one- and two-year-olds, three- to five-year-olds, and six- to twelve-year-olds) for two reasons. First, because the RDAs differ for three-year-olds and four- and five-year-olds, separate estimates were developed for *each* of the age groups in this range. Second, because the sample size of children over the age of ten (who have different RDAs) was too small to support a separate analysis (n=4), the oldest age group considered in this report is six- to ten-year-olds.

⁹The Food Intake Analysis System (FIAS), version 2.3, was used for all nutrient analyses.

lunches, morning snacks, and afternoon snacks, as well as for the total complement of meals and snacks offered.¹⁰

The fifth step in the process was to determine, for each nutrient with an established RDA, the percentage of the RDA supplied in meals and snacks offered to each age group. Age-specific standards were used for all age groups except six- to ten-year-olds. Because this group spans two different RDA age groups (four- to six-year-olds and seven- to ten-year-olds), a weighted average RDA was used.¹¹ Comparable calculations were carried out for breakfasts and lunches offered to five-year-olds and six- to ten-year-olds to determine the percentage of energy provided by fat, saturated fat, carbohydrate, and protein.

Because findings for the analyses described in step five (above) were qualitatively similar across age groups, the sixth and final step in the analysis was to compute an overall average for each provider based on the age groups served (each age group was weighted evenly). Thus, the average percentage of the RDA for energy supplied in breakfasts offered by a provider who serves one- and two-year-olds, three-year-olds, and four-year-olds reflects the overall average for the three age groups served. These overall averages were used in estimating means and percentages presented and discussed in the main body of this report. Age-group-specific results for all major analyses are reported in detailed appendix exhibits.

Meals and Snacks Consumed by CACFP Participants

Results of this analysis reflects *CACFP participant's (children's) energy and nutrient intake on a typical day in care*. The methodology used in the analysis parallels the approach used in the analysis of meals and snacks offered.

¹⁰Because very few providers offer supper or an evening snack (see Volume I), separate tabulations for these CACFP offerings are not presented in this report. Contributions of evening snacks are included, when offered, in tabulations of energy and nutrients in all meals and snacks offered.

¹¹Weighted average RDAs were developed for each nutrient by applying a weight of .20 to the four- to six-year-old RDA and a weight of .80 to the seven- to ten-year-old RDA. This approach is consistent with the methodology used in the nutrient-based menu planning system (NuMenus) used in the NSLP and SBP.

First, data from the child observations were used to determine the total amount of food consumed by each observed child. A separate tabulation was done for each food, subtracting the estimate of the amount left over from the estimate of the total amount taken (amount consumed = amount taken – amount left over).

Next, the nutrient equivalent of each consumed portion was computed and added together, within a given meal or snack, to estimate the total amount of energy and nutrients consumed at each meal and snack. Meal- and snack-specific totals were also tallied to calculate total energy and nutrient intake from all CACFP meals and snacks consumed. Each child's energy and nutrient intake, for discrete meals and snacks as well as for the combination of all meals and snacks, was then compared to age-appropriate RDA standards. Comparable calculations were carried out to determine the percentage of energy provided by fat, saturated fat, carbohydrate, and protein in meals consumed by children five years of age and older.

Finally, because, as was true for the analysis of meals offered, the various age-group-specific results were, in large part, qualitatively similar, an overall average was computed for all children consuming CACFP meals and snacks, as well as for children served by each type of provider. Thus, the average percentage of the RDA provided in the meals and snacks consumed by all CACFP participants (children) reflects the average for all children consuming CACFP meals and snacks, based on comparison of individual intakes to age-appropriate RDAs. These overall averages were used in estimating means and percentages presented and discussed in the main body of this report. Age-group-specific results for all major analyses are reported in detailed appendix exhibits.

The analysis of meals and snacks consumed by CACFP participants also includes several additional lines of inquiry. For each meal and snack, children's mean rates of food consumption are examined, as well as the extent to which available energy and nutrients (i.e., the energy and nutrients in meals and snacks taken) are actually consumed. Rates of food consumption, expressed as percentages, were derived by dividing the total amount of food left over (i.e., not consumed) from the total amount of food taken, including second helpings (for example, children consumed an average of 85 percent of the milk portion taken). Similarly, the percentage of *available* energy and nutrients actually

consumed was determined by dividing the amount of energy and nutrients in the total amount of food consumed by the energy and nutrients *available* in the total amount of food taken.

Data Presentation

As noted in preceding discussions, exhibits included in the body of the report present findings based on overall averages for all groups of children. The interested reader will find age-group-specific results in appendices B (meals and snacks offered) and C (meals and snacks consumed). All reported statistics are based on weighted analyses (see Appendix E for a description of the methodologies used in developing sample weights). Exhibits report unweighted sample sizes (number of providers and number of child observations).

Exhibits present results for all types of providers (Chapter Three) and for all children participating in the CACFP (Chapter Four). Results are also stratified by type of provider (i.e., homes, Head Start centers, child care centers, and all centers combined). However, because preliminary analyses, which compared homes versus all centers and Head Start centers versus child care centers, revealed no meaningful pattern of differences among providers, differences among providers are not emphasized in the discussion of findings.¹² Rather, discussions focus primarily on findings for *all providers* and *all children*. Discussion of differences between providers (using the same between-group comparisons noted above) are limited to situations where conclusions about major research questions differ appreciably for the two groups, for example, a situation where the mean intake of a specific nutrient at breakfast is equivalent to or more than one-fourth of the RDA for one provider group and substantially less than one-fourth of the RDA for the other group.

¹²Differences that proved to be statistically significant had little substantive importance. For example, a minor difference in the percentage of the RDA for energy offered at lunch was significant, but the average for both provider groups was substantially less than the one-third RDA standard used in this study.

Chapter Three

Meals and Snacks Offered by CACFP Providers

This chapter presents information on the meals and snacks offered by child care providers participating in the CACFP. The analysis is based on foods included in menus offered during a specified five-day period, as reported by CACFP providers, and estimates of the average portions served to children of different ages, based on observations of children receiving meals and snacks in CACFP facilities.¹ Findings are therefore indicative of the *potential* contribution of CACFP meals and snacks to children's daily nutrient needs (assuming that all foods are consumed in specified portions), rather than meals and snacks *actually consumed* by children. Data on children's intake of energy and nutrients from CACFP meals and snacks actually consumed are presented in Chapter Four.

This chapter addresses the following research questions:

- Which meals and snacks do providers offer?
- Do meals and snacks offered by CACFP providers comply with meal component requirements?
- Which specific foods are offered most often? Do providers offer options within CACFP meal component categories on a given day? Do providers offer a variety of items within CACFP meal component categories over the course of a week?
- What is the potential contribution to children's daily nutrient needs of individual CACFP meals and snacks?
- How do CACFP breakfasts and lunches offered to children compare with *Dietary Guidelines* and NRC recommendations?
- Which food groups and/or specific foods are major contributors of energy and key nutrients in CACFP breakfasts and lunches?

¹An overview of the methodologies used in collecting and analyzing data is provided in Chapter Two; a detailed description is provided in Appendix A.

- What percentage of CACFP providers offer lunches that meet the *Dietary Guidelines* recommendation for the percentage of energy from total fat? How do lunches offered by these providers compare with other lunches offered by other providers, with regard to both nutrient content and specific food items offered?
- What is the potential contribution to children's daily nutrient needs of the total complement of CACFP meals and snacks offered? How does the total complement of meals and snacks offered compare with *Dietary Guidelines* and NRC recommendations?

Separate sections present detailed findings for CACFP breakfasts, lunches, and snacks.² The final section of the chapter presents data on the nutrient content of the total complement of CACFP meals and snacks offered. Results presented reflect the *nutrient profile of meals and snacks offered by typical (average) CACFP providers*.

As noted in Chapter Two, the data presented in this chapter are based on provider-level averages for meals and snacks offered to all age groups.^{3,4} Results of age-group-specific analyses are provided in Appendix B; standard errors are also provided for all nutrient estimates.⁵ Instances where a conclusion for a specific age group differs appreciably from the conclusion for all children are noted in the discussion (e.g., the overall mean for a specific nutrient in breakfasts offered is equivalent to or more than one-fourth of the RDA, but substantially less than one-fourth of the RDA for one specific age group). Unweighted sample sizes (number of providers) are reported in each exhibit.

²Few homes or centers offer supper or an evening snack. Data for these CACFP meal services are therefore not presented in this report.

³For example, the mean percentage RDA for breakfasts offered by a provider who serves one- and two-year-olds, and three- to five-year-olds was determined by first calculating the percentage of the RDA provided in the average breakfast offered to each age group (one- and two-year olds, three-year-olds, four-year-olds, and five-year-olds). Next, the overall mean percentage RDA was computed for breakfasts offered by the provider by averaging across the four age-group-specific RDA values. Preliminary analyses found that results were not affected by treating menus offered to the three- to five-year-old age group as three different menus rather than using an average for the age group.

⁴There is very little variation in the actual foods offered to different age groups in a particular child care site.

⁵As noted in Chapter Two, preliminary analyses indicated that findings for each age group were, for the most part, qualitatively similar with regard to the nutrient standards used in this study.

While data presentations are stratified by type of provider, for the interested reader, the discussion focuses primarily on findings for *all CACFP providers* (see Chapter Two). Discussions about differences between provider groups (family day care homes versus all centers or Head Start centers versus child care centers) are limited to situations where conclusions about major research questions differ appreciably for the two groups.⁶

All reported statistics are based on weighted analyses (see Appendix E). The reader will notice that findings for all providers resemble most closely findings for family day care homes. The reason for this is that family day care homes account for the majority of all CACFP providers nationwide.⁷ Consequently, results for family day care homes have a strong influence on overall results for all types of CACFP providers combined.

Finally, for ease in interpretation, all food-level analyses presented in this chapter are based on meals and snacks offered to three- to five-year-olds, unless otherwise noted. Since there is very little variation in foods offered to children of different ages within a child care site, findings for meals and snacks offered to one- and two-year olds and six- to ten-year-olds are virtually identical.

BREAKFASTS OFFERED

More than eight out of ten CACFP providers offer breakfast (Exhibit B.1). Breakfast is most common among CACFP providers that operate Head Start programs and among homes and child care centers that operate eight or more hours per day (full-day care). The increased prevalence of breakfast in Head Start centers, even among those that operate part-day programs, is consistent with Head Start performance standards which explicitly require programs to offer breakfast to any child who has not received breakfast at home.

⁶As noted in Chapter Two, preliminary analyses found no meaningful pattern of differences between homes and centers or between Head Start centers and child care centers. This is not unexpected since all providers follow the same meal patterns and, as will be discussed in this chapter, exhibit a high degree of compliance with CACFP meal component requirements.

⁷In FY 1993, when the sample for this study was drawn, homes comprised 87 percent of all CACFP providers. (Source: FCS administrative data, December 1996).

Foods Offered in CACFP Breakfasts

The CACFP meal pattern stipulates that, to receive Federal reimbursement, breakfasts must include at least one serving of three different meal components: fluid milk; fruit, vegetables, or full-strength fruit or vegetable juice; and bread or an acceptable bread alternate (e.g, ready-to-eat cereal). On an average day, more than nine out of ten CACFP breakfast menus comply with all component requirements.

CACFP providers rarely offer children options within a meal component category, for example, a choice between two types of fruit or two types of cereal. Most CACFP breakfasts include only one item within each CACFP meal component (Exhibit 3.1). Moreover, observations of CACFP meal service (see Chapter Two and Appendix A) indicate that, when more than one item is offered, for example, cereal *and* toast (two bread/bread alternate foods), children are generally served both items.

While daily menus tend to be fixed, CACFP providers do offer children a variety of different foods at breakfast over the course of a typical week. An average of four different types of fruits, vegetables, or juices are offered (Exhibit 3.1) as well as three to four different types of breads or acceptable bread alternates. Milk is an exception; providers tend to offer only one type of milk consistently from one day to the next.

The specific foods most frequently offered in CACFP breakfasts are listed in Exhibit 3.2.⁸ For this analysis, daily CACFP breakfast menus, as reported in the Menu Survey, were analyzed and the relative frequency of specific foods and food groups was tabulated. Figures presented in Exhibit 3.2 reflect the percentage of daily CACFP menus, or the percentage of CACFP breakfasts offered nationwide on any given day, that include specific foods (or food groups).⁹ Highlights are summarized by meal component in the following sections.

⁸The list is limited to foods included in 5 percent or more of the breakfasts offered by any provider group.

⁹The percentage of daily menus, as reported in exhibits 3.1 and 3.2, is not directly equivalent to the percentage of providers because the number of days of operation varies from three to five days for each provider.

Exhibit 3.1

**CACFP Providers Tend to Offer a Fixed Breakfast Menu Each Day
but Do Vary Menu Items Over the Course of a Week**

Component/Number of Items Offered per Day/Week	Center-Based Care				
	All Providers	Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
Percentage of Daily Breakfast Menus					
Milk					
0	2%	2%	2%	2%	2%
1	97	97	96	96	96
2	1	1	2	2	2
<i>Mean items per day</i>	1	1	1	1	1
<i>Mean number of different items per week</i>	1	1	1	1	1
Fruit, Vegetable, or Juice					
0	3%	3%	2%	5%	4%
1	89	89	91	86	88
2 or 3	8	8	7	9	8
<i>Mean items per day</i>	1	1	1	1	1
<i>Mean number of different items per week</i>	4	4	4	4	4
Bread or Bread Alternate					
0	1%	1%	1%	1%	1%
1	87	87	91	90	90
2 or 3	12	12	8	8	8
<i>Mean items per day</i>	1	1	1	1	1
<i>Mean number of different items per week</i>	3	3	4	4	4
Number of Daily Breakfast Menus (Unweighted)	7427	1882	3607	1938	5545

Notes: Based on breakfasts offered to three- to five-year-olds.
Detail may not sum to 100 percent due to rounding.

Exhibit 3.2
Foods Most Commonly Offered in CACFP Breakfasts

Breakfast Component/Food	All Providers	Family Day Care Homes	Center-Based Care		
			Head Start Centers	Child Care Centers	All Centers
Percentage of Daily Breakfast Menus in Which Item Is Offered					
Milk	98%	98%	98%	98%	98%
White, 2%	54	52	65	60	62
White, whole	23	24	15	23	20
White, nfs ¹	13	13	14	11	12
White, 1%/1.5%	5	5	5	4	5
White, skim	5	5	1	1	1
Fruits, Vegetables, and Juices	97	97	98	95	96
Juice, orange	22	22	23	22	23
Banana	20	22	8	10	9
Juice, apple	10	10	11	12	12
Apple, fresh	7	7	4	6	5
Orange, fresh	7	6	6	8	7
Applesauce	6	6	7	6	6
Juice, grape	4	3	9	8	8
Peach, canned	4	4	5	5	5
Juice, pineapple	1	1	6	4	5
Any fresh fruit	42	46	22	27	25
Breads and Bread Alternates	99	99	99	99	99
Ready-to-eat cereal	39	39	31	40	36
White bread/toast	24	24	22	21	21
Pancakes, waffles, French toast	18	19	12	12	12
Hot cereal	12	12	11	12	11
Muffins, sweet bread	3	3	7	5	6
Biscuit, croissant	3	2	6	5	5
Noncreditable Foods²	56	57	57	49	52
High-fat condiments ³	30	31	28	25	26
Syrup, honey	16	17	10	10	10
Eggs	9	10	8	6	7
Jelly	6	6	5	6	6
Sugar	6	6	3	4	4
Bacon, sausage ⁴	5	5	6	4	5
Cheese, not low-fat	2	1	5	3	4
Number of Daily Breakfast Menus (Unweighted)	7427	1882	3607	1938	5545

Note: Based on breakfasts offered to three- to five-year-olds. Only items included in 5 percent or more of daily menus for any provider group are listed.

¹No further specification. Menu Survey did not include information on fat content of milk. (For purposes of nutrient analysis, the database assumes a nutrient profile that approximates 2% milk).

²Foods that do not contribute to satisfying the CACFP meal pattern.

³Butter, margarine, cream cheese, gravy.

⁴Sausages are creditable if they are less than 30 percent fat by weight. Most sausages served by providers in this study were pork brown-and-serve style sausages that did not meet this criteria. Sausages that did meet the criteria were included with meats.

Milk. Two-percent milk is the most common type of milk offered in CACFP breakfasts, by a wide margin. Two-percent milk is offered in more than one-half of all CACFP breakfast menus. Skim milk is rarely offered; only 5 percent of all CACFP breakfast menus include skim milk. Flavored milk is even less common in CACFP breakfasts, offered in less than one-half of one percent of all daily menus (data not shown).

Fruits, Vegetables, and Juices. Orange juice, offered in nearly one out of four daily breakfast menus, is the food most often offered to satisfy the fruit, vegetable, juice requirement. Bananas, apple juice, fresh apples, and fresh oranges round out the list of the five most common fruits and juices offered. Overall, *fresh* fruit is included in 42 percent of all daily CACFP breakfast menus. Vegetables of any type are rarely offered in CACFP breakfasts.

Breads and Bread Alternates. Ready-to-eat cereal is the bread alternate most frequently offered in CACFP breakfasts. More than one-third of all daily CACFP breakfast menus includes a ready-to-eat cereal. White bread or toast, offered in roughly one-quarter of all daily breakfast menus, is the next most frequently offered food in this category. Pancakes, waffles, and French toast, as a group, and hot cereal are next on the list, offered in 18 and 12 percent of daily breakfast menus, respectively.

Noncreditable Foods. Providers are encouraged to supplement the CACFP meal pattern with other foods that may increase the overall appeal of the meal as well as its food energy. More than one-half of all daily CACFP breakfast menus include one or more noncreditable foods (i.e., foods that do not contribute to satisfying the CACFP meal pattern). Butter, margarine, cream cheese, and gravy are the most common noncreditable items offered at breakfast, included in almost one-third of all breakfast menus. Syrup and honey are the next most frequently offered noncreditable foods, followed by eggs, jelly, sugar, and bacon or sausage.¹⁰

¹⁰The CACFP breakfast meal pattern does not require that meat or an acceptable meat alternate, as defined in the lunch/supper meal pattern, e.g., eggs, cheese, or peanut butter, be offered at breakfast. Consequently, eggs are considered noncreditable at breakfast. Because of their low protein and/or high fat content, the CACFP does not consider bacon or most breakfast sausages to be an acceptable meat alternate; thus these foods are noncreditable for all meals.

Nutrient Content of CACFP Breakfasts Offered Relative to RDAs

Breakfasts offered in the CACFP provide more than one-fourth of the RDA, except for energy (Exhibit 3.3).¹¹ This general pattern is consistent across provider types as well as across age groups (Exhibit B.3). On average, breakfasts offered by CACFP providers supply more than one-half of the RDA for protein and vitamin A, about three-quarters of the RDA for vitamin C, and more than one-third of the RDA for calcium and iron. By comparison, breakfasts are low in energy, providing, on average, 19 percent of the RDA.

Percentage of Providers Offering at Least One-fourth of the RDA at Breakfast

With the exception of energy and iron, nearly all providers offer breakfasts that provide, on average, one-fourth or more of the RDA (Exhibit 3.4).¹² Only 3 percent of all providers offer breakfasts that supply one-fourth or more of the RDA for energy. And, despite an overall mean of 35 percent of the RDA for iron (Exhibit 3.3), about one-quarter of all providers offer breakfasts that provide an average of less than one-fourth of the RDA for iron.

A greater percentage of homes offer breakfasts that provide one-fourth of the RDA for iron than either Head Start centers or child care centers. This difference is largely attributable to differences in the number and/or types of breads and bread alternates offered. Homes are more likely than either Head Start centers or child care centers to offer two or more servings of breads and/or bread alternates at breakfast (Exhibit 3.1). As will be discussed later in this section, breads and bread alternates provide 83 percent of the iron in CACFP breakfasts. Moreover, Head Start centers offer ready-to-eat cereals less often than either homes or child care centers (Exhibit 3.2). Because most ready-to-eat cereals are fortified with iron, their inclusion can dramatically affect iron content.

¹¹Data on actual mean energy and nutrient content of CACFP breakfasts offered are presented, by age group, in Exhibit B.2. Standard errors for the estimates presented in Exhibit 3.3 are provided, along with age-group-specific estimates, in Exhibit B.3.

¹²Age-group-specific results are presented in Exhibit B.4.

Exhibit 3.3

**Breakfasts Offered by CACFP Providers Supply More Than
One-fourth of the RDA, Except for Energy**

	All Providers	Family Day Care Homes	Center-Based Care		
			Head Start Centers	Child Care Centers	All Centers
Mean Percentage of RDA in CACFP Breakfasts as Offered					
Total Energy	19%	19%	20%	19%	20%
Protein	54	54	56	52	54
Vitamin A	54	55	51	53	52
Vitamin C	76	76	74	77	76
Calcium	36	36	37	35	36
Iron	35	36	31	34	33
Number of Providers (Unweighted)	1659	430	809	420	1229

Exhibit 3.4

With the Exception of Energy, Most Providers Offer Breakfasts That Provide at Least One-fourth or More of the RDA

	All Providers	Family Day Care Homes	Center-Based Care		
			Head Start Centers	Child Care Centers	All Centers
Percentage of Providers Offering One-fourth of the RDA					
Total Energy	3%	3%	5%	5%	5%
Protein	100	100	100	100	100
Vitamin A	97	97	98	98	98
Vitamin C	93	94	93	91	92
Calcium	98	98	99	98	99
Iron	74	76	62	68	65
Number of Providers (Unweighted)	1659	430	809	420	1229

Nutrient Content of CACFP Breakfasts Offered Relative to Dietary Guidelines and NRC Recommendations

CACFP breakfasts offered to five- to ten-year-olds are largely consistent with *Dietary Guidelines* and NRC recommendations (Exhibit 3.5).¹³ This is true for all providers as well as for the two age groups (five-year-olds and six- to ten-year-olds). On average, CACFP breakfasts derive 23 percent of total energy from fat, a level that is consistent with the *Dietary Guidelines* recommendation of no more than 30 percent of total energy from fat. The proportion of energy derived from carbohydrate and protein is also consistent with recommendations, as are levels of cholesterol and sodium.

Breakfasts offered by CACFP providers do not, however, meet the *Dietary Guidelines* recommendation for the percentage of energy from saturated fat. This is true for all providers and for breakfasts offered to both five-year-olds and six- to ten-year-olds. On average, 11 percent of the energy in breakfasts offered to children five years of age and older comes from saturated fat; the recommended level is less than 10 percent. In addition, there is little evidence of decreasing amounts of saturated fat in breakfasts offered to children between the ages of two and five, as recommended by the *Dietary Guidelines* (Exhibits B.2 and B.5).

While on average CACFP breakfasts offered to five- to ten-year-olds provide more energy from saturated fat than recommended, the average amount of saturated fat in CACFP breakfasts is not really excessive. The average amount of saturated fat in breakfasts offered to five- to ten-year-olds does not exceed the amount of saturated fat allowable in an “ideal” breakfast, that is, a breakfast that supplies one-third of the RDA for energy and derives less than 10 percent of its energy from saturated fat. An “ideal” breakfast for this age group could include up to 5.0 gm of saturated fat.¹⁴ CACFP breakfasts offered to five- to ten-year-olds provide an average of 4.1 gm of saturated fat, or about 80 percent of the allowable maximum.

¹³Data on actual mean energy and nutrient content of CACFP breakfasts offered are presented, by age group, in Exhibit B.2. Standard errors for the estimates presented in Exhibit 3.5 are provided, along with age-group-specific estimates, in Exhibit B.5.

¹⁴Based on one-fourth of the RDA for energy [1933 calories (weighted average of RDA for four- to six-year-olds and RDA for seven- to ten-year-olds)] and 9.4 percent of food energy (operational definition of “less than 10 percent”) from saturated fat.

Exhibit 3.5

Breakfasts Offered by CACFP Providers Are Largely Consistent with
Dietary Guidelines and NRC Recommendations

	Recommendation	All Providers	Family Day Care Homes	Center-Based Care		
				Head Start Centers	Child Care Centers	All Centers
Mean Nutrient Content of CACFP Breakfasts As Offered						
Percent of Energy from Fat (%)	≤ 30%	23	23	24	23	23
Percent of Energy from Saturated Fat (%)	< 10%	11	11	12	11	11
Percent of Energy from Carbohydrate (%)	≥ 55%	64	64	63	65	64
Percent of Energy from Protein (%)	≤ 15%	14	14	14	14	14
Cholesterol (mg)	≤ 75 mg	51	53	48	43	45
Sodium (mg)	≤ 600 mg	445	445	456	431	441
Number of Providers (Unweighted)		1631	413	808	410	1218

Note: Based on breakfasts offered to five-year-olds and six- to ten-year-olds. See Chapter Two for a discussion of *Dietary Guidelines* and NRC recommendations and the rationale for age groups used in this analysis.

Thus, the reason CACFP breakfasts do not satisfy the recommendation for the percentage of energy from saturated fat has more to do with the amount of energy provided (relatively low) than with an excessive amount of saturated fat. In fact, if the average energy content of CACFP breakfasts were increased by about 70 calories for five-year-olds and 55 calories for six- to ten-year-olds, by offering more carbohydrate-rich foods such as juices, fruit, and low-fat breads and bread alternates, there would be no need to lower actual saturated fat content.

If increasing the energy content of CACFP breakfasts is not feasible, the saturated fat content would need to be reduced in order to meet the recommendation for the percentage of energy from saturated fat. To avoid further reductions in the contribution of CACFP breakfasts to children's daily energy needs, however, energy lost as a result of reductions in saturated fat will need to be replaced with energy from carbohydrate-rich foods. One way in which the saturated fat content of CACFP breakfasts might be decreased is through increased use of 1% and skim milks and decreased use of 2% and whole milks. Milk contributes 61 percent of the saturated fat in CACFP breakfasts (Exhibit 3.7) and 2% and whole milks are the types of milk most often offered in CACFP breakfasts (Exhibit 3.2).

Percentage of Providers Meeting Dietary Guidelines and NRC Recommendations at Breakfast

More than 80 percent of all providers offer breakfasts to five- to ten-year-olds that meet recommendations for the percentage of energy from fat (Exhibit 3.6).¹⁵ The same is true for recommendations related to the percentage of energy from carbohydrate and protein and to sodium content. A somewhat smaller percentage of providers (72%) offer breakfasts that meet the recommendation for cholesterol content. Mean cholesterol content is strongly influenced by the frequency with which eggs, or products containing eggs, e.g., French toast, pancakes, and waffles, are offered.

¹⁵Detailed distributions are shown in Exhibit B.6.

Exhibit 3.6

With the Exception of Saturated Fat, Most Providers Offer Breakfasts That Meet *Dietary Guidelines* and NRC Recommendations

Recommendation	Center-Based Care				
	All Providers	Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
Percentage of Providers Meeting Recommendation					
Percent of Energy from Fat	89%	89%	86%	91%	89%
Percent of Energy from Saturated Fat	27	28	16	27	23
Percent of Energy from Carbohydrate	93	93	91	96	94
Percent of Energy from Protein	82	82	76	85	81
Cholesterol	72	71	78	81	80
Sodium	93	93	87	95	92
Number of Providers (Unweighted)	1631	413	808	410	1218

Note: Based on breakfasts offered to five-year-olds and six- to ten-year-olds. See Chapter Two for a discussion of *Dietary Guidelines* and NRC recommendations and the rationale for age groups used in this analysis.

Exhibit 3.7

**Sources of Energy and Nutrients in CACFP Breakfasts:
Relative Contribution of CACFP Meal Components**

	CACFP Breakfast Component			
	Milk	Fruits/ Vegetables/Juices	Breads/Bread Alternates	Noncreditable Foods
	Percentage Contribution to Average Amount Offered			
Total Energy	28%	21%	37%	13%
Protein	54	6	31	10
Vitamin A	37	6	46	12
Vitamin C	7	71	21	1
Calcium	74	4	19	3
Iron	3	10	83	4
Total Fat	42	3	29	26
Saturated Fat	61	2	17	20
Carbohydrate	17	33	42	9
Cholesterol	47	0	24	30
Sodium	22	1	64	13

Notes: Based on breakfasts offered to three- to five-year-olds.

A more detailed breakout is provided in Exhibit B.8.

Rows may not total to 100 percent due to rounding.

Sources of Nutrients in CACFP Breakfasts

To assess how the various CACFP meal components, as well as specific foods offered within meal component categories, contribute to the energy and nutrient content of CACFP breakfasts, the percentage contribution of 16 different foods and food groups was calculated for energy and for each of the key nutrients examined in this study. Findings from this analysis may be useful in identifying foods which may be contributing to undesirable characteristics (e.g., high levels of saturated fat) and/or foods which may help boost levels of energy, iron, or other nutrients. Results are summarized, by CACFP breakfast component, in Exhibit 3.7. A more detailed tabulation is provided in Exhibit B.7. Figures reported in both exhibits represent the percentage contribution of the specific food or food group to the average energy or nutrient content of breakfasts offered in the CACFP.

Important findings from this analysis are summarized below:

- Breads and bread alternates provide more than one-third of the energy in CACFP breakfasts. Noncreditable foods contribute 13 percent of the energy in CACFP breakfasts.
- Milk provides more than one-half of the protein in CACFP breakfasts. Breads and bread alternates are the second major contributor of this nutrient.
- Breads and bread alternates, primarily in the form of ready-to-eat cereals (see Exhibit B.7), contribute 46 percent of the vitamin A in CACFP breakfasts. Milk provides another 37 percent of the vitamin A.
- The vast majority of vitamin C (71%) is contributed by fruits, vegetables, and juices. Ready-to-eat cereals, most of which are fortified with vitamins and minerals, provide 21 percent of the vitamin C in CACFP breakfasts. Other foods and food groups contribute relatively minor amounts of vitamin C.
- The principal source of calcium in CACFP breakfasts is fluid milk.
- The major source of iron in CACFP breakfasts is breads and bread alternates, specifically ready-to-eat cereals. Breads and bread alternates as a group provide 83 percent of the iron in CACFP breakfasts; ready-to-eat cereals alone contribute 55 percent.

This finding supports the previous conclusion that differences among providers in the percentage that offer breakfasts supplying one-fourth of the

RDA for iron is largely attributable to differences in the number and type of breads and bread alternates provided, particularly ready-to-eat cereals.

- Milk is the primary source of both fat and saturated fat in CACFP breakfasts, providing 42 percent and 61 percent, respectively, of the fat and saturated fat in CACFP breakfasts. This is consistent with the fact that most providers offer 2% or whole milk (Exhibit 3.2). Noncreditable foods, specifically meats and meat alternates and butter, margarine, cream cheese, and gravy (see exhibits 3.2 and B.7) also contribute substantially to fat and saturated fat content.
- Milk and noncreditable foods, primarily meat and meat alternates such as eggs, bacon, sausage, and cheese, are also the leading sources of cholesterol in CACFP breakfasts.
- Breads and bread alternates provide close to two-thirds of the sodium in CACFP breakfasts.

LUNCHESES OFFERED

Foods Offered in CACFP Lunches

Almost 90 percent of all CACFP providers offer lunch; providers that do not offer lunch generally operate during before- and/or after-school hours. CACFP lunches must include five specific components: fluid milk; two (or more) different types of fruit, vegetables, or full-strength fruit juice; bread or an acceptable bread alternate; and meat or an acceptable meat alternate. On an average day in the CACFP, about 87 percent of lunches offered include all five required components; the specific component most often missing in noncompliant lunches is the second type of fruit, vegetable, or juice (Exhibit 3.8).

As noted for CACFP breakfasts, most CACFP lunches include only one food within each CACFP meal component. When more than one food is offered, children are generally served both foods; examples include spaghetti with garlic bread (a bread and bread alternate) and a ham and cheese sandwich (a meat and a meat alternate).

Exhibit 3.8

CACFP Providers Tend to Offer a Fixed Lunch Menu Each Day but Do Vary Menu Items Over the Course of a Week

Component/Number of Items Offered per Day/Week	All Providers	Family Day Care Homes	Center-Based Care		
			Head Start Centers	Child Care Centers	All Centers
Percentage of Daily Lunch Menus					
Milk					
0	3%	3%	4%	2%	3%
1	96	96	94	95	95
2	1	1	2	2	2
<i>Mean items per day</i>	1	1	1	1	1
<i>Mean number of different items per week</i>	1	1	1	1	1
Fruit, Vegetable, or Juice					
0	0%	0%	0%	0%	0%
1	7	8	5	4	4
2 or 3	92	92	95	96	95
<i>Mean items per day</i>	2	2	3	2	2
<i>Mean number of different items per week</i>	9	9	10	11	10
Bread or Bread Alternate					
0	3%	3%	4%	3%	3%
1	79	80	73	70	71
2 or 3	18	17	22	25	24
<i>Mean items per day</i>	1	1	1	1	1
<i>Mean number of different items per week</i>	3	3	3	4	3
Meat or Meat Alternate					
0	2%	2%	2%	2%	2%
1	84	84	84	86	85
2 or 3	13	13	13	12	12
<i>Mean items per day</i>	1	1	1	1	1
<i>Mean number of different items per week</i>	5	5	4	5	5
Number of Daily Lunch Menus (Unweighted)					
	8207	2178	3892	2137	6029

Notes: Based on lunches offered to three- to five-year-olds.
Detail may not sum to 100 percent due to rounding.

Over the course of a week, CACFP providers offer children a considerable variety of foods at lunch. The type of milk offered tends to be consistent from one day to the next (indeed, from one *meal* to the next). However, on average, providers offer 9 to 10 different types of fruit, vegetables, and full-strength juices over the course of a typical week, as well as 3 different types of breads or acceptable bread alternates; and 5 different meats or meat alternates. The decreased variety of foods offered in the bread/bread alternate component, relative to other components, is attributable to a preponderance of sandwiches and a reliance on white bread and sandwich rolls.

The specific foods most frequently offered in CACFP lunches are listed in Exhibit 3.9.¹⁶ Figures reflect the percentage of daily CACFP lunch menus, or the percentage of CACFP lunches offered nationwide on any given day, that include specific foods or food groups. Highlights are summarized below.

Milk. As noted in the preceding analysis of breakfasts offered, 2% milk is the most common type of milk offered in the CACFP. Skim milk and flavored milks are much less common, offered in less than 5 percent of daily lunch menus (data not shown).

Fruits and Juices. Eight out of ten daily CACFP lunch menus include fruit or juice. The five specific items offered most frequently include fresh apples, applesauce, canned peaches, fruit cocktail, and canned pears. Thirty-seven percent of all daily CACFP lunch menus include *fresh* fruit.

Vegetables. Vegetables are offered in CACFP lunches somewhat more frequently than fruit, appearing in more than nine out of ten daily CACFP lunch menus. The specific vegetables offered most frequently include cooked green beans, raw carrots, corn, fried potatoes, and canned tomatoes or tomato sauce (occurring primarily in mixed dishes such as spaghetti, pizza, etc.).

¹⁶The list is limited to foods included in 5 percent or more of the lunches offered by any provider group.

Exhibit 3.9

Foods Most Commonly Offered in CACFP Lunches

Lunch Component/Food	All Providers	Family Day Care Homes	Center-Based Care		
			Head Start Centers	Child Care Centers	All Centers
Percentage of Daily Lunch Menus in Which Item Is Offered					
Milk	97%	97%	96%	98%	97%
White, 2%	52	51	62	56	58
White, whole	22	22	15	23	20
White, nfs ¹	14	14	13	12	12
White, 1%/1.5%	5	5	5	6	6
Fruits and Juices	80	79	80	83	82
Apple, fresh	13	13	12	10	11
Applesauce	11	12	6	8	7
Peach, canned	11	11	11	13	12
Fruit cocktail, canned	8	7	11	12	12
Pear, canned	7	7	7	10	9
Banana	7	7	4	4	4
Orange, fresh	6	6	10	8	9
Pineapple, canned	5	4	8	9	8
Grapes	4	5	2	1	1
<i>Any fresh fruit</i>	37	38	33	29	30
Vegetables	92	91	97	96	97
Green beans, cooked	13	13	11	15	13
Carrots, raw	12	13	11	8	9
Corn	12	12	10	10	10
Potatoes, fried	12	12	11	11	11
Tomatoes, cooked	10	9	13	15	14
Peas	9	9	7	10	9
Lettuce, salad mix	8	7	18	13	15
Legumes	7	7	8	8	8
Potatoes, mashed/scalloped	7	6	10	11	10
Broccoli, cooked	5	5	7	6	6
Potatoes, baked/roasted	5	5	6	6	6
Carrots, cooked	5	5	4	5	4
Vegetables in mixed dishes	4	4	6	5	5
Tomatoes, raw	4	4	6	4	5
Mixed vegetables	3	3	6	7	6
Cabbage, raw (including coleslaw)	2	1	6	4	5
<i>Any raw vegetables</i>	30	29	42	33	36
Breads and Bread Alternates	97	97	96	97	97
White bread/rolls	60	60	58	59	59
Pasta	20	19	18	21	20
Tortillas, taco shells, pizza crust	9	8	12	10	11
Breading on nuggets/sticks	8	8	6	8	7
Rice	6	6	8	8	8
Cornbread	4	3	7	7	7

**Exhibit 3.9
(continued)**

Lunch Component/Food	All Providers	Family Day Care Homes	Center-Based Care		
			Head Start Centers	Child Care Centers	All Centers
Percentage of Daily Lunch Menus in Which Item Is Offered					
Meats and Meat Alternates	98%	98%	98%	98%	98%
Cheese, not low fat	15	15	12	11	11
Beef in mixed dishes	12	11	16	15	15
Cheese in mixed dishes	11	11	11	11	11
Beef, ground	10	10	12	11	11
Chicken/Turkey, roasted/baked	10	9	13	10	11
Hot dogs	9	10	5	7	7
Chicken/Turkey, fried/processed	6	6	7	7	7
Ham	5	5	6	6	6
Peanut butter/nuts	5	6	2	3	3
Fish, fried/processed	5	5	4	5	5
Fish, canned	5	5	3	3	3
Beef, roast	4	4	5	4	5
Chicken/Turkey in mixed dishes	3	3	4	5	4
Noncreditable Foods²	50	48	57	55	56
High-fat condiments ³	36	34	41	41	41
Low-fat condiments ⁴	11	11	11	10	11
Cakes, brownies, cookies	2	1	5	3	4
Number of Daily Lunch Menus (Unweighted)	8207	2178	3892	2137	6029

Note: Based on lunches offered to three- to five-year-olds. Only items included in 5 percent or more of daily menus for any provider group are listed.

¹No further specification. Menu Survey did not include information on fat content of milk. (For purposes of nutrient analysis, the database assumes a nutrient profile that approximates 2% milk.)

²Foods that do not contribute to satisfying the CACFP meal pattern.

³Butter, margarine, regular salad dressing, regular mayonnaise, gravy, whipped cream, cream cheese, and other high-fat toppings.

⁴Low-fat salad dressing, low-fat mayonnaise, reduced-calorie margarine, sugar, honey, jelly, syrup, catsup, mustard, and other low-fat toppings.

Breads and Bread Alternates. White bread and rolls are the most frequently offered breads, as noted above, appearing in 60 percent of daily lunch menus. Pasta, the next most common food in this group, is offered much less frequently (19% of daily menus). Other bread alternates offered in 5 percent or more of lunch menus are tortillas, taco shells, or pizza crust; breading on items such as chicken nuggets or fish sticks; and rice.

Meats and Meat Alternates. Ground beef and cheese, either alone or in mixed dishes, are the most frequently offered meat and meat alternate. In the aggregate, ground beef and cheese are offered in about one-half of all daily CACFP lunch menus. It is worth noting that both ground beef and cheese are relatively high in fat and saturated fat compared to other meat alternates such as chicken, turkey, and fish. Chicken and turkey are the next most commonly offered foods in this group. Roasted or baked chicken and turkey is offered somewhat more often than breaded, fried, or processed chicken or turkey.

Noncreditable Foods. One-half of all CACFP lunch menus includes one or more noncreditable foods, that is, foods that do not contribute to satisfying the CACFP meal pattern. High-fat condiments such as butter, margarine, salad dressing, mayonnaise, gravy, and whipped cream are the most common noncreditable foods offered at lunch, included in more than one-third of all daily lunch menus.

Nutrient Content of CACFP Lunches Offered Relative to RDAs

On average, CACFP lunches provide more than one-third of the RDA, except for energy and iron (Exhibit 3.10). This general pattern is consistent across provider types as well as across age groups (see Exhibit B.9).¹⁷ The one exception is lunches offered to six- to ten-year-olds which supply exactly one-third of the RDA for iron.

¹⁷Lunches offered to six-year-olds, as well as to five-year-olds in some provider groups, meet the one-third RDA standard for iron (Exhibit B.9).

Exhibit 3.10

**Lunches Offered by CACFP Providers Supply More Than
One-third of the RDA, Except for Energy and Iron**

	All Providers	Family Day Care Homes	Center-Based Care		
			Head Start Centers	Child Care Centers	All Centers
Mean Percentage of RDA in CACFP Lunches as Offered					
Total Energy	28%	27%	29%	30%	30%
Protein	104	103	107	108	107
Vitamin A	99	99	107	99	102
Vitamin C	51	50	62	57	59
Calcium	42	41	42	42	42
Iron	27	27	30	30	30
Number of Providers (Unweighted)	1820	486	878	456	1334

On average, lunches offered by CACFP providers supply about 100 percent of the RDA for protein and vitamin A; 50 percent of the RDA for vitamin C; and about 40 percent of the RDA for calcium (Exhibit 3.10).¹⁸ CACFP lunches provide lesser amounts of energy and iron, averaging about one-fourth (rather than one-third) of the RDA for each.

Percentage of Providers Offering at Least One-third of the RDA at Lunch

Most providers offer lunches that supply, on average, one-third (or more) of the RDA for protein, vitamin A, calcium, and vitamin C (Exhibit 3.11).¹⁹ Few providers, however, offer one-third or more of the RDA for energy or iron. Only eight percent of providers offer lunches that provide, on average one-third of the RDA for energy; and only 14 percent meet this standard for iron.

Nutrient Content of Lunches Offered Relative to Dietary Guidelines and NRC Recommendations

With the exception of cholesterol, lunches offered by CACFP providers do not meet *Dietary Guidelines* and NRC recommendations (Exhibit 3.12).²⁰ Lunches offered to children five years of age and older do not meet *Dietary Guidelines* and NRC recommendations for fat, saturated fat, protein, and carbohydrate.

This pattern is generally consistent across providers and for lunches offered to both five-year-olds and six- to ten-year-olds. Moreover, there is no evidence of a gradual decline in the percentage of calories from fat or saturated fat in lunches offered to children between the ages of two and five, as recommended by the *Dietary Guidelines* (see Exhibits B.8 and B.11).

¹⁸Data on actual mean energy and nutrient content are presented in Exhibit B.8. Age-group-specific results and standard errors for estimates presented in Exhibit 3.10 are provided in Exhibit B.9.

¹⁹Age-group-specific results are presented in Exhibit B.10.

²⁰Data on actual mean energy and nutrient content are presented in Exhibit B.8. Age-group-specific results and standard errors for the estimates presented in Exhibit 3.12 are provided in Exhibit B.11.

Exhibit 3.11

**With the Exception of Energy and Iron, Most Providers Offer Lunches
That Provide at Least One-third of the RDA**

	All Providers	Family Day Care Homes	Center-Based Care		
			Head Start Centers	Child Care Centers	All Centers
Percentage of Providers Offering One-third of the RDA					
Total Energy	8%	7%	16%	16%	16%
Protein	100	100	100	100	100
Vitamin A	96	95	100	98	99
Vitamin C	76	74	92	89	90
Calcium	94	93	95	96	95
Iron	14	12	27	23	24
Number of Providers (Unweighted)	1820	486	878	456	1334

Exhibit 3.12

**Lunches Offered by CACFP Providers Are Not Consistent
with *Dietary Guidelines* and NRC Recommendations**

	Recommendation	All Providers	Center-Based Care			All Centers
			Family Day Care Homes	Head Start Centers	Child Care Centers	
Mean Nutrient Content of CACFP Lunches as Offered						
Percent of Energy from Fat (%)	≤ 30%	35	35	36	35	36
Percent of Energy from Saturated Fat (%)	< 10%	14	14	14	14	14
Percent of Energy from Carbohydrates (%)	≥ 55%	47	47	47	47	47
Percent of Energy from Protein (%)	≤ 15%	20	20	19	19	19
Cholesterol (mg)	≤ 100 mg	65	65	67	67	67
Sodium (mg)	≤ 800 mg	919	910	939	985	966
Number of Providers (Unweighted)		1794	471	877	446	1323

Note: Based on lunches offered to five-year-olds and six- to ten-year-olds. See Chapter Two for a discussion of *Dietary Guidelines* and NRC recommendations and the rationale for age groups used in this analysis.

CACFP lunches offered to children five years of age and older do not meet the NRC recommendation for sodium.

Percentage of Providers Meeting Dietary Guidelines and NRC Recommendations at Lunch

With the exception of cholesterol, few providers offer lunches that meet *Dietary Guidelines* and NRC recommendations (Exhibit 3.13).²¹ One-quarter of providers offer lunches to children five years of age and older that provide, on average, one-third or less of the suggested daily limit (800 mg) of sodium.

The percentage of providers satisfying other recommendations is even lower. Only 14 percent of all CACFP providers offer lunches that supply, on average, no more than 30 percent of energy from fat (the *Dietary Guidelines* recommendation). Fewer than 5 percent of all providers offer lunches that are consistent with recommendations for energy from saturated fat, carbohydrate, and protein.

Characteristics of Low-Fat Lunches

As noted elsewhere in this report, CACFP providers are not required to meet nutrient-based standards. Nonetheless, USDA is committed to lowering the level of fat in meals offered through all Child Nutrition programs. For this reason, an analysis was undertaken to examine the potential impact of lower fat levels on overall nutrient profiles of CACFP lunches; in other words, to determine whether lunches that are lower in fat (as a percentage of total energy) provide substantially different amounts of nutrients. The analysis also examines, in a general way, variations in menu offerings among providers that offer lunches with varying levels of fat. This analysis is limited to menus offered to five-year-olds because five-year-olds are the largest CACFP age group to whom the *Dietary Guidelines* recommendation ($\leq 30\%$ of energy from fat) has been applied in this study.

²¹Detailed distributions are provided in Exhibit B.12.

Exhibit 3.13

With the Exception of Cholesterol, Few Providers Offer Lunches That Meet *Dietary Guidelines* and NRC Recommendations

Recommendation	Center-Based Care				
	All Providers	Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
Percentage of Providers Meeting Recommendation					
Percent of Energy from Fat	14%	15%	8%	10%	9%
Percent of Energy from Saturated Fat	4	4	2	1	1
Percent of Energy from Carbohydrate	2	3	2	2	2
Percent of Energy from Protein	4	4	2	4	3
Cholesterol	91	90	93	93	93
Sodium	24	25	19	14	16
Number of Providers (Unweighted)	1794	471	877	446	1323

Note: Based on lunches offered to five-year-olds and six- to ten-year-olds. See Chapter Two for a discussion of *Dietary Guidelines* and NRC recommendations and the rationale for age groups used in this analysis.

Providers were stratified into one of four groups based on the average percentage of energy from fat in lunches offered to five-year-olds. The four groups include providers that offer:

- **Low-Fat Lunches:** Mean percentage of energy from fat is less than or equal to 30 percent (lunches meet *Dietary Guidelines* recommendation);
- **Moderate-Fat Lunches:** Mean percentage of energy from fat ranges from 31 to 35 percent;
- **High-Fat Lunches:** Mean percentage of energy from fat ranges from 36 to 38 percent; and
- **Highest-Fat Lunches:** Mean percentage of energy from fat is 39 percent or greater.

The following sections detail findings related to the nutrient profile of low-fat lunches compared to other lunches, as well as differences in types of foods offered by providers that serve low-fat and higher-fat lunches.²²

Nutrient Profiles. As Exhibit 3.14 demonstrates, the nutrient profile of lunches offered by providers in the low-fat group is quite comparable to that of lunches offered by providers in the other three groups.²³ Lunches offered by all groups of providers supply, on average, less than one-third of the daily RDA for energy and iron and more than one-third of the RDA for all other key nutrients. Moreover, lunches offered by providers in the low-fat group derive less energy from saturated fat (although the mean percentage of energy from saturated fat still exceeds the *Dietary Guidelines* recommendation), and more energy from carbohydrate (although still not meeting the NRC recommendation). Finally, lunches offered by providers in the low-fat group provide less cholesterol and sodium than lunches offered by other providers.

These findings suggest that a decrease in the percentage of energy derived from fat does not result in detrimental changes in other nutritional characteristics, and may even result in

²²Low-fat lunches meet *Dietary Guidelines* recommendation; cutoffs used for other groups are based on sample distribution.

²³Data on actual mean energy and nutrient content are presented in Exhibit B.13.

Exhibit 3.14

**Low-Fat Lunches Are Somewhat Lower in Total Energy Than Other Lunches
but Provide Comparable Amounts of Key Nutrients**

Nutrient	Level of Fat in CACFP Lunches Offered ¹			
	Low	Moderate	High	Highest
	Mean Percentage of RDA			
Total Energy	23%	26%	27%	27%
Protein	95	93	94	91
Vitamin A	116	95	100	100
Vitamin C	57	52	51	50
Calcium	42	44	45	45
Iron	28	29	30	28
	Mean Percentage of Total Energy			
Fat	27%	33%	37%	41%
Saturated Fat	11	13	15	17
Protein	23	20	19	18
Carbohydrate	52	49	46	42
	Mean Amount			
Cholesterol	54 mg	61 mg	64 mg	69 mg
Sodium	786	895	914	913
Number of Providers (Unweighted)	134	672	559	401

Note: Based on lunches offered to five-year-olds.

¹Low fat is defined as 30 percent or less of total energy from fat; moderate fat as 31 to 35 percent; high fat as 36 to 38 percent; highest fat as 39 to 52 percent. Low-fat group meets *Dietary Guidelines* recommendation; cutoffs used for other groups are based on sample distribution.

additional positive changes (e.g., fewer calories from saturated fat and less cholesterol and sodium).

Foods Offered. Exhibit 3.15 shows the percentage of providers that offer a specific food or food group, in lunches offered to five-year-olds, *at least once per week*. Separate tabulations are presented for *daily* use of some foods: all types of fruit, fresh fruit, juice, all vegetables, and raw vegetables.

Notable differences in foods offered by providers of low-fat lunches in comparison to other provider groups are summarized below. These findings provide some insight into menu planning practices which may influence the level of fat in CACFP lunches.

- **Milk.** A greater percentage of providers in the low-fat group offer 1% and skim milk than providers in the other groups. In addition, a greater percentage of providers in the high- and highest-fat groups offer whole milk than providers in the low-fat group.
- **Fruits and Juices.** Compared to providers in the highest-fat group, a greater percentage of providers in the low-fat group offer fruit on a daily basis.
- **Vegetables.** Fewer providers in the low-fat lunch group offer fried potatoes than providers in the other groups.
- **Breads and Bread Alternates.** More providers in the low-fat group offer rice than providers in the high- and highest-fat groups. Fewer providers in the low-fat group offer breaded processed meat, poultry, or fish than the highest-fat group.
- **Meats and Meat Alternates.** Providers in the low-fat group offer less ground beef than other providers. Moreover, the ground beef that they do offer tends to be included in mixed dishes (e.g., spaghetti with meat sauce, chili, lasagna, burritos) rather than offered by itself (e.g., as a hamburger patty or meatloaf). Providers in the low-fat group also offer more tuna than other providers.

The reverse is true for regular (i.e., not lean or low-fat) cheese and hot dogs, as well as fried chicken. All of these foods are more prevalent among providers in the high-fat and highest-fat groups.

Exhibit 3.15

Providers That Offer Low-Fat Lunches Tend to Offer Certain Foods More Often Than Providers That Offer Higher-Fat Lunches

Lunch Component/Food	Level of Fat in CACFP Lunches Offered ¹			
	Low	Moderate	High	Highest
Percentage of Providers Offering Item at Least Once per Week				
Milk				
Whole milk	13	13	27	51
2% milk	65	85	86	58
1% milk	18	8	3	2
Skim milk	27	6	0	1
Fruits and Juices				
Fresh fruit	85	71	75	82
Canned fruit	84	89	88	73
Juice	9	9	4	2
<i>Fruit daily</i>	67	57	44	41
<i>Fresh fruit daily</i>	9	9	3	12
<i>Juice daily</i>	0	0	0	0
Vegetables				
Baked potato	15	19	21	25
Mashed potato	25	30	30	26
Fried potato	18	40	52	52
Raw vegetables	74	73	80	76
Cooked vegetables	100	100	100	100
High-fat cooked vegetables ²	100	100	100	100
<i>Raw vegetables daily</i>	6	2	1	3
Breads and Bread Alternates				
White bread	97	96	93	98
Wheat bread	10	12	15	8
Biscuit	2	10	8	8
Pancakes, waffles	1	3	2	1
Cornbread	20	14	20	15
Tortilla	17	9	13	9
Crackers	7	20	15	15
Pasta	70	70	62	58
Rice	36	31	19	15
Breading on processed meats/fish/poultry	20	32	31	41
Meats and Meat Alternates				
Ground beef, regular	17	37	37	37
Ground beef in mixed dishes	58	50	42	34
Beef, roast	14	15	18	19
Ground beef, lean	4	8	7	4
Cheese, not low-fat	24	43	62	64
Cheese in mixed dishes	34	42	48	44
Cheese, low-fat	6	4	1	1
Chicken/turkey, fried/processed	17	26	32	37

Exhibit 3.15
(continued)

Lunch Component/Food	Level of Fat in CACFP Lunches Offered ¹			
	Low	Moderate	High	Highest
Percentage of Providers Offering Item at Least Once Per Week				
Meats and Meat Alternates				
(continued)				
Chicken/turkey, roasted/baked	49	34	42	28
Chicken/turkey in mixed dishes	17	14	16	9
Hot dog, regular	8	23	33	48
Hot dog, low-fat	10	12	11	15
Cold cuts	4	11	12	17
Fish, fried/processed	12	24	26	30
Tuna/tuna salad	59	25	16	12
Fish in mixed dishes	9	13	3	4
Fish, not fried	4	12	7	4
Peanut butter/nuts	13	21	28	20
Eggs	12	10	12	13
Ham	13	24	23	26
Pork	11	7	5	5
Noncreditable Foods				
High-fat condiments ³	67	78	89	83
Low-fat condiments ⁴	23	40	38	44
Bacon, sausage, ⁵ salami	4	9	5	7
Yogurt ⁶	3	1	1	2
Snack chips	1	3	3	5
Sugar, syrup, jelly	13	19	24	21
Ice cream, pudding	2	3	3	2
Jello, popsicle, sweetened beverages ⁷	1	2	3	1
Cakes, cookies, brownies	3	7	7	3
Number of Providers (Unweighted)	134	672	559	401

Notes: Based on lunches offered to five-year-olds. Tests of statistical significance not performed.

¹Low fat is defined as 30 percent or less of total energy from fat; moderate fat as 31 to 35 percent; high fat as 36 to 38 percent; highest fat as 39 to 52 percent. Low-fat group meets *Dietary Guidelines* recommendation; cutoffs used for other groups are based on sample distribution.

²Defined as vegetable dishes (other than entrees) that derive more than 20 percent of total energy from fat.

³Butter, margarine, regular salad dressing, regular mayonnaise, gravy, whipped cream, cream cheese, and other high-fat toppings.

⁴Low-fat salad dressing, low-fat mayonnaise, reduced-calorie margarine, sugar, honey, jelly, syrup, catsup, mustard, and other low-fat toppings.

⁵Sausages are creditable if they are less than 30 percent fat by weight. Most sausages served by providers in this study were pork brown-and-serve style sausages that did not meet this criteria. Sausages that did meet the criteria were included with meats.

⁶Yogurt is not creditable for lunch, but is creditable for snacks.

⁷Kool-Aid, Hawaiian Punch, fruit drinks, and sodas.

- **Noncreditable Foods.** In comparison to other providers, fewer providers in the low-fat lunch group offer high-fat condiments such as butter, sour cream, cream cheese, and regular salad dressings.

Sources of Nutrients in CACFP Lunches

The percentage contribution to the average energy and nutrient content of lunches offered by CACFP providers was computed for each lunch component as well as for specific foods offered within each component group. Results for each meal component are summarized in Exhibit 3.16; a more detailed tabulation is provided in Exhibit B.14. Important findings from this analysis are summarized below:

- Meats and meat alternates provide 30 percent of the energy in CACFP lunches. Milk; fruits, juices, and vegetables; and breads and bread alternates make up most of the remainder, each providing 20 to 25 percent of total energy. Noncreditable foods provide only 5 percent of the energy in CACFP lunches.
- Meats and meat alternates are the major source of protein in CACFP lunches (44% of total). Milk and breads and bread alternates also make substantial contributions (28% and 19%, respectively).
- The fruit, juice, and vegetable component provides about one-half of the vitamin A and more than two-thirds of the vitamin C in CACFP lunches. Essentially all of the vitamin A and more than two-thirds of the vitamin C contributed by this combination of foods comes from vegetables (see Exhibit B.14).
- The principal source of calcium in CACFP lunches is fluid milk.
- The major sources of iron in CACFP lunches are breads and bread alternates (37% of total) and meats and meat alternates (33%).
- Meats and meat alternates are the primary source of fat in CACFP lunches, accounting for 43 percent of total fat.
- Meats and meat alternates also contribute substantial amounts of saturated fat and cholesterol (39% and 58%, respectively). Milk is also an important source of saturated fat and cholesterol, contributing 33% and 26%, respectively, of the total amount.
- The major sources of sodium in CACFP lunches are meats and meat alternates (38%) and breads and bread alternates (29%).

Exhibit 3.16

**Sources of Energy and Nutrients in CACFP Lunches:
Relative Contribution of CACFP Meal Components**

	CACFP Lunch Component				
	Milk	Fruits/Vegetables/ Juices	Breads/Bread Alternates	Meats/Meat Alternates	Noncreditable Foods
	Percentage of Total Amount Offered				
Total Energy	20%	21%	25%	30%	5%
Protein	28	8	19	44	1
Vitamin A	24	54	6	11	5
Vitamin C	9	69	8	13	2
Calcium	64	7	15	13	1
Iron	3	25	37	33	1
Total Fat	19	10	18	43	9
Saturated Fat	33	7	15	39	6
Carbohydrate	17	37	32	11	3
Cholesterol	26	1	13	58	2
Sodium	11	17	29	38	5

Notes: Based on all lunches offered to three- to five-year-olds.

A more detailed breakout is provided in Exhibit B.14.

Rows may not total to 100 percent due to rounding.

SNACKS OFFERED

CACFP providers may offer three different types of snacks: morning, afternoon, or evening. Fewer than 10 percent of CACFP providers offer evening snacks, so the present discussion is limited to morning and afternoon snacks.

All but 4 percent of CACFP providers offer one or more snacks (Exhibit 3.17). The afternoon snack is by far the most frequently offered snack. Ninety-one percent of all providers offer an afternoon snack, compared to less than one-half (45%) of providers offering a morning snack. Forty percent of providers offer both morning and afternoon snacks. Head Start centers are much more likely than either homes or child care centers to *not* offer snacks; 30 percent of Head Start centers offer neither a morning nor an afternoon snack. This is simply a reflection of the fact that most Head Start centers operate part-day programs and offer meals (breakfast and lunch) rather than snacks. Evening snacks are offered infrequently (fewer than 10 percent of all providers).

This section describes morning and afternoon snacks offered by CACFP providers. The analysis differs from those presented for breakfasts and lunches in two important ways. First, the mean nutrient content of snacks is evaluated relative to the RDA, but results are not compared to a specific standard (e.g., the one-third RDA standard used for lunches). As outlined in Chapter Two, nutrient standards were not defined for snacks because, as supplementary feedings, single snacks (as opposed to the cumulative total of all snacks consumed over an extended period of time) are not expected to make substantial contributions to nutrient intake.

Second, the nutrient content of snacks is *not* evaluated relative to *Dietary Guidelines* or NRC recommendations. Both the *Dietary Guidelines* and NRC recommendations are for usual dietary intake (i.e., average *daily* intake). While it is permissible to apply these goals to major meals such as lunch and breakfast, the assumption being that meals that meet the goals increase the likelihood that total daily intake will meet the goals, it is not reasonable to apply such standards to minor eating occasions such as snacks.

Exhibit 3.17

The Afternoon Snack is, by Far, the Most Commonly Offered CACFP Snack

Snack(s) Offered	All Providers	Family Day Care Homes	Center-Based Care		
			Head Start Centers	Child Care Centers	All Centers
	Percentage of Providers Offering Snack(s)				
Afternoon Snack Only	51%	49%	54%	58%	57%
Afternoon and Morning Snacks	40	43	8	33	24
Morning Snack Only	5	6	8	3	5
Neither Afternoon nor Morning Snack	4	2	30	6	15
Number of Providers (Unweighted)	1962	501	891	570	1461

Foods Offered in CACFP Morning and Afternoon Snacks

The CACFP meal pattern requires that snacks include foods from any two of the four general CACFP meal component categories: milk; fruit, vegetables, or full-strength juice; bread or an acceptable bread alternate; and meat or an acceptable meat alternate. In keeping with findings reported for CACFP meals, more than 90 percent of daily CACFP snack menus satisfy these meal component requirements. There is evidence of some redundancy in snack menus. Over the course of a typical week, providers offer only two different fruits or juices, two different breads or bread alternates, and one meat/meat alternate (data not shown).

Exhibits 3.18 and 3.19 present data on the specific foods most frequently offered in morning and afternoon snacks. In general, there are few differences between the two types of snacks.

Milk. Milk is offered in 44 percent of daily morning snack menus and 50 percent of afternoon snack menus. As noted elsewhere, 2% milk is the most common type of milk offered.

Fruits and Juices. Fruit or full-strength juice is offered in more than two-thirds of daily morning snack menus and about 60 percent of daily afternoon snack menus. The two most common juices offered, in both morning and afternoon snacks, are apple juice and orange or grapefruit juice. Fresh fruits are offered in about one-quarter of all daily snack menus, both morning and afternoon.

Vegetables. Vegetables are rarely offered for either morning or afternoon snacks. When vegetables are offered, they are almost always raw vegetables, most commonly (but not on more than 5% of daily menus) carrots and celery.

Breads and Bread Alternates. Breads and bread alternates are the foods most frequently offered in both morning and afternoon snacks (77% of all daily menus), and crackers are the specific

Exhibit 3.18
Foods Most Commonly Offered in CACFP Morning Snacks

Snack Component/Food	All Providers	Family Day Care Homes	Center-Based Care		
			Head Start Centers	Child Care Centers	All Centers
Percentage of Daily Morning Snack Menus in Which Item Is Offered					
Milk	44%	45%	50%	37%	40%
White, 2%	22	22	31	22	23
White, whole	10	10	10	7	8
White, nfs ¹	7	7	3	4	3
White, 1%/1.5%	4	4	5	4	4
Fruits and Juices	69	69	69	67	68
Juice, apple	20	20	9	15	14
Juice, orange/grapefruit	10	10	12	14	14
Apple, fresh	7	8	6	4	4
Banana	7	7	5	4	4
Juice blends, non-citrus	6	6	5	5	5
Juice, grape	5	5	7	9	9
Orange, fresh	3	3	6	4	5
Juice, pineapple	1	1	6	3	4
Any fresh fruit	23	24	18	16	16
Vegetables	4	4	8	3	4
Any raw vegetables	4	4	5	2	3
Breads and Bread Alternates	77	77	80	81	81
Crackers	40	40	35	44	42
White bread/rolls	11	11	9	8	8
Ready-to-eat cereal	6	6	9	6	7
Muffins, sweet bread	5	6	6	5	5
Cookies ²	4	4	5	5	5
Meats and Meat Alternates	25	25	26	19	21
Cheese, not low fat	10	11	9	7	7
Peanut butter/nuts	9	9	11	8	9
Noncreditable Foods³	18	18	19	22	21
High-fat condiments ⁴	8	8	11	8	9
Number of Daily Morning Snack Menus (Unweighted)	2530	1034	574	922	1496

Note: Based on morning snacks offered to three- to five-year-olds. Only items included in 5 percent or more of daily menus for any provider group are listed.

¹No further specification. Menu survey did not include information on fat content of milk. (For purposes of nutrient analysis, the database assumes a nutrient profile that approximates 2% milk.)

²Cookies are creditable for snacks up to two times per week.

³Foods that do not contribute to satisfying the CACFP meal pattern.

⁴Butter, margarine, cream cheese, regular salad dressing or mayonnaise, whipped cream, and other high-fat toppings.

Exhibit 3.19

Foods Most Commonly Offered in CACFP Afternoon Snacks

Snack Component/Food	All Providers	Family Day Care Homes	Center-Based Care		All Centers
			Head Start Centers	Child Care Centers	
Percentage of Daily Afternoon Snack Menus in Which Item Is Offered					
Milk	50%	50%	44%	47%	46%
White, 2%	27	27	30	28	28
White, whole	10	10	6	11	10
White, nfs ¹	7	7	5	5	5
Fruits and Juices	60	59	62	60	60
Juice, apple	15	15	8	13	11
Apple, fresh	10	11	5	6	6
Juice, orange/grapefruit	7	7	11	7	8
Juice blends, non-citrus	6	7	3	5	5
Banana	5	5	4	5	5
Juice, grape	4	3	7	7	7
Juice, pineapple	1	1	5	3	3
Any fresh fruit	24	25	17	18	18
Vegetables	6	6	6	4	5
Any raw vegetables	5	5	5	3	4
Breads and Bread Alternates	77	76	84	83	83
Crackers	39	38	40	45	44
White bread/rolls	11	11	11	8	9
Cookies ²	10	9	13	16	15
Muffins, sweet bread	6	6	7	4	5
Meats and Meat Alternates	31	33	28	24	25
Peanut butter, nuts	14	15	13	11	12
Cheese, not low fat	12	12	9	8	8
Noncreditable Foods³	17	17	16	17	17
High-fat condiments ⁴	6	6	7	5	6
Number of Daily Afternoon Snack Menus (Unweighted)	6765	1989	2547	2229	4776

Note: Based on afternoon snacks offered to three- to five-year-olds. Only items included in 5 percent or more of daily menus for any provider group are listed.

¹No further specification. Menu survey did not include information on fat content of milk. (For purposes of nutrient analysis, the data base assumes a nutrient profile that approximates 2% milk.)

²Cookies are creditable for snacks up to two times per week.

³Foods that do not contribute to satisfying the CACFP meal pattern.

⁴Butter, margarine, cream cheese, regular salad dressing or mayonnaise, whipped cream, and other high-fat toppings.

bread alternate item offered most often. White bread and rolls are a distant second, along with, for afternoon snacks, cookies.²⁴

Meats and Meat Alternates. Meats and meat alternates are offered in 25 percent of all daily morning snack menus and just over 30 percent of all afternoon snack menus. In both cases, cheese and peanut butter or nuts are the foods offered most frequently.

Noncreditable Foods. Noncreditable foods are offered in 17 to 18 percent of daily menus for both morning and afternoon snack. High-fat condiments such as butter, margarine, and cream cheese are the specific foods offered most frequently.

Nutrient Content of Snacks Offered Relative to RDAs

Both morning and afternoon snacks, as offered, provide an average of more than 10 percent of the RDA for energy and equivalent or greater percentages of the RDA for all key nutrients (Exhibit 3.20).²⁵ This pattern is generally consistent across types of providers as well as across age groups. Snacks offered to four-year-olds tend to supply a somewhat smaller percentage of the RDA for energy (10%) in comparison to other age groups. The actual energy and nutrient content of snacks offered to three- and four-year-olds is generally quite similar (Exhibits B.15 and B.17), however, because the energy RDA for four-year-olds is 39 percent higher than the energy RDA for three-year-olds (1,300 calories compared to 1,800 calories), the mean RDA contribution is lower for four-year-olds.²⁶

Snacks are especially rich in vitamin C, particularly morning snacks, providing one-third or more of the RDA. Most of the vitamin C in snacks comes from fruits and juices. Two of the

²⁴Cookies are creditable as a bread alternate only for snacks and are limited to twice per week.

²⁵Data on actual mean energy and nutrient content are presented in exhibits B.15 and B.17. Age-group-specific results as well as standard errors for estimates presented in Exhibit 3.20 are provided in exhibits B.16 and B.18.

²⁶This pattern is also noted for other CACFP meals (see age-group-specific exhibits in Appendix B), however, these variations generally do not affect conclusions relative to the nutrient standards used in this study.

Exhibit 3.20

Snacks Offered by CACFP Providers Supply More Than 10 Percent of the RDA for Energy and Comparable or Greater Percentages of the RDA for Key Nutrients

	All Providers	Family Day Care Homes	Center-Based Care		
			Head Start Centers	Child Care Centers	All Centers
Morning Snacks	Mean Percentage of RDA in CACFP Morning Snacks as Offered				
Total Energy	13%	13%	13%	13%	13%
Protein	29	29	32	27	28
Vitamin A	22	22	26	19	20
Vitamin C	40	38	50	51	51
Calcium	18	18	20	16	17
Iron	13	13	16	14	14
Number of Providers (Unweighted)	572	236	133	203	336
Afternoon Snacks	Mean Percentage of RDA in CACFP Afternoon Snacks as Offered				
Total Energy	13%	13%	13%	13%	13%
Protein	32	32	30	29	29
Vitamin A	23	23	23	18	19
Vitamin C	32	31	41	36	37
Calcium	20	20	18	18	18
Iron	11	11	13	12	12
Number of Providers (Unweighted)	1558	458	582	518	1100

most commonly offered juices are orange and grapefruit juices; both of which are high in vitamin C.

ALL MEALS AND SNACKS OFFERED

The preceding discussions provide useful information on the potential nutrient contributions of individual CACFP meals and snacks. However, because more than 60 percent of all children are in care for eight or more hours per day (see Volume I), it is important to assess the potential nutrient contribution of the total complement of meals and snacks offered by CACFP providers. The more hours a child spends in care, the greater his or her dependence on CACFP meals and snacks for meeting daily nutritional requirements and, with respect to *Dietary Guidelines* and NRC recommendations, the more influence CACFP meals and snacks have on the overall quality of total daily intake. While the specific meals and snacks children have access to is influenced by both schedule and the total number of hours in care, as described in Chapter Four, information on the potential cumulative contribution of CACFP meals and snacks is useful for planning purposes.

This section presents information on the average nutrient content of the full complement of meals and snacks offered by CACFP providers. The general analytic approach is comparable to that used in preceding sections; however, results are not compared to a specific RDA standard. Similarly, specific standards for cholesterol and sodium are not applied; in the absence of an RDA standard, it is not possible to establish prorated standards for these nutrients. Instead, the cumulative amount of sodium and cholesterol supplied in all CACFP meals and snacks offered, expressed as a percentage of the suggested daily limit defined by the NRC recommendations, is compared to the average percentage contribution to the RDA for energy. If the contribution to the recommended maximum for sodium or cholesterol outstrips the contribution to the RDA for energy, the cumulative sodium and/or cholesterol content of CACFP meals and snacks may be considered high. If the converse is true, cumulative sodium and/or cholesterol content may be considered acceptable.

The two most common meal and snack combinations offered are breakfast, lunch, and one snack and breakfast, lunch, and two snacks. These combinations provide an average of more than one-half of the RDA for energy and well over one-half of the RDA for all key nutrients examined in this study.

Combinations of Meals and Snacks Offered

Providers offer over 21 different combinations of the six CACFP meals and snacks (breakfast, morning snack, lunch, afternoon snack, supper, evening snack). Most providers offer at least two meals and one snack (Exhibit 3.21). The most common combination of meals and snacks offered is breakfast, lunch, and one snack (most often an afternoon snack, but sometimes a morning snack); this combination is offered by 43 percent of all providers. The next most common combination is breakfast, lunch, and two snacks, which is offered by 26 percent of all providers.²⁷ Other combinations are much less common and none is offered by more than 10 percent of providers overall.

Meal combinations vary by type of provider. Homes and child care centers are fairly comparable, however, child care centers are more likely than homes to offer just one snack (10% versus 2%),²⁸ and homes are more likely than child care centers to offer all available CACFP meals and snacks, with the exception of an evening snack (9% versus less than 1%). In addition, Head Start centers differ from other types of providers in that the second most common meal combination among this group of providers is breakfast and lunch, rather than breakfast, lunch, and two snacks. This pattern probably reflects the fact that most Head Start centers operate part-day programs. Almost 50 percent of children enrolled in Head Start centers are in care less than five hours per day, compared to about 20 percent of children enrolled in homes and child care centers (see Volume I).

²⁷This may change in the future. During the time this study was conducted, centers could receive reimbursement for an additional meal or snack, above and beyond the standard two meals and one snack or one meal and two snacks, for children in care eight or more hours per day. The Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (P.L. 104-193) has since eliminated this “fourth meal” provision.

²⁸As noted elsewhere in this report, most of these centers operate before- or after-school programs.

Exhibit 3.21

**Most CACFP Providers Offer Breakfast and Lunch with
One or Two Snacks**

Meal and Snack Combination	All Providers	Family Day Care Homes	Center-Based Care		
			Head Start Centers	Child Care Centers	All Centers
Percentage of Providers Offering Combination					
Breakfast, Lunch, and One Snack	43%	42%	54%	43%	47%
Breakfast, Lunch, and Two Snacks	26	28	5	22	16
Breakfast and Lunch	2	*	28	2	12
Lunch and One Snack	1	1	6	1	3
Lunch and Two Snacks	5	5	3	7	5
Breakfast, Lunch, Supper, and Two Snacks	7	9	0	*	*
One Snack	2	1	*	10	6
Other	14	14	3	15	11
Number of Providers (Unweighted)	1962	501	891	570	1461

* = Less than one percent.

Note: All combinations that were offered by fewer than 25 providers (unweighted) were included in the Other category.

Nutrient Content of Combinations of Meals and Snacks Offered Relative to RDAs

Exhibit 3.22 presents information on average nutrient contribution of the five most common meal and snack combinations expressed as percentages of the RDA.^{29,30} Figures reflect overall means for all types of providers; results for each type of provider are presented in exhibits B.20 through B.23 and B.25 through B.28.

Both of the most common meal and snack combinations (breakfast, lunch, and one snack and breakfast, lunch, and two snacks) provide, on average, more than one-half of the RDA for energy and substantially more than two-thirds of the RDA for all key nutrients. Indeed, with the exception of iron, nutrients are supplied at levels that, on average, approximate or exceed 100 percent of the RDA. This general pattern holds for all provider types and virtually all age groups. The one exception is mean iron content of the combination of breakfast, lunch, and one snack as offered to one- and two-year-olds. This combination provides somewhat less than two-thirds (63%) of the RDA for iron for this age group.

The less common combinations of breakfast and lunch and lunch and two snacks also provide an average of 50 percent or more of the RDA for energy and more than 75 percent of the RDA for all key nutrients except iron. Protein, vitamin A, and vitamin C are provided at levels that, on average, exceed 100 percent of the RDA.

Finally, the combination of lunch and one snack provides about 40 percent of the RDA for energy and iron, about two-thirds of the RDA for calcium, and about 100 percent of the RDA for protein and vitamins A and C.

²⁹Data are not presented for the combination of breakfast, lunch, supper, and two snacks because individual children are rarely in care long enough to have access to all of these meals and snacks. Moreover, at the time the study was conducted, CACFP reimbursement was limited to a maximum of four meals or snacks for children in care eight or more hours per day.

³⁰Data on actual energy and nutrient content are presented in Exhibit B.19. Age-group-specific results and standard errors for the estimates presented in Exhibit 3.22 are provided in Exhibit B.24.

Exhibit 3.22

**The Full Complement of Meals and Snacks Offered by Most CACFP Providers
Supplies More Than One-half of the RDA for Energy and Substantially
More Than Two-thirds of the RDA for Key Nutrients**

	Breakfast, Lunch, and Snack	Breakfast, Lunch, and Two Snacks	Breakfast and Lunch	Lunch and Snack	Lunch and Two Snacks
Mean Percentage of RDA in all CACFP Meals and Snacks Offered					
Total Energy	61%	71%	51%	41%	53%
Protein	189	216	169	137	165
Vitamin A	169	203	151	120	150
Vitamin C	154	195	146	99	142
Calcium	96	112	83	66	80
Iron	72	86	61	44	56
Number of Providers (Unweighted)	1051	343	265	115	103

Notes: 43 percent of providers offer breakfast, lunch, and one snack and 26 percent of providers offer breakfast, lunch, and two snacks.

Data are not presented for the combination of breakfast, lunch, supper, and two snacks because individual children generally do not have access to all of these meals and snacks.

Nutrient Content of Combinations of Meals and Snacks Offered Relative to Dietary Guidelines and NRC Recommendations

Exhibit 3.23 presents information on the mean macronutrient, cholesterol, and sodium content of the five most common meal and snack combinations.³¹ Figures reflect means for all providers; results for each type of provider are presented in exhibits B.30 through B.33.

The two most common CACFP meal and snack combinations (breakfast, lunch, and one snack and breakfast, lunch, and two snacks), as offered to children five years of age and older, meet or approximate the *Dietary Guidelines* and NRC recommendations for the percentage of energy from fat (30% to 31%), carbohydrate (55% to 56%), and protein (16%). These combinations do not, however, meet the recommendation for the percentage of energy from saturated fat (13% versus a recommendation of less than 10%). This general pattern is true for all types of providers as well as for meals and snacks offered to both five-year-olds and six- to ten-year-olds.

³¹Data on actual energy and nutrient content are presented in Exhibit B.19. Standard errors for the estimates presented in Exhibit 3.23 are provided in Exhibit B.29.

Exhibit 3.23

The Meal and Snack Combinations Offered by Most CACFP Providers Meet or Approximate *Dietary Guidelines* and NRC Recommendations, with the Exception of the Percentage of Energy from Saturated Fat

	Recommendation	Breakfast, Lunch, and Snack	Breakfast, Lunch, and Two Snacks	Breakfast and Lunch	Lunch and Snack	Lunch and Two Snacks
Mean Nutrient Content of all CACFP Meals and Snacks Offered						
Percent of Energy from Fat (%)	≤ 30%	31	30	32	33	30
Percent of Energy from Saturated Fat (%)	< 10%	13	13	13	13	12
Percent of Energy from Carbohydrate (%)	≥ 55%	55	56	53	51	56
Percent of Energy from Protein (%)	≤ 15%	16	16	17	18	16
Cholesterol (mg)	n.s.	133	151	127	87	92
Sodium (mg)	n.s.	1624	1788	1452	1203	1311
Number of Providers (Unweighted)		1023	326	264	108	94

n.s. = Not specified.

Notes: Based on meals and snacks offered to five-year-olds and six- to ten-year-olds. See Chapter Two for a discussion of *Dietary Guidelines* and NRC recommendations and the rationale for age groups used in this analysis.

43 percent of providers offer breakfast, lunch, and one snack and 26 percent of providers offer breakfast, lunch, and two snacks (see Exhibit 3.21).

Data are not presented for the combination of breakfast, lunch, supper, and two snacks because individual children generally do not have access to all of these meals and snacks.

Chapter Four

Meals and Snacks Consumed by CACFP Participants

The preceding chapter presented information on the meals and snacks offered in child care homes and centers participating in the CACFP, based on an analysis of the specific foods offered during a five-day period and estimates of the average portions received by children of different ages. The nutritional profile of meals and snacks actually consumed by participating children may differ from what is offered for several reasons. For example, children may decline one or more of the foods offered; the portions taken by children may differ from the average portion; and children may not consume all of the food they take. Thus, to gain a full understanding of the contribution of CACFP meals and snacks to children's energy and nutrient needs, it is important to examine CACFP meals and snacks *as actually consumed* by children.

This chapter examines meals and snacks consumed by CACFP participants. Data were obtained through on-site observations of children attending sampled CACFP sites.¹ Note that for ease in presentation the term *taken* is used throughout this chapter to refer to children's receipt of CACFP foods, e.g., *foods taken at lunch*. In some CACFP sites, children above a certain age actively select and serve foods to themselves. In other sites, children are always served by providers who may or may not allow children to decline foods that are offered. Moreover, some providers use family-style service which allows, and even encourages, second helpings for children who desire them. To avoid the need for repeated use of complex and potentially confusing descriptions of how children acquire CACFP foods, the general term *taken* is used to cover all potential serving situations.

The chapter addresses the following research questions:

- Do meals and snacks taken by children include all required CACFP meal components?

¹Chapter Two includes an overview of the methodologies used in collecting and analyzing data. Full detail is provided in Appendix A. Appendix H presents results of a special substudy undertaken to assess the reliability, over time, of visual techniques used to estimate children's food selection and consumption.

- What proportion of the foods taken by children, and the energy and nutrients available in these foods, is actually consumed?
- How much do the individual CACFP meals and snacks children consume while in care contribute to their energy and nutrient needs? What is the collective energy and nutrient contribution of all CACFP meals and snacks consumed while in care?
- How do the CACFP breakfasts and lunches children consume while in care compare with *Dietary Guidelines* and NRC recommendations? How does the total complement of CACFP meals and snacks consumed while in care compare with *Dietary Guidelines* and NRC recommendations?

Findings for breakfasts, lunches, and snacks are presented separately, followed by a section that examines cumulative nutrient intake from all CACFP meals and snacks consumed while in care. The analyses presented parallel, in large part, those presented in Chapter Three. Additional analyses examine, for each meal and snack, the foods taken and consumed by children, as well as the extent to which energy and nutrients available in the meals and snacks taken are actually consumed. Estimates of food consumption are derived by computing the total amount eaten (the amount taken minus the amount left over) and dividing by the total amount of food taken. The resulting percentage reflects the percentage of available food that was actually consumed. Similar estimates are presented for the percentage of available energy and nutrients actually consumed.

Finally, each section includes a discussion of differences between the nutrient content of meals and snacks *offered* and meals and snacks *consumed*. While the two measures are not completely equivalent (the meals offered estimates are based, for the majority of providers, on meals and snacks offered over a period of five days; the meals consumed estimates consider only two of those five days), it is useful to compare the two estimates and identify nutrients, if any, for which conclusions differ markedly for the two analyses.

All tabulations are weighted and reflect *CACFP participants' nutrient intake from meals and snacks consumed on a typical day*.² Reported statistics include means and percentages for children of all ages. Results of separate age group analyses are provided in Appendix C; standard errors are also provided for all nutrient estimates.³ Instances where a conclusion for a specific age group differs appreciably from the conclusion for all children are noted in the discussion. Unweighted sample sizes (number of child observations) are reported in each exhibit.

While data presentations are stratified by type of provider, for the interested reader, the discussion focuses primarily on findings for *all CACFP participants (children)*, aggregated across all types of providers (see Chapter Two). Discussions about differences between provider groups (family day care homes versus all centers or Head Start centers versus child care centers) are limited to situations where conclusions about major research questions differ appreciably for the two groups.

BREAKFASTS CONSUMED

Foods Taken in CACFP Breakfasts

The CACFP meal pattern requires that one serving of each of three components be included in CACFP breakfasts: fluid milk; fruit, vegetables, or full-strength juice; and bread or an acceptable bread alternate. On an average day, 83 percent of children participating in the CACFP take breakfasts that include all three required components (Exhibit 4.1).

Average portions taken by children are equivalent to or, in the case of breads and bread alternates, substantially larger than the minimum portions specified in the CACFP meal pattern (Exhibit C.1).

Consumption of Foods and Nutrients in CACFP Breakfasts as Taken

²The methodology used to develop sample weights for the child observations is described in Appendix E.

³As noted in Chapter Two, preliminary analyses indicated that findings for each age group were, for the most part, qualitatively similar with regard to the nutrient standards used in this study.

While CACFP breakfasts taken by children include, for the most part, both the components and portions specified in the program meal pattern, many children do not consume all of the food they take. On average, children consume about three-quarters of the portions of food taken at breakfast (Exhibit 4.2). This general pattern is consistent across providers and across age groups (Exhibit C.2). There is little variation in the rate of consumption for different CACFP meal components, indicating that children do not consistently consume more of one breakfast component than another.

As a consequence of not consuming all of the foods taken, children consume only about three-quarters of the energy available in the CACFP breakfasts they take (Exhibits 4.3 and C.3). Consumption of available nutrients parallels consumption of available energy. That is, children consume about three-quarters of the nutrients available in the breakfasts they take. There are no substantial differences in this measure from one nutrient to the next. This is consistent with the finding that the rate of food consumption is roughly equivalent for each of the three breakfast components.

Nutrient Intake from CACFP Breakfasts Relative to RDAs

On an average day, breakfasts consumed by CACFP participants provide at least one-fourth of the RDA, except for energy and iron (Exhibit 4.4).⁴ On average, children's nutrient intake from CACFP breakfasts provides 40 percent or more of the RDA for protein, vitamin A, and vitamin C. Calcium is consumed at levels equivalent to, on average, 26 percent of the RDA. Iron intake from CACFP breakfasts approximates one-fourth of the RDA (24%) and energy intake averages 15 percent of the RDA.

This pattern is generally consistent across providers. The only nutrient for which conclusions vary appreciably by type of provider (homes versus centers or Head Start centers versus child care centers) is iron. CACFP breakfasts consumed by children receiving care in homes provide more than one-fourth of the RDA for iron (28%), while breakfasts consumed in center-based care provide less than one-fourth of the RDA (21%) (Exhibit 4.4).

⁴Data on actual mean energy and nutrient intake from CACFP breakfasts are presented, by age group, in Exhibit C.4. Standard errors for the estimates presented in Exhibit 4.4 are provided, along with age-group-specific estimates, in Exhibit C.5.

There are at least two potential explanations for this finding. First, children in homes consume a larger percentage of the iron available in the breakfasts they take (Exhibit C.3). Second, breakfasts *offered* in homes tend to be higher in iron than breakfasts offered in centers. A greater percentage of homes than centers [76% versus 65%, respectively (Exhibit 3.4)] offer breakfasts that provide an average of one-fourth or more of the RDA for iron. Moreover, mean iron content of breakfasts offered is higher for homes than for centers [36% of the RDA versus 33% (Exhibit 3.3)]. As discussed in Chapter Three, homes offer ready-to-eat cereals, which can dramatically influence iron content, more often than Head Start centers. Homes are also more likely than either type of center to offer two or more servings of breads or acceptable bread alternates at breakfast [breads and bread alternates provide 83% of the iron in CACFP breakfasts (Exhibit 3.7)].

Findings are also generally consistent across age groups. The only exceptions are calcium intake among one- and two-year-olds and, to a lesser extent, three-year-olds (somewhat less than one-fourth of the RDA); and iron intake among six-to-ten-year-olds (well above one-fourth of the RDA) (Exhibit C.5).⁵ It is worth noting that calcium and iron are the two nutrients examined in this study for which the RDA is consistent for children aged one through ten, despite differences in recommended energy intake that range from 1,300 calories to 2,000 calories. Clearly, in order to satisfy the RDA for these nutrients, concentrations of calcium and iron (per calorie) must be higher in diets consumed by younger children.

Nutrient Intake from CACFP Breakfasts Relative to Dietary Guidelines and NRC Recommendations

Breakfasts consumed by CACFP participants five years of age and older are largely consistent with *Dietary Guidelines* and NRC recommendations (Exhibit 4.5). On average, intakes from CACFP breakfasts meet recommendations for the percentage of energy from total fat, carbohydrate, and protein, as well as recommendations for total cholesterol and sodium intake. Average saturated fat intake, however, expressed as a percentage of total energy intake (11%), does not meet

⁵Statistic for six- to ten-year-olds may be unreliable due to small sample size (n=57 child observations).

recommendations. There is little evidence of a gradual decrease in the amount of fat and saturated fat consumed as children age (Exhibits C.4 and C.6).⁶

This pattern is generally consistent across providers and for five-year-olds (Exhibit C.6). Six- to ten-year-olds actually meet the *Dietary Guidelines* and NRC recommendation for the percentage of energy from saturated fat (9% versus the recommendation of less than 10%).⁷

In keeping with the findings reported in Chapter Three, the average amount of saturated fat in CACFP breakfasts is not excessive in comparison to the amount of saturated fat allowable in an “ideal” breakfast that provides both one-fourth of the RDA for food energy and less than 10 percent of the energy from saturated fat. Five- to ten-year-olds consume an average of 3.5 gm of saturated fat from CACFP breakfasts (Exhibit C.4). This is less than three-quarters of the amount of saturated fat allowable in an “ideal” breakfast for this age group (up to 5.0 gm).⁸ Thus, the reason that breakfasts consumed by CACFP participants five years of age and older do not meet *Dietary Guidelines* and NRC recommendations for the percentage of energy from saturated fat has more to do with the minimal energy contribution of CACFP breakfasts than with excessive amounts of saturated fat.

As noted in Chapter Three, the *Dietary Guidelines* and NRC recommendation for energy from saturated fat could be satisfied if children consumed more food energy, specifically energy from carbohydrate-rich foods such as juice, fruit, and low-fat breads and cereals. Such a change may be difficult to accomplish, however, since, as discussed above, children are already wasting about 25 percent of the foods they take at breakfast.

⁶Six- to ten-year-olds do consume substantially less energy from fat and saturated fat than younger children, however this estimate is likely to be unreliable due to small sample size (n=57 observations).

⁷The sample size for this group is small (n=57 observations). Separate estimates for six- to ten-year-olds are less reliable than those based on larger samples.

⁸Based on one-fourth of RDA for energy [1933 calories (weighted average of RDA for four- to six-year-olds and RDA for seven- to ten-year-olds)] and 9.4% of food energy (operational definition of “less than 10 percent”) from saturated fat.

If energy intake from CACFP breakfasts is not appreciably increased, some reduction in saturated fat intake will be necessary in order to meet the saturated fat recommendation. As noted in Chapter Three, a potentially useful modification would be to substitute 1% and skim milk for whole and 2% milk. Milk provides 61 percent of the saturated fat in CACFP breakfasts (Exhibit 3.7) and 2% and whole milk are the milks offered most frequently (Exhibit 3.2). The food energy (calories) lost as a result of saturated fat reduction should be replaced with energy from carbohydrate-rich foods, as described above.

Differences Between Breakfasts Offered and Breakfasts Consumed

CACFP breakfasts *as consumed* provide smaller percentages of the RDA than CACFP breakfasts *as offered* (described in Chapter Three). This is consistent with expectations given that CACFP participants do not always take all of the foods offered, may take portions of food that differ from the averages used in the meals offered analysis, and consume only about three-quarters of the nutrients available in the breakfast foods they do take. Overall means for energy and nutrients in breakfasts *consumed*, expressed as average percentages of the RDA (Exhibit 4.4), are roughly equivalent to or greater than three-quarters of the means for breakfasts *offered* (Exhibit 3.3), with the exception of vitamin C. The same is true for sodium and cholesterol, expressed in actual units (mg) (Exhibits 4.5 and 3.5).

Mean vitamin C intake from CACFP breakfasts (as a percentage of the RDA), although well above one-fourth of the RDA, is substantially less than three-quarters of the mean for CACFP breakfasts offered. A potential explanation for this finding is that, as noted above, the component most often missing from breakfasts taken by children is the fruit, vegetable, or juice component (Exhibit 4.1). This component accounts for 71 percent of the vitamin C in breakfasts offered (Exhibit 3.7). Thus, one would expect omission of this component to have a significant effect on vitamin C intake.

With regard to sources of food energy, the profiles for breakfasts *offered* (Exhibit 3.5) and breakfasts *consumed* (Exhibit 4.5) are virtually identical. The average percentage of energy from fat in breakfasts offered and consumed is 23 percent and 24 percent, respectively. The percentage of energy from saturated fat, protein, and carbohydrate (11%, 14%, and 64%, respectively) are identical

for the two breakfast measures. The comparability of sources of food energy in breakfasts offered and consumed is consistent with the finding that children tend to consume the different types of food included in CACFP breakfasts in roughly equivalent proportions.

LUNCHESES CONSUMED

Foods Taken in CACFP Lunches

The CACFP meal pattern requires that five specific components be included in CACFP lunches: fluid milk; two (or more) different types of fruit, vegetables, or full-strength juice; bread or an acceptable bread alternate; and meat or an acceptable meat alternate. On a typical day, approximately four out of five children consuming CACFP lunches take lunches that include all five components (Exhibit 4.6). The specific component most often missing is the second serving of fruit, vegetables, or juice.⁹

The average portions taken at lunch, like those taken at breakfast, are generally equivalent to or greater than the minimum portions specified in the CACFP meal pattern (Exhibit C.7).

Consumption of Foods and Nutrients in CACFP Lunches as Taken

With the exception of vegetables, children consume, on average, more than 70 percent of the portions of food they take at lunch (Exhibit 4.7). There is more variation in the consumption of lunch foods than breakfast foods. Mean consumption of vegetables (59% of portion taken) is markedly lower than any other food group.¹⁰ Mean consumption of milk (83% of portion taken) is somewhat higher than other food groups. This general pattern is consistent across all types of providers as well as across age groups (Exhibit C.8). There is a noticeable tendency for older children to consume more of their foods than younger children.

⁹Full-strength juice may be used for only one of the two required servings in this group.

¹⁰Mean consumption was calculated separately for fruits (including juices) and vegetables at lunch because preliminary analysis indicated that children consumed the two types of food at substantially different rates.

Children actually consume, on average, only about three-quarters of the energy available in the CACFP lunches they take (Exhibit 4.8). Consumption of available nutrients generally parallels consumption of available energy. That is, children consume about three-quarters of the nutrients available in the lunches they take. Slight variations, consistent with the food consumption patterns described above, are noted for some nutrients. For example, average consumption of available saturated fat and calcium are somewhat higher than other nutrients. One-third of the saturated fat in CACFP lunches and about two-thirds of the calcium are supplied by milk (Exhibit B.14), which is the component with the highest proportion consumed at lunch. Available vitamins A and C are consumed at somewhat lower rates than other nutrients. Vegetables, the component with the lowest proportion consumed at lunch, supply 50 percent of the vitamin A and 40 percent of the vitamin C in the average lunch offered (Exhibit B.14). The observed patterns of consumption of available nutrients is generally consistent across all types of providers as well as across age groups (Exhibit C.9). In keeping with the pattern noted above, there is a trend for older children to consume a somewhat larger proportion of available nutrients than younger children.

Nutrient Intake from CACFP Lunches Relative to RDAs

On an average day, lunches consumed by CACFP participants provide one-third or more of the RDA, except for energy and iron (Exhibit 4.9).¹¹ Children consuming CACFP lunches receive, on average, more than three-quarters of the RDA for protein and more than one-half of the RDA for vitamin A. Intakes of vitamin C and calcium approximate one-third of the RDA. The relative RDA contribution of CACFP lunches, as consumed, is 23 percent for energy and 22 percent for iron.

This general pattern is consistent across all types of providers. The only nutrient for which conclusions vary appreciably by type of provider (homes versus centers and Head Start centers versus child care centers) is vitamin C. CACFP lunches consumed by children receiving care in homes provide less than one-third of the RDA for vitamin C (31%), on average, while lunches consumed in center-based care provide more than one-third of the RDA (37%) (Exhibit 4.9).

¹¹Data on actual mean energy and nutrient intake from CACFP lunches are presented, by age group, in Exhibit C.10. Standard errors for the estimates presented in Exhibit 4.9 are provided, along with age-group-specific estimates, in Exhibit C.11.

This is consistent with information on the mean vitamin C content of lunches offered, as reported in Chapter Three. Mean vitamin C content of lunches offered is higher for centers than for homes [59% of the RDA versus 50% (Exhibit 3.10)] and the percentage of providers offering lunches that supply an average of one-third or more of the RDA for vitamin C is higher for centers than for homes [90% versus 74%, respectively (Exhibit 3.11)]. One factor that may contribute to this pattern is a lower frequency of fruits, vegetables, and juices (major contributors of vitamin C in CACFP lunches offered) in lunches offered by family day care providers (Exhibit 3.9).

Findings are also generally consistent across age groups. The only exception is vitamin C intake among one- and two-year-olds (somewhat less than one-third of the RDA) and calcium intake among one- and two-year-olds and three-year-olds (less than one-third of the RDA) (Exhibit C.11). Lower vitamin C intake among one- and two-year-olds is entirely attributable to children in family day care homes, which is consistent with the findings discussed above. Lower calcium intake among one- and two-year-olds and three-year-olds is noted in both homes and child care centers.

Nutrient Intake from CACFP Lunches Relative to Dietary Guidelines and NRC Recommendations

Lunches consumed by CACFP participants five years of age and older meet recommendations for cholesterol and sodium intake, but do not meet recommendations for the percentage of energy from fat, saturated fat, protein, or carbohydrate (Exhibit 4.10). With the exception of sodium, discussed below, this pattern is generally consistent across all types of providers. Moreover, age-group-specific results show no evidence of a definitive decline in consumption of fat and saturated fat among children ages two through five (Exhibits C.10 and C.12), as recommended in the *Dietary Guidelines*.

The average amount of fat actually consumed by five-to-ten-year-olds (16.8 gm) is not excessive in comparison to the amount of fat allowable in an “ideal” lunch that provides one-third of the RDA for energy and no more than 30 percent of total energy from fat (up to 21.5 gm).¹² This indicates that the reason CACFP lunches, as consumed, do not meet the *Dietary Guidelines* and NRC

¹²Based on one-third of RDA for energy [1933 calories (weighted average of RDA for four- to six-year-olds and RDA for seven- to ten-year-olds)] and 30% of food energy from fat.

recommendation for the percentage of energy from fat has more to do with the fact that lunches provide too little energy, specifically energy from carbohydrate, than with provision of excessive amounts of fat.

The same can not be said about levels of saturated fat in CACFP lunches. Lunches consumed by CACFP participants five years of age and older, like lunches offered to this age group by providers, are indeed high in saturated fat. The average amount of saturated fat actually consumed by five- to ten-year-olds (7.1 gm) exceeds the upper boundary of the saturated fat allowable in an “ideal” lunch (6.7 gm). Consequently, the only way to meet the recommendation for energy from saturated fat is to decrease actual intake of saturated fat and to replace food energy lost in this process with energy from carbohydrate-rich foods.

Achieving the desired balance in sources of food energy, that is, increasing consumption of energy from carbohydrate while, at the same time, decreasing consumption of saturated fat may be difficult since children do not consume all of the foods presently taken at lunch. Since young children's appetites are self-limiting, it may be more reasonable to offset calories from fat consumed at lunch with carbohydrate calories in a snack that precedes or follows lunch.

The only component for which conclusions vary appreciably by type of provider is sodium. The mean sodium intake of children five and older consuming CACFP lunches in homes and child care centers does not meet the recommendation for sodium, while the intake of children consuming lunches in Head Start centers does meet the recommendation. This difference appears to be due to differences in food consumption. Five-year-olds in Head Start centers consume less food (an average of 380 calories) at lunch than five-year-olds in either homes (423 calories) or child care centers (426 calories) (Exhibit C.10). [All groups consume less than one-third of the RDA for energy (Exhibit C.11)]. Six-year-olds in homes, who consume even more food at breakfast (505 calories) also contribute to a higher overall mean sodium intake for five- to ten-year-olds among children receiving care in homes.

Differences Between Lunches Offered and Lunches Consumed

CACFP lunches *as consumed* provide smaller percentages of the RDA, on average, than lunches *as offered* (described in Chapter Three). This is not unexpected since children do not always take all of the foods offered, may take portions of food that differ from the averages used in the analysis of meals offered, and consume only about three-quarters of the energy and nutrients available in the portions of food they do take.

Overall means for energy and nutrients in lunches *consumed*, expressed as average percentages of the RDA (Exhibit 4.9), are roughly equivalent to or greater than three-quarters of the means for lunches *offered* (Exhibit 3.10), with the exception of vitamin A and, to a lesser extent, vitamin C. Mean sodium and cholesterol intakes, expressed in actual units (mg) (Exhibits 4.10 and 3.12), are also equivalent to or greater than three-quarters of the mean for lunches offered.

Mean lunch intake of vitamin A (as a percentage of the RDA), although well above one-third of the RDA, is substantially less than three-quarters of the mean for lunches offered. Mean intake of vitamin C is also somewhat less than three-quarters of the mean for lunches offered. A potential explanation for the comparatively lower levels of vitamins A and C, relative to energy and other nutrients, in lunches as consumed is that, as noted above, the component most often missing from lunches taken by children is the second serving of fruit, vegetable, or juice (Exhibit 4.6). This component accounts for 54 percent of the vitamin A and 69 percent of the vitamin C in lunches as offered (Exhibit 3.16). Thus, omission of a part of this component is likely to have an impact on mean intakes of vitamins A and C.

Macronutrient profiles, expressed as percentage contributions to total energy intake, for lunches *offered* (Exhibit 3.12) and lunches *consumed* (Exhibit 4.10) are virtually identical. The average percentage of energy from fat is 35 percent for both lunches offered and lunches consumed. The average percentage of energy derived from saturated fat (14% and 15%), carbohydrate (47% and 46%), and protein (20% for both) are also virtually identical. This result was not necessarily expected because mean rates of consumption vary somewhat for different meal components. These differences (greater consumption of milk and lesser consumption of vegetables) are apparently not large enough to cause substantial shifts in the overall nutrient profile of CACFP lunches.

SNACKS CONSUMED

Children's food and nutrient intakes from morning and afternoon CACFP snacks are described in this section.¹³ The organization of the discussion is similar to preceding sections except that intake from CACFP snacks is not compared to *Dietary Guidelines* and NRC recommendations. As discussed in Chapter Two, these recommendations are for total diets; it is inappropriate to apply them to small eating occasions such as snacks.

Foods Taken in CACFP Snacks

The CACFP meal pattern requires that two of the four traditional meal components (fluid milk; fruit, vegetables, or full-strength juice; bread or an acceptable bread alternate; and meat or an acceptable meat alternate) be included in each snack. The majority of children consuming CACFP snacks on an average day (84% for morning snacks and 87% for afternoon snacks) actually take snacks that include two creditable items (Exhibit 4.11). Portions taken for CACFP snacks, like those taken for breakfast and lunch, are consistent with, or greater than, the minimum portions specified in the CACFP meal pattern (data not shown).

¹³Less than 5 percent of all children receive evening snacks. Because of this small sample size, data for evening snacks have not been tabulated separately. Energy and nutrients contributed by evening snacks, when consumed, are included in measures of total nutrient intake from all CACFP meals and snacks, discussed in the next section.

Consumption of Foods and Nutrients in CACFP Snacks as Taken

Children tend to consume a somewhat larger percentage of snack foods than either breakfast or lunch foods. On average, children consume 80 percent or more of the portions of all foods taken at snack (Exhibit 4.12).¹⁴ Mean consumption is consistently higher for morning snacks, ranging from a low of 81 percent of the portion taken for breads and bread alternates to a high, for creditable foods, of 88 percent for fruits, vegetables, and juices and meats and meat alternates.

On a typical day, children consume more than 80 percent of the energy and nutrients available in the CACFP snacks they take (Exhibit 4.13). As noted above, consumption is consistently higher for morning snacks. This general pattern is consistent across age groups and across different types of providers (Exhibits C.13 and C.14).

Nutrient Intake from CACFP Snacks Relative to RDAs

A primary reason for serving snacks in the CACFP is to provide toddlers and preschoolers, whose appetites may be erratic and self-limiting at meal time, with additional opportunities to consume needed energy and nutrients. Data from this study indicate that CACFP snacks are fulfilling this intended purpose.

Snacks consumed by CACFP participants provide, on average, about 10 percent of the RDA for energy and comparable or greater percentages of the RDA for all key nutrients except iron (Exhibit 4.14).¹⁵ Snacks make the most concentrated contribution to children's vitamin C intake, providing an average of 30 percent (afternoon snacks) to 44 percent (morning snacks) of the RDA.

ALL MEALS AND SNACKS CONSUMED

¹⁴Age-group-specific results for this analysis are not reported for snacks because most of the cells in the exhibits (morning and afternoon snacks) had sample sizes of fewer than 25 observations. The large number of cells with insufficient samples is due to the relatively small number of observations available (morning snack) and the fact that, since the meal pattern requires that just two meal components be offered, only two of the four meal component rows in the exhibit apply to any one snack.

¹⁵Data on actual mean energy and nutrient intakes from morning and afternoon snacks are presented, by age group, in exhibits C.15 and C.17, respectively. Standard errors for the estimates presented in Exhibit 4.14 are provided, along with age-group-specific estimates, in exhibits C.16 and C.18.

The vast majority of children participating in the CACFP receive more than one meal or snack through the program. To gain a full appreciation of the contributions CACFP meals and snacks make toward ensuring that children receive the energy and nutrients they need for growth and good health, it is important to examine children's total nutrient intake from CACFP meals and snacks over the course of a typical day in care. Because the number of meals and snacks available to children is influenced by the amount of time spent in care, data are presented separately for children in care *at least* four but *less than* eight hours per day and for children in care eight or more hours per day. School-age-children (six- to ten-year-olds) are excluded from this analysis because most of these children are in care before- and/or after-school and their patterns of consumption are substantially different from other children in care.

Children in Care Four to Eight Hours per Day

Most children in care four to eight hours per day (children in part-day care) consume at least two CACFP meals and/or snacks while in care (Exhibit 4.15). About one-quarter of these children receive lunch and one snack while in care; and an equivalent proportion receive breakfast, lunch, and one snack. About one-quarter also receive breakfast and lunch (23%). Eighteen percent of non-school-age children in care four to eight hours per day consume only one meal or snack. This is particularly true among children attending child care centers, where 36 percent of part-day children receive only one meal or snack.

Nutrient Intake from All CACFP Meals and Snacks Consumed Relative to RDAs. On a typical day, children in care *at least* four but *less than* eight hours per day consume, from CACFP meals and snacks, an average of more than three-quarters of the RDA for protein, vitamin A, and vitamin C; one-half of the RDA for calcium; and about one-third of the RDA for energy and iron (Exhibit 4.16).¹⁶ Overall, these findings are consistent with Head Start performance standards which recommend that children in part-day care receive meals and snacks that provide at least one-third of the RDA.

¹⁶Data on actual mean energy and nutrient intake are presented, by age group, in Exhibit C.19. Standard errors for the estimates presented in Exhibit 4.16 are provided, along with age-group-specific estimates, in Exhibit C.20.

Mean intakes are notably lower, however, among children receiving care in child care centers. This is not surprising, given that 23 percent of these children receive only one snack and another 10 percent receive only lunch (Exhibit 4.15).

Nutrient Intake from All Meals and Snacks Consumed Relative to Dietary Guidelines and NRC Recommendations. The total complement of CACFP meals and snacks typically consumed by five-year-old children in care four to eight hours per day meets recommendations for the percentage of calories from total fat and carbohydrate. Average total intake from CACFP meals and snacks exceeds recommendations for the percentage of calories from saturated fat and protein, however (Exhibit 4.17). Saturated fat provides an average of 12 percent of total energy, compared to the recommended level of less than 10 percent; protein provides 16 percent of total energy, compared to the recommendation of 15 percent or less.

Cumulative intake of sodium and cholesterol from all CACFP meals and snacks is evaluated with respect to the cumulative contribution to the RDA for energy. Ideally, relative contributions to recommended daily intakes of energy, cholesterol, and sodium should be comparable. Five-year-olds in part-day care consume, on average, 32 percent of the RDA for energy from CACFP meals and snacks (Exhibit C.20). These meals and snacks also contribute 23 percent of the recommended daily limit of cholesterol [(70 mg (mean intake)/300 mg (suggested daily limit)] (Exhibit C.21), an acceptable level in light of the mean contribution to recommended energy intake. Mean contribution to the recommended daily limit for sodium intake is 37 percent [(893 mg (mean intake)/2,400 mg (suggested daily limit)] (Exhibit C.21), a level that exceeds the contribution to recommended daily energy intake.

Children in Care Eight or More Hours per Day

About three-quarters of the children in care eight or more hours per day (full-day care) consume breakfast, lunch, and one or two snacks while in care (Exhibit 4.18). As noted in Chapter Three, breakfast, lunch, and one snack and breakfast, lunch, and two snacks are the two most common combinations of meals and snacks offered by CACFP providers. An additional 19 percent of children consume lunch and one or two snacks, while another 4 percent consume breakfast and lunch.

Nutrient Intake from All CACFP Meals and Snacks Relative to RDAs. Children in full-day care consume an average of more than 100 percent of the RDA for protein, vitamin A, and vitamin C; about three-quarters of the RDA for calcium; and about one-half of the RDA for energy and iron (Exhibit 4.19).¹⁷ This pattern, which is generally consistent across providers and across age groups, is consistent with Head Start performance standards which suggest that children in care eight or more hours per day receive one-half to two-thirds of daily energy and nutrient needs.

Nutrient Intake from All CACFP Meals and Snacks Relative to Dietary Guidelines and NRC Recommendations. On average, the total complement of meals and snacks consumed by five-year-old children in full-day care does not meet *Dietary Guidelines* and NRC recommendations for the percentage of energy from fat, saturated fat, carbohydrate, or protein (Exhibit 4.20). The mean percentage of energy from fat and saturated fat is 32 percent and 15 percent, respectively, compared to recommendations of no more than 30 percent and less than 10 percent. There is little evidence that children's fat intake from CACFP meals and snacks declines with age (Exhibit C.24). In fact, in both homes and child care centers, five-year-olds have higher fat intakes, as a percentage of total energy, than younger children.

As noted in the preceding section on part-day care, intake of cholesterol and sodium should, ideally, be consistent with contributions to daily energy needs. Five-year-old children in full-day care consume an average of 47 percent of the RDA for energy (Exhibit C.23). Mean cholesterol intake, equivalent to 33 percent of the suggested daily limit [98 mg (mean intake)/300 mg (suggested daily limit)], is in line with contributions to recommended daily energy intake. Mean sodium intake is equivalent to 52 percent of the suggested daily limit for sodium [1244 mg (mean intake)/2,400 mg (suggested daily limit)] (Exhibit C.24), a level which exceeds the contribution to energy needs.

¹⁷Data on actual energy and nutrient intake are presented in Exhibit C.22. Standard errors for means presented in Exhibit 4.19 are shown in Exhibit C.23.

Exhibit 4.1

More Than 80 Percent of CACFP Participants Take Breakfasts That Include All Required Meal Components

Breakfast Component	Children Receiving Care in:				
	All Children	Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
	Percentage of Children Taking Component(s)				
<i>Three or More Creditable Items</i>	83%	86%	89%	76%	81%
Milk	94	96	94	90	92
Fruits, Vegetables, or Juices	88	89	94	83	87
Breads or Bread Alternates	96	97	97	95	96
Noncreditable Foods ¹	47	57	51	32	40
Number of Child Observations (Unweighted)	1689	339	818	532	1350

¹Foods that do not contribute to satisfying the CACFP meal pattern.

Exhibit 4.2

CACFP Participants Consume About Three-quarters of the Portions of Food Taken at Breakfast

Breakfast Component	Children Receiving Care in:				
	All Children	Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
	Mean Percentage of Breakfast Portion Consumed¹				
Milk	75%	80%	70%	73%	72%
Fruits, Vegetables, and Juices	77	80	76	75	75
Breads and Bread Alternates	76	81	71	73	72
Noncreditable Foods ²	79	83	74	74	74
Number of Child Observations (Unweighted) ³	1689	339	818	532	1350

¹Breakfast portion defined as total amount taken, including second helpings in family-style service.

²Foods that do not contribute to satisfying the CACFP meal pattern.

³Total number of child observations. Actual sample size varies for each meal component because children did not necessarily receive all components.

Exhibit 4.3

**CACFP Participants Actually Consume About Three-quarters
of the Energy and Nutrients Available in the Breakfasts They Take**

	Children Receiving Care in:				
	All Children	Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
Mean Percentage of Available Nutrients Actually Consumed¹					
Total Energy	77%	81%	73%	75%	74%
Total Fat	76	80	72	74	74
Saturated Fat	76	80	72	74	73
Carbohydrate	77	81	73	75	74
Protein	76	80	71	74	73
Vitamin A	76	82	71	73	72
Vitamin C	78	81	75	77	76
Calcium	76	81	71	73	72
Iron	76	80	73	74	74
Cholesterol	76	80	72	73	73
Sodium	76	81	72	73	73
Number of Child Observations (Unweighted)	1689	339	818	532	1350

¹Available nutrients defined as nutrients in total amount of food taken, including second helpings in family-style service.

Exhibit 4.4

Breakfasts Consumed by CACFP Participants Provide More Than One-fourth of the RDA, Except for Energy and Iron

	Children Receiving Care in:				
	All Children	Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
Mean Percentage of RDA from CACFP Breakfasts Consumed					
Total Energy	15%	17%	14%	13%	13%
Protein	41	46	39	35	37
Vitamin A	40	48	34	35	34
Vitamin C	48	42	50	53	52
Calcium	26	29	26	24	25
Iron	24	28	20	22	21
Number of Child Observations (Unweighted)	1689	339	818	532	1350

Exhibit 4.5

**Breakfasts Consumed by CACFP Participants Five Years of Age and Older
Are Largely Consistent with *Dietary Guidelines* and NRC Recommendations**

	Recommendation	All Children	Children Receiving Care in:			
			Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
Mean Intake from CACFP Breakfasts						
Percent of Energy from Fat (%)	≤ 30%	24	23	26	21	24
Percent of Energy from Saturated Fat (%)	< 10%	11	10	13	11	12
Percent of Energy from Carbohydrate (%)	≥ 55%	64	64	60	67	63
Percent of Energy from Protein (%)	≤ 15%	14	14	15	14	14
Cholesterol (mg)	≤ 75 mg	38	52	40	22	31
Sodium (mg)	≤ 600 mg	356	452	347	263	305
Number of Child Observations (Unweighted)		563	89	333	141	474

Note: *Dietary Guidelines* and NRC recommendations have been applied only to children five years of age and older (see Chapter Two).

Exhibit 4.6

More Than 80 Percent of CACFP Participants Take Lunches That Include All Required Meal Components

Lunch Component	Children Receiving Care in:				
	All Children	Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
	Percentage of Children Taking Component(s)				
<i>Five or More Creditable Items</i>	82%	83%	82%	81%	81%
Milk	96	95	95	97	96
Fruits, Vegetables, or Juices	99	99	97	99	98
Two or more servings	91	91	88	92	90
Only one serving	99	99	97	99	98
Breads or Bread Alternates	95	93	96	96	96
Meats or Meat Alternates	96	98	95	95	95
Noncreditable Foods ¹	37	36	36	38	38
Number of Child Observations (Unweighted)	2174	412	1050	712	1762

¹Foods that do not contribute to satisfying the CACFP meal pattern.

Exhibit 4.7

With the Exception of Vegetables, CACFP Participants Consume More Than 70 Percent of the Portions of Food Taken at Lunch

Lunch Component	Children Receiving Care in:				
	All Children	Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
Mean Percentage of Lunch Portion Consumed¹					
Milk	83%	82%	81%	84%	83%
Fruits and Juices	78	76	78	80	80
Vegetables	59	60	58	60	59
Breads and Bread Alternates	70	76	66	69	68
Meats and Meat Alternates	76	78	69	79	75
Mixed Entrees ²	73	75	69	73	72
Noncreditable Foods ³	76	74	79	76	77
Number of Child Observations (Unweighted) ⁴	2174	412	1050	712	1762

¹Lunch portion defined as total amount taken, including second helpings in family-style service.

²Entree items including two or more components, most often meat and bread.

³Foods that do not contribute to satisfying the CACFP meal pattern.

⁴Total number of child observations. Actual sample size varies for each meal component because children did not necessarily receive all components.

Exhibit 4.8

CACFP Participants Actually Consume About Three-quarters of the Energy and Nutrients Available in the Lunches They Take

	Children Receiving Care in:				
	All Children	Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
Mean Percentage of Available Nutrients Actually Consumed¹					
Total Energy	76%	77%	73%	76%	75%
Total Fat	76	77	73	76	75
Saturated Fat	78	78	75	78	77
Carbohydrate	75	77	73	75	75
Protein	76	77	74	77	76
Vitamin A	73	73	72	73	72
Vitamin C	71	72	70	72	71
Calcium	79	80	78	80	79
Iron	73	75	69	73	72
Cholesterol	77	79	74	78	77
Sodium	74	76	71	74	73
Number of Child Observations (Unweighted)	2174	412	1050	712	1762

¹Available nutrients defined as nutrients in total amount of food taken, including second helpings in family-style service.

Exhibit 4.9

Lunches Consumed by CACFP Participants Provide One-third or More of the RDA, Except for Energy and Iron

	Children Receiving Care in:				
	All Children	Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
Mean Percentage of RDA from CACFP Lunches Consumed					
Total Energy	23%	24%	21%	23%	22%
Protein	87	90	79	90	86
Vitamin A	61	58	68	59	63
Vitamin C	35	31	35	37	37
Calcium	34	33	36	34	35
Iron	22	21	23	22	22
Number of Child Observations (Unweighted)	2174	412	1050	712	1762

Exhibit 4.10

**Lunches Consumed by CACFP Participants Five Years of Age and Older
Meet Recommendations for Cholesterol and Sodium Intake but
Do Not Meet Recommendations for the Percentage of Energy
From Fat, Saturated Fat, or Carbohydrate**

	Recommendation	All Children	Children Receiving Care in:			
			Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
Mean Intake from CACFP Lunches						
Percent of Energy from Fat (%)	≤ 30%	35	36	34	36	35
Percent of Energy from Saturated Fat (%)	< 10%	15	14	15	16	16
Percent of Energy from Carbohydrate (%)	≥ 55%	46	46	46	45	46
Percent of Energy from Protein (%)	≤ 15%	20	19	21	20	20
Cholesterol (mg)	≤ 100 mg	55	56	50	59	55
Sodium (mg)	≤ 800 mg	772	836	682	812	753
Number of Child Observations (Unweighted)		700	83	426	191	617

Note: NRC recommendations have been applied only to children five years of age and older (see Chapter Two).

Exhibit 4.11

**More Than 80 Percent of CACFP Participants Take Snacks
That Include All Required Components**

Snack Component	Children Receiving Care in:				
	All Children	Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
Morning Snack	Percentage of Children Taking Component(s)				
<i>Two or More Creditable Items</i>	84%	84%	82%	85%	84%
Milk	42	39	24	48	45
Fruits, Vegetables, or Juices	70	76	74	65	66
Breads and Bread Alternates	73	72	75	74	74
Meats and Meat Alternates	14	19	12	9	10
Noncreditable Foods ¹	20	9	22	29	28
Number of Child Observations (Unweighted)	431	137	124	170	294
Afternoon Snack	Percentage of Children Taking Component(s)				
<i>Two or More Creditable Items</i>	87%	91%	94%	82%	84%
Milk	47	53	34	45	43
Fruits, Vegetables, or Juices	64	64	72	61	64
Breads and Bread Alternates	76	74	84	75	77
Meats and Meat Alternates	21	22	26	19	21
Noncreditable Foods ¹	17	16	12	19	17
Number of Child Observations (Unweighted)	1564	399	495	670	1165

¹Foods that do not contribute to satisfying the CACFP meal pattern.

Exhibit 4.12

CACFP Participants Consume 80 Percent or More of the Portions of Food Taken at Snack

Snack Component	Children Receiving Care in:				
	All Children	Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
Morning Snacks	Mean Percentage of Morning Snack Portion Consumed¹				
Milk	86%	86%	n/a	86%	86%
Fruits, Vegetables, and Juices	88	87	89%	88	88
Breads and Bread Alternates	81	85	88	77	79
Meats and Meat Alternates	88	n/a	n/a	n/a	n/a
Noncreditable Foods ²	91	n/a	n/a	91	91
Number of Child Observations (Unweighted) ³	431	137	124	170	294
Afternoon Snacks	Mean Percentage of Afternoon Snack Portion Consumed¹				
Milk	82%	84%	80%	82%	81%
Fruits, Vegetables, and Juices	82	86	82	78	79
Breads and Bread Alternates	82	86	74	81	80
Meats and Meat Alternates	82	84	81	82	82
Noncreditable Foods ²	80	88	84	73	75
Number of Child Observations (Unweighted) ³	1564	399	495	670	1165

n/a = Fewer than 25 child observations.

¹Snack portion defined as total amount taken, including second helpings in family-style service.

²Foods that do not contribute to satisfying the CACFP meal pattern.

³Total number of child observations. Actual sample size varies for each snack component because children did not necessarily receive all components.

Exhibit 4.13

CACFP Participants Actually Consume More Than 80 Percent of the Energy and Nutrients Available in the Snacks They Take

Snack/Nutrient	Children Receiving Care in:				
	All Children	Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
Morning Snacks	Mean Percentage of Available Nutrients Actually Consumed¹				
Total Energy	85%	87%	89%	83%	84%
Protein	85	86	86	84	84
Vitamin A	85	87	85	84	84
Vitamin C	87	87	87	87	87
Calcium	85	86	89	84	85
Iron	86	87	88	85	85
Number of Child Observations (Unweighted)	431	137	124	170	294
Afternoon Snacks	Mean Percentage of Available Nutrients Actually Consumed¹				
Total Energy	82%	84%	79%	81%	81%
Protein	81	84	78	80	80
Vitamin A	82	84	80	81	81
Vitamin C	82	85	83	79	80
Calcium	82	84	79	81	80
Iron	81	84	78	80	80
Number of Child Observations (Unweighted)	1564	399	495	670	1165

¹Available nutrients defined as nutrients in total amount of food taken, including second helpings in family-style service.

Exhibit 4.14

**Snacks Consumed by CACFP Participants Provide About
10 Percent of the RDA for Energy and Comparable or Greater
Percentages of the RDA for All Key Nutrients**

Snack/Nutrient	Children Receiving Care in:				
	All Children	Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
Morning Snacks	Mean Percentage of RDA from CACFP Morning Snacks Consumed				
Total Energy	10%	12%	8%	10%	9%
Protein	22	25	13	21	20
Vitamin A	11	11	8	12	11
Vitamin C	44	32	55	53	53
Calcium	13	15	8	12	12
Iron	9	9	8	9	9
Number of Child Observations (Unweighted)	431	137	124	170	294
Afternoon Snacks	Mean Percentage of RDA from CACFP Afternoon Snacks Consumed				
Total Energy	11%	12%	9%	10%	10%
Protein	23	25	19	22	21
Vitamin A	15	18	14	13	13
Vitamin C	30	29	32	31	31
Calcium	16	17	12	15	15
Iron	9	10	8	8	8
Number of Child Observations (Unweighted)	1564	399	495	670	1165

Exhibit 4.15

**Most Children in Care Four to Eight Hours per Day
Consume at Least Two CACFP Meals and/or Snacks**

Meal/Snack Combination	Children Receiving Care in				
	All Children	Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
Percentage of Children in Care Four to Eight Hours per Day					
Lunch and one snack	24%	34%	18%	24%	21%
Breakfast, lunch, and one snack	25	24	34	15	26
Breakfast and lunch	23	6	42	9	27
Morning snack only	6	0	0	17	8
Lunch only	7	10	2	10	6
Lunch and two snacks	7	15	0	10	4
Afternoon snack only	3	3	0	6	3
Breakfast, lunch, and two snacks	3	6	2	3	2
Breakfast Only	2	1	1	3	2
Other meals, snacks, or combinations	2	1	1	4	2
Number of Child Observations (Unweighted)	1200	80	904	216	1120

Notes: School-age children (six- to ten-year-olds) not included in tabulations.

Detail may not sum to 100 percent due to rounding.

Exhibit 4.16

CACFP Meals and Snacks Consumed by Children in Care Four to Eight Hours per Day Make Substantial Contributions to Daily Nutrient Needs

	Children Receiving Care in:				
	All Children	Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
Mean Percentage of RDA in All CACFP Meals and Snacks Consumed					
Total Energy	34%	39%	36%	29%	33%
Protein	108	116	118	91	106
Vitamin A	80	81	100	55	80
Vitamin C	86	84	94	77	87
Calcium	53	56	62	41	53
Iron	37	37	43	30	37
Number of Child Observations (Unweighted)	1200	80	904	216	1120

Note: School-age children (six- to ten-year-olds) not included in tabulations.

Exhibit 4.17

**CACFP Meals and Snacks Consumed by Five-Year-Old Children
in Care Four to Eight Hours Per Day Meet Recommendations
for Total Fat, Carbohydrate, and Cholesterol but Not for
Saturated Fat, Protein, or Sodium**

	Recommendation	Children Receiving Care in:				
		All Children	Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
Mean Intake from All CACFP Meals and Snacks						
Percent of Energy from Fat (%)	≤ 30%	29	n/a	32	25	29
Percent of Energy from Saturated Fat (%)	< 10%	12	n/a	14	10	12
Percent of Energy from Carbohydrate (%)	≥ 55%	56	n/a	52	63	57
Percent of Energy from Protein (%)	≤ 15%	16	n/a	18	38	66
Cholesterol (% ¹)	n.s.	70	n/a	84	38	66
Sodium (% ¹)	n.s.	893	n/a	1008	575	839
Number of Child Observations (Unweighted)		440	13	366	61	427

n/a = Fewer than 25 child observations.

Notes: *Dietary Guidelines* and NRC recommendations apply only to children five years of age and older (see Chapter Two).
School-age children (six- to ten-year-olds) not included in part-day tabulations.

n.s. = Not specified.

Exhibit 4.18

**Most Children in Care Eight or More Hours per Day
Receive Breakfast, Lunch, and One or Two Snacks**

Meal/Snack Combination	Children Receiving Care in:				
	All Children	Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
	Percentage of Children in Care Eight or More Hours per Day				
Breakfast, lunch, and one snack	57%	53%	83%	58%	60%
Breakfast, lunch, and two snacks	18	22	2	16	15
Breakfast and lunch	4	6	11	2	3
Lunch and two snacks	10	9	0	13	12
Lunch and one snack	9	8	3	11	10
Other combinations	1	2	2	1	1
Number of Child Observations (Unweighted)	845	310	57	478	535

Note: School-age children (six- to ten-year-olds) not included in full-day tabulations.

Detail may not sum to 100 percent due to rounding.

Exhibit 4.19

CACFP Meals and Snacks Consumed by Children in Care Eight or More Hours per Day Provide 50 to 100 Percent of Children's Energy and Nutrient Needs

	Children Receiving Care in:				
	All Children	Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
Mean Percentage of RDA in All CACFP Meals and Snacks Consumed					
Total Energy	49%	53%	47%	47%	47%
Protein	155	163	160	145	147
Vitamin A	112	118	99	107	106
Vitamin C	106	96	111	116	116
Calcium	73	74	79	71	72
Iron	52	55	46	49	49
Number of Child Observations (Unweighted)	845	310	57	478	535

Note: School-age children (six- to ten-year-olds) not included in full-day tabulations.

Exhibit 4.20

With the Exception of Cholesterol, CACFP Meals and Snacks Consumed by Five-Year-Old Children in Care Eight or More Hours per Day Do Not Meet Dietary Guidelines and NRC Recommendations

	Recommendation	Children Receiving Care in:				
		All Children	Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
Mean Intake from All CACFP Meals and Snacks						
Percent of Energy from Fat (%)	≤ 30%	32	32	n/a	33	32
Percent of Energy from Saturated Fat (%)	< 10%	14	13	n/a	15	15
Percent of Energy from Carbohydrate (%)	≥ 55%	53	53	n/a	52	53
Percent of Energy from Protein (%)	≤ 15%	17	16	n/a	17	17
Cholesterol (% ¹)	n.s.	98	104	n/a	94	95
Sodium (% ¹)	n.s.	1244	1322	n/a	1228	1219
Number of Child Observations (Unweighted)		170	42	18	110	128

n/a = Fewer than 25 child observations.

Notes: *Dietary Guidelines* and NRC recommendations apply only to children five years of age and older (see Chapter Two).
School-age children (six- to ten-year-olds) not included in part-day tabulations.

n.s. = Not specified.

Chapter Five

Nutrition Knowledge and Food Service Practices

This chapter examines the nutrition knowledge of individuals with primary responsibility for food preparation in CACFP sites (food preparers), as well as the practices used by CACFP providers in procuring and preparing foods for CACFP meals and snacks. The analysis focuses, in part, on knowledge and practices related to the *Dietary Guidelines for Americans*. While, as noted in Chapter Two, CACFP providers are not required to meet the *Dietary Guidelines* in planned meals, program guidance materials encourage providers to consider the *principles* of the *Dietary Guidelines*—less fat, sugar, and salt and more fruits, vegetables, and fiber—when planning and preparing meals.

The following research questions are addressed:

- **Nutrition Knowledge.** Do food preparers have an understanding of key principles of good nutrition? Do food preparers know how to implement the principles of the *Dietary Guidelines for Americans*?
- **Food Service Practices.** Do CACFP providers consider the principles of the *Dietary Guidelines* when purchasing foods? Do they use menu planning and food preparation practices that are consistent with the *Dietary Guidelines for Americans*? Do food purchasers examine nutrition labels on packaged foods when making purchasing decisions?

DATA SOURCES

Data for this analysis are drawn from the Food Preparer Interview, a brief survey that was administered over the telephone or, for sites included in the on-site visits, in a face-to-face interview. All interviews were completed between January and June, 1995; response rates were over 85 percent for all provider groups (see Appendix F).

For family day care homes, the provider was almost always the respondent. For most centers, the respondent was the center cook. In cases where meals were prepared off-site, whether for homes or for centers, the respondent was the responsible cook in the off-site preparation facility. Survey items

related to menu planning practices were phrased so that the food preparer could answer them even if he/she was not directly responsible for planning menus, e.g., statements were phrased with reference to how often particular types of foods are actually served rather than whether specific principles are considered when menus are planned. Survey items related to food purchasing were left blank if the food preparer had no direct involvement in food purchasing. Thus, findings reported in this chapter reflect the nutrition knowledge of food preparers and the food service practices of CACFP providers, as reported by food preparers. This information may be useful to program planners in designing future training and technical assistance materials.

Items included in the survey instrument were based primarily on principles stressed in CACFP guidance materials and/or included on a checklist of quality food purchasing and preparation practices developed by the Child Nutrition Division of the California State Department of Education. Survey items are described in detail in the following sections, which address, in turn, nutrition knowledge of CACFP food preparers and reported food service practices (meal planning, preparation, and food purchasing).

NUTRITION KNOWLEDGE OF CACFP FOOD PREPARERS

Food preparers answered a series of 37 items designed to assess knowledge of key principles of good nutrition (19 items) as well as knowledge of the *Dietary Guidelines* principles (18 items). The general nutrition items assessed knowledge of the following: the relationship between diet and disease; the food pyramid; sources of vitamin A, vitamin C, and iron (key nutrients emphasized in program guidance materials); and basic concepts related to feeding young children. The *Dietary Guidelines* items assessed knowledge of food selection, preparation, and service practices consistent with the principles of the *Dietary Guidelines*.

With the exception of the items assessing knowledge of the food pyramid, items were constructed as true/false statements. Knowledge of the food pyramid was assessed with an item that asked whether respondents had ever seen or heard of the food pyramid and an open-ended question,

answered only by respondents who indicated familiarity with the food pyramid, that asked respondents to name the food groups.

A total knowledge score, reflecting the percentage of items answered correctly, was computed for each respondent. Missing, don't know, and, for the first food pyramid question, negative responses were considered incorrect answers. Each of the five food groups in the pyramid was counted as a separate item and respondents were considered to have given a correct answer if the food group was named and an incorrect answer if the food group was not named. In addition to the overall knowledge score, separate scores were generated for general nutrition knowledge and for *Dietary Guidelines*-related knowledge. Results are shown in Exhibit 5.1.

As the exhibit shows, overall, food preparers have a reasonably high level of nutrition knowledge. Across all providers, the mean score for the entire nutrition knowledge battery is 73 percent, indicating that, on average, respondents answered 73 percent of the items correctly.

CACFP food preparers are more knowledgeable about ways to implement the *Dietary Guidelines* than they are about general principles of good nutrition, as measured in this study. Across all providers, the overall score for the 19 items dealing with general nutrition knowledge was 69 percent, compared to a score of 77 percent for the 18 *Dietary Guidelines* items. Differences among the three types of providers are larger for the general nutrition knowledge score than for the *Dietary Guidelines* score, with food preparers in Head Start centers scoring higher than food preparers in either homes or child care centers.

General Nutrition Knowledge

Exhibit 5.2 presents results for each of the general nutrition knowledge items. As the exhibit shows, almost all CACFP food preparers are aware that dietary intake can influence disease risk and most are familiar with the food pyramid. Food preparers have some misconceptions,

Exhibit 5.1

CACFP Food Preparers Have a Reasonably High Level of Nutrition Knowledge

	All Providers	Family Day Care Homes	Center-Based Care		
			Head Start Centers	Child Care Centers	All Centers
Overall Knowledge Score				Mean Score (Percentage of Items Correct)	
	73%	72%	77%	74%	75%
General nutrition knowledge score	69	68	74	69	71
<i>Dietary Guidelines</i> knowledge score	77	77	80	79	79
Number of Food Preparers (Unweighted)	2010	529	888	593	1481

Exhibit 5.2
CACFP Food Preparers Are Familiar with the Food Guide Pyramid But Have Some Misconceptions About the Nutrient Content of Foods

	Center-Based Care				
	All Providers	Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
Percentage of Food Preparers with Correct Response					
Relationship between diet and disease¹	93%	94%	92%	91%	91%
Food Guide Pyramid					
Knows Food Guide Pyramid	85	85	91	86	88
Named milk, yogurt, cheese group	72	72	79	72	75
Named bread, cereal, rice, and pasta group	80	79	85	78	80
Named fruit group	77	77	80	75	77
Named vegetable group	80	81	86	77	80
Named meat, poultry, fish, dried beans, eggs, and nuts group	77	77	83	77	80
Sources of Vitamin A					
Potatoes are a good source of vitamin A ²	19	17	35	28	31
Carrots are a good source of vitamin A ³	83	82	89	86	87
Celery is a good source of vitamin A ²	19	18	28	24	25
Sources of Vitamin C					
Orange juice is a good source of vitamin C ³	100	100	100	100	100
Broccoli is a good source of vitamin C ³	77	75	88	80	83
Grapes are a good source of vitamin C ²	19	18	25	22	23

¹A single true/false item (true as stated) regarding the fact that what you eat can affect chances of getting certain diseases.

²Statement is false.

³Statement is true.

**Exhibit 5.2
(continued)**

	All Providers	Family Day Care Homes	Center-Based Care		
			Head Start Centers	Child Care Centers	All Centers
Percentage of Food Preparers with Correct Response					
Sources of Iron					
Red meat is a good source of iron ³	71%	70%	77%	71%	73%
Whole grain breads are a good source of iron ³	71	71	79	70	73
Milk is a good source of iron ²	27	27	33	28	30
Feeding Children					
Children need a variety of foods every day ³	95	95	95	95	95
Picky eaters should be served the same foods every day ²	93	92	94	93	93
Children should not eat too many starchy foods because these foods make people fat ²	67	68	61	65	63
Number of Food Preparers	2010	529	888	593	1481

²Statement is false.

³Statement is true.

however, about food sources of key nutrients, particularly vitamin A.¹ Food preparers in Head Start centers are somewhat more likely than family day care providers or food preparers in child care centers to have answered questions about nutrient content correctly.

While more than 80 percent of CACFP food preparers know that carrots are a good source of vitamin A, fewer than 20 percent know that potatoes and celery are *not* good sources of vitamin A. All food preparers are aware that orange juice is a good source of vitamin C, and about three-quarters know that broccoli is also a good source of vitamin C. However, fewer than 20 percent of CACFP food preparers know that grapes are *not* a good source of vitamin C. Finally, 71 percent of all CACFP food preparers know that red meat and whole grain breads are good sources of iron; only 27 percent of food preparers know, however, that milk is *not* a good source of iron.

Almost all food preparers are aware that children need to consume a variety of foods and that new foods should be offered to picky eaters. One-third of all food preparers are misinformed about the importance of carbohydrates, however, believing that children's intake of “starchy” foods should be limited because they are “fattening.”

Knowledge About Implementing the Dietary Guidelines

Exhibit 5.3 presents item-level results for *Dietary Guidelines* knowledge. As noted above, CACFP food preparers are very knowledgeable about techniques that can be used to implement the *Dietary Guidelines*. In general, food preparers are most knowledgeable about ways to decrease sodium. Nine out of ten food preparers know that flavoring foods with herbs and spices instead of salt is a good way to decrease the amount of sodium in children's meals and that serving canned vegetables instead of fresh vegetables will *not* decrease sodium content. Similarly, 84 percent of food preparers know that serving processed foods like chicken nuggets and hot dogs less often is another way to lower the amount of sodium in children's meals.

¹Correct answers regarding “good” nutrient sources are based on information provided in program guidance materials [*Child and Adult Care Food Program: Nutrition Guidance for Child Care Centers* (1995) and *Child and Adult Care Food Program: Nutrition Guidance for Child Care Homes* (1995)].

Exhibit 5.3

CACFP Food Preparers Know a Lot About How to Implement the *Dietary Guidelines*

	All Providers	Family Day Care Homes	Center-Based Care		
			Head Start Centers	Child Care Centers	All Centers
Percentage of Food Preparers with Correct Response					
Ways to Decrease Sugar					
Serve fruit for dessert instead of cakes or cookies ¹	99%	99%	100%	99%	99%
Use honey instead of sugar to sweeten foods ²	20	20	25	17	20
Use fruit canned in juice rather than heavy syrup ¹	98	98	99	98	99
Ways to Increase Carbohydrates					
Serve larger portions of fruits and vegetables ¹	70	69	75	76	76
Serve foods like chili, baked beans, bean soups ¹	66	66	69	66	67
Serve cold, unsweetened cereal or popcorn for snacks ¹	63	61	73	69	70
Ways to Increase Fiber					
Serve whole wheat bread instead of white bread ¹	98	97	98	99	99
Serve eggs and fish more often ²	52	51	60	54	56
Serve raw vegetables for snacks ¹	96	96	98	96	97
Ways to Decrease Fat					
Serve fried chicken instead of hamburgers ²	85	85	88	88	88
Serve fresh fruit for snacks instead of cheese and crackers ¹	97	97	97	96	96
Serve cream cheese on bread or toast instead of jelly ²	63	63	57	64	61

¹Statement is true.

²Statement is false.

**Exhibit 5.3
(continued)**

	All Providers	Family Day Care Homes	Center-Base Care		
			Head Start Centers	Child Care Centers	All Centers
Percentage of Food Preparers with Correct Response					
Ways to Decrease Saturated Fat					
Use corn oil instead of butter ¹	84%	83%	92%	87%	89%
Serve lowfat milk to children over the age of three ¹	85	83	92	89	90
Serve cheese as a snack food ²	51	51	50	49	49
Ways to Decrease Sodium					
Use herbs and spices instead of salt to flavor foods ¹	90	89	93	94	94
Serve processed, convenience items less often ¹	84	84	84	83	83
Serve canned vegetables instead of fresh vegetables ²	93	92	96	95	95
Number of Food Preparers	2010	529	888	593	1481

¹Statement is true.

²Statement is false.

Food preparers are also very knowledgeable about ways to increase fiber and to decrease fat, saturated fat, and sugar, however, some providers have inaccurate perceptions about the fiber or fat content of particular foods. Virtually all food preparers know that serving whole wheat bread and raw vegetables are good ways to increase fiber in child care meals. However, only about one-half of CACFP food preparers know that serving meat and eggs more often will *not* increase the fiber content of child care meals.

Most food preparers know that fried chicken is not a good substitute for hamburgers when the goal is to lower fat content and that fresh fruit as a snack is a good substitute for cheese and crackers. However, more than one-third of food preparers believe, incorrectly, that serving cream cheese in place of jelly will lower fat content. With regard to saturated fat, most food preparers are cognizant of the saturated-fat content of butter and whole milk and aware of appropriate substitutes, however, many are apparently not aware that cheese is also high in saturated fat. About one-half of all respondents indicated that serving cheese as a snack food would lead to decreased levels of saturated fat.

Finally, almost all providers know that serving fruit instead of baked desserts and using fruit canned in juice rather than fruit in heavy syrup are recommended techniques for decreasing sugar in child care meals. Eighty percent of food preparers, however, believe that substituting honey for white sugar is a useful means of decreasing sugar content.

Food preparers are least knowledgeable about techniques for increasing carbohydrate content of child care meals. For each of the techniques included in the survey (serving larger portions of fruits and vegetables; serving foods made with dried beans and peas; and serving cold, unsweetened cereal or popcorn for snacks), close to one-third (or more) of CACFP food preparers gave the wrong answer.

FOOD SERVICE PRACTICES

Food preparers provided information on the extent to which the *Dietary Guidelines* principles are considered when meals are planned, prepared, and served. Those who were able to answer questions about food purchasing practices also reported on the extent to which nutrition labels are consulted when packaged foods are purchased and on the specific factors considered when food purchasing decisions are made. Results for each of these analyses are presented in the following sections.

Implementation of the Dietary Guidelines

Respondents were asked about how often desirable food service practices were used. Survey items queried practices relative to sugar (six items); fiber (two items); fat (nine items); and sodium (three items). Response categories for all items were: often, sometimes, rarely, and never. An overall *Dietary Guidelines* practice score was computed for each CACFP provider; the score reflects the percentage of desirable practices that are actually used in the CACFP site. Survey items presented both desirable and undesirable practices. In computing scores, reported practices were considered consistent with the *Dietary Guidelines* if, in the case of desirable practices, such as modifying recipes to decrease sugar content, the response was often or sometimes, or, in the case of undesirable practices, such as frying meat, chicken, or fish, the response was rarely or never.

According to food preparers, CACFP sites are implementing many food service practices that are consistent with *Dietary Guidelines* principles (Exhibit 5.4). Overall, CACFP providers reportedly use, at least some of the time, close to three-quarters of the desired practices assessed in this study. Approximately 80 percent or more of all providers modify recipes or menus to decrease sugar content; keep sugar bowls, butter/margarine, and salt shakers off the table(s) where children eat; avoid use of sweetened cereals; offer foods made with dried beans or peas; offer lean meat, chicken, or fish; remove skin from chicken before cooking; offer low-fat or skim milk to children over the age of three; and use herbs and spices rather than salt to flavor foods.

Specific practices that have the lowest rate of utilization (i.e., are reportedly used by fewer than 50 percent of all CACFP providers) include: avoiding use of jelly on sandwiches; offering

Exhibit 5.4

According to Food Preparers, CACFP Providers Are Implementing Many Food Service Practices That Are Consistent with the *Dietary Guidelines*

	All Providers	Family Day Care Homes	Center-Based Care		
			Head Start Centers	Child Care Centers	All Centers
Mean Percentage of Desirable Practices Actually Implemented					
Overall <i>Dietary Guidelines</i> Practices Score	71%	71%	72%	69%	70%
Practices to Decrease Sugar					
Percentage of Providers Using Desired Practices					
Often or sometimes change recipes or menus to decrease sugar content	79	78	86	85	85
Rarely or never serve brownies, cookies, cakes	71	72	76	63	68
Rarely or never serve canned fruit packed in syrup	54	55	48	45	46
Rarely or never add jelly to peanut butter sandwiches	33	31	53	36	42
Rarely or never keep sugar bowls on table	98	98	98	98	98
Rarely or never serve sweetened cereals	81	81	86	80	82
Practices to Increase Fiber					
Rarely or never serve white bread	35	34	42	39	40
Often or sometimes offer foods made with dried beans	82	82	89	83	85
Practices to Decrease Fat					
Rarely or never add butter/margarine to vegetables	49	51	38	41	40
Rarely or never fry chicken, meat, or fish	73	72	80	78	79
Often or sometimes offer low-fat cheeses	69	69	66	67	67
Rarely or never keep butter/margarine on table	89	90	80	89	86
Often or sometimes serve lean meat, fish, and chicken	96	97	97	90	92

**Exhibit 5.4
(continued)**

	All Providers	Family Day Care Homes	Center-Based Care		
			Head Start Centers	Child Care Centers	All Centers
Practices to Decrease Fat (continued)					
Often or sometimes remove skin from chicken before cooking	87%	90%	71%	71%	71%
Rarely or never serve hot dogs, cold cuts, or sausages	43	41	54	46	49
Rarely or never buy regular ground beef rather than lean or extra-lean ground beef	65	67	52	53	53
Often or sometimes serve low-fat or skim milk to children over the age of three	79	79	88	76	81
Practices Related to Sodium					
Rarely or never keep salt shakers on table	96	95	98	99	99
Often or sometimes use herbs and spices in place of salt	84	83	88	86	87
Rarely or never buy processed, convenience foods	60	61	53	50	51
Number of Food Preparers	2010	529	888	593	1481

bread other than white bread; avoiding the addition of butter or margarine to cooked vegetables; and using fewer processed, convenience items.

Use of Nutrition Labels

CACFP food preparers with responsibility for food purchasing make good use of nutrition labels (Exhibit 5.5). More than nine out of ten CACFP food preparers always or sometimes read the nutrition information on food package labels and consider nutrient content when making food purchasing decisions. Almost all food preparers compare the nutrient content of different brands and review ingredient lists.

Factors Considered in Purchasing Foods

CACFP food preparers who have at least some purchasing responsibility were asked about the extent to which 12 different factors are considered when purchasing decisions are made. Response options were often, sometimes, rarely, and never. Exhibit 5.6 summarizes the major factors considered by CACFP food preparers (i.e., the factors that are reported to be considered *often*). Results indicate that, overall, the needs of children and food service considerations are paramount in food purchasing decisions in the CACFP. The single most important factor is an interest in providing a variety of foods to children; 87 percent of all CACFP food preparers consider the need for variety when making food purchasing decisions. More than two-thirds of all CACFP food preparers consider children's feeding and eating abilities and food preferences, and nearly two-thirds consider the need to introduce children to new foods.

Sanitation considerations are also important to food purchasing decisions in the CACFP. More than three quarters of all food preparers consider possible sanitation/cleanliness problems when deciding whether or not to purchase a particular food item. Required preparation time is also a consideration for 50 percent of CACFP food preparers.

With regard to nutrient content, sugar is a major concern of CACFP food preparers. Cited by 81 percent of all respondents, it is the second most common purchasing consideration. Other aspects of nutrient content receive somewhat less focus, particularly fiber and vitamin C.

Cost is a comparatively less important consideration in CACFP food purchasing decisions. Less than one-half of all providers included cost on the list of factors they consider regularly (often) when making purchasing decisions.

Exhibit 5.5

**Food Preparers with Food Purchasing Responsibility
Make Good Use of Nutrition Labels**

	All Providers	Family Day Care Homes	Center-Based Care		
			Head Start Centers	Child Care Centers	All Centers
Percentage of Food Preparers Reporting Desired Practices					
Always or sometimes consider the nutrition information on label	93%	92%	93%	94%	94%
Always or sometimes compare nutrient content of different brands	90	90	89	89	89
Always or sometimes read ingredient list	93	93	96	95	95
Number of Food Preparers (Unweighted)	1930	529	836	565	1401

Note: Includes only food preparers with purchasing/shopping responsibilities.

Exhibit 5.6

**Food Preparers Give Paramount Consideration to Needs of Children,
Sugar Content of Foods, and Sanitation Considerations
When Making Food Purchasing Decisions**

	All Providers	Family Day Care Homes	Center-Based Care		
			Head Start Centers	Child Care Centers	All Centers
	Percentage Who Consider Factor¹				
Cost	49%	46%	63%	65%	64%
Nutrient Content					
Sugar content	81	81	85	81	82
Fat content	70	69	80	74	76
Fiber content	43	41	61	52	55
Vitamin C content	52	49	77	66	70
Salt/sodium content	64	62	81	73	76
Children's Needs					
Interest in introducing new foods	63	62	71	62	65
Interest in providing variety of foods	87	87	91	86	88
Children's food preferences	71	71	73	68	70
Children's feeding/eating abilities	78	77	85	82	83
Food Service Considerations					
Possible sanitation/cleanliness problems	80	78	88	87	87
Required preparation time	50	48	70	58	62
Number of Food Preparers (Unweighted)	1930	529	836	565	1401

¹Consider factor often (as opposed to sometimes, rarely, or never).

Note: Includes only food preparers with purchasing/shopping responsibilities.

References

- Child and Adult Care Food Program: Nutrition Guidance for Child Care Centers* (1995). Washington, DC: U.S. Department of Agriculture, Food and Consumer Service.
- Child and Adult Care Food Program: Nutrition Guidance for Child Care Homes* (1995). Washington, DC: U.S. Department of Agriculture, Food and Consumer Service.
- Pao E. *et al.* (1990). *Foods Commonly Eaten by Individuals: Amount Per Eating Occasion and Per Day*. Washington, DC: U.S. Department of Agriculture, Consumer Nutrition Center, Human Nutrition Information Service.

Appendix A

Methodology Used in Determining the Nutrient Content of Meals and Snacks Offered and Consumed

This appendix describes the methodology used in determining the average nutrient content of meals and snacks offered by CACFP providers and of meals and snacks actually consumed by children receiving child care in CACFP sites.

MEALS AND SNACKS OFFERED

The primary objective of this analysis is to determine the average nutrient content of meals and snacks offered by CACFP providers. A secondary objective is to describe the type and frequency of foods offered in CACFP meals and snacks and their relative nutrient contributions. Both objectives require information on the *foods offered* to children over a five-day period.¹ This information was obtained directly from providers, who completed a self-administered survey booklet.

In order to assess nutrient content, information about the *portion of each food* offered is also required. Portion size information was not collected from respondents in the Early Childhood and Child Care Study because a pretest revealed that most respondents had difficulty providing sufficient detail.² Consequently, portion sizes were imputed using data obtained from a nationally-representative sample of children receiving care in CACFP facilities.

The following sections describe the methodologies used in collecting and processing data related to both the foods offered by providers and the average portions served to children.

Data on Foods Offered

¹To obtain a reasonable assessment of nutrient content, it is necessary to examine meals offered over a period of time rather than a single meal or single day's offerings. The National Research Council (NRC) recommends that group feeding programs plan menus so that nutrient standards are met over a five- to ten-day period. A sample five-day period, equivalent to one school week, is routinely used in assessing USDA's Child Nutrition programs.

²Most providers either left the portion-size column blank or recorded very general descriptions (e.g., "one glass" rather than "six ounces" or "one sandwich" rather than providing information about the individual components of the sandwich).

All sampled CACFP providers were asked to complete a Menu Survey which requested detailed information about the foods included in meals and snacks offered during a specified five-day period (the target week). Respondents were asked to list *all* foods offered, including foods which may not have contributed to satisfying the CACFP meal pattern. For each food offered during the target week, providers were asked to record the following information: food name; a detailed description (a brochure that outlined the types of descriptive information required for different types of food was provided); brand name; preparation; recipes (when applicable and readily available); and the age groups of children to whom the food was offered (some foods may be offered only to some children, e.g., nuts may not be offered to toddlers).

The Menu Survey was prepared in an easy-to-use booklet format with a separate section for each day and subsections for each potential meal and snack. Detailed instructions were included for each form. Survey materials were mailed to providers several weeks prior to the target week during which the Menu Survey was to be completed. A toll-free “help” number was provided and respondents were encouraged to call with any questions or problems. Several followup calls were made to each respondent to ensure receipt and completion of survey materials and to provide assistance as needed.

Data on Portions Offered

As noted above, portion sizes were imputed for all foods reported in the Menu Surveys. Information collected during observations of a nationally representative sample of CACFP participants was used to develop estimates of *average portions offered*, by age group and type of meal. The methodology used in developing these estimates is described below.

Child Observations. A subsample of all homes and centers included in the study was selected for on-site observations. In each of these sites, trained field staff observed all meals and snacks consumed by a sample of children on two nonconsecutive days (Monday and Thursday or Tuesday and Friday). Observations were conducted during the target week (i.e., the same week covered in the Menu Survey). To facilitate observations, all children observed in a home or center (from one to six children) were seated together.

Prior to each meal and snack, observers weighed or measured five reference portions of each food to be offered.³ Using visual estimation techniques, observers then recorded the total amount of each food served to each sampled child, including second helpings, as well as the total amount of each food that was left over (i.e., not consumed). (Additional information on the visual estimation technique used, and the reliability of visual estimates over time, is provided in Appendix H).

Developing Estimates of Average Portions Offered. Information from the child observations was used to develop estimates of average portions offered for use in calculating nutrient content of meals and snacks offered by CACFP providers. Each observed food was first assigned to one of the 61 food groups shown in Exhibit A.1. These food groups reflect CACFP meal component categories, important differences in relative gram weight among comparable types of food (e.g., very light ready-to-eat cereals vs. much heavier cooked cereals), and the foods reported in the Menu Surveys.

Next, the available information on portions offered (i.e., total amounts of food served to observed children) was used to calculate *average portions* for each of the foods and food groups listed in Exhibit A.1. Depending on the meals and snacks in which foods were offered, separate calculations were carried out for breakfast, lunch, and snacks. For each meal and snack, average portions were calculated for five different age groups (one- and two-year-olds, three-year-olds, four-year-olds, five-year-olds, and six- to ten-year-olds). With the exception of fruits and vegetables, portions were estimated in grams; volume measures (cups) were used for fruits and vegetables. The total volume of fruits and vegetables assigned was adjusted for the total respective number of fruits and vegetables offered because examination of the data indicated that the total volume of fruits and vegetables received varied depending on the specific combinations offered (e.g., two fruits, two vegetables, or one of each). Juice was estimated separately.

³A reference portion was defined as the smallest possible portion that could be served to or selected by a child (e.g., a spoonful of mashed potatoes, a cracker, or a chicken nugget).

Exhibit A.1 Food Groups Used in Determining Average Portions Offered	
<p>MILK¹</p> <p>FRUITS AND VEGETABLES²</p> <p>JUICES¹</p> <p>BREADS AND BREAD ALTERNATES¹ Ready-to-eat cereals³ Hot cereals Breads, rolls Bagels, muffins Crackers and taco shells Pancakes, waffles, tortillas Rice and other grains Pasta Cookies⁴</p> <p>MEATS AND MEAT ALTERNATES¹ Meat, poultry, fish, cheese Breaded meat, poultry, fish Meat with gravy Meatloaf Peanut butter Eggs Yogurt⁵</p> <p>COMBINATION ENTREES¹</p> <p>Sandwiches Hamburgers/Cheeseburgers Hot dogs Peanut butter sandwiches Sandwiches with breaded patties Other sandwiches</p> <p>Other Mixtures Burritos Tacos Eggrolls Soup Lasagna Macaroni and cheese Pizza Chili</p>	<p>Other Mixtures (continued) Potpies Omelets French toast Other combination items⁶</p> <p>NONCREDITABLE FOODS¹</p> <p>Condiments Gravy Salad dressing Butter Mayonnaise Catsup, mustard Sugar Honey Jelly Syrup Other toppings</p> <p>Sweets and Sweetened Beverages Pudding and jello (unfruited) Ice cream Ice cream cone Other ice cream novelties Popsicles Cakes Candy Pies Crisps Sweetened beverages</p> <p>Other Foods Bacon Pork sausage⁷ Cream cheese Pickles and olives Snack chips</p>

¹Average weight in grams.

²Average volume in cups.

³Because of the wide variation in weight among different types of cereal (e.g., puffed cereals to granolas), average portions were determined for six different types of ready-to-eat cereals differentiated on the basis of average weight per cup.

⁴Cookies are creditable as a bread alternate for two snacks per week; otherwise they are considered noncreditable.

⁵Yogurt is creditable as a meat alternate for snacks only.

⁶Miscellaneous mixed foods; nine different categories were tabulated, based on average gram weight per cup (80 gm to 250 gm), as reported in the Food Intake Analysis System (the nutrient analysis software used to process the data).

⁷Sausages are creditable if they are less than 30 percent fat by weight. Most sausages served by providers in this study were pork brown-and-serve style sausages that did not meet this criteria. Sausages that did meet the criteria were included with meat.

When fewer than 25 observations were available for a particular calculation (food group *x*, age group *x*, meal or snack), one of two different approaches was used to develop a portion size estimate:

Approach 1: *When 25 or more total observations (all age groups combined) were available for the food or food group, an overall average portion was computed by averaging across all available observations rather than by age group. This overall average was then calibrated to reflect typical age-group-specific differences in portions. Five adjustment ratios were developed to reflect the amount of the overall average portion that was offered to each age group. These ratios are shown in Exhibit A.2. As the exhibit indicates, portions offered to three-year-olds at lunch were, on average, equivalent to 92 percent of the overall average portion.*

Exhibit A.2

Meal-Specific Adjustment Ratios for Each Age Group

Meal Snack	Age 1–2	Age 3	Age 4	Age 5	Age 6–10
Breakfast	0.87	0.93	1.04	1.05	1.06
Lunch	0.91	0.92	1.02	1.04	1.26
Snacks	0.96	1.01	0.96	1.05	1.11

Approach 2: *When there were fewer than 25 total observations (all age groups combined), a default portion was assigned based on data from the Continuing Survey of Food Intake of Individuals (CSFII).⁴ For a few foods not included in the CSFII data, the default (i.e., “no serving specified”) portion size included in the Food Intake Analysis System (FIAS), the nutrient analysis system used for all nutrient analysis in this study, was used as a starting point. Portion sizes obtained from both CFSII and FIAS were adjusted using age-specific ratios similar to those described above; separate ratios were developed for observation data to CSFII data and for observation data to FIAS data.*

Average portions computed for each of the 74 foods and food groups (including several categories of cereals and mixtures, based on gram weight per cup), by age group and meal, are shown in Exhibit A.3.

⁴Pao E. *et al.* (1990). *Foods Commonly Eaten by Individuals: Amount Per Eating Occation and Per Day*. Washington, DC: U.S. Department of Agriculture, Consumer Nutrition Center, Human Nutrition Information Service. This reference provides separate summaries for portions eaten by one- to two-year-olds, three- to five-year-olds, and six- to eight-year-olds (as well as other age groups). Data are provided for 200 commonly eaten foods.

Assigning Portion Sizes to Menus. For analytic purposes, separate “menus” were developed for each of the five age groups for each CACFP meal and snack. For the most part, a simple one-to-one link was made between each menu item and the database of average portions offered (Exhibit A.3). For fruits and vegetables, however, the average portion (total volume) was divided evenly among whatever fruits and vegetables were offered. For example, if the average portion for fruits was three-quarters of a cup and the menu included grapes and peaches, the three-quarter cup portion was split evenly between the two items (.375 cup of grapes and .375 cup of peaches). Actual gram weights for each item were assigned to the menu (i.e., .375 cup of grapes = x gm and .375 cup of peaches = y gm). The process was repeated for vegetables. The same approach was used when both meat and cheese were included in a single sandwich. If, for example, the average portion for meat, poultry, fish, and cheese was 28 gm (approximately one ounce), then a ham and cheese sandwich was assigned a portion of 14 gm for the ham and 14 gm for the cheese.

Condiments were linked to foods and, when necessary, portion sizes were adjusted to reflect the total amount of the linked food assigned to the menu. For example, if a menu had corn and salad, the average vegetable portion for two vegetables would be split between the corn and the salad. If the menu also included salad dressing, the salad dressing would be linked to the salad and, consequently, the portion assigned to the salad dressing would be half of the full average portion.

The Menu Surveys and child observations indicated that in general, CACFP meals and snacks offer very few choices (i.e., menus rarely include a choice of entrees) and that children are generally served all items listed on the menu. Therefore, with the exceptions noted above for fruits and vegetables, meats, and condiments, the full average portion was assigned to every item on the menu *except* when obvious choices were available (e.g., two more different types of milk, entrees, or desserts). In these cases, half of the average portion of each item (or one-third of the portion, if three choices were offered, etc.) was assigned to the menu so that the two (or three or more) choices would be averaged in the nutrient analysis.

Exhibit A.3

Average Portions Offered by Age Group and Meal

Food/Meal or Snack	Age 1–2	Age 3	Age 4	Age 5	Age 6–10
MILK (gm)					
Breakfast	151.90	169.60	193.68	189.58	177.11
Snack	160.41	157.67	159.73	174.07	192.85
Lunch	160.37	163.34	188.30	194.58	221.58
FRUITS AND VEGETABLES (cups)					
When 1 fruit offered					
Breakfast	.38	.38	.48	.49	.43
Snack	.44	.45	.41	.51	.56
Lunch	.36	.36	.39	.44	.52
When 2 or more fruits offered					
Breakfast	.59	.58	.67	.64	.65
Snack	.58	.60	.58	.64	.74
Lunch	.39	.41	.46	.48	.54
When 1 vegetable offered					
Breakfast	.33	.33	.41	.42	.34
Snack	.29	.30	.28	.32	.36
Lunch	.34	.34	.40	.43	.39
When 2 vegetables offered					
Breakfast	.54	.66	.78	.72	.79
Snack	.61	.64	.73	.75	.85
Lunch	.56	.69	.76	.74	.89
When 3 or more vegetables offered					
Breakfast	.85	.89	1.08	1.06	1.09
Snack	.81	.86	.87	1.10	1.10
Lunch	.88	.93	1.05	.94	1.23

Exhibit A.3 (continued)

Food/Meal or Snack	Age 1-2	Age 3	Age 4	Age 5	Age 6-10
JUICES (gm)					
Breakfast	146.93	145.14	147.38	152.69	158.34
Snack	160.80	155.85	160.59	152.40	171.35
Lunch	182.65	184.62	206.05	202.28	252.70
BREADS AND BREAD ALTERNATES					
Cereals: 16-20 gm per cup (gm)					
Breakfast	15.18	15.48	18.77	18.25	20.17
Snack	17.64	17.22	15.77	17.59	16.62
Cereals: 21-25 gm per cup (gm)					
Breakfast	23.85	25.43	28.50	28.65	29.05
Snack	20.75	21.75	19.92	22.21	21.36
Cereals: 26-30 gm per cup (gm)					
Breakfast	21.03	22.42	25.12	25.25	25.61
Snack	22.82	25.38	23.24	25.92	26.11
Cereals: 31-35 gm per cup (gm)					
Breakfast	25.47	28.58	31.94	35.69	32.98
Snack	23.40	24.65	23.42	25.56	27.21
Cereals: 36-40 gm per cup (gm)					
Breakfast	34.59	36.88	41.33	41.55	42.14
Snack	30.08	32.63	29.88	33.32	33.23
Cereals: More than 40 gm per cup (gm)					
Breakfast	29.47	31.41	35.20	35.39	35.89
Snack	36.31	35.35	32.37	36.10	38.77
Hot cereals (gm)					
Breakfast	103.18	110.00	123.27	123.92	125.68
Snack	107.93	110.33	105.03	129.37	138.12

Exhibit A.3 (continued)

Food/Meal or Snack	Age 1–2	Age 3	Age 4	Age 5	Age 6–10
Breads and rolls					
Breakfast	24.63	23.63	27.48	29.71	29.55
Snack	26.00	27.39	27.49	27.19	30.24
Lunch	23.53	26.92	29.68	31.39	36.54
Bagels and muffins (gm)					
Breakfast	41.31	44.04	49.35	49.61	50.32
Snack	50.90	53.62	50.95	55.60	59.20
Lunch	38.92	39.34	43.91	44.63	53.85
Crackers and taco shells (gm)					
Breakfast	13.39	16.30	19.76	19.21	22.09
Snack	15.22	17.97	16.13	20.52	22.33
Lunch	10.20	10.31	11.50	11.69	14.11
Pancakes, waffles, tortillas (gm)					
Breakfast	48.56	51.77	58.01	58.32	59.14
Snack	50.79	51.93	49.42	60.89	64.99
Lunch	49.29	53.17	55.17	58.73	62.69
Rice and other grains (gm)					
Breakfast	61.84	62.19	74.24	71.65	78.21
Snack	58.83	59.99	59.80	74.00	79.27
Lunch	64.02	64.71	72.22	73.41	88.57
Pasta (gm)					
Lunch	70.45	71.21	79.48	80.78	97.47
Cookies (gm)					
Breakfast	19.18	21.32	25.86	25.13	29.65
Snack	26.41	27.82	26.43	28.85	30.71
Lunch	25.75	26.02	29.04	29.52	35.62

Exhibit A.3 (continued)

Food/Meal or Snack	Age 1–2	Age 3	Age 4	Age 5	Age 6–10
MEATS AND MEAT ALTERNATES					
Meat, poultry, fish, cheese (gm)					
Breakfast	25.58	27.27	30.56	34.05	31.16
Snack	25.95	24.68	25.75	28.35	30.18
Lunch	42.23	44.88	49.88	50.30	59.26
Breaded meat, poultry, fish (gm)					
Breakfast	30.90	32.63	37.45	42.65	37.52
Snack	31.35	29.53	31.55	35.51	36.34
Lunch	53.78	54.36	60.67	61.66	74.41
Meat with gravy (gm)					
Breakfast	44.34	46.84	53.75	61.22	53.85
Snack	44.98	42.39	45.29	50.97	52.16
Lunch	77.19	78.02	87.08	88.50	106.79
Meatloaf (gm)					
Lunch	78.56	79.40	98.78	90.07	108.68
Peanut butter (gm)					
Breakfast	9.49	10.12	11.34	11.40	11.56
Snack	14.99	15.79	17.87	17.13	17.43
Lunch	15.82	15.99	17.85	18.14	21.89
Eggs (gm)					
Breakfast	50.32	53.64	60.11	60.43	61.29
Snack	49.80	49.85	45.65	50.91	48.26
Lunch	51.07	55.09	57.16	60.85	64.97
Yogurt (gm)					
Breakfast	104.54	105.15	119.42	112.73	105.35
Snack	102.59	108.07	102.68	112.06	119.31
Lunch	126.70	110.12	126.91	113.52	118.12

Exhibit A.3 (continued)

Food/Meal or Snack	Age 1-2	Age 3	Age 4	Age 5	Age 6-10
SANDWICHES					
Hamburgers/Cheeseburgers (gm)					
Snack	102.70	105.14	96.28	107.37	112.35
Lunch	102.37	120.67	125.28	125.05	156.43
Hot dogs (gm)					
Snack	74.61	82.30	75.65	83.98	89.93
Lunch	69.25	70.00	78.12	79.40	95.81
Peanut butter sandwiches (gm)					
Snack	81.64	90.04	82.77	91.88	98.39
Lunch	84.91	96.75	100.44	100.25	126.55
Sandwiches with breaded patties (gm)					
Lunch	127.82	145.64	151.20	150.92	190.51
Other sandwiches (gm)					
Breakfast	63.78	64.14	76.58	73.89	80.66
Lunch	66.03	66.74	74.49	75.71	91.35
OTHER MIXTURES					
Burritos (gm)					
Breakfast	89.87	96.03	112.11	108.90	125.23
Snack	96.56	106.50	97.90	108.68	116.38
Lunch	100.43	114.43	118.80	118.58	149.69
Tacos (gm)					
Breakfast	62.09	66.35	77.46	75.24	86.53
Snack	66.71	73.58	67.64	75.09	80.41
Lunch	69.39	79.06	82.08	81.93	103.42
Eggrolls (gm)					
Snack	56.18	61.96	56.96	63.23	67.71
Lunch	58.43	66.58	69.12	68.99	87.09

Exhibit A.3 (continued)

Food/Meal or Snack	Age 1–2	Age 3	Age 4	Age 5	Age 6–10
Soup (gm)					
Snack	127.82	130.32	129.91	160.75	172.22
Lunch	139.09	140.58	156.90	159.47	192.43
Lasagna (gm)					
Lunch	135.89	137.36	153.30	155.81	188.01
Macaroni and cheese (gm)					
Lunch	90.69	91.67	102.31	103.98	125.47
Pizza (gm)					
Breakfast	69.65	83.11	100.78	97.95	126.76
Snack	80.92	92.45	84.66	94.41	104.44
Lunch	91.59	92.58	111.19	101.29	126.71
Chili (gm)					
Lunch	110.78	111.97	124.97	127.02	153.26
Potpies (gm)					
Lunch	186.12	199.74	207.36	206.98	245.66
Omelets (gm)					
Breakfast	61.61	65.69	73.61	73.99	75.04
Snack	74.69	72.51	66.40	74.05	75.16
Lunch	74.45	83.22	86.40	86.24	104.65
French toast (gm)					
Breakfast	49.40	52.67	59.02	59.33	60.17
Snack	51.67	52.83	50.29	61.94	66.13
Lunch	50.14	54.09	56.13	59.75	63.78
Mixtures: 80–99 gm per cup (gm)					
Lunch	41.51	47.29	49.10	49.01	61.86
Mixtures: 100–119 gm per cup (gm)					
Lunch	51.88	59.12	61.37	61.26	77.33

Exhibit A.3 (continued)

Food/Meal or Snack	Age 1–2	Age 3	Age 4	Age 5	Age 6–10
Mixtures: 120–139 gm per cup (gm)					
Lunch	62.26	70.94	73.65	73.51	92.79
Mixtures: 140–159 gm per cup (gm)					
Lunch	72.63	82.76	85.92	85.76	108.26
Mixtures: 160–184 gm per cup (gm)					
Lunch	83.01	94.59	98.20	98.01	123.73
Mixtures: 185–209 gm per cup (gm)					
Lunch	95.98	109.36	113.54	113.33	143.06
Mixtures: 210–229 gm per cup (gm)					
Lunch	108.95	124.14	128.88	128.64	162.39
Mixtures: 230–249 gm per cup (gm)					
Lunch	95.01	96.04	107.18	108.94	131.45
Mixtures: 250 gm per cup (gm)					
Lunch	135.89	137.36	153.30	155.81	188.01
CONDIMENTS					
Gravy (gm)					
Breakfast	20.40	20.52	24.50	23.64	25.80
Lunch	21.12	21.35	23.83	24.22	29.22
Salad dressing (gm)					
Snack	8.58	8.75	8.73	10.80	11.57
Lunch	9.34	9.44	10.54	10.71	12.93
Butter (gm)					
Breakfast	4.36	3.94	4.54	5.54	4.70
Snack	4.12	4.34	4.13	4.50	4.79
Lunch	3.30	5.35	6.61	5.65	6.88
Mayonnaise (gm)					
Snack	8.30	11.78	10.79	12.03	9.49
Lunch	9.17	9.27	10.34	10.51	12.68

Exhibit A.3 (continued)

Food/Meal or Snack	Age 1–2	Age 3	Age 4	Age 5	Age 6–10
Catsup, mustard (gm)					
Breakfast	11.61	13.85	16.80	16.33	18.25
Snack	13.49	15.41	14.11	15.74	15.03
Lunch	14.57	14.72	16.43	16.70	20.15
Sugar (gm)					
Breakfast	4.77	5.08	5.70	5.73	5.81
Snack	4.99	5.10	4.86	5.98	6.39
Lunch	4.84	5.22	5.42	5.77	6.16
Honey (gm)					
Breakfast	13.39	17.93	21.74	21.13	29.77
Snack	15.56	19.94	18.26	20.36	24.53
Lunch	15.51	22.89	23.76	23.72	34.15
Jelly (gm)					
Breakfast	8.74	9.32	10.44	10.50	10.65
Snack	10.91	11.49	10.91	11.91	12.68
Lunch	13.44	16.64	17.28	17.25	23.13
Syrup (gm)					
Breakfast	27.25	29.06	32.56	32.73	33.20
Snack	28.50	29.15	27.74	34.17	36.49
Lunch	27.66	29.84	30.96	32.96	35.19
Other toppings (gm)					
Lunch	38.35	43.69	45.36	45.28	57.15
SWEETS AND SWEETENED BEVERAGES					
Puddings and jello (gm)					
Snack	71.66	75.48	71.72	78.27	83.33
Lunch	98.33	99.38	110.92	112.74	136.03

Exhibit A.3 (continued)

Food/Meal or Snack	Age 1–2	Age 3	Age 4	Age 5	Age 6–10
Ice cream (gm)					
Snack	71.58	77.95	71.38	79.60	88.61
Lunch	71.35	89.47	92.88	92.71	123.38
Ice cream cone (gm)					
Snack	68.47	75.52	69.42	77.06	82.52
Lunch	71.21	81.14	84.24	84.08	106.14
Other ice cream novelties (gm)					
Snack	49.16	54.22	49.84	55.33	59.25
Lunch	51.13	58.26	60.48	60.37	76.20
Popsicles (gm)					
Snack	77.25	85.20	78.32	86.94	93.10
Lunch	80.34	91.55	95.04	94.86	119.75
Cakes (gm)					
Snack	48.62	51.22	48.66	53.11	56.54
Lunch	37.74	38.14	42.57	43.27	52.21
Candy (gm)					
Snack	12.29	13.55	12.46	13.83	14.81
Lunch	12.78	14.56	15.12	15.09	19.05
Pies (gm)					
Breakfast	70.55	86.37	104.73	101.79	121.96
Snack	81.95	96.08	87.98	98.11	100.48
Lunch	81.69	110.27	114.48	114.27	139.90
Crisps (gm)					
Breakfast	100.49	107.38	125.36	121.77	140.04
Snack	107.97	119.09	109.47	121.52	130.13
Lunch	112.30	127.96	132.84	132.59	167.38

Exhibit A.3 (continued)

Food/Meal or Snack	Age 1-2	Age 3	Age 4	Age 5	Age 6-10
Sweetened beverages (gm)					
Breakfast	146.93	145.14	147.38	152.69	158.34
Snack	160.80	155.85	160.59	152.40	171.35
Lunch	182.65	184.62	206.05	202.28	252.70
OTHER FOODS					
Bacon (gm)					
Breakfast	12.50	13.04	15.81	15.36	21.13
Snack	14.52	14.50	13.28	14.81	17.41
Lunch	14.48	16.64	17.28	17.25	24.24
Sausage (gm)					
Breakfast	31.90	34.01	38.11	38.31	38.85
Snack	35.27	35.35	32.37	36.10	36.40
Lunch	35.16	40.57	42.12	42.04	50.67
Cream cheese (gm)					
Breakfast	20.52	21.88	24.52	24.65	25.0
Snack	11.51	12.12	11.52	12.57	13.38
Pickles and olives (gm)					
Lunch	19.67	19.89	22.19	22.56	27.22
Snack chips (gm)					
Snack	13.34	14.05	13.35	14.57	15.51
Lunch	15.09	15.25	17.02	17.30	20.87

Note: Portion sizes not computed for foods or food groups that did not appear in Menu Survey data for specific meals and snacks.

Calculating the Nutrient Content of Meals and Snacks Offered

The Food Intake Analysis System (FIAS) (version 2.3), which incorporates the USDA Survey Nutrient Database, was used for all nutrient calculations. A food code from the FIAS database was selected for each menu item. Using this code and the average portion assigned, as described above, the following nutrient summaries were calculated for each provider:

- *total nutrient content* of each daily meal and snack offered. Separate totals were calculated for each age-group-specific meal offered. Calculations included all foods offered in each meal or snack, including noncreditable foods; and
- *average nutrient content* of meals and snacks offered during the target week, by age group.

The average nutrient content of each age-group-specific meal or snack offered was then compared to the nutrient standards outlined in Chapter Two. Next, an overall average was computed for each provider by averaging across all age groups served.

Characterizing the Types of Food Offered

In addition to the codes used for nutrient analyses, study staff assigned two other codes to every item reported in the Menu Surveys in order to facilitate a detailed tabulation of the specific types of foods offered. A *link code* was created to identify individual CACFP components in multi-component foods. The link code consisted of a five-digit binary code that flagged each CACFP meal component group:

First digit	Milk
Second digit	Fruit
Third digit	Vegetable
Fourth digit	Meats and meat alternates
Fifth digit	Breads and bread alternates

For example, the entree beef and noodles with tomato sauce would be coded as 00111.

Foods were also assigned *taxonomy codes*, three-digit codes that provided additional detail about the food. The first digit identifies the food group from the link code (values = 1,2,...5). This is followed by a two-digit field that provides additional detail on the food item. Each food was assigned up to

three taxonomy codes; for example, the beef and noodles with tomato sauce entree would receive three taxonomy codes:

310	3 = vegetable, 10 = cooked tomato
405	4 = meat, 5 = beef in a mixed dish
512	5 = grain, 12 = pasta

The full code for beef and noodles with tomato sauce is:

2721210	00111	310 405 512
FIAS code	link code	taxonomy codes

Taxonomy codes are listed in Exhibit A.4. For some analyses (e.g., assessment of the major food sources of nutrients), codes were collapsed or combined to facilitate interpretation and presentation of the data.

MEALS AND SNACKS CONSUMED

The objective of this analysis is to determine the average nutrient content of meals and snacks actually *consumed* by CACFP participants (children). Data collected during the on-site observations, described briefly above, were used to address this objective. Visual estimation techniques were used to record the total amount of each food served to each observed child as well as the total amount left over. The following sections describe the visual estimation technique used to collect data and the methods used to process the data to compute nutrient intake.

Visual Estimation Technique

The method used was adapted from that used by several other investigators (see Appendix H) who have demonstrated that trained observers can reliably estimate food intake using visual estimation rather than actually weighing and measuring foods.

The methodology requires that observers first establish reference gram weights by weighing or measuring five samples of the smallest portion of food that could be served to a child (e.g., a chicken nugget, a carrot stick, a quarter- or half-sandwich, etc). Next, the observer sits or stands in an

unobtrusive spot that provides an unobstructed view of all children and their plates.⁵ As children serve themselves or are served by staff, observers record the number of reference *portions served* to each observation child (from one to six, depending on the site). Records are adjusted as the meal or snack progresses to account for second helpings, spills, and food trading. At the end of the eating period the observer records, for each sampled child, the *number of reference portions left over* or not consumed by each child. Whenever a portion to be estimated was less than a full reference portion, observers estimated to the nearest quarter portion, i.e., 3/4 portion, 1/2 portion, 1/4 portion. Likewise, portions greater than one reference portion could be estimated to the nearest quarter portion, e.g., 1 1/4 portions.

Calculating the Nutrient Content of Meals and Snacks Consumed

Data from the observation records were used to compute the total amount (gram weight) of each food served to each sampled child (number of reference portions served multiplied by the average gram weight of reference portions), as well as the total amount of each food that was actually consumed (grams served minus grams left over). The latter figures were used in the nutrient analysis to compute the total nutrient content of each meal and snack consumed by each sampled child.

In computing the average nutrient content of meals and snacks consumed, each “child day” was treated as an independent observation. When there were two days of data for a particular child, the child's sample weight was evenly divided between the two days, ensuring that each child's data were weighted properly.

⁵To facilitate observations, all sampled children were seated at the same table for all meals and snacks. In center-based care, children were sampled within age group or classroom.

Exhibit A.4

Food Codes Used for Food Group Analyses

MILK

- 101 White, whole
- 102 White, 2%
- 103 White, 1.5%/1%
- 104 White, skim
- 106 Flavored (all types)

FRUITS AND JUICES

- 201 Orange, fresh
- 202 Other fresh citrus
- 203 Orange, canned
- 204 Raisins
- 205 Other fruit, dried
- 206 Apple, fresh
- 207 Applesauce
- 208 Apple, canned
- 209 Apricots, canned
- 210 Banana
- 211 Melon
- 212 Grapes
- 213 Peach, fresh
- 214 Peach, canned
- 215 Pear, fresh
- 216 Pear, canned
- 217 Pineapple, canned
- 218 Watermelon
- 219 Berries, fresh
- 220 Berries, frozen
- 221 Fruit cocktail, canned
- 222 Juice, apple
- 223 Juice, orange/grapefruit
- 224 Juice, grape
- 225 Juice, pineapple
- 226 Juice blends, citrus
- 227 Juice blends, non-citrus
- 228 Other fruit, fresh
- 229 Other fruit, canned
- 230 Kiwifruit
- 231 Plums, fresh

VEGETABLES

- 301 Potatoes, baked/roasted
- 302 Potatoes, mashed/scalloped
- 303 Potatoes, fried
- 304 Sweet potato
- 305 Spinach, cooked
- 306 Greens (except spinach), cooked
- 307 Broccoli, cooked
- 308 Carrots, cooked
- 309 Peas and carrots
- 310 Tomatoes, cooked
- 311 Broccoli, raw
- 312 Carrots, raw
- 313 Tomatoes, raw
- 314 Celery, raw
- 315 Cucumber, raw
- 316 Lettuce, salad mix
- 317 Peppers, raw
- 318 Cauliflower, raw
- 319 Green beans, cooked
- 320 Cabbage, cooked
- 321 Corn
- 322 Peas
- 323 Mixed vegetables
- 324 Beets
- 325 Cauliflower, cooked
- 326 Summer squash, cooked
- 327 Legumes
- 328 Cabbage, raw (including coleslaw)
- 329 Other vegetables, raw
- 330 Other vegetables, cooked
- 331 Vegetable soup

MEATS AND MEAT ALTERNATES

- 401 Cheese, not low fat
- 402 Cheese, low fat
- 403 Beef, steak/roast
- 404 Beef, ground
- 405 Meat and meat alternate mixtures¹

Exhibit A.4 (continued)

<p>MEATS AND MEAT ALTERNATES (continued)</p> <p>406 Pork</p> <p>407 Ham</p> <p>409 Chicken/Turkey, roasted/baked</p> <p>410 Chicken/Turkey, fried/processed</p> <p>411 Yogurt</p> <p>412 Hot dogs</p> <p>413 Cold cuts</p> <p>414 Fish, baked/broiled</p> <p>415 Fish, fried/processed</p> <p>416 Fish, canned</p> <p>417 Peanut butter, nuts</p> <p>418 Eggs</p> <p>420 Other meats, lamb, liver, etc.</p>	<p>BREADS AND BREAD ALTERNATES</p> <p>501 Bread, roll, bagel, English muffin</p> <p>502 Biscuit, croissant</p> <p>503 Sweet roll, doughnut, danish</p> <p>504 Muffins, sweet bread</p> <p>505 Pancakes, waffles, French toast</p> <p>506 Cornbread, tortilla, taco shell</p> <p>507 Crackers</p> <p>508 Pasta, rice, other grains</p> <p>509 Ready-to-eat cereal</p> <p>510 Cookies</p> <p>511 Grain-based mixtures²</p> <p>NONCREDITABLE FOODS</p> <p>408 Bacon, sausage,³ salami</p> <p>601 Snack chips</p> <p>701 Sugar</p> <p>702 Syrup, honey, candy</p> <p>703 Jelly</p> <p>704 Pudding, gelatin</p> <p>705 Ice cream, popsicles</p> <p>706 Sweetened beverages</p> <p>707 Cakes, brownies, pies</p> <p>801 High-fat condiments</p> <p>802 Low-fat condiments</p>
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¹Includes all mixed items that have meat, poultry, fish, or meat alternate as a primary ingredient (based on FIAS categorizations).

²Includes all mixed dishes that have a grain product (bread alternate) as a primary ingredient (based on FIAS categorizations).

³Sausages are creditable if they are less than 30 percent fat by weight. Most sausages served by providers in this study were pork brown-and-serve style sausages that did not meet this criteria. Sausages that did meet the criteria were included with meat.

Appendix B

*Detailed Tables on Meals and Snacks Offered
by CACFP Providers*

Exhibit B.1

**Percentage of Providers Offering CACFP Breakfast
by Hours of Operation**

Hours of Operation	All Providers	Family Day Care Homes	Center-Based Care		
			Head Start Centers	Child Care Centers	All Centers
Less than eight hours per day	55%	n/a	85%	37%	65%
Eight or more hours per day	86	86%	92	84	86
All Providers	83	84	89	75	80

n/a = Fewer than 25 providers in this category.

Exhibit B.2

Mean Energy and Nutrient Content of CACFP Breakfasts Offered by Age Group

	All Providers	Family Day Care Homes	Center-Based Care		
			Head Start Centers	Child Care Centers	All Centers
Total Energy (kcal)					
Ages 1 – 2	275	276	267	271	271
3	288	288	292	283	287
4	326	326	331	320	324
5	332	333	336	326	330
6 – 10	318	317	n/a	325	328
All Ages	307	307	319	305	311
Total Fat (gm)					
Ages 1 – 2	7.5	7.5	7.8	7.3	7.3
3	7.7	7.7	8.3	7.4	7.8
4	8.8	8.8	9.4	8.4	8.8
5	9.0	9.0	9.6	8.6	9.0
6 – 10	8.4	8.4	n/a	8.3	8.5
All Ages	8.3	8.2	9.1	8.0	8.4
Saturated Fat (gm)					
Ages 1 – 2	3.5	3.5	3.7	3.5	3.5
3	3.7	3.7	4.0	3.7	3.8
4	4.2	4.2	4.5	4.2	4.3
5	4.2	4.2	4.6	4.2	4.3
6 – 10	3.9	3.9	n/a	3.9	4.0
All Ages	3.9	3.9	4.3	3.9	4.1
Carbohydrate (gm)					
Ages 1 – 2	43.7	43.8	40.8	43.5	43.3
3	45.5	45.6	45.1	45.4	45.2
4	51.6	51.7	50.8	51.2	51.0
5	52.7	52.8	51.8	52.2	52.0
6 – 10	50.9	50.7	n/a	53.1	53.0
All Ages	48.8	48.7	49.1	48.9	49.0
Protein (gm)					
Ages 1 – 2	9.5	9.5	9.5	9.1	9.2
3	10.4	10.4	10.6	10.0	10.2
4	11.8	11.8	12.1	11.3	11.6
5	11.8	11.8	12.1	11.3	11.7
6 – 10	11.2	11.2	n/a	11.1	11.2
All Ages	10.9	10.9	11.6	10.7	11.0
Vitamin A (mcg RE)					
Ages 1 – 2	215	216	196	204	204
3	243	247	216	230	224
4	275	280	245	260	254
5	285	290	251	267	261
6 – 10	261	261	n/a	267	265
All Ages	256	258	237	248	243
Vitamin C (mg)					
Ages 1 – 2	30	30	37	29	29
3	30	30	30	32	31
4	33	33	32	34	33
5	34	34	33	35	35
6 – 10	35	34	n/a	36	36
All Ages	33	33	32	33	33

**Exhibit B.2
(continued)**

	All Providers	Family Day Care Homes	Center-Based Care		
			Head Start Centers	Child Care Centers	All Centers
Calcium (mg)					
Ages 1 – 2	249	250	241	239	240
3	273	274	273	264	268
4	311	312	311	301	305
5	309	310	309	298	302
6 – 10	290	290	n/a	283	285
All Ages	286	286	296	280	286
Iron (mg)					
Ages 1 – 2	3.0	3.0	2.8	2.8	2.8
3	3.3	3.4	2.9	3.1	3.0
4	3.7	3.8	3.2	3.5	3.4
5	4.0	4.0	3.3	3.6	3.5
6 – 10	3.8	3.7	n/a	4.1	4.0
All Ages	3.5	3.6	3.1	3.4	3.3
Cholesterol (mg)					
Ages 1 – 2	43	43	39	36	36
3	45	47	42	38	39
4	51	53	48	42	45
5	51	53	48	42	45
6 – 10	50	51	n/a	41	42
5 – 10	51	53	48	43	45
Sodium (mg)					
Ages 1 – 2	361	362	349	352	352
3	387	388	394	372	381
4	437	438	446	421	431
5	449	451	456	431	441
6 – 10	426	426	n/a	427	434
5 – 10	445	445	456	431	441
Number of Providers (Unweighted)					
Ages 1 – 2	681	347	59	275	334
3	1599	389	808	402	1210
4	1599	389	808	402	1210
5	1599	389	808	402	1210
6 – 10	377	227	17	133	150
All Ages	1659	430	809	420	1229

n/a = Fewer than 25 providers served this age group at breakfast.

Note: For cholesterol and sodium, aggregation across age groups has been limited to menus offered to five-year-olds and six- to ten-year-olds because NRC recommendations for these nutrients are applicable only to children five years of age and older. See Chapter Two for a discussion of NRC recommendations and the rationale for this approach.

Exhibit B.3

Mean Percentage of RDAs Provided in CACFP Breakfasts Offered by Age Group

	All Providers		Family Day Care		Center-Based Care					
	Mean	Std Err	Mean	Std Err	Head Start Centers		Child Care Centers		All Centers	
					Mean	Std Err	Mean	Std Err	Mean	Std Err
Total Energy										
Ages 1 – 2	21.2	0.1	21.2	0.2	20.5	0.5	20.8	0.2	20.8	0.1
3	22.1	0.1	22.1	0.2	22.5	0.3	21.8	0.1	22.1	0.1
4	18.1	0.1	18.1	0.1	18.4	0.2	17.8	0.1	18.0	0.1
5	18.5	0.1	18.5	0.1	18.7	0.2	18.1	0.1	18.3	0.1
6 – 10	16.2	0.2	16.2	0.2	n/a	n/a	16.6	0.2	16.7	0.2
All Ages	19.4	0.2	19.4	0.2	19.9	0.3	19.3	0.1	19.5	0.1
Protein										
Ages 1 – 2	59.4	0.6	59.7	0.7	59.6	1.1	57.0	0.7	57.2	0.6
3	64.7	0.6	64.9	0.7	66.5	0.7	62.3	0.5	64.0	0.5
4	49.0	0.5	49.1	0.6	50.3	0.5	47.1	0.4	48.4	0.3
5	49.2	0.5	49.3	0.6	50.5	0.5	47.2	0.4	48.5	0.4
6 – 10	41.6	0.5	41.6	0.6	n/a	n/a	41.0	0.7	41.4	0.8
All Ages	53.7	0.6	53.6	0.7	55.8	0.6	52.3	0.4	53.7	0.4
Vitamin A										
Ages 1 – 2	53.7	0.9	54.0	1.0	49.0	2.5	51.1	1.6	50.9	1.4
3	60.7	2.2	61.8	2.7	53.9	1.3	57.4	1.2	56.0	0.9
4	55.0	1.9	55.9	2.4	48.9	1.2	52.0	1.1	50.8	0.8
5	57.1	2.2	58.1	2.7	50.2	1.3	53.5	1.1	52.1	0.9
6 – 10	39.2	0.8	39.2	0.9	n/a	n/a	40.1	1.4	39.8	1.3
All Ages	54.3	1.8	54.7	2.2	51.0	1.2	52.9	1.1	52.1	0.8
Vitamin C										
Ages 1 – 2	74.1	3.0	74.2	3.4	91.7	9.9	71.6	4.1	72.9	3.9
3	76.1	3.3	75.8	3.9	75.1	2.3	78.9	4.0	77.3	3.1
4	74.0	3.0	74.0	3.7	72.0	2.1	76.0	3.7	74.4	2.8
5	76.6	3.2	76.6	3.9	74.2	2.1	78.6	3.9	76.8	2.9
6 – 10	76.8	3.2	76.6	3.5	n/a	n/a	79.3	4.4	79.7	4.3
All Ages	76.1	3.2	76.1	3.8	74.1	2.0	76.9	3.7	75.8	2.8

**Exhibit B.3
(continued)**

	All Providers		Family Day Care		Center-Based Care						
	Mean	Std Err	Mean	Std Err	Head Start Centers		Child Care Centers		All Centers		
					Mean	Std Err	Mean	Std Err	Mean	Std Err	
Calcium											
Ages 1 – 2	31.1	0.2	31.3	0.2	30.1	0.3	29.9	0.2	29.9	0.2	
3	34.1	0.2	34.3	0.2	34.1	0.3	33.0	0.2	33.5	0.1	
4	38.8	0.2	39.0	0.2	38.8	0.4	37.6	0.2	38.1	0.2	
5	38.6	0.2	38.7	0.2	38.6	0.4	37.3	0.2	37.8	0.2	
6 – 10	36.2	0.3	36.3	0.4	n/a	n/a	35.4	0.3	35.6	0.3	
All Ages	35.8	0.2	35.8	0.2	37.0	0.4	35.0	0.2	35.8	0.2	
Iron											
Ages 1 – 2	30.1	1.0	30.3	1.1	28.2	2.3	28.2	1.3	28.2	1.2	
3	33.3	1.6	34.1	1.9	28.6	1.3	30.8	1.1	29.9	0.9	
4	37.5	1.8	38.3	2.2	32.2	1.5	34.6	1.2	33.6	1.0	
5	39.5	2.0	40.5	2.4	33.5	1.5	36.1	1.3	35.1	1.1	
6 – 10	37.7	1.0	37.4	1.1	n/a	n/a	40.9	2.5	40.5	2.4	
All Ages	35.5	1.4	35.9	1.6	31.4	1.4	34.1	1.5	33.0	1.1	
Number of Providers (Unweighted)											
Ages 1 – 2	681		347		59		275		334		
3	1599		389		808		402		1210		
4	1599		389		808		402		1210		
5	1599		389		808		402		1210		
6 – 10	377		227		17		133		150		
All Ages	1659		430		809		420		1229		

n/a = Fewer than 25 providers served this age group at breakfast.

Exhibit B.4

Percentage of Providers Offering CACFP Breakfasts That Provide One-fourth or More of the RDA for Energy and Key Nutrients by Age Group

	All Providers	Family Day Care Homes	Center-Based Care		
			Head Start Centers	Child Care Centers	All Centers
Total Energy					
Ages 1 – 2	9.4%	9.3%	5.0%	10.2%	9.9%
3	17.2	17.3	21.5	13.5	16.7
4	0.5	0.5	1.0	0.7	0.8
5	0.8	0.6	2.1	1.5	1.7
6 – 10	0.3	0.2	n/a	2.0	1.9
All ages	3.2	2.9	5.3	4.6	4.9
Protein					
Ages 1 – 2	100.0	100.0	100.0	100.0	100.0
3	100.0	100.0	100.0	100.0	100.0
4	100.0	100.0	99.7	100.0	99.9
5	100.0	100.0	99.7	100.0	99.9
6 – 10	100.0	100.0	n/a	100.0	100.0
All ages	100.0	100.0	99.9	100.0	99.9
Vitamin A					
Ages 1 – 2	97.9	98.0	97.8	96.9	97.0
3	99.0	99.0	99.1	98.8	98.9
4	98.4	98.5	98.0	97.7	97.8
5	98.4	98.5	97.9	98.0	97.9
6 – 10	87.4	87.2	n/a	89.6	89.5
All ages	96.9	96.6	98.5	97.9	98.1
Vitamin C					
Ages 1 – 2	89.1	89.2	97.4	87.3	87.9
3	92.1	92.1	92.6	91.1	91.7
4	92.8	92.9	93.2	91.4	92.1
5	94.0	94.3	93.4	92.2	92.7
6 – 10	93.0	93.3	n/a	89.1	89.5
All ages	93.5	93.8	93.0	90.9	91.7
Calcium					
Ages 1 – 2	98.1	98.4	98.8	95.0	95.2
3	98.1	98.2	98.4	97.3	97.7
4	99.0	99.1	99.1	98.8	98.9
5	99.0	99.1	99.1	98.8	98.9
6 – 10	98.1	98.0	n/a	99.1	99.1
All ages	98.4	98.4	99.1	98.1	98.5
Iron					
Ages 1 – 2	63.5	64.3	60.3	55.2	55.6
3	71.8	74.3	55.6	63.0	60.0
4	79.5	82.0	63.1	70.3	67.4
5	80.3	82.7	65.1	72.0	69.2
6 – 10	80.4	80.8	n/a	76.1	75.8
All ages	73.9	75.5	62.0	67.6	65.4
Number of Providers (Unweighted)					
Ages 1 – 2	681	347	59	275	334
3	1599	389	808	402	1210
4	1599	389	808	402	1210
5	1599	389	808	402	1210
6 – 10	377	227	17	133	150
All ages	1659	430	809	420	1229

n/a = Fewer than 25 providers served to this age group at breakfast.

Exhibit B.5

**Mean Macronutrient, Cholesterol, and Sodium Content of
CACFP Breakfasts Offered by Age Group**

	All Providers		Family Day Care		Center-Based Care					
	Mean	Std Err	Mean	Std Err	Head Start Centers		Child Care Centers		All Centers	
					Mean	Std Err	Mean	Std Err	Mean	Std Err
Percent of Energy from Fat (%)										
Ages 1 – 2	23.7	0.5	23.7	0.5	25.1	1.1	23.1	0.5	23.3	0.5
3	23.2	0.4	23.2	0.4	24.2	0.4	22.6	0.4	23.3	0.3
4	23.2	0.4	23.2	0.4	24.3	0.4	22.7	0.4	23.4	0.3
5	23.3	0.4	23.2	0.4	24.4	0.4	22.7	0.4	23.4	0.3
6 – 10	22.8	0.5	22.8	0.5	n/a	n/a	21.9	0.7	22.4	0.6
5 – 10	23.2	0.4	23.1	0.4	24.4	0.4	22.7	0.4	23.4	0.3
Percent of Energy from Saturated Fat (%)										
Ages 1 – 2	11.4	0.2	11.4	0.2	12.1	0.4	11.4	0.2	11.4	0.2
3	11.3	0.2	11.2	0.2	11.8	0.2	11.4	0.2	11.6	0.1
4	11.3	0.2	11.2	0.2	11.9	0.2	11.4	0.2	11.6	0.1
5	11.2	0.2	11.1	0.2	11.8	0.2	11.3	0.2	11.5	0.1
6 – 10	10.9	0.2	10.9	0.2	n/a	n/a	10.7	0.3	10.9	0.3
5 – 10	11.1	0.2	11.0	0.2	11.8	0.2	11.2	0.2	11.4	0.1
Percent of Energy from Carbohydrate (%)										
Ages 1 – 2	64.2	0.5	64.2	0.6	62.2	0.9	65.0	0.5	64.8	0.5
3	64.1	0.4	64.2	0.5	62.9	0.3	64.9	0.4	64.1	0.3
4	64.2	0.4	64.2	0.5	62.8	0.4	64.8	0.4	64.0	0.3
5	64.4	0.4	64.4	0.5	63.0	0.3	65.0	0.4	64.2	0.3
6 – 10	64.9	0.5	64.8	0.5	n/a	n/a	66.2	0.7	65.7	0.6
5 – 10	64.4	0.4	64.5	0.5	63.0	0.3	65.1	0.3	64.2	0.3
Percent of Energy from Protein (%)										
Ages 1 – 2	14.0	0.1	14.0	0.1	14.5	0.2	13.6	0.1	13.7	0.1
3	14.6	0.1	14.6	0.1	14.7	0.1	14.2	0.1	14.4	0.1
4	14.6	0.1	14.6	0.1	14.7	0.1	14.3	0.1	14.4	0.1
5	14.4	0.1	14.4	0.1	14.5	0.1	14.0	0.1	14.2	0.1
6 – 10	14.3	0.1	14.3	0.1	n/a	n/a	13.8	0.1	13.8	0.1
5 – 10	14.3	0.1	14.4	0.1	14.5	0.1	14.0	0.1	14.2	0.1

**Exhibit B.5
(continued)**

	All Providers		Family Day Care		Center-Based Care						
	Mean	Std Err	Mean	Std Err	Head Start Centers		Child Care Centers		All Centers		
					Mean	Std Err	Mean	Std Err	Mean	Std Err	
Cholesterol (mg)											
Ages 1 – 2	42.7	2.1	43.4	2.3	39.0	2.8	36.1	1.3	36.3	1.3	
3	45.4	2.1	46.6	2.5	42.2	1.6	37.5	1.2	39.4	1.0	
4	51.2	2.3	52.6	2.8	47.6	1.8	42.4	1.4	44.5	1.2	
5	51.2	2.3	52.6	2.8	47.7	1.8	42.4	1.4	44.6	1.2	
6 – 10	50.0	3.2	50.6	3.5	n/a	n/a	40.6	3.7	42.2	4.0	
5 – 10	51.4	2.2	52.7	2.7	47.8	1.8	43.0	1.6	44.9	1.3	
Sodium (mg)											
Ages 1 – 2	361.4	5.6	362.3	6.0	348.9	16.2	352.4	4.1	352.2	3.8	
3	386.5	5.4	387.7	5.8	393.6	9.3	372.4	3.9	381.0	5.2	
4	437.2	6.2	438.5	6.7	446.0	10.5	421.3	4.4	431.3	5.9	
5	448.9	6.3	450.5	6.8	456.3	10.7	431.0	4.4	441.3	5.9	
6 – 10	426.2	7.2	425.6	7.5	n/a	n/a	427.3	8.7	433.6	9.9	
5 – 10	444.6	6.5	445.4	7.0	456.3	10.6	431.0	4.4	441.1	5.8	
Number of Providers (Unweighted)											
Ages 1 – 2	681		347		59		275		334		
3	1599		389		808		402		1210		
4	1599		389		808		402		1210		
5	1599		389		808		402		1210		
6 – 10	377		227		17		133		150		
5 – 10	1631		413		808		410		1218		

n/a = Fewer than 25 providers served to this age group at breakfast.

Note: Aggregation across age groups has been limited to menus offered to five-year-olds and six- to ten-year-olds because *Dietary Guidelines* and NRC recommendations for these nutrients are applicable only to children five years of age and older. See Chapter Two for a discussion of *Dietary Guidelines* and NRC recommendations.

Exhibit B.6

Distribution of Macronutrients, Cholesterol, and Sodium in Breakfasts Offered to Five- to Ten-Year-Olds

	All Providers	Family Day Care Homes	Center-Based Care		
			Head Start Centers	Child Care Centers	All Centers
Percentage of Providers					
Percent of Total Energy from Fat					
20% or less	32.9%	33.4%	25.0%	34.4%	30.7%
21% – 30%	56.0	55.5	60.9	56.8	58.5
31% – 35%	9.3	9.4	11.9	7.4	9.2
More than 35%	1.8	1.8	2.2	1.3	1.7
<i>Mean</i>	23.2	23.2	24.4	22.7	23.4
<i>Median</i>	23.2	23.2	23.8	22.6	23.2
Percent of Total Energy from Saturated Fat					
Less than 10%	27.2%	28.1%	16.1%	27.3%	22.8%
10% – 12%	43.9	43.6	49.2	42.9	45.4
13% – 14%	18.9	18.6	21.2	20.0	20.5
More than 14%	10.0	9.7	13.4	9.8	11.2
<i>Mean</i>	11.1	11.0	11.8	11.2	11.4
<i>Median</i>	11.0	10.9	11.4	11.0	11.1
Percent of Total Energy from Carbohydrate					
40% – 54%	6.5%	6.6%	9.0%	4.4%	6.2%
55% or more	93.5	93.4	91.0	95.6	93.8
<i>Mean</i>	64.4	64.5	63.0	65.1	64.2
<i>Median</i>	64.5	64.5	63.2	65.6	64.7
Percent of Total Energy from Protein					
10% or less	0.3%	0.2%	0.6%	0.7%	0.6%
11% – 14%	81.6	81.8	75.2	84.4	80.7
15 or more	18.1	18.0	24.2	14.9	18.6
<i>Mean</i>	14.3	14.4	14.5	14.0	14.2
<i>Median</i>	14.3	14.3	14.3	14.1	14.2
Cholesterol (mg)					
75 mg or less	72.3%	70.9%	78.0%	80.6%	79.6%
76 – 100 mg	18.3	19.1	15.6	13.9	14.6
More than 100 mg	9.3	10.0	6.4	5.4	5.8
<i>Mean</i>	51.4	52.7	47.8	43.0	44.9
<i>Median</i>	36.5	37.1	35.9	30.0	32.5
Sodium (mg)					
300 mg or less	0.9%	0.6%	3.3%	1.9%	2.4%
301 – 600 mg	92.0	92.5	83.9	92.8	89.2
More than 600 mg	7.1	6.9	12.8	5.4	8.3
<i>Mean</i>	445	445	456	431	441
<i>Median</i>	425	425	431	410	417
<hr/>					
Number of Providers (Unweighted)	1631	413	808	410	1218

Exhibit B.7

Sources of Energy and Nutrients in CACFP Breakfasts

Breakfast Component/Foods	Total Energy	Protein	Vitamin A	Vitamin C	Calcium
Percentage Contribution to Average Amount Offered					
Milk	28%	54%	37%	7%	74%
Whole milk	8	13	6	2	17
Low-fat milk ¹	15	31	23	4	43
Other milks	5	10	7	1	14
Fruits, Vegetables, and Juices	21	6	6	71	4
Breads and Bread Alternates	37	31	46	21	19
Bread/rolls	8	7	*	*	3
Biscuit/croissant	1	1	*	*	1
Sweet roll	2	1	*	*	1
Muffin	1	1	*	*	1
Pancakes	8	7	2	*	8
Pasta/Rice	3	3	3	0	2
Ready-to-eat cereals	14	11	38	20	4
Noncreditable Foods²	13	10	12	1	3
Meats/meat alternates	6	9	6	1	3
Other noncreditable foods	8	1	6	1	1
All Foods	100	100	100	100	100

Breakfast Component/Foods	Iron	Fat	Saturated Fat	Carbohydrate	Cholesterol	Sodium
Percentage Contribution to Average Amount Offered						
Milk	3%	42%	61%	17%	47%	22%
Whole milk	1	14	18	4	14	5
Low-fat milk ¹	2	21	34	10	25	13
Other milks	1	7	10	3	8	4
Fruits, Vegetables, and Juices	10	3	2	33	0	1
Breads and Bread Alternates	83	29	17	42	24	64
Bread/rolls	10	4	2	9	1	11
Biscuit/croissant	1	1	1	1	*	2
Sweet roll	1	3	2	2	1	2
Muffin	2	2	1	1	3	2
Pancakes	6	10	7	7	17	15
Pasta/Rice	7	3	2	3	1	6
Ready-to-eat cereals	55	6	3	17	0	26
Noncreditable Foods²	4	26	20	9	30	13
Meats/meat alternates	4	14	11	1	27	9
Other noncreditable foods	1	12	9	8	2	4
All Foods	100	100	100	100	100	100

* = Less than one percent.

Notes: Based on breakfasts offered to three- to five-year-olds.

Detail may not sum to 100 due to rounding.

¹Includes 1% and 2% milk.

²Foods that do not contribute to satisfying the CACFP meal pattern.

Exhibit B.8

Mean Energy and Nutrient Content of CACFP Lunches Offered by Age Group

	All Providers	Family Day Care Homes	Center-Based Care		
			Head Start Centers	Child Care Centers	All Centers
Total Energy (kcal)					
Ages 1 – 2	383	380	395	412	411
3	405	400	432	432	432
4	455	449	485	485	485
5	465	460	494	495	495
6 – 10	533	528	n/a	596	600
All Ages	439	434	470	466	468
Total Fat (gm)					
Ages 1 – 2	15.5	15.4	16.3	16.7	16.6
3	16.4	16.2	17.6	17.5	17.5
4	18.5	18.3	19.9	19.7	19.8
5	18.6	18.3	19.9	19.7	19.8
6 – 10	21.7	21.5	n/a	24.0	24.3
All Ages	17.7	17.5	19.1	18.7	18.9
Saturated Fat (gm)					
Ages 1 – 2	6.4	6.4	6.6	6.8	6.8
3	6.6	6.5	6.8	7.0	6.9
4	7.5	7.4	7.7	7.9	7.8
5	7.5	7.5	7.8	8.0	7.9
6 – 10	8.7	8.7	n/a	9.7	9.8
All Ages	7.2	7.1	7.5	7.5	7.5
Carbohydrate (gm)					
Ages 1 – 2	43.8	43.4	44.7	48.0	47.8
3	46.5	45.8	49.6	50.5	50.1
4	52.0	51.2	55.3	56.3	55.9
5	54.2	53.4	57.4	58.6	58.1
6 – 10	61.1	60.4	n/a	70.6	70.9
All Ages	50.6	49.9	54.0	54.6	54.4
Protein (gm)					
Ages 1 – 2	18.6	18.5	19.0	19.2	19.2
3	19.5	19.3	20.4	20.1	20.2
4	21.9	21.8	23.0	22.6	22.7
5	22.3	22.2	23.3	23.0	23.1
6 – 10	25.3	25.2	n/a	26.8	27.0
All Ages	21.1	21.0	22.2	21.7	21.9
Vitamin A (mcg RE)					
Ages 1 – 2	384	385	505	370	378
3	430	428	456	430	441
4	491	489	517	488	500
5	500	499	519	492	503
6 – 10	556	555	n/a	566	561
All Ages	466	465	495	457	472
Vitamin C (mg)					
Ages 1 – 2	19	18	22	20	20
3	20	19	25	23	24
4	22	22	28	25	26
5	23	22	29	26	27
6 – 10	26	26	n/a	30	30
All Ages	22	21	27	25	26

**Exhibit B.8
(continued)**

	All Providers	Family Day Care Homes	Center-Based Care		
			Head Start Centers	Child Care Centers	All Centers
Calcium (mg)					
Ages 1 – 2	294	293	298	300	300
3	304	303	307	310	309
4	346	345	350	353	352
5	356	354	359	363	361
6 – 10	399	397	n/a	425	425
All Ages	332	331	338	338	338
Iron (mg)					
Ages 1 – 2	2.3	2.3	2.6	2.6	2.6
3	2.5	2.5	2.8	2.8	2.8
4	2.8	2.8	3.1	3.1	3.1
5	2.9	2.8	3.1	3.2	3.1
6 – 10	3.3	3.3	n/a	3.7	3.7
All Ages	2.7	2.7	3.0	3.0	3.0
Cholesterol (mg)					
Ages 1 – 2	54	53	56	57	56
3	56	55	59	58	58
4	62	62	66	64	65
5	63	62	67	65	66
6 – 10	72	71	n/a	78	78
5 – 10	65	65	67	67	67
Sodium (mg)					
Ages 1 – 2	735	727	806	817	816
3	783	771	827	850	840
4	880	868	928	954	943
5	892	879	936	964	952
6 – 10	1029	1019	n/a	1160	1163
5 – 10	919	910	939	985	966
Number of Providers (Unweighted)					
Ages 1 – 2	765	396	61	308	369
3	1766	448	877	441	1318
4	1766	448	877	441	1318
5	1766	448	877	441	1318
6 – 10	326	193	21	112	133
5 – 10	1820	486	878	456	1334

n/a = Fewer than 25 providers served this age group at lunch.

Note: For cholesterol and sodium, aggregation across age groups has been limited to menus offered to five-year-olds and six- to ten-year-olds because NRC recommendations for these nutrients are applicable only to children five years of age and older. See Chapter Two for a discussion of NRC recommendations and the rationale for this approach.

Exhibit B.9

Mean Percentages of RDAs Provided in CACFP Lunches Offered by Age Group

	All Providers		Family Day Care		Center-Based Care					
	Mean	Std Err	Mean	Std Err	Head Start Centers		Child Care Centers		All Centers	
					Mean	Std Err	Mean	Std Err	Mean	Std Err
Total Energy										
Ages 1 – 2	29.5	0.3	29.3	0.3	30.4	1.1	31.7	0.2	31.6	0.2
3	31.1	0.4	30.7	0.4	33.2	0.4	33.3	0.2	33.2	0.2
4	25.3	0.3	25.0	0.3	26.9	0.3	27.0	0.2	26.9	0.2
5	25.9	0.3	25.5	0.3	27.4	0.3	27.5	0.2	27.5	0.2
6 – 10	27.2	0.4	26.9	0.5	n/a	n/a	30.4	0.5	30.6	0.5
All Ages	27.8	0.3	27.5	0.3	29.2	0.3	29.7	0.2	29.5	0.2
Protein										
Ages 1 – 2		0.8	115.7	0.9	118.5	3.7	119.9	0.9	119.8	0.8
	116.1									
3		0.9	120.7	1.0	127.6	0.7	125.5	0.9	126.4	0.6
	121.6									
4	91.3	0.7	90.7	0.7	95.7	0.5	94.1	0.7	94.7	0.5
5	93.0	0.7	92.4	0.7	97.1	0.5	95.8	0.7	96.3	0.5
6 – 10	93.7	1.1	93.3	1.2	n/a	n/a	99.3	1.1	99.9	1.2
All Ages		0.8	103.4	0.9	107.0	0.6	107.6	0.8	107.4	0.6
	104.0									
Vitamin A										
Ages 1 – 2	96.0	2.3	96.1	2.7	126.1	15.0	92.5	5.3	94.6	5.1
3		2.1	107.0	2.7	113.9	3.5	107.5	5.9	110.1	4.5
	107.5									
4	98.1	1.9	97.8	2.5	103.3	3.1	97.6	5.3	99.9	4.0
5		1.9	99.9	2.5	103.7	3.0	98.3	5.2	100.5	4.0
	100.0									
6 – 10	83.5	3.9	83.4	4.1	n/a	n/a	85.0	4.9	84.2	4.3
All Ages	99.2	2.2	98.7	2.7	106.7	3.2	98.6	5.1	101.9	4.0
Vitamin C										
Ages 1 – 2	46.5	1.2	46.1	1.4	53.8	2.6	50.4	1.7	50.6	1.6
3	49.8	1.3	48.0	1.4	61.9	1.4	57.0	1.6	59.0	1.3
4	49.7	1.2	47.9	1.4	61.5	1.4	56.6	1.5	58.6	1.2
5	51.7	1.2	49.9	1.4	63.6	1.3	58.6	1.5	60.7	1.2
6 – 10	58.0	2.1	57.3	2.2	n/a	n/a	66.8	3.0	67.5	2.6

**Exhibit B.9
(continued)**

	All Providers		Family Day Care		Center-Based Care					
	Mean	Std Err	Mean	Std Err	Head Start Centers		Child Care Centers		All Centers	
					Mean	Std Err	Mean	Std Err	Mean	Std Err
All Ages	51.2	1.1	49.7	1.3	62.3	1.4	57.4	1.7	59.4	1.3

**Exhibit B.9
(continued)**

	All Providers		Family Day Care		Center-Based Care						
	Mean	Std Err	Mean	Std Err	Head Start Centers		Child Care Centers		All Centers		
					Mean	Std Err	Mean	Std Err	Mean	Std Err	
Calcium											
Ages 1 – 2	36.7	0.4	36.6	0.4	37.3	1.0	37.5	0.3	37.5	0.2	
3	38.0	0.4	37.8	0.5	38.4	0.2	38.8	0.2	38.6	0.2	
4	43.3	0.5	43.1	0.5	43.8	0.2	44.1	0.2	44.0	0.2	
5	44.4	0.5	44.3	0.6	44.8	0.2	45.3	0.2	45.1	0.2	
6 – 10	49.9	0.8	49.7	0.8	n/a	n/a	53.1	0.7	53.1	0.7	
All Ages	41.5	0.4	41.4	0.5	42.3	0.2	42.3	0.3	42.3	0.2	
Iron											
Ages 1 – 2	23.5	0.4	23.3	0.4	25.9	1.3	26.0	0.3	26.0	0.3	
3	25.2	0.4	24.7	0.4	27.7	0.4	27.6	0.3	27.6	0.2	
4	28.2	0.4	27.7	0.5	30.9	0.4	30.8	0.3	30.8	0.3	
5	28.9	0.4	28.4	0.5	31.5	0.4	31.5	0.3	31.5	0.3	
6 – 10	33.0	0.7	32.7	0.7	n/a	n/a	36.8	0.6	37.1	0.6	
All Ages	27.3	0.4	26.8	0.4	30.0	0.4	29.6	0.4	29.8	0.3	
Number of Providers (Unweighted)											
Ages 1 – 2	765		396		61		308		369		
3	1766		448		877		441		1318		
4	1766		448		877		441		1318		
5	1766		448		877		441		1318		
6 – 10	326		193		21		112		133		
All Ages	1820		486		878		456		1334		

n/a = Fewer than 25 providers served this age group at lunch.

Exhibit B.10

Percentage of Providers Offering CACFP Lunches That Provide One-third or More of the RDA for Energy and Key Nutrients by Age Group

	All Providers	Family Day Care Homes	Center-Based Care		
			Head Start Centers	Child Care Centers	All Centers
Total Energy					
Ages 1 – 2	16.6%	14.8%	28.0%	35.0%	34.6%
3	30.9	27.1	47.9	51.8	50.2
4	0.9	0.3	2.8	4.7	4.0
5	1.5	0.8	5.3	5.4	5.4
6 – 10	7.4	6.2	n/a	19.3	23.7
All ages	8.0	6.5	16.0	16.4	16.2
Protein					
Ages 1 – 2	100.0	100.0	100.0	100.0	100.0
3	100.0	100.0	100.0	100.0	100.0
4	100.0	100.0	100.0	99.6	99.8
5	100.0	100.0	100.0	99.6	99.8
6 – 10	100.0	100.0	n/a	100.0	100.0
All ages	100.0	100.0	100.0	99.9	99.9
Vitamin A					
Ages 1 – 2	96.3	96.2	100.0	97.9	98.1
3	97.7	97.3	99.8	99.1	99.4
4	96.7	96.4	99.5	97.7	98.5
5	97.0	96.6	99.7	98.1	98.8
6 – 10	89.2	88.7	n/a	95.1	95.5
All ages	95.9	95.4	99.7	97.9	98.6
Vitamin C					
Ages 1 – 2	69.1	67.9	98.4	79.5	80.7
3	75.4	72.4	92.1	89.7	90.7
4	74.9	71.8	91.9	89.7	90.6
5	76.3	73.3	92.8	90.8	91.6
6 – 10	89.5	89.2	n/a	92.7	93.3
All ages	76.4	73.9	92.3	89.0	90.3
Calcium					
Ages 1 – 2	81.4	80.9	88.1	85.9	86.0
3	88.4	88.2	88.4	90.8	89.8
4	95.7	95.6	95.4	96.5	96.0
5	96.2	96.2	95.6	97.1	96.5
6 – 10	96.6	96.4	n/a	98.9	98.9
All ages	93.6	93.3	94.7	95.6	95.2
Iron					
Ages 1 – 2	2.3	2.1	6.8	4.8	4.9
3	5.8	4.5	11.9	13.0	12.6
4	17.4	14.8	31.0	30.7	30.8
5	22.2	19.5	36.1	36.4	36.3
6 – 10	51.0	49.0	n/a	75.5	77.3
All ages	13.5	11.5	26.7	22.6	24.3
Number of Providers (Unweighted)					
Ages 1 – 2	765	396	61	308	369
3	1766	448	877	441	1318
4	1766	448	877	441	1318
5	1766	448	877	441	1318
6 – 10	326	193	21	112	133
All ages	1820	486	878	456	1334

n/a = Fewer than 25 providers served this age group at lunch.

Exhibit B.11

**Mean Macronutrient, Cholesterol, and Sodium Content
of CACFP Lunches Offered by Age Group**

	All Providers		Family Day Care		Center-Based Care					
					Head Start Centers		Child Care Centers		All Centers	
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err
Percent of Energy from Fat (%)										
Ages 1 – 2	36.0	0.3	36.0	0.3	36.8	0.5	36.0	0.4	36.0	0.4
3	35.8	0.4	35.8	0.4	36.1	0.3	35.8	0.3	36.0	0.3
4	36.0	0.4	36.0	0.4	36.4	0.3	36.1	0.3	36.2	0.3
5	35.3	0.4	35.3	0.4	35.7	0.4	35.4	0.3	35.5	0.3
6 – 10	36.1	0.3	36.1	0.4	n/a	n/a	35.9	0.5	36.0	0.5
5 – 10	35.4	0.3	35.4	0.4	35.7	0.4	35.4	0.3	35.5	0.3
Percent of Energy from Saturated Fat (%)										
Ages 1 – 2	15.0	0.2	15.0	0.2	15.0	0.3	14.8	0.2	14.8	0.2
3	14.5	0.2	14.5	0.3	14.1	0.1	14.4	0.2	14.3	0.1
4	14.6	0.2	14.6	0.3	14.3	0.1	14.6	0.2	14.4	0.1
5	14.4	0.2	14.4	0.3	14.1	0.1	14.4	0.2	14.2	0.1
6 – 10	14.5	0.2	14.5	0.2	n/a	n/a	14.5	0.3	14.5	0.3
5 – 10	14.4	0.2	14.4	0.3	14.1	0.1	14.4	0.2	14.2	0.1
Percent of Energy from Carbohydrate (%)										
Ages 1 – 2	45.8	0.3	45.7	0.3	45.4	0.6	46.7	0.4	46.6	0.4
3	46.2	0.3	46.1	0.3	46.1	0.3	46.8	0.3	46.5	0.3
4	45.9	0.2	45.8	0.3	45.8	0.3	46.5	0.3	46.2	0.3
5	46.7	0.3	46.7	0.3	46.6	0.3	47.4	0.3	47.1	0.3
6 – 10	46.0	0.3	45.9	0.3	n/a	n/a	47.4	0.7	47.3	0.7
5 – 10	46.7	0.2	46.6	0.3	46.6	0.3	47.4	0.3	47.1	0.3
Percent of Energy from Protein (%)										
Ages 1 – 2	19.8	0.2	19.9	0.2	19.5	0.2	19.0	0.1	19.0	0.1
3	19.6	0.2	19.7	0.2	19.3	0.1	19.0	0.1	19.1	0.1
4	19.7	0.2	19.8	0.2	19.4	0.1	19.0	0.1	19.2	0.1
5	19.6	0.2	19.7	0.2	19.3	0.1	18.9	0.1	19.1	0.1
6 – 10	19.4	0.3	19.5	0.3	n/a	n/a	18.4	0.2	18.4	0.2
5 – 10	19.6	0.2	19.7	0.2	19.3	0.1	18.9	0.1	19.1	0.1

**Exhibit B.11
(continued)**

	All Providers		Family Day Care		Center-Based Care					
	Mean	Std Err	Mean	Std Err	Head Start Centers		Child Care Centers		All Centers	
					Mean	Std Err	Mean	Std Err	Mean	Std Err
Cholesterol (mg)										
Ages 1 – 2	53.7	0.9	53.4	0.9	55.6	3.5	56.5	0.8	56.5	0.8
3	55.7	1.0	55.2	1.1	59.4	0.9	57.5	0.8	58.3	0.7
4	62.3	1.1	61.7	1.2	66.4	0.9	64.4	0.9	65.2	0.8
5	63.0	1.1	62.4	1.2	67.0	0.9	65.1	1.0	65.9	0.8
6 – 10	71.8	2.6	71.4	2.8	n/a	n/a	77.5	2.3	78.1	2.3
5 – 10	65.1	1.3	64.8	1.4	67.2	0.9	66.5	0.9	66.8	0.7
Sodium (mg)										
Ages 1 – 2	734.6	11.1	726.6	11.8	806.2	30.3	816.9	10.5	816.2	9.9
3	782.5	13.7	771.1	15.4	826.6	10.7	849.8	9.1	840.2	7.8
4	880.1	15.5	867.6	17.4	928.4	11.9	954.0	10.6	943.4	8.8
5	891.5	15.1	879.5	17.0	936.2	11.1	964.0	10.8	952.5	8.8
6 – 10	1028.8	24.1	1018.5	25.1	n/a	n/a	1159.5	18.4	1163.1	17.3
5 – 10	918.7	16.8	909.8	18.9	939.0	11.6	984.9	9.7	966.1	8.4
Number of Providers (Unweighted)										
Ages 1 – 2	765		396		61		308		369	
3	1766		448		877		441		1318	
4	1766		448		877		441		1318	
5	1766		448		877		441		1318	
6 – 10	326		193		21		112		133	
5 – 10	1794		471		877		446		1323	

n/a = Fewer than 25 providers served this age group at lunch.

Note: Aggregation across age groups has been limited to menus offered to five-year-olds and six- to ten-year-olds because *Dietary Guidelines* and NRC recommendations for these nutrients are applicable only to children five years of age and older. See Chapter Two for a discussion of *Dietary Guidelines* and NRC recommendations.

Exhibit B.12

Distribution of Macronutrients, Cholesterol, and Sodium in Lunches Offered to Five- to Ten-Year-Olds

	All Providers	Family Day Care Homes	Center-Based Care		
			Head Start Centers	Child Care Centers	All Centers
Percentage of Providers					
Percent of Total Energy from Fat					
20% or less	0.0%	0.0%	0.0%	0.0%	0.0%
21% – 30%	13.8	14.7	8.0	10.1	9.2
31% – 35%	36.4	35.8	40.8	39.1	39.8
More than 35%	49.8	49.5	51.2	50.9	51.0
<i>Mean</i>	35.4	35.4	35.7	35.4	35.5
<i>Median</i>	35.4	35.4	35.6	35.6	35.6
Percent of Total Energy from Saturated Fat					
Less than 10%	3.6%	4.0%	2.0%	0.8%	1.2%
10% – 12%	18.6	18.5	19.2	19.6	19.4
13% – 14%	29.6	28.1	39.6	36.6	37.9
More than 14%	48.2	49.4	39.2	43.0	41.5
<i>Mean</i>	14.4	14.4	14.1	14.4	14.2
<i>Median</i>	14.4	14.4	14.0	14.2	14.0
Percent of Total Energy from Carbohydrate					
40% – 54%	97.5%	97.4%	98.0%	98.2%	98.2%
55% or more	2.5	2.6	2.0	1.8	1.8
<i>Mean</i>	46.7	46.6	46.6	47.4	47.1
<i>Median</i>	46.8	46.7	46.5	47.5	47.1
Percent of Total Energy from Protein					
10% or less	0.0%	0.0%	0.0%	0.0%	0.0%
11% – 14%	3.6	3.7	2.0	3.6	3.0
15 or more	96.4	96.3	98.0	96.4	97.0
<i>Mean</i>	19.6	19.7	19.3	18.9	19.1
<i>Median</i>	19.4	19.5	19.2	18.8	19.0
Cholesterol (mg)					
50 mg or less	21.8%	23.3%	14.8%	13.2%	13.9%
51 – 100 mg	68.8	66.8	77.9	80.2	79.3
More than 100 mg	9.4	9.9	7.2	6.6	6.9
<i>Mean</i>	65.1	64.8	67.2	66.5	66.8
<i>Median</i>	59.8	59.1	63.2	63.2	63.2
Sodium (mg)					
400 mg or less	0.0%	0.0%	0.0%	0.4%	0.2%
401 – 800 mg	23.8	25.2	19.4	13.8	16.1
801 – 1000 mg	46.1	46.5	47.8	40.7	43.6
More than 1000 mg	30.1	28.2	32.7	45.1	40.1
<i>Mean</i>	919	910	939	985	966
<i>Median</i>	908	898	934	980	960
Number of Providers (Unweighted)	1794	471	877	446	1323

Exhibit B.13

Mean Energy and Nutrient Content of CACFP Lunches with Varying Levels of Energy from Fat¹

	Level of Fat in CACFP Lunches ¹			
	Low	Moderate	High	Very High
Total Energy (kcal)	411	459	482	483
Total Fat (gm)	12.8	17.0	19.9	22.1
Saturated Fat (gm)	5.0	6.9	8.1	9.0
Carbohydrate (gm)	53.0	56.3	55.2	50.9
Protein (gm)	22.7	22.4	22.5	21.9
Vitamin A (mcg RE)	580	473	501	498
Vitamin C (mg)	26	23	23	22
Calcium (mg)	337	351	363	363
Iron (mg)	2.8	2.9	3.0	2.8
Number of Providers (Unweighted)	134	672	559	401

Note: Based on lunches offered to five-year-olds.

¹Defined for each provider on the basis of the average percentage of energy from fat in lunches offered to five-year-olds. Low fat is defined as less than or equal to 30 percent of total energy from fat; moderate fat as 31 to 35 percent; high fat as 36 to 38 percent; very high fat as 39 to 52 percent.

Exhibit B.14

Sources of Energy and Nutrients in CACFP Lunches

Lunch Component/Foods	Total Energy	Protein	Vitamin A	Vitamin C	Calcium
Percentage Contribution to Average Amount Offered					
Milk	20%	28%	24%	9%	64%
Whole milk	5	6	4	2	14
Low-fat milk ¹	11	16	16	5	37
Other milks	4	6	5	2	13
Fruits, Vegetables, and Juices	21	8	54	69	7
Fruit or Juice	10	2	4	28	2
Vegetables	11	7	50	40	5
Breads and Bread Alternates	25	19	6	8	15
Bread/rolls	11	7	*	*	6
Biscuit/croissant	1	*	*	*	*
Cornbread	1	1	*	*	1
Crackers	*	*	*	*	*
Pasta/rice	2	1	*	*	*
Grain-based mixtures	10	10	5	7	7
Meats and Meat Alternates	30	44	11	13	13
Meat, poultry, fish	16	29	3	8	2
Eggs	1	1	1	*	*
Cheese	2	3	2	*	5
Legumes	2	2	*	1	1
Peanut butter/nuts	1	1	*	*	*
Meat mixtures	7	9	5	4	4
Noncreditable Foods²	5	1	5	2	1
Sweets	1	*	*	1	*
High-fat condiments ³	3	*	4	*	*
Low-fat condiments ⁴	*	*	*	1	*
All Foods	100	100	100	100	100

Exhibit B.14
(continued)

Lunch Component/Foods	Iron	Fat	Saturated Fat	Carbohydrate	Cholesterol	Sodium
Milk	3%	19%	33%	17%	26%	11%
Whole milk	1	7	10	4	8	2
Low-fat milk ¹	2	9	18	10	13	6
Other milks	1	3	5	4	5	2
Fruits, Vegetables, and Juices	25	10	7	37	1	17
Fruit or Juice	7	1	1	21	*	*
Vegetables	18	9	7	16	1	16
Breads and Bread Alternates	37	18	15	32	13	29
Bread/rolls	19	4	3	17	*	11
Biscuit/croissant	1	1	*	1	*	1
Cornbread	1	1	1	2	1	1
Crackers	1	*	*	1	*	*
Pasta/rice	3	1	*	3	1	2
Grain-based mixtures	13	11	11	9	11	13
Meats and Meat Alternates	33	43	39	11	58	38
Meat, poultry, fish	17	24	20	3	37	22
Eggs	1	2	1	*	6	1
Cheese	1	5	7	*	5	4
Legumes	5	1	1	2	*	3
Peanut butter/nuts	1	2	1	*	*	*
Meat mixtures	9	9	9	5	10	9
Noncreditable Foods²	1	9	6	3	2	5
Sweets	1	1	1	2	*	*
High-fat condiments ³	*	8	5	*	1	2
Low-fat condiments ⁴	*	*	*	1	*	2
All Foods	100	100	100	100	100	100

* = Less than one percent.

Notes: Based on lunches offered to three- to five-year-olds.

Detail may not sum to 100% due to rounding.

¹Includes 1% and 2% milks.

²Foods that do not contribute to satisfying the CACFP meal pattern.

³Butter, margarine, regular salad dressing, regular mayonnaise, gravy, whipped cream, cream cheese, and other high-fat toppings.

⁴Low-fat salad dressing, low-fat mayonnaise, reduced-calorie margarine, sugar, honey, jelly, syrup, catsup, mustard, and other low-fat toppings.

Exhibit B.15

Mean Energy and Nutrient Content of CACFP Morning Snacks Offered by Age Group

	All Providers	Family Day Care Homes	Center-Based Care		
			Head Start Centers	Child Care Centers	All Centers
Total Energy (kcal)					
Ages 1 – 2	185	184	n/a	185	185
3	192	192	206	193	195
4	188	187	201	188	191
5	206	206	221	206	209
6 – 10	223	224	n/a	221	222
All Ages	195	195	209	196	198
Vitamin A (mcg RE)					
Ages 1 – 2	97	98	n/a	84	84
3	99	100	118	84	91
4	97	98	118	82	90
5	107	108	129	91	99
6 – 10	140	146	n/a	88	87
All Ages	103	104	119	85	92
Vitamin C (mg)					
Ages 1 – 2	16	16	n/a	22	22
3	16	16	22	21	21
4	16	16	22	21	21
5	17	16	23	21	22
6 – 10	17	16	n/a	25	25
All Ages	17	16	22	22	22
Calcium (mg)					
Ages 1 – 2	134	136	n/a	115	115
3	138	139	156	121	128
4	138	139	157	121	128
5	151	152	171	133	140
6 – 10	165	170	n/a	122	122
All Ages	141	142	160	125	132
Iron (mg)					
Ages 1 – 2	1.2	1.2	n/a	1.4	1.4
3	1.3	1.3	1.6	1.4	1.4
4	1.2	1.2	1.5	1.3	1.3
5	1.4	1.3	1.7	1.4	1.5
6 – 10	1.5	1.5	n/a	1.7	1.6
All Ages	1.3	1.3	1.6	1.4	1.4
Number of Providers (Unweighted)					
Ages 1 – 2	330	189	7	134	141
3	538	216	132	190	322
4	538	216	132	190	322
5	538	216	132	190	322
6 – 10	142	76	4	62	66
All Ages	572	236	133	203	336

n/a = Fewer than 25 providers served this age group at morning snack.

Exhibit B.16

Mean Percentage of RDAs Provided in CACFP Morning Snacks Offered by Age Group

	All Providers		Family Day Care		Center-Based Care					
	Mean	Std Err	Mean	Std Err	Head Start Centers		Child Care Centers		All Centers	
					Mean	Std Err	Mean	Std Err	Mean	Std Err
Total Energy										
Ages 1 – 2	14.2	0.2	14.2	0.2	n/a	n/a	14.3	0.5	14.2	0.4
3	14.8	0.2	14.7	0.3	15.9	0.5	14.8	0.4	15.0	0.3
4	10.4	0.2	10.4	0.2	11.2	0.3	10.4	0.3	10.6	0.2
5	11.4	0.2	11.4	0.2	12.3	0.3	11.5	0.3	11.6	0.3
6 – 10	11.4	0.4	11.4	0.4	n/a	n/a	11.3	0.3	11.3	0.3
All Ages	12.6	0.2	12.6	0.2	13.1	0.4	12.6	0.3	12.7	0.2
Protein										
Ages 1 – 2	34.4	0.8	34.7	0.9	n/a	n/a	30.6	2.5	30.5	2.4
3	35.8	0.9	36.0	0.8	40.5	1.0	32.8	2.6	34.4	2.2
4	23.8	0.6	23.9	0.6	26.8	0.7	21.7	1.8	22.7	1.5
5	26.1	0.6	26.2	0.6	29.4	0.7	23.8	2.0	24.9	1.6
6 – 10	25.5	1.1	26.0	1.2	n/a	n/a	20.6	2.0	20.7	2.0
All Ages	29.3	0.7	29.5	0.7	32.1	0.8	26.9	2.0	27.9	1.6
Vitamin A										
Ages 1 – 2	24.2	1.8	24.4	1.9	n/a	n/a	21.0	1.8	21.1	1.8
3	24.8	1.5	25.1	1.7	29.6	2.5	21.1	2.2	22.8	1.7
4	19.4	1.2	19.5	1.3	23.5	2.1	16.5	1.7	17.9	1.4
5	21.4	1.3	21.7	1.4	25.8	2.2	18.3	1.9	19.8	1.5
6 – 10	21.0	2.9	21.9	3.2	n/a	n/a	13.1	2.4	13.1	2.4
All Ages	22.1	1.3	22.4	1.5	25.8	2.3	18.5	1.8	20.0	1.3
Vitamin C										
Ages 1 – 2	41.2	2.2	40.2	2.2	n/a	n/a	54.7	9.1	54.0	9.1
3	40.8	3.0	39.2	3.3	55.3	4.1	52.9	8.3	53.4	7.0
4	36.3	2.6	34.8	2.9	49.1	3.7	47.2	7.7	47.6	6.4
5	36.9	2.7	35.5	3.0	50.2	3.6	47.6	7.1	48.1	5.9
6 – 10	36.7	3.5	34.8	3.8	n/a	n/a	54.7	9.4	54.5	9.2
All Ages	39.5	2.4	38.1	2.7	50.5	4.2	51.1	6.6	51.0	5.8

Exhibit B.16
(continued)

	All Providers		Family Day Care		Center-Based Care						
	Mean	Std Err	Mean	Std Err	Head Start Centers		Child Care Centers		All Centers		
					Mean	Std Err	Mean	Std Err	Mean	Std Err	
Calcium											
Ages 1 – 2	16.8	0.6	16.9	0.6	n/a	n/a	14.4	1.8	14.3	1.7	
3	17.2	0.6	17.3	0.5	19.6	0.7	15.1	1.8	16.0	1.5	
4	17.2	0.6	17.4	0.6	19.6	0.7	15.1	1.8	16.0	1.5	
5	18.8	0.6	19.0	0.6	21.4	0.8	16.6	2.0	17.5	1.6	
6 – 10	20.7	1.2	21.2	1.2	n/a	n/a	15.3	2.1	15.3	2.1	
All Ages	17.6	0.5	17.8	0.5	20.0	0.7	15.7	1.6	16.5	1.3	
Iron											
Ages 1 – 2	12.4	0.5	12.3	0.6	n/a	n/a	13.6	0.7	13.6	0.7	
3	12.8	0.4	12.6	0.5	15.8	1.4	13.5	0.6	14.0	0.5	
4	12.2	0.4	12.1	0.5	15.0	1.3	12.9	0.5	13.3	0.4	
5	13.5	0.5	13.4	0.5	16.8	1.4	14.3	0.6	14.8	0.5	
6 – 10	14.9	1.0	14.7	1.1	n/a	n/a	16.5	1.4	16.5	1.3	
All Ages	13.3	0.4	13.2	0.5	15.7	1.3	13.7	0.5	14.1	0.4	
Number of Providers (Unweighted)											
Ages 1 – 2	330		189		7		134		141		
3	538		216		132		190		322		
4	538		216		132		190		322		
5	538		216		132		190		322		
6 – 10	142		76		4		62		66		
All Ages	572		236		133		203		336		

n/a = Fewer than 25 providers served this age group at morning snack.

Exhibit B.17

Mean Energy and Nutrient Content of CACFP Afternoon Snacks Offered by Age Group

	All Providers	Family Day Care Homes	Center-Based Care		
			Head Start Centers	Child Care Centers	All Centers
Total Energy (kcal)					
Ages 1 – 2	193	193	192	192	192
3	199	199	199	199	199
4	195	195	194	194	194
5	214	214	214	213	214
6 – 10	236	236	230	241	241
All Ages	207	206	202	210	208
Vitamin A (mcg RE)					
Ages 1 – 2	97	99	98	74	75
3	103	106	102	82	88
4	102	105	101	81	87
5	113	116	112	90	96
6 – 10	132	135	88	108	108
All Ages	109	112	105	88	93
Vitamin C (mg)					
Ages 1 – 2	13	13	11	15	15
3	13	13	17	14	15
4	13	13	17	14	15
5	14	13	18	15	16
6 – 10	15	15	10	18	17
All Ages	14	13	18	16	16
Calcium (mg)					
Ages 1 – 2	152	154	181	130	133
3	150	152	137	137	137
4	150	153	137	137	137
5	164	167	150	150	150
6 – 10	187	189	202	168	170
All Ages	160	162	142	146	145
Iron (mg)					
Ages 1 – 2	1.0	1.0	1.0	1.1	1.1
3	1.1	1.1	1.3	1.1	1.2
4	1.1	1.1	1.3	1.1	1.1
5	1.2	1.2	1.4	1.2	1.3
6 – 10	1.3	1.2	1.2	1.4	1.4
All Ages	1.1	1.1	1.3	1.2	1.2
Number of Providers (Unweighted)					
Ages 1 – 2	715	364	55	296	351
3	1464	418	581	465	1046
4	1464	418	581	465	1046
5	1464	418	581	465	1046
6 – 10	553	280	26	247	273
All Ages	1558	458	582	518	1100

Exhibit B.18

Mean Percentage of RDAs Provided in CACFP Afternoon Snacks Offered by Age Group

	All Providers		Family Day Care		Center-Based Care						
	Mean	Std Err	Mean	Std Err	Head Start Centers		Child Care Centers		All Centers		
					Mean	Std Err	Mean	Std Err	Mean	Std Err	
Total Energy											
Ages 1 – 2	14.8	0.1	14.8	0.1	14.7	0.6	14.8	0.2	14.8	0.2	
3	15.3	0.1	15.3	0.1	15.3	0.2	15.3	0.2	15.3	0.1	
4	10.8	0.1	10.9	0.1	10.8	0.2	10.8	0.2	10.8	0.1	
5	11.9	0.1	11.9	0.1	11.9	0.2	11.9	0.2	11.9	0.1	
6 – 10	12.1	0.1	12.0	0.1	11.7	0.4	12.3	0.2	12.3	0.2	
All Ages	13.0	0.1	13.0	0.1	12.7	0.2	13.0	0.2	12.9	0.1	
Protein											
Ages 1 – 2	38.3	0.8	38.7	0.8	43.2	4.0	33.5	1.0	34.1	0.9	
3	38.7	0.6	39.2	0.6	37.6	1.5	35.6	1.1	36.2	0.8	
4	25.9	0.4	26.2	0.4	25.0	1.0	23.7	0.7	24.0	0.5	
5	28.2	0.4	28.6	0.5	27.3	1.1	26.0	0.8	26.4	0.6	
6 – 10	28.4	0.7	28.6	0.8	29.2	2.1	26.4	0.9	26.5	0.9	
All Ages	31.9	0.5	32.4	0.5	30.1	1.2	29.2	0.7	29.4	0.5	
Vitamin A											
Ages 1 – 2	24.2	1.3	24.7	1.4	24.4	3.4	18.5	1.1	18.9	1.1	
3	25.8	1.1	26.4	1.3	25.6	1.6	20.5	0.9	22.0	0.9	
4	20.5	0.9	21.0	1.1	20.2	1.2	16.2	0.7	17.4	0.7	
5	22.6	1.0	23.2	1.2	22.4	1.4	18.0	0.8	19.3	0.8	
6 – 10	19.8	1.1	20.2	1.3	13.3	1.7	16.3	1.5	16.1	1.4	
All Ages	22.7	1.0	23.3	1.2	22.7	1.4	18.1	0.7	19.4	0.7	
Vitamin C											
Ages 1 – 2	32.1	1.5	31.7	1.6	26.4	3.1	37.1	2.0	36.5	1.9	
3	33.0	1.4	32.0	1.7	43.6	3.1	36.2	1.9	38.4	1.3	
4	29.2	1.3	28.3	1.5	38.7	2.7	32.1	1.7	34.1	1.2	
5	30.1	1.3	29.2	1.5	39.9	2.8	33.0	1.6	35.0	1.2	
6 – 10	34.4	2.3	33.9	2.5	21.2	3.2	39.4	4.3	38.8	4.1	
All Ages	32.3	1.4	31.4	1.5	40.8	2.9	36.1	2.2	37.4	1.4	

Exhibit B.18
(continued)

	All Providers		Family Day Care		Center-Based Care						
	Mean	Std Err	Mean	Std Err	Head Start Centers		Child Care Centers		All Centers		
					Mean	Std Err	Mean	Std Err	Mean	Std Err	
Calcium											
Ages 1 – 2	19.0	0.5	19.3	0.5	22.6	2.1	16.3	0.7	16.6	0.7	
3	18.7	0.4	19.0	0.4	17.1	1.0	17.1	0.7	17.1	0.6	
4	18.8	0.4	19.1	0.4	17.1	1.1	17.1	0.7	17.1	0.6	
5	20.5	0.4	20.9	0.5	18.7	1.2	18.8	0.8	18.8	0.6	
6 – 10	23.4	0.7	23.7	0.8	25.3	2.3	21.1	0.9	21.2	0.9	
All Ages	20.0	0.4	20.3	0.5	17.7	1.1	18.3	0.6	18.1	0.5	
Iron											
Ages 1 – 2	10.4	0.2	10.3	0.2	10.4	0.8	10.6	0.3	10.6	0.2	
3	11.2	0.2	11.1	0.2	13.4	0.4	11.3	0.3	11.9	0.2	
4	10.7	0.2	10.6	0.2	12.7	0.4	10.8	0.3	11.4	0.2	
5	11.9	0.2	11.8	0.2	14.2	0.4	12.0	0.3	12.7	0.2	
6 – 10	12.6	0.2	12.4	0.3	11.8	0.9	14.2	0.7	14.2	0.6	
All Ages	11.4	0.2	11.2	0.2	13.4	0.4	12.0	0.4	12.4	0.3	
Number of Providers (Unweighted)											
Ages 1 – 2	715		364		55		296		351		
3	1464		418		581		465		1046		
4	1464		418		581		465		1046		
5	1464		418		581		465		1046		
6 – 10	553		280		26		247		273		
All Ages	1558		458		582		518		1100		

Exhibit B.19

**Mean Energy and Nutrient Content of Most Common Meal Combinations
Offered by Age Group: All Providers**

	Breakfast, Lunch, and Snack	Breakfast, Lunch, and Two Snacks	Breakfast and Lunch	Lunch and Snack	Lunch and Two Snacks
Total Energy (kcal)					
Ages 1 – 2	859	1006	n/a	593	752
3	901	1051	752	597	791
4	987	1129	841	643	830
5	1022	1181	860	673	880
6 – 10	1070	1272	n/a	757	n/a
All Ages	955	1107	822	684	819
Total Fat (gm)					
Ages 1 – 2	30.0	34.2	n/a	22.6	25.9
3	31.4	35.6	26.8	22.7	26.5
4	34.7	38.6	30.1	24.7	28.2
5	35.5	40.1	30.5	25.5	29.6
6 – 10	37.6	45.9	n/a	27.4	n/a
All Ages	33.3	37.6	29.6	25.2	27.8
Saturated Fat (gm)					
Ages 1 – 2	12.8	14.6	n/a	9.7	10.6
3	13.2	15.0	11.2	9.4	10.2
4	14.6	16.4	12.6	10.3	11.0
5	15.0	17.0	12.8	10.6	11.5
6 – 10	15.5	19.2	n/a	11.1	n/a
All Ages	14.0	15.9	12.3	10.3	11.0
Carbohydrate (gm)					
Ages 1 – 2	117.2	140.7	n/a	74.5	102.8
3	122.7	146.8	99.0	74.3	111.1
4	133.4	156.3	110.2	78.7	114.7
5	139.6	164.8	113.9	83.9	123.1
6 – 10	144.9	171.4	n/a	97.7	n/a
All Ages	129.9	154.5	107.4	87.8	114.0
Protein (gm)					
Ages 1 – 2	34.1	38.9	n/a	25.5	30.5
3	36.0	40.9	31.7	26.4	31.1
4	39.9	44.7	35.6	28.9	33.5
5	40.9	46.3	36.1	30.0	35.0
6 – 10	43.1	49.4	n/a	33.0	n/a
All Ages	38.3	43.2	34.8	29.8	32.6
Vitamin A (mcg RE)					
Ages 1 – 2	686	782	n/a	490	650
3	751	891	664	571	647
4	840	983	752	629	706
5	865	1031	762	653	734
6 – 10	919	1091	n/a	645	n/a
All Ages	797	940	711	611	691
Vitamin C (mg)					
Ages 1 – 2	60	76	n/a	39	56
3	62	79	59	38	53
4	67	85	64	41	56
5	69	88	66	42	58
6 – 10	71	90	n/a	46	n/a
All Ages	66	83	63	43	60

Exhibit B.19
(continued)

	Breakfast, Lunch, and Snack	Breakfast, Lunch, and Two Snacks	Breakfast and Lunch	Lunch and Snack	Lunch and Two Snacks
Calcium (mg)					
Ages 1 – 2	695	807	n/a	479	593
3	722	847	613	475	609
4	802	928	693	518	653
5	824	961	703	543	690
6 – 10	851	1015	n/a	572	n/a
All Ages	765	895	661	532	640
Iron (mg)					
Ages 1 – 2	6.3	7.5	n/a	3.7	5.1
3	6.9	8.2	5.6	3.8	5.2
4	7.6	8.8	6.2	4.1	5.4
5	7.9	9.4	6.5	4.3	5.7
6 – 10	8.2	9.3	n/a	5.0	n/a
All Ages	7.2	8.6	6.1	4.4	5.6
Cholesterol (mg)					
Ages 1 – 2	111	127	n/a	83	89
3	116	133	112	80	80
4	128	145	125	86	85
5	130	148	126	90	89
6 – 10	135	162	n/a	84	n/a
5 – 10	133	151	127	87	92
Sodium (mg)					
Ages 1 – 2	1318	1461	n/a	976	1115
3	1409	1556	1262	985	1150
4	1555	1689	1415	1072	1232
5	1603	1764	1440	1113	1293
6 – 10	1709	1893	n/a	1275	n/a
5 – 10	1624	1788	1452	1203	1311
Number of Providers (Unweighted)					
Ages 1 – 2	423	234	19	31	47
3	996	319	259	82	89
4	996	319	259	82	89
5	996	319	259	82	89
6 – 10	147	98	14	40	15
All Ages	1051	343	265	115	103

n/a = Fewer than 25 providers offered this combination to this age group.

Note: For cholesterol and sodium, aggregation across age groups has been limited to menus offered to five-year-olds and six- to ten-year-olds because NRC recommendations for these nutrients are applicable only to children five years of age and older. See Chapter Two for a discussion of NRC recommendations and the rationale for this approach.

Exhibit B.20

**Mean Energy and Nutrient Content of Most Common Meal Combinations
Offered by Age Group: Family Day Care Homes**

	Breakfast, Lunch, and Snack	Breakfast, Lunch, and Two Snacks	Breakfast and Lunch	Lunch and Snack	Lunch and Two Snacks
Total Energy (kcal)					
Ages 1 – 2	857	1005	n/a	591	n/a
3	900	1046	n/a	590	782
4	986	1124	n/a	635	820
5	1022	1176	n/a	666	870
6 – 10	1065	1266	n/a	755	n/a
All Ages	953	1103	n/a	682	810
Total Fat (gm)					
Ages 1 – 2	29.9	34.2	n/a	22.5	n/a
3	31.4	35.5	n/a	22.5	26.0
4	34.6	38.5	n/a	24.5	27.7
5	35.5	40.0	n/a	25.2	29.1
6 – 10	37.4	45.9	n/a	27.4	n/a
All Ages	33.3	37.5	n/a	25.1	27.3
Saturated Fat (gm)					
Ages 1 – 2	12.8	14.7	n/a	9.6	n/a
3	13.2	15.0	n/a	9.4	10.0
4	14.6	16.3	n/a	10.2	10.7
5	15.0	16.9	n/a	10.6	11.2
6 – 10	15.5	19.2	n/a	11.0	n/a
All Ages	14.0	15.9	n/a	10.3	10.8
Carbohydrate (gm)					
Ages 1 – 2	116.8	140.2	n/a	74.3	n/a
3	122.4	146.0	n/a	73.1	110.0
4	133.2	155.4	n/a	77.4	113.5
5	139.4	163.9	n/a	82.6	121.9
6 – 10	144.2	169.8	n/a	97.5	n/a
All Ages	129.5	153.7	n/a	87.5	112.9
Protein (gm)					
Ages 1 – 2	34.2	38.9	n/a	25.5	n/a
3	36.1	40.9	n/a	26.4	31.1
4	40.0	44.7	n/a	28.9	33.4
5	41.0	46.2	n/a	30.0	35.0
6 – 10	43.0	49.4	n/a	33.0	n/a
All Ages	38.3	43.2	n/a	29.8	32.4
Vitamin A (mcg RE)					
Ages 1 – 2	690	784	n/a	490	n/a
3	752	897	n/a	575	648
4	841	990	n/a	633	708
5	868	1039	n/a	659	736
6 – 10	918	1101	n/a	644	n/a
All Ages	796	945	n/a	613	695
Vitamin C (mg)					
Ages 1 – 2	60	75	n/a	38	n/a
3	60	78	n/a	36	52
4	65	84	n/a	38	54
5	67	87	n/a	40	56
6 – 10	70	89	n/a	46	n/a
All Ages	65	83	n/a	42	59

Exhibit B.20
(continued)

	Breakfast, Lunch, and Snack	Breakfast, Lunch, and Two Snacks	Breakfast and Lunch	Lunch and Snack	Lunch and Two Snacks
Calcium (mg)					
Ages 1 – 2	697	810	n/a	479	n/a
3	727	847	n/a	475	615
4	807	928	n/a	519	660
5	829	962	n/a	544	697
6 – 10	850	1016	n/a	571	n/a
All Ages	767	896	n/a	533	643
Iron(mg)					
Ages 1 – 2	6.3	7.5	n/a	3.7	n/a
3	6.9	8.2	n/a	3.8	5.1
4	7.6	8.8	n/a	4.0	5.3
5	8.0	9.4	n/a	4.2	5.6
6 – 10	8.1	9.2	n/a	5.0	n/a
All Ages	7.2	8.6	n/a	4.4	5.5
Cholesterol (mg)					
Ages 1 – 2	111	128	n/a	83	n/a
3	117	133	n/a	81	78
4	129	145	n/a	88	83
5	131	149	n/a	91	87
6 – 10	135	164	n/a	83	n/a
5 – 10	134	151	n/a	88	91
Sodium (mg)					
Ages 1 – 2	1313	1456	n/a	974	n/a
3	1407	1548	n/a	975	1120
4	1552	1680	n/a	1061	1200
5	1600	1756	n/a	1103	1259
6 – 10	1701	1879	n/a	1271	n/a
5 – 10	1624	1779	n/a	1200	1277
Number of Providers (Unweighted)					
Ages 1 – 2	202	139	4	28	18
3	217	163	6	30	25
4	217	163	6	30	25
5	217	163	6	30	25
6 – 10	92	57	4	33	4
All Ages	254	179	8	57	34

n/a = Fewer than 25 providers offered this combination to this age group.

Note: For cholesterol and sodium, aggregation across age groups has been limited to menus offered to five-year-olds and six- to ten-year-olds because NRC recommendations for these nutrients are applicable only to children five years of age and older. See Chapter Two for a discussion of NRC recommendations and the rationale for this approach.

Exhibit B.21

**Mean Energy and Nutrient Content of Most Common Meal Combinations
Offered by Age Group: Head Start Centers**

	Breakfast, Lunch, and Snack	Breakfast, Lunch, and Two Snacks	Breakfast and Lunch	Lunch and Snack	Lunch and Two Snacks
Total Energy (kcal)					
Ages 1 – 2	844	n/a	n/a	n/a	n/a
3	903	1140	732	642	848
4	988	1225	824	692	892
5	1021	1282	838	718	941
6 – 10	n/a	n/a	n/a	n/a	n/a
All Ages	968	1215	802	687	893
Total Fat (gm)					
Ages 1 – 2	31.1	n/a	n/a	n/a	n/a
3	31.4	40.8	26.4	23.9	28.8
4	34.6	44.3	29.9	26.1	31.0
5	35.4	45.8	30.0	26.7	32.2
6 – 10	n/a	n/a	n/a	n/a	n/a
All Ages	33.7	43.6	28.9	25.6	30.6
Saturated Fat (gm)					
Ages 1 – 2	13.5	n/a	n/a	n/a	n/a
3	12.9	16.8	11.0	9.6	11.9
4	14.3	18.4	12.5	10.5	12.8
5	14.6	19.0	12.5	10.8	13.3
6 – 10	n/a	n/a	n/a	n/a	n/a
All Ages	13.9	18.1	12.1	10.3	12.6
Carbohydrate (gm)					
Ages 1 – 2	109.6	n/a	n/a	n/a	n/a
3	122.9	153.4	95.4	83.7	119.6
4	133.1	162.9	106.8	88.8	123.5
5	139.1	172.5	109.7	93.3	131.9
6 – 10	n/a	n/a	n/a	n/a	n/a
All Ages	131.3	162.8	104.4	89.1	124.9
Protein (gm)					
Ages 1 – 2	35.2	n/a	n/a	n/a	n/a
3	36.4	44.8	31.2	26.2	32.1
4	40.3	48.8	35.2	28.7	34.5
5	41.3	50.5	35.5	29.5	36.0
6 – 10	n/a	n/a	n/a	n/a	n/a
All Ages	39.2	48.0	34.1	28.3	34.2
Vitamin A (mcg RE)					
Ages 1 – 2	818	n/a	n/a	n/a	n/a
3	786	825	639	546	668
4	876	915	724	607	721
5	897	948	728	616	746
6 – 10	n/a	n/a	n/a	n/a	n/a
All Ages	849	893	696	591	710
Vitamin C (mg)					
Ages 1 – 2	66	n/a	n/a	n/a	n/a
3	71	79	56	52	73
4	76	83	61	55	75
5	79	87	63	57	78
6 – 10	n/a	n/a	n/a	n/a	n/a
All Ages	75	83	61	55	75

Exhibit B.21
(continued)

	Breakfast, Lunch, and Snack	Breakfast, Lunch, and Two Snacks	Breakfast and Lunch	Lunch and Snack	Lunch and Two Snacks
Calcium (mg)					
Ages 1 – 2	722	n/a	n/a	n/a	n/a
3	704	910	579	461	604
4	784	991	659	505	646
5	803	1030	665	526	684
6 – 10	n/a	n/a	n/a	n/a	n/a
All Ages	761	975	635	498	644
Iron (mg)					
Ages 1 – 2	6.4	n/a	n/a	n/a	n/a
3	7.0	8.0	5.5	4.4	6.2
4	7.6	8.6	6.1	4.6	6.3
5	7.9	9.1	6.3	4.8	6.8
6 – 10	n/a	n/a	n/a	n/a	n/a
All Ages	7.5	8.5	6.0	4.6	6.4
Cholesterol (mg)					
Ages 1 – 2	116	n/a	n/a	n/a	n/a
3	115	152	103	67	88
4	127	167	116	73	93
5	129	171	117	75	97
6 – 10	n/a	n/a	n/a	n/a	n/a
All Ages	129	171	117	75	97
Sodium (mg)					
Ages 1 – 2	1341	n/a	n/a	n/a	n/a
3	1418	1713	1210	1041	1315
4	1563	1856	1364	1137	1405
5	1608	1935	1380	1165	1475
6 – 10	n/a	n/a	n/a	n/a	n/a
All Ages	1609	1935	1388	1176	1475
Number of Providers (Unweighted)					
Ages 1 – 2	50	5	4	0	1
3	527	42	232	43	26
4	527	42	232	43	26
5	527	42	232	43	26
6 – 10	7	4	6	1	0
All Ages	528	42	235	44	26

n/a = Fewer than 25 providers offered this combination to this age group.

Note: For cholesterol and sodium, aggregation across age groups has been limited to menus offered to five-year-olds and six- to ten-year-olds because NRC recommendations for these nutrients are applicable only to children five years of age and older. See Chapter Two for a discussion of NRC recommendations and the rationale for this approach.

Exhibit B.22

**Mean Energy and Nutrient Content of Most Common Meal Combinations
Offered by Age Group: Child Care Centers**

	Breakfast, Lunch, and Snack	Breakfast, Lunch, and Two Snacks	Breakfast and Lunch	Lunch and Snack	Lunch and Two Snacks
Total Energy (kcal)					
Ages 1 – 2	879	1028	n/a	n/a	812
3	909	1094	n/a	n/a	843
4	994	1173	n/a	n/a	889
5	1029	1226	n/a	n/a	936
6 – 10	1145	1340	n/a	n/a	n/a
All Ages	966	1148	n/a	n/a	884
Total Fat (gm)					
Ages 1 – 2	30.7	33.7	n/a	n/a	28.5
3	31.6	36.2	n/a	n/a	29.4
4	34.8	39.2	n/a	n/a	31.6
5	35.7	40.6	n/a	n/a	32.8
6 – 10	40.4	45.6	n/a	n/a	n/a
All Ages	33.7	38.0	n/a	n/a	31.3
Saturated Fat (gm)					
Ages 1 – 2	13.0	14.3	n/a	n/a	11.7
3	13.3	15.2	n/a	n/a	11.6
4	14.7	16.6	n/a	n/a	12.6
5	15.0	17.1	n/a	n/a	13.1
6 – 10	16.8	19.0	n/a	n/a	n/a
All Ages	14.2	16.0	n/a	n/a	12.5
Carbohydrate (gm)					
Ages 1 – 2	121.0	147.8	n/a	n/a	112.4
3	124.7	156.4	n/a	n/a	117.4
4	135.2	166.2	n/a	n/a	121.7
5	141.3	175.0	n/a	n/a	129.5
6 – 10	156.0	189.7	n/a	n/a	n/a
All Ages	132.3	163.7	n/a	n/a	121.1
Protein (gm)					
Ages 1 – 2	33.5	38.1	n/a	n/a	30.3
3	35.4	40.7	n/a	n/a	31.2
4	39.2	44.5	n/a	n/a	33.7
5	40.2	45.9	n/a	n/a	35.1
6 – 10	44.7	49.2	n/a	n/a	n/a
All Ages	37.8	43.2	n/a	n/a	33.6
Vitamin A (mcg RE)					
Ages 1 – 2	632	748	n/a	n/a	570
3	721	830	n/a	n/a	637
4	807	917	n/a	n/a	693
5	825	945	n/a	n/a	715
6 – 10	938	972	n/a	n/a	n/a
All Ages	766	876	n/a	n/a	651
Vitamin C (mg)					
Ages 1 – 2	63	85	n/a	n/a	55
3	68	88	n/a	n/a	62
4	73	93	n/a	n/a	65
5	76	96	n/a	n/a	66
6 – 10	82	100	n/a	n/a	n/a
All Ages	71	92	n/a	n/a	64

Exhibit B.22
(continued)

	Breakfast, Lunch, and Snack	Breakfast, Lunch, and Two Snacks	Breakfast and Lunch	Lunch and Snack	Lunch and Two Snacks
Calcium (mg)					
Ages 1 – 2	667	777	n/a	n/a	563
3	703	828	n/a	n/a	563
4	782	909	n/a	n/a	607
5	802	939	n/a	n/a	639
6 – 10	874	1009	n/a	n/a	n/a
All Ages	751	877	n/a	n/a	612
Iron (mg)					
Ages 1 – 2	6.4	7.7	n/a	n/a	5.5
3	6.8	8.2	n/a	n/a	5.9
4	7.4	8.8	n/a	n/a	6.1
5	7.8	9.3	n/a	n/a	6.4
6 – 10	8.7	10.2	n/a	n/a	n/a
All Ages	7.2	8.6	n/a	n/a	6.0
Cholesterol (mg)					
Ages 1 – 2	106	117	n/a	n/a	92
3	109	122	n/a	n/a	90
4	121	134	n/a	n/a	96
5	123	137	n/a	n/a	100
6 – 10	138	139	n/a	n/a	n/a
All Ages	124	139	n/a	n/a	104
Sodium (mg)					
Ages 1 – 2	1366	1520	n/a	n/a	1292
3	1423	1632	n/a	n/a	1341
4	1569	1768	n/a	n/a	1437
5	1615	1842	n/a	n/a	1505
6 – 10	1825	2059	n/a	n/a	n/a
All Ages	1635	1876	n/a	n/a	1544
Number of Providers (Unweighted)					
Ages 1 – 2	171	90	11	3	28
3	252	114	21	9	38
4	252	114	21	9	38
5	252	114	21	9	38
6 – 10	48	37	4	6	11
All Ages	269	122	22	14	43

n/a = Fewer than 25 providers offered this combination to this age group.

Note: For cholesterol and sodium, aggregation across age groups has been limited to menus offered to five-year-olds and six- to ten-year-olds because NRC recommendations for these nutrients are applicable only to children five years of age and older. See Chapter Two for a discussion of NRC recommendations and the rationale for this approach.

Exhibit B.23

**Mean Energy and Nutrient Content of Most Common Meal Combinations
Offered by Age Group: All Centers**

	Breakfast, Lunch, and Snack	Breakfast, Lunch, and Two Snacks	Breakfast and Lunch	Lunch and Snack	Lunch and Two Snacks
Total Energy (kcal)					
Ages 1 – 2	875	1029	n/a	n/a	812
3	907	1099	728	654	844
4	991	1180	819	705	890
5	1026	1233	834	730	937
6 – 10	1146	1339	n/a	n/a	n/a
All Ages	967	1156	800	714	886
Total Fat (gm)					
Ages 1 – 2	30.8	33.8	n/a	n/a	28.5
3	31.5	36.7	26.2	24.7	29.3
4	34.7	39.8	29.6	26.9	31.5
5	35.6	41.3	29.8	27.5	32.7
6 – 10	40.6	45.8	n/a	n/a	n/a
All Ages	33.7	38.7	28.8	26.9	31.2
Saturated Fat (gm)					
Ages 1 – 2	13.0	14.3	n/a	n/a	11.7
3	13.1	15.4	10.9	9.9	11.7
4	14.5	16.8	12.4	10.9	12.6
5	14.9	17.3	12.5	11.2	13.1
6 – 10	16.8	19.0	n/a	n/a	n/a
All Ages	14.1	16.3	12.0	10.8	12.6
Carbohydrate (gm)					
Ages 1 – 2	120.0	147.9	n/a	n/a	112.6
3	124.0	156.1	95.0	84.3	117.8
4	134.4	165.8	106.5	89.6	122.1
5	140.4	174.7	109.5	93.9	130.0
6 – 10	155.5	189.0	n/a	n/a	n/a
All Ages	131.9	163.6	104.3	91.8	121.8
Protein (gm)					
Ages 1 – 2	33.7	38.1	n/a	n/a	30.2
3	35.8	41.2	31.0	26.6	31.4
4	39.7	45.0	35.0	29.2	33.8
5	40.6	46.5	35.4	30.0	35.3
6 – 10	44.8	49.1	n/a	n/a	n/a
All Ages	38.4	43.7	34.0	29.4	33.7
Vitamin A (mcg RE)					
Ages 1 – 2	649	747	n/a	n/a	569
3	747	830	642	533	643
4	835	917	727	593	698
5	854	945	734	604	721
6 – 10	940	968	n/a	n/a	n/a
All Ages	798	878	699	586	661
Vitamin C (mg)					
Ages 1 – 2	64	85	n/a	n/a	55
3	69	87	56	55	64
4	74	92	62	58	67
5	77	95	64	59	68
6 – 10	82	100	n/a	n/a	n/a
All Ages	73	91	62	56	66

Exhibit B.23
(continued)

	Breakfast, Lunch, and Snack	Breakfast, Lunch, and Two Snacks	Breakfast and Lunch	Lunch and Snack	Lunch and Two Snacks
Calcium (mg)					
Ages 1 – 2	672	776	n/a	n/a	562
3	704	838	579	468	571
4	783	919	659	514	614
5	803	950	666	534	648
6 – 10	877	1003	n/a	n/a	n/a
All Ages	755	888	635	518	618
Iron (mg)					
Ages 1 – 2	6.4	7.7	n/a	n/a	5.5
3	6.9	8.2	5.5	4.4	5.9
4	7.5	8.8	6.2	4.7	6.1
5	7.8	9.3	6.4	4.9	6.5
6 – 10	8.7	10.2	n/a	n/a	n/a
All Ages	7.3	8.6	6.1	4.7	6.1
Cholesterol (mg)					
Ages 1 – 2	107	117	n/a	n/a	92
3	111	126	103	70	89
4	123	138	115	76	95
5	125	141	116	79	99
6 – 10	138	141	n/a	n/a	n/a
All Ages	126	143	117	82	103
Sodium (mg)					
Ages 1 – 2	1364	1522	n/a	n/a	1294
3	1421	1642	1207	1068	1336
4	1566	1778	1358	1165	1431
5	1612	1854	1376	1194	1499
6 – 10	1826	2058	n/a	n/a	n/a
All Ages	1625	1883	1390	1232	1532
Number of Providers (Unweighted)					
Ages 1 – 2	221	95	15	3	29
3	779	156	253	52	64
4	779	156	253	52	64
5	779	156	253	52	64
6 – 10	55	41	10	7	11
All Ages	797	164	257	58	69

n/a = Fewer than 25 providers offered this combination to this age group.

Note: For cholesterol and sodium, aggregation across age groups has been limited to menus offered to five-year-olds and six- to ten-year-olds because NRC recommendations for these nutrients are applicable only to children five years of age and older. See Chapter Two for a discussion of NRC recommendations and the rationale for this approach.

Exhibit B.24

**Mean Percentage of RDAs Provided in Most Common Meal and Snack Combinations
Offered by Age Group: All Providers**

	Breakfast, Lunch, and One Snack		Breakfast, Lunch, and Two Snacks		Breakfast and Lunch		Lunch and One Snack		Lunch and Two Snacks		
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	
Total Energy											
Ages 1 – 2	66.1	0.5	77.4	0.7	n/a	n/a	45.6	1.8	57.8	1.7	
3	69.3	0.5	80.8	0.5	57.8	1.0	45.9	1.1	60.8	1.8	
4	54.8	0.4	62.7	0.4	46.7	0.7	35.7	0.9	46.1	1.4	
5	56.8	0.4	65.6	0.4	47.8	0.8	37.4	0.9	48.9	1.4	
6 – 10	54.6	0.9	64.9	1.2	n/a	n/a	38.6	1.4	n/a	n/a	
All Ages	60.6	0.5	70.9	0.5	51.5	0.9	41.1	1.0	53.1	1.1	
Protein											
Ages 1 – 2	213.4	1.3	243.1	3.2	n/a	n/a	159.4	5.3	190.5	2.6	
3	225.2	1.6	255.7	2.7	197.8	3.3	165.1	3.8	194.4	4.9	
4	166.3	1.2	186.3	1.9	148.2	2.2	120.4	2.8	139.6	3.5	
5	170.5	1.2	192.7	1.9	150.4	2.4	124.8	2.8	146.0	3.8	
6 – 10	159.8	2.7	183.0	4.8	n/a	n/a	122.2	2.3	n/a	n/a	
All Ages	189.1	1.4	215.5	2.8	169.4	4.8	136.6	3.1	165.4	4.4	
Vitamin A											
1 – 2	71.4	3.9	195.4	7.8	n/a	n/a	122.5	11.8	162.5	14.0	
3	187.7	4.2	222.8	9.0	166.1	11.9	142.7	12.3	161.8	11.7	
4	168.0	3.7	196.7	8.0	150.3	10.8	125.8	10.9	141.3	10.4	
5	173.1	3.7	206.2	8.9	152.4	10.7	130.6	11.3	146.8	9.9	
6 – 10	138.0	8.1	163.8	9.2	n/a	n/a	96.8	8.6	n/a	n/a	
All Ages	168.8	3.6	202.7	7.0	151.2	11.3	119.6	7.5	150.2	8.7	
Vitamin C											
Ages 1 – 2	150.1	4.0	189.8	6.9	n/a	n/a	97.2	6.2	140.0	12.5	
3	153.8	3.1	198.0	4.8	147.5	7.4	95.0	7.0	133.7	11.7	
4	147.9	3.0	188.0	4.7	142.7	6.7	90.1	6.5	124.7	10.5	
5	152.9	3.0	194.8	4.8	147.5	7.0	92.7	6.7	128.0	10.8	
6 – 10	157.3	7.5	200.5	9.9	n/a	n/a	103.2	7.8	n/a	n/a	
All Ages	154.4	3.1	195.0	4.5	145.7	6.3	99.2	6.2	141.6	8.6	

**Exhibit B.24
(continued)**

	Breakfast, Lunch, and One Snack		Breakfast, Lunch, and Two Snacks		Breakfast and Lunch		Lunch and One Snack		Lunch and Two Snacks		
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	
Calcium											
Ages 1 – 2	86.8	0.6	100.9	1.6	n/a	n/a	59.9	2.5	74.1	2.1	
3	90.3	0.7	105.8	1.4	76.6	2.7	59.3	1.4	76.1	2.4	
4	100.3	0.8	115.9	1.5	86.7	2.7	64.8	1.6	81.7	2.4	
5	103.0	0.8	120.1	1.6	87.9	2.9	67.9	1.6	86.3	2.8	
6 – 10	106.4	2.6	126.9	3.1	n/a	n/a	71.5	2.5	n/a	n/a	
All Ages	95.6	0.8	111.9	1.6	82.7	2.9	66.5	1.8	80.0	1.9	
Iron											
Ages 1 – 2	63.4	0.9	75.1	2.2	n/a	n/a	37.4	2.1	50.7	3.9	
3	69.0	1.1	81.9	3.8	56.1	2.1	38.4	1.3	51.8	2.7	
4	75.6	1.2	88.1	4.3	62.5	2.4	40.8	1.2	53.8	2.6	
5	79.3	1.3	93.6	4.7	64.7	2.5	43.0	1.3	57.2	2.8	
6 – 10	81.6	2.2	92.8	2.2	n/a	n/a	49.6	1.9	n/a	n/a	
All Ages	72.3	1.0	85.8	3.9	60.7	2.2	44.2	1.3	55.7	2.9	
Number of Providers											
Ages 1 – 2	423		234		19		31		47		
3	996		319		259		82		89		
4	996		319		259		82		89		
5	996		319		259		82		89		
6 – 10	147		98		14		40		15		
All Ages	1051		343		265		115		103		

n/a = Fewer than 25 providers offered this meal combination to this age group.

Exhibit B.25

**Mean Percentage of RDAs Provided in Most Common Meal and Snack Combinations
Offered by Age Group: Family Day Care Homes**

	Breakfast, Lunch, and One Snack		Breakfast, Lunch, and Two Snacks		Breakfast and Lunch		Lunch and One Snack		Lunch and Two Snacks		
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	
Total Energy											
Ages 1 – 2	65.9	0.5	77.3	0.8	n/a	n/a	45.5	1.8	n/a	n/a	
3	69.2	0.6	80.5	0.6	n/a	n/a	45.4	1.3	60.1	2.0	
4	54.8	0.5	62.5	0.5	n/a	n/a	35.3	1.0	45.6	1.5	
5	56.8	0.5	65.4	0.5	n/a	n/a	37.0	1.1	48.4	1.5	
6 – 10	54.4	1.0	64.6	1.3	n/a	n/a	38.5	1.4	n/a	n/a	
All Ages	60.5	0.5	70.7	0.6	n/a	n/a	41.0	1.1	52.6	1.3	
Protein											
Ages 1 – 2	213.8	1.4	243.4	3.4	n/a	n/a	159.2	5.3	n/a	n/a	
3	225.5	1.9	255.6	2.8	n/a	n/a	165.0	4.4	194.2	5.6	
4	166.5	1.4	186.2	2.0	n/a	n/a	120.2	3.2	139.3	4.0	
5	170.8	1.4	192.6	2.1	n/a	n/a	124.8	3.2	145.8	4.4	
6 – 10	159.4	3.0	183.1	5.1	n/a	n/a	122.1	2.3	n/a	n/a	
All Ages	189.1	1.8	215.4	3.0	n/a	n/a	136.6	3.4	165.0	5.3	
Vitamin A											
Ages 1 – 2	172.5	4.6	196.1	7.3	n/a	n/a	122.5	12.1	n/a	n/a	
3	187.9	5.3	224.3	9.3	n/a	n/a	143.9	13.9	162.0	13.5	
4	168.3	4.7	197.9	8.3	n/a	n/a	126.7	12.3	141.5	12.0	
5	173.6	4.7	207.8	9.3	n/a	n/a	131.7	12.8	147.2	11.4	
6 – 10	137.8	8.5	165.4	9.5	n/a	n/a	96.7	8.9	n/a	n/a	
All Ages	168.0	4.4	203.8	7.2	n/a	n/a	119.5	8.4	151.2	9.8	
Vitamin C											
Ages 1 – 2	149.1	4.5	188.1	6.8	n/a	n/a	96.0	6.2	n/a	n/a	
3	149.2	3.8	196.2	4.5	n/a	n/a	90.0	6.7	129.4	13.1	
4	143.7	3.6	186.5	4.6	n/a	n/a	85.3	6.3	121.0	11.7	
5	148.6	3.7	193.3	4.6	n/a	n/a	87.9	6.5	124.2	12.1	
6 – 10	155.7	7.8	198.7	10.4	n/a	n/a	103.0	7.9	n/a	n/a	
All Ages	151.2	3.8	193.4	4.5	n/a	n/a	97.0	6.7	139.8	9.6	

Exhibit B.25
(continued)

	Breakfast, Lunch, and One Snack		Breakfast, Lunch, and Two Snacks		Breakfast and Lunch		Lunch and One Snack		Lunch and Two Snacks		
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	
Calcium											
Ages 1 – 2	87.1	0.6	101.2	1.8	n/a	n/a	59.9	2.6	n/a	n/a	
3	90.9	0.8	105.9	1.5	n/a	n/a	59.4	1.6	76.9	2.9	
4	100.9	0.9	116.0	1.6	n/a	n/a	64.9	1.7	82.5	2.9	
5	103.6	0.9	120.2	1.7	n/a	n/a	68.1	1.8	87.1	3.2	
6 – 10	106.2	2.9	127.1	3.3	n/a	n/a	71.4	2.6	n/a	n/a	
All Ages	95.9	0.9	112.0	1.7	n/a	n/a	66.6	1.9	80.4	2.1	
Iron											
Ages 1 – 2	63.3	1.0	74.9	2.4	n/a	n/a	37.4	2.1	n/a	n/a	
3	69.1	1.2	81.9	4.2	n/a	n/a	37.7	1.4	50.6	3.0	
4	75.8	1.3	88.2	4.7	n/a	n/a	40.1	1.3	52.6	2.8	
5	79.5	1.4	93.7	5.2	n/a	n/a	42.3	1.4	55.9	3.0	
6 – 10	81.2	2.3	92.0	2.5	n/a	n/a	49.5	1.9	n/a	n/a	
All Ages	72.1	1.1	85.8	4.3	n/a	n/a	43.9	1.3	55.0	3.2	
Number of Providers (Unweighted)											
Ages 1 – 2	202		139		4		28		18		
3	217		163		6		30		25		
4	217		163		6		30		25		
5	217		163		6		30		25		
6 – 10	92		57		4		33		4		
All Ages	254		179		8		57		34		

n/a = Fewer than 25 providers offered this meal combination to this age group.

Exhibit B.26

**Mean Percentage of RDAs Provided in Most Common Meal and Snack Combinations
Offered by Age Group: Head Start Centers**

	Breakfast, Lunch, and One Snack		Breakfast, Lunch, and Two Snacks		Breakfast and Lunch		Lunch and One Snack		Lunch and Two Snacks		
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	
Total Energy											
Ages 1 – 2	64.9	1.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
3	69.5	0.7	87.7	1.5	56.3	0.9	49.4	0.8	65.3	0.9	0.9
4	54.9	0.5	68.0	1.1	45.8	0.7	38.5	0.6	49.6	0.6	0.6
5	56.7	0.5	71.2	1.2	46.5	0.7	39.9	0.6	52.3	0.7	0.7
6 – 10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
All Ages	60.5	0.6	75.6	1.2	49.6	0.8	42.6	0.7	55.8	0.7	0.7
Protein											
Ages 1 – 2	220.0	2.9	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
3	227.8	2.6	279.9	5.5	194.8	1.5	164.0	3.5	200.8	3.9	3.9
4	168.1	1.8	203.5	4.0	146.5	1.1	119.7	2.6	143.6	2.5	2.5
5	172.0	1.8	210.5	4.3	148.1	1.1	123.1	2.7	150.1	2.9	2.9
6 – 10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
All Ages	190.1	2.0	231.0	4.6	163.1	1.2	135.3	2.9	165.1	3.0	3.0
Vitamin A											
Ages 1 – 2	204.5	18.7	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
3	196.4	6.6	206.3	9.1	159.6	8.3	136.5	6.8	167.1	18.4	18.4
4	175.2	5.8	182.9	8.4	144.7	7.4	121.4	6.1	144.2	15.0	15.0
5	179.3	6.1	189.5	8.7	145.7	7.2	123.1	6.1	149.2	16.3	16.3
6 – 10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
All Ages	183.4	6.1	191.5	9.0	149.3	7.4	126.5	6.2	153.4	16.6	16.6
Vitamin C											
Ages 1 – 2	163.8	11.9	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
3	177.8	5.5	196.8	11.3	139.8	6.5	130.1	10.5	181.5	17.1	17.1
4	169.5	5.0	185.0	10.5	136.0	6.3	123.0	9.8	166.8	16.0	16.0
5	174.8	5.0	192.8	10.7	140.3	6.8	125.7	9.4	172.7	14.9	14.9
6 – 10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
All Ages	174.2	5.0	191.8	10.8	140.1	5.9	126.2	9.7	173.8	15.9	15.9

Exhibit B.26
(continued)

	Breakfast, Lunch, and One Snack		Breakfast, Lunch, and Two Snacks		Breakfast and Lunch		Lunch and One Snack		Lunch and Two Snacks		
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	
Calcium											
Ages 1 – 2	90.3	2.0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
3	88.1	1.6	113.7	4.6	72.3	0.5	57.6	1.4	75.5	4.7	
4	98.0	1.7	123.8	4.7	82.3	0.5	63.2	1.5	80.8	4.8	
5	100.4	1.8	128.7	5.1	83.1	0.5	65.7	1.5	85.5	5.3	
6 – 10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
All Ages	95.2	1.7	121.9	4.8	79.4	0.5	62.3	1.5	80.6	4.9	
Iron											
Ages 1 – 2	63.5	2.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
3	69.6	2.2	80.2	3.2	54.6	1.9	43.8	2.6	61.9	5.5	
4	75.9	2.5	85.8	3.0	61.1	2.1	46.2	2.5	63.2	5.1	
5	79.2	2.5	90.6	3.3	62.9	2.1	48.3	2.6	67.8	5.6	
6 – 10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
All Ages	74.8	2.4	85.4	3.2	59.7	2.0	46.1	2.5	64.2	5.4	
Number of Providers (Unweighted)											
Ages 1 – 2	50		5		4		0		1		
3	527		42		232		43		26		
4	527		42		232		43		26		
5	527		42		232		43		26		
6 – 10	7		4		6		1		0		
All Ages	528		42		235		44		26		

n/a = Fewer than 25 providers offered this meal combination to this age group.

Exhibit B.27

**Mean Percentage of RDAs Provided in Most Common Meal and Snack Combinations
Offered by Age Group: Child Care Centers**

	Breakfast, Lunch, and One Snack		Breakfast, Lunch, and Two Snacks		Breakfast and Lunch		Lunch and One Snack		Lunch and Two Snacks		
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	
Total Energy											
Ages 1 – 2	67.6	0.5	79.1	1.3	n/a	n/a	n/a	n/a	62.5	1.3	
3	69.9	0.6	84.1	1.0	n/a	n/a	n/a	n/a	64.9	1.4	
4	55.2	0.5	65.2	0.8	n/a	n/a	n/a	n/a	49.4	1.0	
5	57.2	0.5	68.1	0.8	n/a	n/a	n/a	n/a	52.0	1.1	
6 – 10	58.4	0.6	68.4	0.8	n/a	n/a	n/a	n/a	n/a	n/a	
All Ages	61.9	0.5	73.3	0.9	n/a	n/a	n/a	n/a	56.9	1.0	
Protein											
Ages 1 – 2	209.4	1.7	238.2	4.6	n/a	n/a	n/a	n/a	189.2	4.5	
3	221.3	1.3	254.6	4.5	n/a	n/a	n/a	n/a	195.0	6.2	
4	163.4	1.0	185.5	3.1	n/a	n/a	n/a	n/a	140.3	4.4	
5	167.5	1.0	191.4	3.3	n/a	n/a	n/a	n/a	146.4	4.6	
6 – 10	165.6	1.8	182.1	3.0	n/a	n/a	n/a	n/a	n/a	n/a	
All Ages	188.4	1.1	214.6	3.9	n/a	n/a	n/a	n/a	168.5	4.7	
Vitamin A											
Ages 1 – 2	158.0	5.7	186.9	10.6	n/a	n/a	n/a	n/a	142.6	7.5	
3	180.2	6.5	207.5	10.3	n/a	n/a	n/a	n/a	159.3	11.8	
4	161.4	5.8	183.4	9.3	n/a	n/a	n/a	n/a	138.5	10.3	
5	165.0	5.8	189.0	8.9	n/a	n/a	n/a	n/a	142.9	10.2	
6 – 10	140.9	4.1	145.9	12.0	n/a	n/a	n/a	n/a	n/a	n/a	
All Ages	165.8	5.4	189.2	9.7	n/a	n/a	n/a	n/a	140.7	9.8	
Vitamin C											
Ages 1 – 2	158.7	6.4	211.4	12.4	n/a	n/a	n/a	n/a	137.3	18.7	
3	169.6	6.0	219.9	15.6	n/a	n/a	n/a	n/a	155.0	16.5	
4	162.7	5.7	207.1	14.5	n/a	n/a	n/a	n/a	143.6	15.1	
5	167.9	5.9	213.2	13.6	n/a	n/a	n/a	n/a	146.9	14.7	
6 – 10	182.0	12.7	221.2	16.4	n/a	n/a	n/a	n/a	n/a	n/a	
All Ages	166.8	6.0	216.4	11.5	n/a	n/a	n/a	n/a	150.1	14.8	

Exhibit B.27
(continued)

	Breakfast, Lunch, and One Snack		Breakfast, Lunch, and Two Snacks		Breakfast and Lunch		Lunch and One Snack		Lunch and Two Snacks		
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	
Calcium											
Ages 1 – 2	83.3	0.6	97.1	2.5	n/a	n/a	n/a	n/a	70.4	2.5	
3	87.9	0.6	103.5	2.3	n/a	n/a	n/a	n/a	70.3	3.3	
4	97.7	0.6	113.6	2.3	n/a	n/a	n/a	n/a	75.8	3.4	
5	100.3	0.6	117.4	2.5	n/a	n/a	n/a	n/a	79.9	3.6	
6 – 10	109.3	1.8	126.1	3.0	n/a	n/a	n/a	n/a	n/a	n/a	
All Ages	93.9	0.8	109.6	2.2	n/a	n/a	n/a	n/a	76.6	2.1	
Iron											
Ages 1 – 2	64.1	1.5	76.6	2.0	n/a	n/a	n/a	n/a	55.4	1.9	
3	67.9	1.3	82.2	1.5	n/a	n/a	n/a	n/a	58.6	1.9	
4	74.2	1.4	88.1	1.6	n/a	n/a	n/a	n/a	60.8	1.9	
5	77.7	1.5	93.0	1.7	n/a	n/a	n/a	n/a	64.5	2.0	
6 – 10	87.4	3.1	102.2	2.1	n/a	n/a	n/a	n/a	n/a	n/a	
All Ages	72.4	1.7	86.2	1.7	n/a	n/a	n/a	n/a	59.9	1.7	
Number of Providers (Unweighted)											
Ages 1 – 2	171		90		11		3		28		
3	252		114		21		9		38		
4	252		114		21		9		38		
5	252		114		21		9		38		
6 – 10	48		37		4		6		11		
All Ages	269		122		22		14		43		

n/a = Fewer than 25 providers offered this meal combination to this age group.

Exhibit B.28

**Mean Percentage of RDAs Provided in Most Common Meal and Snack Combinations
Offered by Age Group: All Centers**

	Breakfast, Lunch, and One Snack		Breakfast, Lunch, and Two Snacks		Breakfast and Lunch		Lunch and One Snack		Lunch and Two Snacks	
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err
Total Energy										
Ages 1 – 2	67.3	0.5	79.1	1.3	n/a	n/a	n/a	n/a	62.5	1.2
3	69.7	0.4	84.6	0.9	56.0	0.9	50.3	1.2	64.9	1.1
4	55.1	0.3	65.5	0.7	45.5	0.7	39.2	1.0	49.4	0.8
5	57.0	0.3	68.5	0.7	46.3	0.7	40.5	0.9	52.1	0.8
6 – 10	58.4	0.5	68.3	0.8	n/a	n/a	n/a	n/a	n/a	n/a
All Ages	61.3	0.4	73.6	0.8	49.6	0.9	43.4	0.9	56.7	0.8
Protein										
Ages 1 – 2	210.4	1.5	238.2	4.7	n/a	n/a	n/a	n/a	189.0	4.5
3	223.9	1.4	257.7	4.2	193.9	1.8	166.6	3.8	196.1	5.1
4	165.3	1.0	187.7	3.0	145.8	1.3	121.6	2.7	141.0	3.6
5	169.3	1.0	193.8	3.1	147.5	1.3	125.0	2.8	147.1	3.8
6 – 10	166.0	1.6	181.8	3.2	n/a	n/a	n/a	n/a	n/a	n/a
All Ages	189.1	1.0	216.5	3.6	163.2	1.6	137.0	2.7	167.9	3.9
Vitamin A										
Ages 1 – 2	162.3	5.8	186.6	10.3	n/a	n/a	n/a	n/a	142.2	7.3
3	186.7	5.5	207.4	9.1	160.4	7.4	133.4	6.9	160.8	10.9
4	166.9	4.8	183.4	8.2	145.3	6.6	118.7	6.1	139.6	9.4
5	170.8	4.9	189.1	7.9	146.7	6.4	120.7	6.6	144.1	9.4
6 – 10	141.2	4.8	145.4	11.5	n/a	n/a	n/a	n/a	n/a	n/a

**Exhibit B.28
(continued)**

	Breakfast, Lunch, and One Snack		Breakfast, Lunch, and Two Snacks		Breakfast and Lunch		Lunch and One Snack		Lunch and Two Snacks	
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err
All Ages	172.6	4.7	189.5	8.6	149.7	6.6	120.8	6.6	142.9	9.0
Vitamin C										
Ages 1 – 2	159.2	5.8	212.0	12.2	n/a	n/a	n/a	n/a	137.8	18.6
3	172.9	5.2	217.1	14.3	140.9	6.5	137.0	9.0	160.1	13.7
4	165.4	4.8	204.5	13.3	137.3	6.2	129.8	8.3	148.1	12.4
5	170.7	5.0	210.7	12.5	141.7	6.6	131.7	7.7	151.9	12.0
6 – 10	181.3	11.9	221.2	15.7	n/a	n/a	n/a	n/a	n/a	n/a
All Ages	169.7	5.1	213.5	10.6	143.2	5.5	129.9	6.5	154.1	12.7

Exhibit B.28
(continued)

	Breakfast, Lunch, and One Snack		Breakfast, Lunch, and Two Snacks		Breakfast and Lunch		Lunch and One Snack		Lunch and Two Snacks		
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	
Calcium											
Ages 1 – 2	84.0	0.6	97.0	2.5	n/a	n/a	n/a	n/a	70.2	2.5	
3	88.0	0.7	104.8	2.2	72.4	0.6	58.5	1.5	71.3	2.8	
4	97.8	0.8	114.9	2.3	82.4	0.7	64.2	1.6	76.8	2.9	
5	100.3	0.8	118.7	2.5	83.2	0.7	66.8	1.7	81.0	3.1	
6 – 10	109.6	1.6	125.4	3.0	n/a	n/a	n/a	n/a	n/a	n/a	
All Ages	94.4	0.9	111.0	2.1	79.4	0.8	64.7	1.3	77.2	1.9	
Iron											
Ages 1 – 2	64.1	1.3	76.7	2.0	n/a	n/a	n/a	n/a	55.4	1.8	
3	68.6	1.2	81.9	1.4	55.5	1.8	44.2	1.5	59.3	1.6	
4	74.9	1.4	87.8	1.4	62.1	2.0	46.8	1.4	61.3	1.6	
5	78.3	1.4	92.7	1.5	64.0	2.1	48.8	1.5	65.1	1.7	
6 – 10	87.0	3.1	101.8	2.0	n/a	n/a	n/a	n/a	n/a	n/a	
All Ages	73.3	1.4	86.1	1.5	60.8	2.0	47.4	1.4	60.7	1.5	
Number of Providers (Unweighted)											
Ages 1 – 2	221		95		15		3		29		
3	779		156		253		52		64		
4	779		156		253		52		64		
5	779		156		253		52		64		
6 – 10	55		41		10		7		11		
All Ages	797		164		257		58		69		

n/a = Fewer than 25 providers offered this meal combination to this age group.

Exhibit B.29

**Mean Macronutrient, Cholesterol, and Sodium Content of Most Common Meal Combinations
Offered by Age Group: All Providers**

	Breakfast, Lunch, and One Snack		Breakfast, Lunch, and Two Snacks		Breakfast and Lunch		Lunch and One Snack		Lunch and Two Snacks	
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err
Percent of Energy from Fat (%)										
Ages 1 – 2	31.1	0.4	30.3	0.3	n/a	n/a	33.9	1.0	30.8	0.7
3	31.0	0.3	30.2	0.4	31.7	0.5	33.7	0.7	29.8	0.6
4	31.2	0.3	30.4	0.4	31.8	0.5	34.1	0.7	30.3	0.7
5	30.9	0.3	30.2	0.4	31.5	0.5	33.6	0.7	29.9	0.7
6 – 10	31.1	0.6	32.0	0.6	n/a	n/a	32.0	1.0	n/a	n/a
5 – 10	31.0	0.3	30.3	0.4	31.6	0.5	32.6	0.8	30.0	0.7
Percent of Energy from Saturated Fat (%)										
Ages 1 – 2	13.4	0.2	13.0	0.1	n/a	n/a	14.6	0.3	12.6	0.5
3	13.1	0.2	12.8	0.2	13.3	0.3	14.1	0.3	11.6	0.4
4	13.2	0.2	13.0	0.2	13.4	0.3	14.3	0.3	11.8	0.4
5	13.0	0.2	12.8	0.2	13.3	0.3	14.1	0.3	11.7	0.4
6 – 10	12.9	0.2	13.4	0.3	n/a	n/a	12.9	0.6	n/a	n/a
5 – 10	13.0	0.1	12.8	0.2	13.3	0.3	13.3	0.4	11.8	0.4
Percent of Energy from Carbohydrate (%)										
Ages 1 – 2	54.8	0.4	56.1	0.3	n/a	n/a	50.3	1.0	54.6	1.3
3	54.8	0.3	56.1	0.4	52.9	0.6	50.0	0.8	56.2	0.8
4	54.4	0.3	55.6	0.4	52.7	0.5	49.2	0.8	55.3	0.7
5	54.9	0.3	56.0	0.4	53.2	0.5	50.1	0.8	56.0	0.7
6 – 10	54.7	0.4	54.3	0.5	n/a	n/a	51.9	0.8	n/a	n/a
5 – 10	54.8	0.3	55.9	0.4	53.2	0.5	51.4	0.8	55.9	0.8
Percent of Energy from Protein (%)										
Ages 1 – 2	16.0	0.1	15.6	0.2	n/a	n/a	17.6	0.4	16.5	0.7
3	16.1	0.1	15.7	0.1	17.1	0.2	18.0	0.4	16.1	0.7
4	16.3	0.1	16.0	0.1	17.1	0.2	18.3	0.4	16.5	0.8
5	16.1	0.1	15.8	0.1	17.0	0.2	18.1	0.4	16.2	0.7
6 – 10	16.1	0.2	15.6	0.3	n/a	n/a	17.8	0.5	n/a	n/a
5 – 10	16.1	0.1	15.7	0.1	16.9	0.2	17.8	0.3	16.1	0.7

**Exhibit B.29
(continued)**

	Breakfast, Lunch, and One Snack		Breakfast, Lunch, and Two Snacks		Breakfast and Lunch		Lunch and One Snack		Lunch and Two Snacks	
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err
Cholesterol (mg)										
Ages 1 – 2	111.0	3.2	127.1	4.0	n/a	n/a	83.3	7.6	89.2	5.0
3	115.8	2.9	132.7	3.5	111.7	5.1	80.1	6.6	79.8	4.6
4	127.8	3.3	144.7	3.9	124.6	5.6	86.5	6.7	85.1	4.6
5	130.2	3.3	148.4	3.9	125.9	5.8	89.6	7.0	88.8	4.8
6 – 10	135.0	6.5	162.4	8.2	n/a	n/a	83.9	4.0	n/a	n/a
5 – 10	132.5	3.1	150.6	3.8	126.5	5.6	87.5	4.0	92.5	4.9
Sodium (mg)										
Ages 1 – 2	1317.8	15.2	1461.0	21.5	n/a	n/a	975.6	38.4	1115.3	59.3
3	1409.4	18.8	1556.3	17.1	1261.9	34.5	984.9	30.4	1149.7	57.7
4	1554.9	21.4	1688.6	18.9	1414.7	36.5	1071.8	34.6	1231.6	59.9
5	1602.8	20.7	1764.1	19.4	1439.8	39.4	1112.5	36.1	1292.6	62.9
6 – 10	1708.7	32.1	1893.1	42.7	n/a	n/a	1274.6	53.4	n/a	n/a
5 – 10	1623.9	17.7	1787.6	20.9	1451.7	43.9	1202.9	39.2	1310.8	61.8

Number of Providers (Unweighted)

Exhibit B.29
(continued)

	Breakfast, Lunch, and One Snack		Breakfast, Lunch, and Two Snacks		Breakfast and Lunch		Lunch and One Snack		Lunch and Two Snacks	
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err
Ages 1 – 2	423		234		19		31		47	
3	996		319		259		82		89	
4	996		319		259		82		89	
5	996		319		259		82		89	
6 – 10	147		98		14		40		15	
5 – 10	1023		326		264		108		94	

n/a = Fewer than 25 providers offered this meal combination to this age group.

Note: Aggregation across age groups has been limited to menus offered to five-year-olds and six- to ten-year-olds because *Dietary Guidelines* and recommendations for these nutrients are applicable only to children five years of age and older. See Chapter Two for a discussion of *Dietary Guidelines* and NRC recommendations.

Exhibit B.30

**Mean Macronutrient, Cholesterol, and Sodium Content of Most Common Meal Combinations
Offered by Age Group: Family Day Care Homes**

	Breakfast, Lunch, and One Snack		Breakfast, Lunch, and Two Snacks		Breakfast and Lunch		Lunch and One Snack		Lunch and Two Snacks	
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err
Percent of Energy from Fat (%)										
Ages 1 – 2	31.1	0.4	30.4	0.4	n/a	n/a	33.9	1.1	n/a	n/a
3	31.0	0.4	30.2	0.4	n/a	n/a	33.7	0.8	29.6	0.7
4	31.2	0.4	30.5	0.5	n/a	n/a	34.1	0.8	30.1	0.8
5	30.9	0.4	30.3	0.4	n/a	n/a	33.6	0.8	29.8	0.7
6 – 10	31.1	0.6	32.2	0.6	n/a	n/a	32.0	1.0	n/a	n/a
5 – 10	31.0	0.4	30.4	0.5	n/a	n/a	32.6	0.9	29.8	0.8
Percent of Energy from Saturated Fat (%)										
Ages 1 – 2	13.4	0.2	13.1	0.2	n/a	n/a	14.6	0.4	n/a	n/a
3	13.1	0.2	12.8	0.3	n/a	n/a	14.2	0.4	11.4	0.5
4	13.2	0.2	13.0	0.3	n/a	n/a	14.4	0.4	11.7	0.5
5	13.1	0.2	12.9	0.3	n/a	n/a	14.2	0.4	11.5	0.5
6 – 10	12.9	0.3	13.5	0.3	n/a	n/a	12.9	0.6	n/a	n/a
5 – 10	13.0	0.2	12.9	0.3	n/a	n/a	13.3	0.5	11.7	0.5
Percent of Energy from Carbohydrate (%)										
Ages 1 – 2	54.7	0.4	56.0	0.4	n/a	n/a	50.3	1.1	n/a	n/a
3	54.7	0.4	56.0	0.4	n/a	n/a	49.8	0.9	56.2	0.9
4	54.3	0.4	55.5	0.4	n/a	n/a	49.0	0.9	55.3	0.8
5	54.9	0.4	56.0	0.4	n/a	n/a	49.9	0.9	56.0	0.8
6 – 10	54.7	0.5	54.1	0.5	n/a	n/a	51.9	0.8	n/a	n/a
5 – 10	54.8	0.3	55.9	0.5	n/a	n/a	51.3	0.9	56.0	0.9
Percent of Energy from Protein (%)										
Ages 1 – 2	16.1	0.1	15.6	0.2	n/a	n/a	17.6	0.4	n/a	n/a
3	16.2	0.1	15.7	0.1	n/a	n/a	18.2	0.4	16.2	0.8
4	16.3	0.1	16.0	0.1	n/a	n/a	18.5	0.5	16.6	0.9
5	16.2	0.1	15.8	0.1	n/a	n/a	18.3	0.4	16.4	0.8
6 – 10	16.2	0.2	15.7	0.4	n/a	n/a	17.8	0.5	n/a	n/a
5 – 10	16.2	0.1	15.8	0.2	n/a	n/a	17.9	0.3	16.3	0.8

**Exhibit B.30
(continued)**

	Breakfast, Lunch, and One Snack		Breakfast, Lunch, and Two Snacks		Breakfast and Lunch		Lunch and One Snack		Lunch and Two Snacks	
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err
Cholesterol (mg)										
Ages 1 – 2	111.4	3.7	127.9	4.1	n/a	n/a	83.3	7.7	n/a	n/a
3	116.8	3.8	133.4	3.6	n/a	n/a	81.3	7.2	78.3	5.1
4	129.0	4.2	145.3	4.0	n/a	n/a	87.7	7.3	83.5	5.1
5	131.4	4.3	149.1	4.0	n/a	n/a	90.9	7.7	87.1	5.3
6 – 10	134.7	7.4	164.3	9.0	n/a	n/a	83.5	4.0	n/a	n/a
5 – 10	133.9	4.0	151.3	3.9	n/a	n/a	87.9	4.4	90.9	5.2
Sodium (mg)										
Ages 1 – 2	1312. 6	16.9	1456.4	21.9	n/a	n/a	973.9	38.7	n/a	n/a
3	1406. 6	22.6	1548.4	17.4	n/a	n/a	974.8	34.3	1119.7	62.6
4	1552. 1	25.7	1680.3	19.3	n/a	n/a	1060.5	38.9	1199.5	65.0
5	1600. 5	25.0	1755.8	19.9	n/a	n/a	1102.6	40.6	1259.2	68.2
6 – 10	1701. 2	34.8	1878.6	46.0	n/a	n/a	1271.3	53.9	n/a	n/a
5 – 10	1623. 7	21.2	1779.0	21.7	n/a	n/a	1200.5	41.4	1276.5	65.9

Number of Providers (Unweighted)

Exhibit B.30
(continued)

	Breakfast, Lunch, and One Snack		Breakfast, Lunch, and Two Snacks		Breakfast and Lunch		Lunch and One Snack		Lunch and Two Snacks	
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err
Ages 1 – 2	202		139		4		28		18	
3	217		163		6		30		25	
4	217		163		6		30		25	
5	217		163		6		30		25	
6 – 10	92		57		4		33		4	
5 – 10	239		168		7		50		28	

n/a = Fewer than 25 providers offered this meal combination to this age group.

Note: Aggregation across age groups has been limited to menus offered to five-year-olds and six- to ten-year-olds because *Dietary Guidelines* and NRC recommendations for these nutrients are applicable only to children five years of age and older. See Chapter Two for a discussion of *Dietary Guidelines* and NRC recommendations.

Exhibit B.31

Mean Macronutrient, Cholesterol, and Sodium Content of Most Common Meal Combinations Offered by Age Group: Head Start Centers

	Breakfast, Lunch, and One Snack		Breakfast, Lunch, and Two Snacks		Breakfast and Lunch		Lunch and One Snack		Lunch and Two Snacks	
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err
Percent of Energy from Fat (%)										
Ages 1 – 2	32.9	0.8	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
3	30.9	0.3	31.9	0.6	32.0	0.6	33.1	0.5	30.5	0.7
4	31.2	0.3	32.2	0.6	32.1	0.6	33.6	0.5	31.1	0.7
5	30.9	0.3	31.9	0.6	31.8	0.6	33.1	0.5	30.6	0.7
6 – 10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
5 – 10	30.9	0.3	31.9	0.6	31.8	0.6	33.0	0.5	30.6	0.7
Percent of Energy from Saturated Fat (%)										
Ages 1 – 2	14.3	0.4	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
3	12.8	0.2	13.2	0.3	13.3	0.3	13.4	0.4	12.6	0.4
4	12.9	0.2	13.4	0.3	13.4	0.3	13.7	0.4	12.9	0.4
5	12.8	0.2	13.2	0.3	13.3	0.3	13.5	0.4	12.7	0.4
6 – 10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
5 – 10	12.8	0.2	13.2	0.3	13.3	0.3	13.5	0.4	12.7	0.4
Percent of Energy from Carbohydrate (%)										
Ages 1 – 2	52.2	0.8	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
3	54.6	0.2	54.0	0.7	52.4	0.6	52.3	0.5	56.3	0.7
4	54.2	0.3	53.4	0.7	52.2	0.6	51.5	0.5	55.4	0.7
5	54.7	0.3	54.0	0.7	52.7	0.6	52.2	0.5	56.1	0.7
6 – 10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
5 – 10	54.7	0.3	54.0	0.7	52.7	0.6	52.3	0.5	56.1	0.7
Percent of Energy from Protein (%)										
Ages 1 – 2	16.8	0.3	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
3	16.3	0.1	15.8	0.3	17.3	0.2	16.5	0.3	15.4	0.2
4	16.5	0.1	16.1	0.3	17.3	0.2	16.7	0.3	15.7	0.2
5	16.3	0.1	15.9	0.3	17.2	0.2	16.6	0.3	15.5	0.2
6 – 10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
5 – 10	16.3	0.1	15.9	0.3	17.2	0.2	16.6	0.3	15.5	0.2

**Exhibit B.31
(continued)**

	Breakfast, Lunch, and One Snack		Breakfast, Lunch, and Two Snacks		Breakfast and Lunch		Lunch and One Snack		Lunch and Two Snacks	
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err
Cholesterol (mg)										
Ages 1 – 2	116.4	5.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
3	115.0	2.4	152.3	7.0	103.3	2.9	66.9	1.8	87.5	7.0
4	126.8	2.7	166.9	8.1	116.0	3.3	73.1	1.9	93.1	6.6
5	129.1	2.7	170.8	8.0	116.7	3.3	75.2	2.0	97.5	7.3
6 – 10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
5 – 10	129.2	2.7	171.0	8.0	116.9	3.3	75.2	2.0	97.5	7.3
Sodium (mg)										
Ages 1 – 2	1341.2	36.6	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
3	1417.9	16.1	1712.7	30.0	1210.4	32.6	1041.2	18.4	1315.5	41.2
4	1562.6	18.3	1856.5	31.2	1363.8	36.2	1137.1	19.8	1404.7	43.9
5	1608.1	17.7	1935.0	32.8	1380.3	35.5	1165.5	20.6	1474.7	48.5
6 – 10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
5 – 10	1609.4	17.7	1935.5	30.2	1387.7	38.7	1176.4	23.9	1474.7	48.5
Number of Providers (Unweighted)										
Ages 1 – 2	50		5		4		0		1	
3	527		42		232		43		26	
4	527		42		232		43		26	

**Exhibit B.31
(continued)**

	Breakfast, Lunch, and One Snack		Breakfast, Lunch, and Two Snacks		Breakfast and Lunch		Lunch and One Snack		Lunch and Two Snacks	
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err
5	527		42		232		43		26	
6 – 10	7		4		6		1		0	
5 – 10	527		42		235		44		26	

n/a = Fewer than 25 providers offered this meal combination to this age group.

Note: Aggregation across age groups has been limited to menus offered to five-year-olds and six- to ten-year-olds because *Dietary Guidelines* and NRC recommendations for these nutrients are applicable only to children five years of age and older. See Chapter Two for a discussion of *Dietary Guidelines* and NRC recommendations.

Exhibit B.32

**Mean Macronutrient, Cholesterol, and Sodium Content of Most Common Meal Combinations
Offered by Age Group: Child Care Centers**

	Breakfast, Lunch, and One Snack		Breakfast, Lunch, and Two Snacks		Breakfast and Lunch		Lunch and One Snack		Lunch and Two Snacks	
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err
Percent of Energy from Fat (%)										
Ages 1 – 2	31.0	0.4	29.4	0.5	n/a	n/a	n/a	n/a	31.4	0.8
3	30.9	0.3	29.5	0.4	n/a	n/a	n/a	n/a	31.1	0.5
4	31.1	0.3	29.8	0.4	n/a	n/a	n/a	n/a	31.7	0.5
5	30.8	0.3	29.6	0.4	n/a	n/a	n/a	n/a	31.3	0.5
6 – 10	31.4	0.6	30.3	0.6	n/a	n/a	n/a	n/a	n/a	n/a
5 – 10	30.9	0.4	29.6	0.4	n/a	n/a	n/a	n/a	31.5	0.6
Percent of Energy from Saturated Fat (%)										
Ages 1 – 2	13.1	0.2	12.5	0.3	n/a	n/a	n/a	n/a	12.9	0.4
3	13.0	0.1	12.4	0.2	n/a	n/a	n/a	n/a	12.4	0.2
4	13.1	0.1	12.6	0.2	n/a	n/a	n/a	n/a	12.7	0.2
5	13.0	0.1	12.4	0.2	n/a	n/a	n/a	n/a	12.5	0.2
6 - 10	13.0	0.4	12.7	0.2	n/a	n/a	n/a	n/a	n/a	n/a
5 – 10	13.0	0.1	12.5	0.2	n/a	n/a	n/a	n/a	12.7	0.2
Percent of Energy from Carbohydrate (%)										
Ages 1 – 2	55.4	0.3	57.7	0.6	n/a	n/a	n/a	n/a	55.5	1.0
3	55.2	0.3	57.4	0.5	n/a	n/a	n/a	n/a	55.8	0.6
4	54.8	0.3	56.8	0.5	n/a	n/a	n/a	n/a	54.9	0.6
5	55.3	0.3	57.3	0.4	n/a	n/a	n/a	n/a	55.5	0.6
6 – 10	54.7	0.7	56.8	0.5	n/a	n/a	n/a	n/a	n/a	n/a
5 – 10	55.2	0.3	57.2	0.4	n/a	n/a	n/a	n/a	55.2	0.6
Percent of Energy from Protein (%)										
Ages 1 – 2	15.4	0.1	14.9	0.1	n/a	n/a	n/a	n/a	15.1	0.4
3	15.7	0.2	15.0	0.2	n/a	n/a	n/a	n/a	14.9	0.3
4	15.9	0.2	15.3	0.2	n/a	n/a	n/a	n/a	15.2	0.3
5	15.7	0.2	15.1	0.2	n/a	n/a	n/a	n/a	15.1	0.3
6 – 10	15.7	0.2	14.8	0.1	n/a	n/a	n/a	n/a	n/a	n/a
5 – 10	15.7	0.1	15.1	0.1	n/a	n/a	n/a	n/a	15.2	0.3

**Exhibit B.32
(continued)**

	Breakfast, Lunch, and One Snack		Breakfast, Lunch, and Two Snacks		Breakfast and Lunch		Lunch and One Snack		Lunch and Two Snacks	
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err
Cholesterol (mg)										
Ages 1 – 2	106.1	2.6	116.8	5.2	n/a	n/a	n/a	n/a	91.9	4.6
3	109.1	2.0	122.4	5.1	n/a	n/a	n/a	n/a	89.6	5.1
4	120.6	2.2	134.0	5.5	n/a	n/a	n/a	n/a	95.6	5.0
5	122.9	2.2	137.0	5.7	n/a	n/a	n/a	n/a	99.9	5.4
6 – 10	137.8	6.3	139.0	6.2	n/a	n/a	n/a	n/a	n/a	n/a
5 – 10	124.4	2.2	138.7	5.6	n/a	n/a	n/a	n/a	103.7	5.4
Sodium (mg)										
Ages 1 – 2	1366.1	17.7	1519.6	36.3	n/a	n/a	n/a	n/a	1292.1	34.5
3	1422.8	17.8	1631.8	32.2	n/a	n/a	n/a	n/a	1340.6	35.8
4	1568.7	20.2	1767.6	35.0	n/a	n/a	n/a	n/a	1436.8	38.8
5	1615.3	20.3	1842.4	35.4	n/a	n/a	n/a	n/a	1504.7	39.5
6 – 10	1824.9	22.7	2058.6	51.1	n/a	n/a	n/a	n/a	n/a	n/a
5 – 10	1635.3	18.9	1875.6	35.6	n/a	n/a	n/a	n/a	1544.3	35.2

Number of Providers (Unweighted)

Exhibit B.32
(continued)

	Breakfast, Lunch, and One Snack		Breakfast, Lunch, and Two Snacks		Breakfast and Lunch		Lunch and One Snack		Lunch and Two Snacks	
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err
Ages 1 – 2	171		90		11		3		28	
3	252		114		21		9		38	
4	252		114		21		9		38	
5	252		114		21		9		38	
6 – 10	48		37		4		6		11	
5 – 10	257		116		22		14		40	

n/a = Fewer than 25 providers offered this meal combination to this age group.

Note: Aggregation across age groups has been limited to menus offered to five-year-olds and six- to ten-year-olds because *Dietary Guidelines* and NRC recommendations for these nutrients are applicable only to children five years of age and older. See Chapter Two for a discussion of *Dietary Guidelines* and NRC recommendations.

Exhibit B.33

**Mean Macronutrient, Cholesterol, and Sodium Content of Most Common Meal Combinations
Offered by Age Group: All Centers**

	Breakfast, Lunch, and One Snack		Breakfast, Lunch, and Two Snacks		Breakfast and Lunch		Lunch and One Snack		Lunch and Two Snacks	
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err
Percent of Energy from Fat (%)										
Ages 1 – 2	31.2	0.4	29.4	0.5	n/a	n/a	n/a	n/a	31.3	0.7
3	30.9	0.3	29.8	0.4	31.9	0.5	33.5	0.5	31.0	0.4
4	31.1	0.3	30.1	0.4	32.0	0.5	33.9	0.5	31.6	0.4
5	30.8	0.3	29.9	0.4	31.7	0.5	33.5	0.5	31.1	0.4
6 – 10	31.5	0.5	30.5	0.6	n/a	n/a	n/a	n/a	n/a	n/a
5 – 10	30.9	0.3	29.9	0.3	31.7	0.5	33.4	0.5	31.3	0.5
Percent of Energy from Saturated Fat (%)										
Ages 1 – 2	13.3	0.2	12.5	0.3	n/a	n/a	n/a	n/a	12.9	0.4
3	12.9	0.1	12.5	0.2	13.4	0.2	13.6	0.3	12.4	0.2
4	13.1	0.1	12.7	0.2	13.5	0.2	13.8	0.3	12.7	0.2
5	12.9	0.1	12.5	0.2	13.3	0.2	13.7	0.3	12.6	0.2
6 – 10	13.1	0.3	12.7	0.2	n/a	n/a	n/a	n/a	n/a	n/a
5 – 10	12.9	0.1	12.6	0.2	13.3	0.2	13.6	0.2	12.7	0.2
Percent of Energy from Carbohydrate (%)										
Ages 1 – 2	55.1	0.3	57.7	0.6	n/a	n/a	n/a	n/a	55.6	1.0
3	55.0	0.2	57.0	0.5	52.5	0.5	51.9	0.5	55.9	0.5
4	54.5	0.2	56.4	0.5	52.3	0.5	51.2	0.5	55.0	0.5
5	55.0	0.2	56.9	0.4	52.8	0.5	51.8	0.5	55.7	0.5
6 – 10	54.5	0.6	56.6	0.5	n/a	n/a	n/a	n/a	n/a	n/a
5 – 10	55.0	0.2	56.8	0.4	52.8	0.5	51.8	0.5	55.4	0.5
Percent of Energy from Protein (%)										
Ages 1 – 2	15.5	0.1	14.9	0.1	n/a	n/a	n/a	n/a	15.0	0.4
3	15.9	0.1	15.1	0.2	17.3	0.2	16.4	0.3	15.0	0.3
4	16.1	0.1	15.4	0.2	17.3	0.2	16.7	0.3	15.3	0.3
5	16.0	0.1	15.2	0.1	17.2	0.2	16.6	0.3	15.2	0.3
6 – 10	15.8	0.1	14.8	0.1	n/a	n/a	n/a	n/a	n/a	n/a
5 – 10	16.0	0.1	15.2	0.1	17.2	0.2	16.6	0.2	15.2	0.2

**Exhibit B.33
(continued)**

	Breakfast, Lunch, and One Snack		Breakfast, Lunch, and Two Snacks		Breakfast and Lunch		Lunch and One Snack		Lunch and Two Snacks	
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err
Cholesterol (mg)										
Ages 1 – 2	107.0	2.4	117.0	5.3	n/a	n/a	n/a	n/a	91.6	4.6
3	111.4	1.5	126.0	4.8	103.0	3.0	70.0	2.7	89.2	4.2
4	123.1	1.7	138.0	5.2	115.5	3.3	76.4	2.8	95.2	4.1
5	125.4	1.7	141.1	5.4	116.3	3.3	78.5	2.9	99.4	4.4
6 – 10	138.5	5.7	141.0	6.7	n/a	n/a	n/a	n/a	n/a	n/a
5 – 10	126.3	1.7	142.6	5.3	117.1	3.3	82.2	2.3	102.5	4.5
Sodium (mg)										
Ages 1 – 2	1363.8	17.6	1521.9	36.3	n/a	n/a	n/a	n/a	1294.2	34.5
3	1420.9	12.4	1641.6	29.3	1206.8	29.8	1067.5	31.2	1335.7	28.6
4	1566.2	14.3	1778.4	31.9	1358.2	33.4	1164.8	33.8	1430.6	30.7
5	1612.4	14.0	1853.6	32.2	1376.4	32.5	1194.3	33.7	1498.9	31.8
6 – 10	1825.6	20.8	2058.3	48.6	n/a	n/a	n/a	n/a	n/a	n/a
5 – 10	1625.0	13.3	1882.7	31.9	1390.2	38.1	1232.1	32.3	1531.6	26.3

Number of Providers (Unweighted)

Exhibit B.33
(continued)

	Breakfast, Lunch, and One Snack		Breakfast, Lunch, and Two Snacks		Breakfast and Lunch		Lunch and One Snack		Lunch and Two Snacks	
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err
Ages 1 – 2	221		95		15		3		29	
3	779		156		253		52		64	
4	779		156		253		52		64	
5	779		156		253		52		64	
6 – 10	55		41		10		7		11	
5 – 10	784		158		257		58		66	

n/a = Fewer than 25 providers offered this meal combination to this age group.

Note: Aggregation across age groups has been limited to menus offered to five-year-olds and six- to ten-year-olds because *Dietary Guidelines* and NRC recommendations for these nutrients are applicable only to children five years of age and older. See Chapter Two for a discussion of *Dietary Guidelines* and NRC recommendations.

Appendix C

*Detailed Tables on Meals and Snacks Consumed
by CACFP Participants*

Exhibit C.1

Mean Portion Sizes of CACFP Breakfast Foods Taken by Children

Breakfast Component	CACFP Portion Requirement	Children Receiving Care In			
		Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
Mean Portion Taken at Breakfast¹					
Milk					
Ages 1 – 2	.50 cups	.64 cups	n/a	.56 cups	.56 cups
3	.75	.65	.84 cups	.67	.71
4	.75	.76	.83	.76	.80
5	.75	.69	.82	.77	.80
Fruits, Vegetables, or Juices					
Ages 1 – 2	.25 cups	.47 cups	n/a	.47 cups	.47 cups
3	.50	.66	.46 cups	.49	.49
4	.50	.69	.51	.58	.54
5	.50	.59	.56	.56	.56
Breads or Bread Alternates ²					
Ages 1 – 2	14 gm ³	31 gm	n/a	26 gm	26 gm
3	14	32	28 gm	30	29
4	14	35	28	33	31
5	14	30	33	36	34
Number of Child Observations (Unweighted)					
Ages 1 – 2		132	2	114	116
3		69	97	137	234
4		49	386	140	526
5		45	327	134	461

n/a = Fewer than 25 child observations.

Note: Data for six- to ten-year-olds not shown because fewer than 25 children were observed in each mode of care.

¹Breakfast portion defined as total amount taken, including second helpings in family-style service.

²Mean gram weight of breads and bread alternates taken; dry weight used for items such as hot cereal, pasta, and rice.

³Approximate gram weight of required one-half slice of bread (1 slice of bread = 28 gm).

Exhibit C.2

Mean Percentage of Breakfast Portions Consumed by Age Group¹

	All Children	Children Receiving Care in:			
		Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
Milk					
Ages 1 – 2	75%	76%	n/a	73%	72%
3	72	75	61%	74	71
4	73	82	70	70	70
5	77	85	74	76	75
6 – 10	90	93	n/a	n/a	n/a
All Ages	75	80	70	73	72
Fruits, Vegetables, and Juices					
Ages 1 – 2	73	72	n/a	75	75
3	73	70	65	79	75
4	78	95	76	69	72
5	80	86	80	77	79
6 – 10	92	93	n/a	n/a	n/a
All Ages	77	80	76	75	75
Breads and Bread Alternates					
Ages 1 – 2	75	77	n/a	73	73
3	73	80	66	71	70
4	75	82	73	71	72
5	76	84	72	77	74
6 – 10	92	93	n/a	n/a	n/a
All Ages	76	81	71	73	72
Noncreditable Foods²					
Ages 1 – 2	75	76	n/a	n/a	n/a
3	80	89	77	72	73
4	77	84	76	73	74
5	78	87	72	82	75
6 – 10	97	n/a	n/a	n/a	n/a
All Ages	79	83	74	74	74
Number of Child Observations (Unweighted)³					
Ages 1 – 2	248	132	2	114	116
3	303	69	97	137	234
4	575	49	386	140	526
5	506	45	327	134	461
6 – 10	57	44	6	7	13
All Ages	1689	339	818	532	1350

¹Breakfast portions defined as total amount taken, including second helpings in family-style service.

²Foods that do not contribute to satisfying the CACFP meal pattern.

³Total number of child observations. Actual sample size varies for each meal component because children did not necessarily receive all components.

Exhibit C.3

Mean Percentage of Available Breakfast Nutrients Actually Consumed¹

	All Children	Children Receiving Care in:			All Centers
		Family Day Care Homes	Head Start Centers	Child Care Centers	
Total Energy					
Ages 1 – 2	75%	75%	n/a	75%	75%
3	74	79	66%	74	72
4	76	84	73	72	72
5	79	85	76	79	77
6 – 10	91	93	n/a	n/a	n/a
All Ages	77	81	73	75	74
Macronutrients					
Total Fat					
Ages 1 – 2	75	75	n/a	76	75
3	74	78	66	75	72
4	75	82	73	72	72
5	77	84	75	76	76
6 – 10	91	93	n/a	n/a	n/a
All Ages	76	80	72	74	74
Saturated Fat					
Ages 1 – 2	76	76	n/a	76	75
3	74	77	65	74	72
4	74	82	72	71	72
5	77	84	75	76	75
6 – 10	90	93	n/a	n/a	n/a
All Ages	76	80	72	74	73
Carbohydrate					
Ages 1 – 2	75	75	n/a	75	75
3	74	78	66	74	72
4	76	85	74	71	73
5	79	85	76	79	78
6 – 10	91	93	n/a	n/a	n/a
All Ages	77	81	73	75	74
Protein					
Ages 1 – 2	75	76	n/a	73	73
3	73	77	65	73	71
4	74	82	72	71	72
5	78	85	74	77	76
6 – 10	90	92	n/a	n/a	n/a
All Ages	76	80	71	74	73
Vitamins and Minerals					
Vitamin A					
Ages 1 – 2	76	78	n/a	72	71
3	73	78	65	71	70
4	74	83	71	71	71
5	78	86	74	78	76
6 – 10	90	92	n/a	n/a	n/a
All Ages	76	82	71	73	72

**Exhibit C.3
(continued)**

	All Children	Children Receiving Care in:			
		Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
Vitamin C					
Ages 1 – 2	77%	76%	n/a	80%	80%
3	74	72	69%	78	76
4	78	88	74	73	73
5	80	85	78	81	79
6 – 10	91	93	n/a	n/a	n/a
All Ages	78	81	75	77	76
Calcium					
Ages 1 – 2	75	76	n/a	74	73
3	73	78	64	73	71
4	74	82	71	71	71
5	77	86	74	76	75
6 – 10	90	93	n/a	n/a	n/a
All Ages	76	81	71	73	72
Iron					
Ages 1 – 2	76	76	n/a	75	75
3	73	76	67	73	71
4	75	83	73	71	72
5	78	84	75	79	77
6 – 10	90	91	n/a	n/a	n/a
All Ages	76	80	73	74	74
Other Dietary Constituents					
Cholesterol					
Ages 1 – 2	75	77	n/a	71	71
3	73	76	63	74	71
4	75	82	72	72	72
5	78	84	76	76	76
6 – 10	89	91	n/a	n/a	n/a
All Ages	76	80	72	73	73
Sodium					
Ages 1 – 2	76	77	n/a	72	72
3	73	79	66	70	69
4	75	81	72	72	72
5	78	85	74	79	76
6 – 10	91	93	n/a	n/a	n/a
All Ages	76	81	72	73	73
Number of Child Observations (Unweighted)					
Ages 1 – 2	248	132	2	114	116
3	303	69	97	137	234
4	575	49	386	140	526
5	506	45	327	134	461
6 – 10	57	44	6	7	13
All Ages	1689	339	818	532	1350

n/a = Fewer than 25 child observations.

¹Available nutrients defined as nutrients in total amount of food taken, including second helpings in family-style service.

Exhibit C.4

Mean Energy and Nutrient Intake from CACFP Breakfasts Consumed by Age Group

	All Children	Children Receiving Care in:			All Centers
		Family Day Care Homes	Head Start Centers	Child Care Centers	
Total Energy (kcal)					
Ages 1 – 2	201	218	n/a	162	161
3	202	231	186	186	186
4	245	278	238	227	233
5	254	323	257	216	237
6 – 10	322	332	n/a	n/a	n/a
All Ages	232	259	236	199	214
Macronutrients					
Total Fat (gm)					
Ages 1 – 2	6.0	6.7	n/a	4.5	4.5
3	6.1	7.5	5.6	5.3	5.4
4	6.6	7.2	6.9	5.8	6.4
5	7.6	10.2	8.2	5.7	6.9
6 – 10	7.8	8.0	n/a	n/a	n/a
5 – 10	7.6	9.0	8.2	5.6	6.9
Saturated Fat (gm)					
Ages 1 – 2	2.8	3.2	n/a	2.0	2.0
3	2.8	3.4	2.7	2.4	2.5
4	3.2	3.5	3.3	2.9	3.1
5	3.6	4.5	3.8	2.9	3.4
6 – 10	3.3	3.4	n/a	n/a	n/a
5 – 10	3.5	3.9	3.8	2.9	3.3
Carbohydrate (gm)					
Ages 1 – 2	30.4	32.4	n/a	25.7	25.6
3	30.5	33.9	27.4	29.0	28.6
4	38.9	45.8	35.7	37.0	36.3
5	38.4	48.2	37.4	34.6	36.0
6 – 10	53.2	54.9	n/a	n/a	n/a
5 – 10	41.5	51.9	37.4	34.3	35.8
Protein (gm)					
Ages 1 – 2	7.2	7.9	n/a	5.5	5.4
3	7.0	8.1	7.3	6.2	6.5
4	8.8	9.3	9.0	8.0	8.6
5	9.1	11.2	9.4	7.7	8.6
6 – 10	10.9	11.2	n/a	n/a	n/a
5 – 10	9.4	11.2	9.3	7.7	8.5
Vitamins and Minerals					
Vitamin A (mcg RE)					
Ages 1 – 2	170	186	n/a	136	135
3	158	192	157	135	140
4	185	220	169	175	172
5	187	251	162	181	172
6 – 10	322	332	n/a	n/a	n/a
All Ages	184	220	165	156	160

**Exhibit C.4
(continued)**

	All Children	Children Receiving Care in:			
		Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
Vitamin C (mg)					
Ages 1 – 2	16	14	n/a	21	21
3	16	13	22	16	18
4	24	23	21	29	25
5	25	22	24	27	25
6 – 10	27	28	n/a	n/a	n/a
All Ages	21	18	22	23	23
Calcium (mg)					
Ages 1 – 2	181	203	n/a	131	131
3	188	206	183	177	178
4	223	243	209	223	215
5	231	272	229	212	221
6 – 10	287	294	n/a	n/a	n/a
All Ages	211	230	212	189	198
Iron (mg)					
Ages 1 – 2	2.4	2.4	n/a	2.5	2.5
3					
4	2.4	2.7	2.3	2.4	2.3
5	2.3	2.8	1.9	2.6	2.2
6 – 10	4.0	4.0	n/a	n/a	n/a
All Ages	2.4	2.8	2.0	2.2	2.1
Other Dietary Constituents					
Cholesterol (mg)					
Ages 1 – 2	37	44	n/a	19	19
3	35	51	40	23	27
4	34	40	37	26	32
5	35	50	40	22	31
6 – 10	51	53	n/a	n/a	n/a
5 – 10	38	52	40	22	31
Sodium (mg)					
Ages 1 – 2	271	297	n/a	211	210
3	264	314	254	230	236
4	301	327	307	272	291
5	335	453	348	264	306
6 – 10	438	451	n/a	n/a	n/a
5 – 10	356	452	347	263	305
Number of Child Observations (Unweighted)					
Ages 1 – 2	248	132	2	114	116
3	303	69	97	137	234
4	575	49	386	140	526
5	506	45	327	134	461
6 – 10	57	44	6	7	13
All Ages	1689	339	818	532	1350

n/a: Fewer than 25 child observations.

Note: For macronutrients, cholesterol, and sodium, aggregation across age groups has been limited to five-year-olds and six- to ten-year-olds (see Chapter Two).

Exhibit C.5

Mean Percentage of RDAs Provided in CACFP Breakfasts Consumed by Age Group

	Children Receiving Care in:									
	All Children		Family Day Care		Head Start Centers		Child Care Centers		All Centers	
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err
Total Energy										
Ages 1 – 2	15.4	0.8	16.8	1.0	n/a	n/a	12.4	0.9	12.4	0.9
3	15.5	0.9	17.8	1.1	14.3	1.5	14.3	1.6	14.3	1.1
4	13.6	0.7	15.5	1.6	13.2	0.7	12.6	1.3	12.9	0.6
5	14.1	1.0	18.0	3.2	14.3	0.7	12.0	1.4	13.2	0.9
6 – 10	16.8	0.8	17.3	0.8	n/a	n/a	n/a	n/a	n/a	n/a
All Ages	14.8	0.6	17.0	0.7	13.8	0.6	13.0	0.9	13.3	0.6
Protein										
Ages 1 – 2	44.8	3.1	49.5	4.1	n/a	n/a	34.2	2.1	34.0	2.2
3	44.0	2.7	50.4	4.8	45.6	4.0	38.8	3.3	40.5	2.6
4	36.5	2.5	38.8	4.1	37.5	3.7	33.5	3.7	35.6	2.2
5	37.8	3.2	46.5	7.0	39.1	2.0	32.1	4.7	35.6	2.8
6 – 10	41.7	2.6	42.6	2.7	n/a	n/a	n/a	n/a	n/a	n/a
All Ages	40.6	2.1	46.5	2.9	39.3	2.8	35.0	3.0	36.7	2.1
Vitamin A										
Ages 1 – 2	42.6	3.8	46.4	4.7	n/a	n/a	34.0	4.9	33.8	4.9
3	39.6	2.8	47.9	6.9	39.4	3.3	33.7	3.1	35.1	2.9
4	37.0	2.0	44.0	3.1	33.8	2.5	34.9	2.6	34.3	1.9
5	37.4	4.1	50.1	6.1	32.4	4.8	36.3	5.3	34.3	4.3
6 – 10	52.2	6.5	53.5	7.2	n/a	n/a	n/a	n/a	n/a	n/a
All Ages	39.8	1.7	47.6	2.6	34.2	3.0	34.6	2.4	34.5	2.2
Vitamin C										
Ages 1 – 2	39.5	4.9	33.9	5.7	n/a	n/a	52.7	8.9	52.5	8.8
3	40.5	4.5	33.4	5.1	55.1	6.9	40.7	7.4	44.3	6.8
4	53.9	4.5	51.2	7.6	45.9	4.5	65.5	10.0	54.9	5.8
5	55.1	4.6	49.4	8.0	53.7	4.7	59.4	12.1	56.5	6.4
6 – 10	59.3	11.3	61.6	12.7	n/a	n/a	n/a	n/a	n/a	n/a
All Ages	48.2	2.7	42.4	4.0	50.4	3.3	53.3	5.0	52.2	3.5

**Exhibit C.5
(continued)**

	Children Receiving Care in:									
	All Children		Family Day Care		Head Start Centers		Child Care Centers		All Centers	
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err
Calcium										
Ages 1 – 2	22.6	1.8	25.3	2.5	n/a	n/a	16.4	1.4	16.3	1.4
3	23.5	1.3	25.7	2.8	22.8	1.2	22.1	1.5	22.3	1.2
4	27.8	2.2	30.4	3.8	26.1	1.3	27.8	4.1	26.9	2.0
5	28.8	3.0	34.0	4.9	28.6	1.6	26.6	4.7	27.6	2.7
6 – 10	35.8	2.6	36.8	2.7	n/a	n/a	n/a	n/a	n/a	n/a
All Ages	26.4	1.7	28.8	2.0	26.4	1.3	23.6	2.4	24.7	1.7
Iron										
Ages 1 – 2	24.1	2.9	23.8	3.4	n/a	n/a	24.9	5.4	24.8	5.4
3	19.8	2.2	28.3	5.1	15.4	2.9	15.1	2.9	15.2	2.2
4	24.3	2.7	27.1	7.4	22.6	2.6	23.9	3.9	23.2	2.6
5	23.3	2.9	27.7	5.5	18.7	2.9	25.8	4.6	22.2	3.3
6 – 10	40.2	6.9	39.6	7.3	n/a	n/a	n/a	n/a	n/a	n/a
All Ages	23.9	1.5	27.9	2.9	20.0	2.1	21.9	2.5	21.2	1.9
Number of Child Observations (Unweighted)										
Ages 1 – 2	248		132		2		114		116	
3	303		69		97		137		234	
4	575		49		386		140		526	
5	506		45		327		134		461	
6 – 10	57		44		6		7		13	
All Ages	1689		339		818		532		1350	

n/a = Fewer than 25 child observations.

Exhibit C.6

**Mean Macronutrient, Cholesterol, and Sodium Content of
CACFP Breakfasts Consumed by Age Group**

	Children Receiving Care in:									
	All Children		Family Day Care		Head Start Centers		Child Care Centers		All Centers	
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err
Percent of Energy from Fat (%)										
Ages 1 – 2	25.8	1.2	26.9	1.5	n/a	n/a	23.3	2.2	23.3	2.2
3	26.4	1.5	29.3	2.0	24.3	3.0	24.9	2.1	24.8	1.8
4	23.5	0.9	23.9	2.2	24.0	1.4	22.6	0.6	23.4	0.9
5	24.3	1.0	26.4	2.3	26.6	1.0	20.9	1.7	23.8	1.1
6 – 10	20.6	2.0	20.6	2.1	n/a	n/a	n/a	n/a	n/a	n/a
5 – 10	23.5	1.1	23.2	1.9	26.4	1.0	21.0	1.7	23.8	1.1
Percent of Energy from Saturated Fat (%)										
Ages 1 – 2	12.1	0.5	12.9	0.7	n/a	n/a	10.3	0.9	10.3	0.9
3	13.0	0.6	13.9	1.0	12.7	0.9	12.5	0.8	12.5	0.7
4	11.9	0.5	11.6	1.2	12.1	0.7	11.8	0.8	12.0	0.5
5	12.1	0.5	12.1	1.0	12.9	0.5	11.1	1.0	12.0	0.6
6 – 10	9.0	1.0	8.9	1.1	n/a	n/a	n/a	n/a	n/a	n/a
5 – 10	11.4	0.5	10.3	1.0	12.8	0.5	11.1	1.0	12.0	0.5
Percent of Energy from Carbohydrate (%)										
Ages 1 – 2	61.6	1.8	59.9	2.1	n/a	n/a	65.6	3.7	65.6	3.7
3	60.3	1.8	58.0	3.2	62.1	3.0	61.4	2.2	61.6	2.0
4	63.7	1.3	64.8	3.1	62.1	2.1	64.5	1.4	63.2	1.3
5	62.8	1.2	60.7	2.4	60.1	0.8	66.9	2.6	63.4	1.3
6 – 10	67.4	2.1	67.5	2.2	n/a	n/a	n/a	n/a	n/a	n/a
5 – 10	63.8	1.2	64.4	2.0	60.3	0.9	66.7	2.5	63.4	1.3
Percent of Energy from Protein (%)										
Ages 1 – 2	14.4	0.6	14.8	0.8	n/a	n/a	13.4	1.1	13.4	1.1
3	15.0	0.6	14.6	1.0	15.8	1.1	15.1	1.2	15.3	0.8
4	14.7	0.5	13.8	1.0	15.3	0.7	14.9	0.9	15.1	0.6
5	14.5	0.4	14.6	1.0	14.9	0.3	13.9	0.9	14.4	0.4
6 – 10	13.5	0.5	13.4	0.5	n/a	n/a	n/a	n/a	n/a	n/a
5 – 10	14.3	0.4	13.9	0.6	14.9	0.3	14.0	0.9	14.4	0.4

**Exhibit C.6
(continued)**

	All Children		Children Receiving Care in:							
	Mean	Std Err	Family Day Care Mean	Std Err	Head Start Centers Mean	Std Err	Child Care Centers Mean	Std Err	All Centers Mean	Std Err
Cholesterol (mg)										
Ages 1 – 2	36.7	7.0	44.3	9.3	n/a	n/a	19.2	3.3	19.1	3.3
3	35.4	5.6	50.7	11.4	40.2	16.6	22.9	1.6	27.1	3.7
4	34.1	3.8	39.5	12.1	37.4	5.1	25.9	3.1	32.1	2.7
5	35.0	4.0	50.3	17.2	40.1	3.7	22.3	4.0	31.3	2.4
6 – 10	51.2	16.0	52.9	16.9	n/a	n/a	n/a	n/a	n/a	n/a
5 – 10	38.4	5.6	51.8	13.6	40.2	3.5	22.1	3.9	31.2	2.3
Sodium (mg)										
Ages 1 – 2	271.0	13.9	297.5	16.5	n/a	n/a	210.7	14.5	210.2	14.5
3	263.5	14.7	314.2	23.3	253.7	30.9	230.2	22.7	236.0	18.3
4	300.7	15.9	326.6	26.1	306.9	17.2	272.1	29.7	290.9	15.1
5	335.1	26.6	453.2	92.6	347.7	22.7	264.0	40.0	306.3	24.3
6 – 10	438.1	27.4	450.8	26.5	n/a	n/a	n/a	n/a	n/a	n/a
5 – 10	356.5	24.1	451.9	44.6	346.9	23.1	263.2	39.0	305.3	24.0
Number of Child Observations (Unweighted)										
Ages 1 – 2	248		132		2		114		116	
3	303		69		97		137		234	
4	575		49		386		140		526	
5	506		45		327		134		461	
6 – 10	57		44		6		7		13	
5 – 10	563		89		333		141		474	

n/a = Fewer than 25 child observations.

Note: Aggregation across age groups has been limited to five-year-olds and six- to ten-year-olds (see Chapter Two).

Exhibit C.7

Mean Portion Sizes of CACFP Lunch Foods Taken by Children

Lunch Component	CACFP Portion Requirement	Children Receiving Care in:			
		Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
Mean Portion Taken at Lunch¹					
Milk					
Ages 1 – 2	.50 cups	.68 cups	n/a	.61 cups	.61 cups
3	.75	.63	.84 cups	.66	.69
4	.75	.72	.82	.73	.78
5	.75	.69	.84	.79	.81
Fruits, Vegetables, or Juices					
Ages 1 – 2	.25 cups	.51 cups	n/a	.51 cups	.51 cups
3	.50	.57	.65 cups	.56	.57
4	.50	.55	.64	.67	.65
5	.50	.43	.67	.62	.65
Breads or Bread Alternates ²					
Ages 1 – 2	14 gm ³	33 gm	n/a	25 gm	25 gm
3	14	31	28 gm	29	29
4	14	31	31	30	31
5	14	29	33	31	32
Meats or Meat Alternates					
Ages 1 – 2	28 gm ⁴	40 gm	n/a	45 gm	45 gm
3	42	42	55 gm	44	46
4	42	47	50	51	51
5	42	45	55	46	51
Number of Child Observations (Unweighted)					
Ages 1 – 2		167	2	143	145
3		90	113	188	301
4		72	509	190	699
5		54	420	171	591

n/a = Fewer than 25 child observations.

Note: Data for six- to ten-year-olds not shown because fewer than 25 children were observed in each mode of care.

¹Lunch portion defined as total amount taken, including second helpings in family-style service.

²Mean gram weight of breads and bread alternates taken; dry weight for items such as pasta and rice.

³Approximate gram weight of required one-half slice of bread (1 slice of bread = 28 gm).

⁴Approximate gram weight of required 1 oz (one- to two-year-olds) and 1.5 oz (three- to five-year-olds) of meat, fish, poultry, or cheese.

Exhibit C.8

Mean Percentage of Lunch Portions Consumed by Age Group¹

	All Children	Children Receiving Care in:			
		Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
Milk					
Ages 1 – 2	81%	80%	n/a	83%	83%
3	77	75	74%	80	79
4	82	83	81	82	81
5	88	94	84	90	87
6 – 10	96	99	n/a	n/a	n/a
All Ages	83	82	81	84	83
Fruits and Juices					
Ages 1 – 2	76	75	n/a	79	79
3	75	70	77	77	77
4	76	68	79	79	79
5	85	93	78	87	83
6 – 10	89	96	n/a	n/a	n/a
All Ages	78	76	78	80	80
Vegetables					
Ages 1 – 2	58	59	n/a	56	56
3	50	48	53	51	51
4	58	57	57	59	58
5	68	78	60	73	67
6 – 10	77	84	n/a	n/a	n/a
All Ages	59	60	58	60	59
Breads and Bread Alternates					
Ages 1 – 2	67	73	n/a	60	60
3	67	63	73	67	68
4	69	80	60	72	66
5	76	94	69	77	73
6 – 10	79	n/a	n/a	n/a	n/a
All Ages	70	76	66	69	68
Meats and Meat Alternates					
Ages 1 – 2	74	79	n/a	65	66
3	75	72	63	79	76
4	73	73	67	80	73
5	80	83	72	88	80
6 – 10	84	n/a	n/a	n/a	n/a
All Ages	76	78	69	79	75
Mixed Entrees²					
Ages 1 – 2	74	73	n/a	75	75
3	69	73	82	64	67
4	72	72	66	77	72
5	79	89	66	81	76
6 – 10	n/a	n/a	n/a	n/a	n/a
All Ages	73	75	69	73	72

**Exhibit C.8
(continued)**

	All Children	Children Receiving Care in:			
		Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
Noncreditable Foods³					
Ages 1 – 2	60%	60%	n/a	61%	62%
3	82	88	83%	78	79
4	76	74	75	78	77
5	85	n/a	80	86	83
6 – 10	74	n/a	n/a	n/a	n/a
All Ages	76	74	79	76	77
Number of Child Observations⁴ (Unweighted)					
Ages 1 – 2	312	167	2	143	145
3	391	90	113	188	301
4	771	72	509	190	699
5	645	54	420	171	591
6 – 10	55	29	6	20	26
All Ages	2174	412	1050	712	1762

¹Lunch portions defined as total amount taken, including second helpings in family-style service.

²Entree items including two or more components, most often meat and bread.

³Foods that do not contribute to satisfying the CACFP meal pattern.

⁴Total number of child observations. Actual sample size varies for each meal component because children did not necessarily receive all components.

Exhibit C.9

Mean Percentage of Available Lunch Nutrients Actually Consumed¹

	Children Receiving Care in:				
	All Children	Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
Total Energy					
Ages 1 – 2	74%	74%	n/a	72%	72%
3	72	72	73%	71	72
4	75	76	71	77	74
5	81	89	76	84	80
6 – 10	87	93	n/a	n/a	70
All Ages	76	77	73	76	75
Macronutrients					
Total Fat					
Ages 1 – 2	74	75	n/a	71	71
3	73	74	73	72	72
4	74	74	71	77	74
5	82	89	76	84	80
6 – 10	88	95	n/a	n/a	68
All Ages	76	77	73	76	75
Saturated Fat					
Ages 1 – 2	75	76	n/a	74	74
3	74	75	74	74	74
4	76	77	74	79	76
5	83	90	78	85	82
6 – 10	90	96	n/a	n/a	75
All Ages	78	78	75	78	77
Carbohydrate					
Ages 1 – 2	73	74	n/a	72	72
3	71	70	73	71	71
4	75	77	72	77	74
5	81	89	75	83	79
6 – 10	86	92	n/a	n/a	70
All Ages	75	77	73	75	75
Protein					
Ages 1 – 2	74	74	n/a	72	72
3	72	72	73	72	72
4	76	77	72	78	75
5	82	89	77	84	81
6 – 10	88	94	n/a	n/a	70
All Ages	76	77	74	77	76
Vitamins and Minerals					
Vitamin A					
Ages 1 – 2	69	69	n/a	70	70
3	68	66	72	67	68
4	74	78	71	74	72
5	78	87	73	79	76
6 – 10	84	88	n/a	n/a	72
All Ages	73	73	72	73	72

**Exhibit C.9
(continued)**

	Children Receiving Care in:				
	All Children	Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
Vitamin C					
Ages 1 – 2	68%	67%	n/a	69%	69%
3	65	67	70%	63	65
4	72	71	70	74	72
5	78	87	70	83	76
6 – 10	82	89	n/a	n/a	62
All Ages	71	72	70	72	71
Calcium					
Ages 1 – 2	76	76	n/a	78	78
3	75	76	74	76	75
4	79	81	77	79	78
5	84	91	80	86	83
6 – 10	92	96	n/a	n/a	81
All Ages	79	80	78	80	79
Iron					
Ages 1 – 2	71	72	n/a	68	68
3	69	69	71	68	69
4	71	74	67	74	70
5	79	88	72	81	77
6 – 10	84	91	n/a	n/a	65
All Ages	73	75	69	73	72
Other Dietary Constituents					
Cholesterol					
Ages 1 – 2	75	76	n/a	73	73
3	74	74	73	74	74
4	76	77	72	79	75
5	83	90	77	85	82
6 – 10	88	94	n/a	n/a	72
All Ages	77	79	74	78	77
Sodium					
Ages 1 – 2	71	72	n/a	69	69
3	69	71	71	68	69
4	73	75	69	76	72
5	80	88	74	82	78
6 – 10	85	92	n/a	n/a	66
All Ages	74	76	71	74	73
Number of Child Observations (Unweighted)					
Ages 1 – 2	312	167	2	143	145
3	391	90	113	188	301
4	771	72	509	190	699
5	645	54	420	171	591
6 – 10	55	29	6	20	26
All Ages	2174	412	1050	712	1762

n/a = Fewer than 25 child observations.

¹Available nutrients defined as nutrients in total amount of food taken, including second helpings in family-style service.

Exhibit C.10

Mean Energy and Nutrient Intake from CACFP Lunches Consumed by Age Group

	All Children	Children Receiving Care in:			
		Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
Total Energy (kcal)					
Ages 1 – 2	301	310	n/a	279	279
3	333	344	346	322	327
4	365	364	346	387	365
5	408	423	380	426	405
6 – 10	473	505	n/a	n/a	382
All Ages	357	353	360	360	360
Macronutrients					
Total Fat (gm)					
Ages 1 – 2	12.2	12.7	n/a	10.8	10.8
3	13.1	13.9	13.8	12.4	12.7
4	14.1	13.9	13.1	15.4	14.2
5	16.5	17.4	14.8	17.6	16.3
6 – 10	18.6	20.4	n/a	n/a	13.4
5 – 10	16.8	18.6	14.8	17.3	16.2
Saturated Fat (gm)					
Ages 1 – 2	5.1	5.3	n/a	4.7	4.7
3	5.5	5.8	6.0	5.2	5.4
4	5.9	5.7	5.6	6.2	5.9
5	7.0	6.7	6.2	7.9	7.1
6 – 10	7.7	8.5	n/a	n/a	5.4
5 – 10	7.1	7.4	6.2	7.7	7.0
Carbohydrate (gm)					
Ages 1 – 2	35.0	35.9	n/a	32.8	32.8
3	38.0	38.4	39.3	37.4	37.7
4	42.7	42.7	40.8	44.7	42.6
5	45.9	46.6	44.2	47.0	45.7
6 – 10	56.0	59.2	n/a	n/a	47.2
5 – 10	47.2	51.6	44.3	47.0	45.8
Protein (gm)					
Ages 1 – 2	14.0	14.1	n/a	13.8	13.9
3	16.6	17.2	16.7	16.2	16.3
4	17.8	17.8	17.2	18.6	17.9
5	20.3	21.3	18.9	21.2	20.1
6 – 10	22.0	22.9	n/a	n/a	19.4
5 – 10	20.5	22.0	18.9	21.1	20.1
Vitamins and Minerals					
Vitamin A (mcg RE)					
Ages 1 – 2	219	228	n/a	197	197
3	249	288	317	205	228
4	304	221	360	312	338

**Exhibit C.10
(continued)**

	All Children	Children Receiving Care in:			All Centers
		Family Day Care Homes	Head Start Centers	Child Care Centers	
5	331	310	306	360	335
6 – 10	269	278	n/a	n/a	243
All Ages	278	252	331	272	294

**Exhibit C.10
(continued)**

	All Children	Children Receiving Care in:			
		Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
Vitamin C (mg)					
Ages 1 – 2	12	12	n/a	14	14
3	14	14	13	14	14
4	15	11	15	18	17
5	17	15	17	18	17
6 – 10	19	21	n/a	n/a	13
All Ages	15	13	16	16	16
Calcium (mg)					
Ages 1 – 2	231	238	n/a	213	213
3	245	254	269	233	240
4	284	291	280	282	281
5	319	302	299	343	322
6 – 10	355	369	n/a	n/a	314
All Ages	274	268	286	273	278
Iron (mg)					
Ages 1 – 2	1.8	1.8	n/a	1.7	1.7
3	2.1	2.2	2.0	2.1	2.1
4	2.2	2.1	2.2	2.3	2.2
5	2.5	2.6	2.4	2.5	2.5
6 – 10	2.7	3.0	n/a	n/a	2.0
All Ages	2.2	2.1	2.3	2.2	2.2
Other Dietary Constituents					
Cholesterol (mg)					
Ages 1 – 2	39	38	n/a	40	40
3	47	45	49	47	48
4	48	43	49	53	50
5	55	54	50	60	55
6 – 10	57	59	n/a	n/a	51
5 - 10	55	56	50	59	55
Sodium (mg)					
Ages 1 – 2	579	581	n/a	574	575
3	666	695	607	660	649
4	704	684	639	797	713
5	758	779	679	820	754
6 – 10	872	922	n/a	n/a	733
5 - 10	772	836	682	812	753
Number of Child Observations (Unweighted)					
Ages 1 – 2	312	167	2	143	145
3	391	90	113	188	301
4	771	72	509	190	699
5	645	54	420	171	591
6 – 10	55	29	6	20	26
All Ages	2174	412	1050	712	1762

Exhibit C.10
(continued)

n/a = Fewer than 25 child observations.

Note: For macronutrients, cholesterol, and sodium, aggregation across age groups has been limited to five-year-olds and six- to ten-year-olds (see Chapter Two).

Exhibit C.11

Mean Percentage of RDAs Provided in CACFP Lunches Consumed by Age Group

	Children Receiving Care in:									
	All Children		Family Day Care		Head Start Centers		Child Care Centers		All Centers	
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err
Total Energy										
Ages 1 – 2	23.1	0.9	23.8	1.0	n/a	n/a	21.5	1.9	21.5	1.8
3	25.6	1.3	26.4	1.9	26.6	2.0	24.8	2.1	25.1	1.8
4	20.3	0.8	20.2	1.4	19.2	0.9	21.5	1.2	20.3	0.8
5	22.6	1.0	23.5	2.5	21.1	0.8	23.7	1.3	22.5	0.9
6 – 10	25.5	1.5	27.1	1.6	n/a	n/a	n/a	n/a	20.9	1.1
All Ages	22.9	0.6	23.9	0.8	21.0	0.6	23.1	1.1	22.3	0.8
Protein										
Ages 1 – 2	87.8	2.7	88.1	3.4	n/a	n/a	86.5	5.0	86.8	5.0
3	103.8	5.3	107.4	12.0	104.1	6.9	101.4	9.2	101.9	7.9
4	74.3	3.0	74.2	6.2	71.8	2.3	77.4	5.0	74.4	2.8
5	84.6	4.2	88.8	10.6	78.7	3.0	88.4	6.3	83.8	4.3
6 – 10	87.9	6.1	91.0	8.1	n/a	n/a	n/a	n/a	79.0	8.0
All Ages	87.2	1.7	89.9	4.1	79.1	2.3	89.5	4.5	85.6	3.3
Vitamin A										
Ages 1 – 2	54.8	5.8	57.0	7.4	n/a	n/a	49.3	6.8	49.1	6.7
3	62.3	8.3	72.1	16.5	79.1	23.3	51.4	8.4	56.9	8.9
4	60.9	7.1	44.2	4.2	72.0	16.6	62.4	9.9	67.5	10.2
5	66.1	9.3	62.0	10.7	61.3	10.2	71.9	15.8	66.9	10.2
6 – 10	49.2	6.0	50.1	7.4	n/a	n/a	n/a	n/a	46.4	4.6
All Ages	60.8	4.1	57.8	6.5	68.4	10.1	59.1	8.6	62.6	7.3
Vitamin C										
Ages 1 – 2	31.1	2.1	29.3	2.5	n/a	n/a	35.7	4.7	35.6	4.7
3	34.8	5.1	35.7	9.8	33.2	3.0	34.6	7.1	34.3	5.8
4	33.5	2.0	24.3	2.6	33.7	2.6	41.1	3.5	37.2	2.4
5	37.4	3.1	33.1	4.8	37.3	4.2	39.0	4.2	38.2	3.4
6 – 10	42.7	10.1	47.3	12.5	n/a	n/a	n/a	n/a	29.7	3.3
All Ages	34.5	1.3	31.3	2.9	35.1	2.3	37.3	2.9	36.5	2.1

Exhibit C.11
(continued)

	All Children		Children Receiving Care in:							
	Mean	Std Err	Family Day Care		Head Start Centers		Child Care Centers		All Centers	
			Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err
Calcium										
Ages 1 – 2	28.8	1.3	29.7	1.6	n/a	n/a	26.6	2.0	26.6	2.0
3	30.6	2.1	31.7	2.6	33.6	2.6	29.1	3.3	30.0	2.5
4	35.5	1.7	36.4	4.3	35.0	1.0	35.3	2.2	35.1	1.1
5	39.9	2.3	37.8	3.9	37.3	1.3	42.9	4.2	40.3	2.5
6 – 10	44.3	2.8	46.1	3.5	n/a	n/a	n/a	n/a	39.2	6.1
All Ages	34.2	1.4	33.5	1.9	35.7	0.9	34.1	2.5	34.7	1.7
Iron										
Ages 1 – 2	17.7	0.9	18.0	0.9	n/a	n/a	17.0	2.0	17.1	2.0
3	21.1	1.7	21.8	4.3	20.4	2.1	20.9	2.1	20.8	1.8
4	22.0	1.0	21.5	1.3	21.7	1.6	22.8	1.6	22.2	1.3
5	25.0	1.2	25.9	2.8	24.3	1.8	25.2	1.6	24.8	1.3
6 – 10	27.1	3.5	29.8	3.6	n/a	n/a	n/a	n/a	19.5	2.2
All Ages	21.8	0.6	21.2	1.0	22.6	1.1	21.9	1.1	22.1	1.0
Number of Child Observations (Unweighted)										
Ages 1 – 2	312		167		2		143		145	
3	391		90		113		188		301	
4	771		72		509		190		699	
5	645		54		420		171		591	
6 – 10	55		29		6		20		26	
All Ages	2174		412		1050		712		1762	

n/a = Fewer than 25 child observations.

Exhibit C.12

**Mean Macronutrient, Cholesterol, and Sodium Content of
CACFP Lunches Consumed by Age Group**

	Children Receiving Care in:									
	All Children		Family Day Care		Head Start Centers		Child Care Centers		All Centers	
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err
Percent of Energy from Fat (%)										
Ages 1 – 2	35.6	0.8	36.5	1.1	n/a	n/a	33.1	1.0	33.2	1.0
3	34.3	1.3	35.8	1.4	34.5	1.1	33.1	1.9	33.4	1.5
4	33.6	0.6	33.4	1.7	32.5	0.6	35.1	1.0	33.7	0.5
5	35.5	1.3	35.1	1.8	34.3	0.9	36.6	2.4	35.5	1.6
6 – 10	34.8	1.6	36.2	1.9	n/a	n/a	n/a	n/a	30.9	0.8
5 – 10	35.4	1.3	35.6	1.3	34.4	0.9	36.1	2.4	35.3	1.6
Percent of Energy from Saturated Fat (%)										
Ages 1 – 2	15.4	0.4	15.6	0.4	n/a	n/a	14.9	0.7	14.9	0.7
3	15.0	0.6	15.4	1.0	14.9	0.7	14.7	1.0	14.7	0.8
4	14.3	0.3	14.0	0.9	14.3	0.2	14.5	0.4	14.4	0.2
5	15.4	0.8	13.9	0.9	14.8	0.4	16.4	1.4	15.6	0.9
6 – 10	14.7	0.6	15.0	0.7	n/a	n/a	n/a	n/a	13.9	0.6
5 – 10	15.3	0.8	14.3	0.7	14.7	0.4	16.2	1.4	15.6	0.9
Percent of Energy from Carbohydrate (%)										
Ages 1 – 2	47.4	0.8	47.1	0.9	n/a	n/a	48.0	1.8	47.9	1.8
3	47.0	1.4	45.7	1.5	47.2	1.1	47.8	2.1	47.7	1.6
4	47.6	0.5	47.6	1.6	48.6	0.7	46.5	0.6	47.6	0.4
5	45.7	1.7	46.2	2.3	46.4	1.2	44.9	2.9	45.6	2.0
6 – 10	47.3	1.5	46.8	1.9	n/a	n/a	n/a	n/a	48.7	2.4
5 – 10	45.9	1.6	46.5	1.6	46.3	1.2	45.2	2.9	45.7	2.0
Percent of Energy from Protein (%)										
Ages 1 – 2	18.9	0.6	18.2	0.5	n/a	n/a	20.5	1.0	20.6	1.0
3	20.0	0.4	19.7	1.0	19.3	0.9	20.4	0.7	20.1	0.5
4	20.0	0.4	19.9	0.8	20.3	0.5	19.6	0.7	20.0	0.4
5	20.2	0.4	20.1	1.5	20.6	0.4	19.8	0.6	20.2	0.4
6 – 10	19.2	0.7	18.4	1.1	n/a	n/a	n/a	n/a	21.5	1.5
5 – 10	20.1	0.4	19.4	1.0	20.6	0.4	20.0	0.6	20.3	0.4

Exhibit C.12
(continued)

	Children Receiving Care in:									
	All Children		Family Day Care		Head Start Centers		Child Care Centers		All Centers	
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err
Cholesterol (mg)										
Ages 1 – 2	39.1	1.7	38.5	2.0	n/a	n/a	40.4	2.7	40.5	2.7
3	46.7	3.2	45.2	3.3	49.4	5.6	47.1	5.6	47.6	4.6
4	48.4	2.5	43.4	3.4	48.5	2.2	52.5	4.7	50.4	2.7
5	55.1	3.7	54.2	6.0	50.2	1.9	59.7	5.7	55.3	3.7
6 – 10	56.9	4.1	59.0	5.1	n/a	n/a	n/a	n/a	51.0	6.6
5 – 10	55.3	3.3	56.2	4.0	50.3	1.9	59.1	5.7	55.1	3.7
Sodium (mg)										
Ages 1 – 2	579.3	18.8	581.0	23.0	n/a	n/a	574.5	33.5	575.2	33.4
3	665.6	53.3	695.3	121.4	606.6	58.6	660.0	62.2	649.4	52.3
4	704.5	26.0	684.3	51.9	639.0	35.2	796.6	40.7	712.5	28.9
5	757.9	28.8	779.5	61.1	678.9	39.2	819.8	38.6	753.7	32.8
6 – 10	872.1	73.7	921.7	92.0	n/a	n/a	n/a	n/a	733.1	78.4
5 – 10	772.5	26.8	836.4	50.2	681.5	39.3	811.9	39.0	752.8	32.7
Number of Child Observations (Unweighted)										
Ages 1 – 2	312		167		2		143		145	
3	391		90		113		188		301	
4	771		72		509		190		699	
5	645		54		420		171		591	
6 – 10	55		29		6		20		26	
5 – 10	700		83		426		191		617	

n/a = Fewer than 25 child observations.

Note: Aggregation across age groups has been limited to five-year-olds and six- to ten-year-olds (see Chapter Two).

Exhibit C.13

Mean Percentage of Available Morning Snack Nutrients Actually Consumed¹

	All Children	Children Receiving Care in:			
		Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
Total Energy					
Ages 1 – 2	84%	82%	n/a	96%	96%
3	86	92	n/a	77	77
4	81	n/a	86%	75	77
5	88	n/a	92	88	89
6 – 10	n/a	n/a	n/a	n/a	n/a
All Ages	85	87	89	83	84
Protein					
Ages 1 – 2	83	81	n/a	95	95
3	84	90	n/a	74	74
4	80	n/a	85	74	76
5	91	n/a	89	92	91
6 – 10	n/a	n/a	n/a	n/a	n/a
All Ages	85	86	86	84	84
Vitamin A					
Ages 1 – 2	83	81	n/a	96	96
3	83	92	n/a	70	70
4	79	n/a	84	72	74
5	92	n/a	88	94	93
6 – 10	n/a	n/a	n/a	n/a	n/a
All Ages	85	87	85	84	84
Vitamin C					
Ages 1 – 2	87%	85%	n/a	95%	95%
3	85	93	n/a	74	74
4	84	n/a	80%	82	82
5	91	n/a	95	94	94
6 – 10	n/a	n/a	n/a	n/a	n/a
All Ages	87	87	87	87	87
Calcium					
Ages 1 – 2	83	80	n/a	95	95
3	82	90	n/a	71	71
4	80	n/a	87	73	76
5	93	n/a	93	93	93
6 – 10	n/a	n/a	n/a	n/a	n/a
All Ages	85	86	89	84	85
Iron					
Ages 1 – 2	84	82	n/a	96	96
3	88	94	n/a	79	80
4	82	n/a	82	77	78
5	88	n/a	91	89	89
6 – 10	n/a	n/a	n/a	n/a	n/a
All Ages	86	87	88	85	85
Number of Child Observations (Unweighted)					
Ages 1 – 2	86	57	0	29	29
3	101	43	7	51	58
4	132	21	63	48	111
5	97	10	54	33	87
6 – 10	15	6	0	9	9
All Ages	431	137	124	170	294

n/a = Fewer than 25 child observations.

¹Available nutrients defined as nutrients in total amount of food taken, including second helpings in family style service.

Exhibit C.14

Mean Percentage of Available Afternoon Snack Nutrients Actually Consumed¹

	Children Receiving Care in:				
	All Children	Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
Total Energy					
Ages 1 – 2	80%	80%	n/a	82%	82%
3	75	72	78%	77	78
4	84	91	78	81	80
5	84	91	83	82	82
6 – 10	89	96	n/a	83	83
All Ages	82	84	79	81	81
Protein					
Ages 1 – 2	78	78	n/a	79	79
3	74	71	76	76	76
4	82	90	76	80	78
5	84	89	82	83	83
6 – 10	90	97	n/a	83	83
All Ages	81	84	78	80	80
Vitamin A					
Ages 1 – 2	80	81	n/a	78	78
3	78	73	80	82	82
4	82	85	79	82	81
5	80	88	82	76	78
6 – 10	91	96	n/a	87	87
All Ages	82	84	80	81	81
Vitamin C					
Ages 1 – 2	84%	82%	n/a	89%	89%
3	74	74	80%	74	75
4	83	89	82	79	80
5	82	90	86	77	79
6 – 10	88	96	n/a	83	83
All Ages	82	85	83	79	80
Calcium					
Ages 1 – 2	79	78	n/a	81	81
3	75	71	75	77	77
4	84	91	80	81	81
5	84	89	80	83	82
6 – 10	89	97	n/a	82	82
All Ages	82	84	79	81	80
Iron					
Ages 1 – 2	81	80	n/a	82	82
3	75	71	77	76	76
4	82	89	74	81	78
5	83	91	83	80	81
6 – 10	89	95	n/a	84	84
All Ages	81	84	78	80	80
Number of Child Observations (Unweighted)					
Ages 1 – 2	277	141	2	134	136
3	312	79	60	173	233
4	473	64	251	158	409
5	371	52	178	141	319
6 – 10	131	63	4	64	68
All Ages	1564	399	495	670	1165

n/a = Fewer than 25 child observations.

¹Available nutrients defined as nutrients in afternoon snacks taken, including second helpings in family-style service.

Exhibit C.15

**Mean Energy and Nutrient Intake from CACFP Morning Snacks
by Age Group**

	All Children	Children Receiving Care in:				
		Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers	
Total Energy (kcal)						
Ages 1 – 2	151	151	n/a	150	150	
3	147	166	n/a	125	120	
4	143	n/a	124	125	125	
5	191	n/a	158	199	193	
6 – 10	n/a	n/a	n/a	n/a	n/a	
All ages	161	165	136	162	158	
Protein (gm)						
Ages 1 – 2	3.6	3.7	n/a	3.1	3.1	
3	3.9	4.2	n/a	3.6	3.5	
4	4.1	n/a	3.7	3.7	3.7	
5	5.4	n/a	2.9	5.6	5.2	
6 – 10	n/a	n/a	n/a	n/a	n/a	
All ages	4.7	4.4	3.3	4.8	3.6	
Vitamin A (mcg RE)						
Ages 1 – 2	45	41	n/a	65	65	
3	45	44	n/a	46	45	
4	41	n/a	52	25	31	
5	71	n/a	33	76	70	
6 – 10	n/a	n/a	n/a	n/a	n/a	
All Ages	51	49	41	54	53	
Vitamin C (mg)						
Ages 1 – 2	11	11	n/a	15	15	
3	13	13	n/a	16	15	
4	23	n/a	15	27	25	
5	25	n/a	36	24	26	
6 – 10	n/a	n/a	n/a	n/a	n/a	
All Ages	19	13	25	23	24	
Calcium (mg)						
Ages 1 – 2	99	101	n/a	89	89	
3	102	114	n/a	88	84	
4	75	n/a	91	48	56	
5	135	n/a	52	142	128	
6 – 10	n/a	n/a	n/a	n/a	n/a	
All Ages	104	117	66	100	95	
Iron (mg)						
Ages 1 – 2	0.9	0.8	n/a	1.6	1.6	
3	0.8	0.9	n/a	0.8	0.8	
4	0.8	n/a	0.6	0.7	0.7	
5	0.9	n/a	1.1	0.9	1.0	
6 – 10	n/a	n/a	n/a	n/a	n/a	
All ages	0.9	0.9	0.8	0.9	0.9	
Number of Child Observations (Unweighted)						
Ages 1 – 2	86	57	0	29	29	
3	101	43	7	51	58	
4	132	21	63	48	111	
5	97	10	54	33	87	
6 – 10	15	6	0	9	9	
All Ages	431	137	124	170	294	

n/a = Fewer than 25 child observations.

Exhibit C.16

**Mean Percentages of RDAs Provided in CACFP Morning Snacks
Consumed by Age Group**

	Children Receiving Care in:									
	All Children		Family Day Care		Head Start Centers		Child Care Centers		All Centers	
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err
Total Energy										
Ages 1 – 2	11.6	0.9	11.6	1.0	n/a	n/a	11.6	2.4	11.6	2.4
3	11.3	0.9	12.8	1.3	n/a	n/a	9.6	1.5	9.2	1.4
4	8.0	1.0	n/a	n/a	6.9	1.1	6.9	1.0	6.9	0.9
5	10.6	0.6	n/a	n/a	8.8	1.4	11.1	0.8	10.7	0.7
6 – 10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
All Ages	10.4	0.4	11.7	0.7	7.7	1.1	9.7	0.8	9.4	0.7
Protein										
Ages 1 – 2	22.7	3.7	23.3	4.3	n/a	n/a	19.1	3.3	19.1	3.3
3	24.5	2.3	26.3	4.3	n/a	n/a	22.7	3.0	21.9	3.0
4	17.1	3.0	n/a	n/a	15.5	2.7	15.3	4.5	15.4	3.7
5	22.3	1.8	n/a	n/a	12.1	2.8	23.4	1.4	21.6	2.0
6 – 10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
All Ages	21.8	1.6	24.6	3.2	13.3	2.6	20.7	1.9	19.6	1.9
Vitamin A										
Ages 1 – 2	11.2	1.8	10.3	1.5	n/a	n/a	16.3	6.5	16.3	6.5
3	11.2	1.6	11.0	3.1	n/a	n/a	11.5	2.0	11.4	1.9
4	8.2	1.1	n/a	n/a	10.5	3.1	5.1	1.5	6.1	1.6
5	14.2	2.3	n/a	n/a	6.7	2.9	15.3	2.2	13.9	2.3
6 – 10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
All Ages	11.2	1.1	11.3	1.5	8.4	2.9	11.6	1.9	11.1	1.8
Vitamin C										
Ages 1 – 2	28.3	4.6	26.6	4.9	n/a	n/a	37.2	8.8	37.2	8.8
3	33.7	6.0	31.3	7.6	n/a	n/a	39.7	10.2	37.0	9.3
4	51.7	6.8	n/a	n/a	33.6	11.5	60.7	8.4	55.6	6.9
5	55.3	14.9	n/a	n/a	80.5	18.4	52.8	15.8	57.2	15.1
6 – 10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
All Ages	44.1	6.1	31.7	6.5	55.5	16.9	53.2	8.6	53.5	8.4

**Exhibit C.16
(continued)**

	All Children		Children Receiving Care in:							
	Mean	Std Err	Family Day Care		Head Start Centers		Child Care Centers		All Centers	
			Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err
Calcium										
Ages 1 – 2	12.4	2.6	12.6	3.1	n/a	n/a	11.1	2.3	11.1	2.3
3	12.7	1.6	14.3	2.7	n/a	n/a	11.0	2.6	10.5	2.5
4	9.4	1.0	n/a	n/a	11.4	2.4	6.1	1.1	7.1	1.2
5	16.9	2.7	n/a	n/a	6.5	2.3	17.8	2.0	16.0	2.4
6 – 10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
All Ages	13.1	1.7	14.6	2.6	8.2	2.4	12.5	2.0	11.9	1.9
Iron										
Ages 1 – 2	9.0	1.4	7.6	0.6	n/a	n/a	16.3	7.1	16.3	7.1
3	8.5	0.9	8.7	1.0	n/a	n/a	8.5	1.3	8.1	1.3
4	8.1	1.4	n/a	n/a	6.1	1.6	7.0	2.0	6.8	1.6
5	9.5	1.2	n/a	n/a	11.0	3.3	9.5	1.4	9.7	1.4
6 – 10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
All Ages	8.8	0.8	8.6	0.6	8.4	2.3	9.0	1.4	9.0	1.2
Number of Child Observations (Unweighted)										
Ages 1 – 2	86		57		0		29		29	
3	101		43		7		51		58	
4	132		21		63		48		111	
5	97		10		54		33		87	
6 – 10	15		6		0		9		9	
All Ages	431		137		124		170		294	

n/a = Fewer than 25 child observations.

Exhibit C.17

**Mean Energy and Nutrient Intake from CACFP Afternoon Snacks
by Age Group**

	All Children	Children Receiving Care in:			
		Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
Total Energy (kcal)					
Ages 1 – 2	145	147	n/a	142	142
3	155	154	135	160	156
4	169	191	154	161	158
5	173	228	146	164	159
6 – 10	224	242	n/a	210	209
All Ages	172	182	147	169	164
Protein (gm)					
Ages 1 – 2	3.7	3.8	n/a	3.5	3.5
3	3.9	4.5	4.2	3.3	3.5
4	4.9	5.0	4.5	5.3	4.9
5	5.2	6.9	3.5	5.2	4.7
6 – 10	6.8	7.5	n/a	6.2	6.2
All ages	4.6	4.8	4.3	4.2	4.1
Vitamin A (mcg RE)					
Ages 1 – 2	53	56	n/a	45	45
3	62	73	97	48	55
4	63	57	70	63	66
5	65	106	41	59	54
6 – 10	150	191	n/a	118	118
All Ages	76	90	66	67	67
Vitamin C (mg)					
Ages 1 – 2	10	8	n/a	13	13
3	8	7	9	9	9
4	14	16	15	10	12
5	13	23	16	8	10
6 – 10	23	16	n/a	28	27
All Ages	13	13	14	13	14
Calcium (mg)					
Ages 1 – 2	103	109	n/a	90	89
3	101	125	112	82	87
4	123	117	104	143	126
5	136	190	70	142	122
6 – 10	175	201	n/a	156	155
All Ages	126	139	94	123	117
Iron (mg)					
Ages 1 – 2	0.9	0.9	n/a	0.7	0.7
3	0.8	0.9	0.7	0.7	0.7
4	0.8	1.0	0.8	0.7	0.8
5	0.9	1.4	0.8	0.8	0.8
6 – 10	0.9	1.0	n/a	0.8	0.8
All Ages	0.9	1.0	0.8	0.8	0.8
Number of Child Observations (Unweighted)					
Ages 1 – 2	277	141	2	134	136
3	312	79	60	173	233
4	473	64	251	158	409
5	371	52	178	141	319
6 – 10	131	63	4	64	68

**Exhibit C.17
(continued)**

	All Children	Children Receiving Care in:			All Centers
		Family Day Care Homes	Head Start Centers	Child Care Centers	
All Ages	1564	399	495	670	1165

n/a = Fewer than 25 child observations.

Exhibit C.18

Mean Percentage of RDAs Provided in CACFP Afternoon Snacks Consumed by Age Group

	Children Receiving Care in:									
	All Children		Family Day Care		Head Start Centers		Child Care Centers		All Centers	
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err
Total Energy										
Ages 1 – 2	11.2	0.7	11.3	0.8	n/a	n/a	10.9	1.3	10.9	1.3
3	11.9	0.8	11.8	1.2	10.4	1.0	12.3	1.0	12.0	0.9
4	9.4	0.4	10.6	0.8	8.5	0.4	8.9	0.5	8.8	0.4
5	9.6	0.9	12.7	1.4	8.1	0.5	9.1	1.1	8.8	0.9
6 – 10	11.4	1.0	12.4	0.6	n/a	n/a	10.6	1.7	10.6	1.7
All Ages	10.7	0.5	11.6	0.4	8.7	0.3	10.5	0.8	10.1	0.7
Protein										
Ages 1 – 2	23.1	1.8	23.6	2.1	n/a	n/a	21.9	3.0	21.8	3.0
3	24.1	2.5	28.4	3.3	26.5	3.7	20.9	3.4	21.7	3.3
4	20.6	1.6	20.6	3.0	18.6	1.8	22.0	3.0	20.6	2.0
5	21.6	2.7	28.7	3.6	14.7	2.8	21.6	3.3	19.7	2.8
6 – 10	25.1	3.9	28.2	2.1	n/a	n/a	22.7	6.9	22.6	6.9
All Ages	22.8	1.7	25.4	1.9	18.7	2.0	21.7	2.9	21.1	2.4
Vitamin A										
Ages 1 – 2	13.2	2.3	14.1	3.1	n/a	n/a	11.2	2.5	11.3	2.4
3	15.4	1.9	18.2	3.7	24.2	7.9	12.0	2.7	13.8	2.3
4	12.6	1.7	11.4	2.4	14.0	4.7	12.5	2.5	13.2	2.6
5	13.0	2.4	21.3	4.4	8.2	2.8	11.9	2.2	10.9	1.9
6 – 10	22.7	4.4	29.5	8.7	n/a	n/a	17.3	2.8	17.3	2.7
All Ages	15.2	1.3	18.0	2.5	13.9	4.8	13.1	1.3	13.3	1.1
Vitamin C										
Ages 1 – 2	24.9	5.0	21.0	4.6	n/a	n/a	33.4	7.2	33.4	7.2
3	20.4	3.5	17.6	4.1	22.8	6.4	21.8	5.8	22.0	4.9
4	30.4	6.2	36.3	16.5	32.9	8.0	23.0	5.7	27.2	3.1
5	28.8	5.4	51.1	15.3	35.3	7.5	18.0	5.2	22.9	3.9
6 – 10	50.2	8.1	36.4	8.5	n/a	n/a	61.5	10.3	61.1	10.2
All Ages	30.2	3.4	29.0	6.7	31.7	6.5	30.8	4.6	31.0	3.8

**Exhibit C.18
(continued)**

	All Children		Children Receiving Care in:							
	Mean	Std Err	Family Day Care		Head Start Centers		Child Care Centers		All Centers	
			Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err
Calcium										
Ages 1 – 2	12.9	1.1	13.7	1.3	n/a	n/a	11.2	1.7	11.2	1.7
3	12.6	1.5	15.6	1.8	14.1	2.9	10.3	2.0	10.9	2.0
4	15.4	1.5	14.6	2.9	13.0	1.3	17.9	2.6	15.8	1.7
5	17.0	2.6	23.7	4.2	8.7	2.3	17.8	3.0	15.2	2.5
6 – 10	21.9	3.8	25.1	2.7	n/a	n/a	19.5	6.5	19.4	6.4
All Ages	15.7	1.4	17.3	1.6	11.8	1.6	15.3	2.4	14.6	1.9
Iron										
Ages 1 – 2	8.7	1.6	9.4	2.3	n/a	n/a	7.3	1.1	7.3	1.1
3	7.8	0.8	9.0	1.9	6.8	1.0	7.2	0.7	7.2	0.7
4	8.5	0.7	10.3	1.6	7.7	0.4	7.4	0.7	7.5	0.5
5	9.1	1.5	14.2	4.3	7.7	0.8	7.8	1.1	7.8	1.0
6 – 10	9.1	0.7	10.4	1.0	n/a	n/a	8.1	0.8	8.0	0.8
All Ages	8.6	0.7	10.1	1.2	7.5	0.4	7.6	0.5	7.6	0.4
Number of Child Observations (Unweighted)										
Ages 1 – 2	277		141		2		134		136	
3	312		79		60		173		233	
4	473		64		251		158		409	
5	371		52		178		141		319	
6 – 10	131		63		4		64		68	
All Ages	1564		399		495		670		1165	

n/a = Fewer than 25 child observations.

Exhibit C.19

**Mean Energy and Nutrient Intake from All CACFP Meals and Snacks Consumed by Children
in Care Four to Eight Hours per Day by Age Group**

	Children Receiving Care in:				
	All Children	Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
Total Energy (kcal)					
Ages 1 – 2	453	415	n/a	529	529
3	533	n/a	586	482	520
4	591	n/a	614	484	571
5	581	n/a	650	388	548
6 – 10	545	n/a	n/a	n/a	446
All Ages	560	596	625	456	550
Total Fat (gm)					
Ages 1 – 2	16.6	15.9	n/a	17.9	18.0
3	18.1	n/a	20.6	16.2	17.8
4	20.4	n/a	21.2	18.1	20.2
5	20.0	n/a	23.0	12.4	18.9
6 – 10	20.2	n/a	n/a	n/a	16.1
All Ages	20.0	31.9	23.0	12.4	18.9
Saturated Fat (gm)					
Ages 1 – 2	7.3	7.0	n/a	8.0	8.0
3	7.5	n/a	9.0	6.6	7.5
4	8.6	n/a	9.3	7.1	8.6
5	8.4	n/a	9.6	5.0	7.8
6 – 10	9.0	n/a	n/a	n/a	7.8
All Ages	8.4	14.2	9.6	5.0	7.8
Carbohydrate (gm)					
Ages 1 – 2	59.8	52.9	n/a	74.4	74.0
3	73.4	n/a	76.9	67.0	70.7
4	80.0	n/a	81.5	62.3	75.1
5	78.2	n/a	85.7	55.3	73.9
6 – 10	70.2	n/a	n/a	n/a	58.6
All Ages	78.2	122.8	85.7	55.3	73.9
Protein (gm)					
Ages 1 – 2	18.1	17.0	n/a	20.3	20.5
3	21.1	n/a	25.0	18.9	21.1
4	24.2	n/a	26.4	20.0	24.3
5	24.3	n/a	27.6	15.6	22.9
6 – 10	23.1	n/a	n/a	n/a	19.4
All Ages	24.3	38.4	27.6	15.6	22.9
Vitamin A (mcg RE)					
Ages 1 – 2	346	326	n/a	391	387
3	343	n/a	571	225	353
4	408	n/a	501	259	421
5	365	n/a	436	207	346
6 – 10	374	n/a	n/a	n/a	363
All Ages	375	363	482	247	378

**Exhibit C.19
(continued)**

	Children Receiving Care in:				
	All Children	Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
Vitamin C (mg)					
Ages 1 – 2	29	24	n/a	41	41
3	29	n/a	36	25	29
4	41	n/a	40	40	40
5	41	n/a	46	32	40
6 – 10	43	n/a	n/a	n/a	43
All Ages	38	36	42	33	38
Calcium (mg)					
Ages 1 – 2	370	350	n/a	415	411
3	390	n/a	496	330	391
4	445	n/a	496	347	447
5	449	n/a	503	274	414
6 – 10	481	n/a	n/a	n/a	439
All Ages	427	446	498	325	422
Iron (mg)					
Ages 1 – 2	3.2	2.5	n/a	4.5	4.5
3	3.3	n/a	3.8	2.8	3.2
4	4.0	n/a	4.4	3.0	3.9
5	3.8	n/a	4.3	2.6	3.6
6 – 10	3.0	n/a	n/a	n/a	2.3
All Ages	3.7	3.7	4.3	3.0	3.7
Cholesterol (mg)					
Ages 1 – 2	57	55	n/a	60	61
3	67	n/a	98	53	70
4	73	n/a	85	55	75
5	70	n/a	84	38	66
6 – 10	67	n/a	n/a	n/a	47
All Ages	70	112	84	38	66
Sodium (mg)					
Ages 1 – 2	693	617	n/a	845	847
3	781	n/a	897	678	759
4	906	n/a	962	767	897
5	893	n/a	1008	575	839
6 – 10	817	n/a	n/a	n/a	656
All Ages	893	1449	1008	575	839
Sample Size (unweighted)					
Ages 1 – 2	62	26	2	34	36
3	173	20	100	53	153
4	525	21	436	68	504
5	440	13	366	61	427
6 – 10	54	24	8	22	30
All Ages	1200	80	904	216	1120

n/a = Fewer than 25 child observations.

Note: School-age-children (six- to ten-year olds) not included in part-day tabulations.

Exhibit C.20

**Mean Percentages of RDAs Provided in All Meals and Snacks
Consumed by Children in Care Four to Eight Hours per Day by Age Group**

	Children Receiving Care in:									
	All Children		Family Day Care		Head Start Centers		Child Care Centers		All Centers	
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err
Total Energy										
Ages 1 – 2	34.8	2.7	31.9	3.9	n/a	n/a	40.7	5.3	40.7	5.2
3	41.0	2.3	n/a	n/a	45.1	2.9	37.1	3.4	40.0	2.6
4	32.8	2.3	n/a	n/a	34.1	1.1	26.9	4.2	31.7	2.2
5	32.3	4.9	n/a	n/a	36.1	2.1	21.6	6.1	30.4	4.1
6 – 10	28.6	5.7	n/a	n/a	n/a	n/a	n/a	n/a	22.6	7.4
All Ages	34.4	2.4	38.6	2.7	36.3	1.0	29.4	5.1	33.2	2.8
Protein										
Ages 1 – 2	113.3	9.6	106.2	14.6	n/a	n/a	127.1	16.6	127.9	16.3
3	131.6	8.3	n/a	n/a	156.4	9.8	117.9	13.5	132.1	10.0
4	100.9	6.5	n/a	n/a	109.9	3.4	83.3	15.5	101.1	7.9
5	101.4	16.9	n/a	n/a	115.2	5.1	65.2	24.3	95.6	14.7
6 – 10	88.6	24.0	n/a	n/a	n/a	n/a	n/a	n/a	70.8	31.9
All Ages	108.3	8.1	115.6	5.6	118.0	3.4	91.3	19.6	106.2	10.6
Vitamin A										
Ages 1 – 2	86.6	18.0	81.5	25.5	n/a	n/a	97.7	19.7	96.9	19.3
3	85.7	11.4	n/a	n/a	142.8	24.8	56.1	5.8	88.2	13.7
4	81.7	7.1	n/a	n/a	100.2	8.0	51.8	12.2	84.2	9.3
5	73.0	12.3	n/a	n/a	87.1	9.0	41.4	14.8	69.3	10.7
6 – 10	61.5	13.2	n/a	n/a	n/a	n/a	n/a	n/a	54.2	15.3
All Ages	80.2	5.2	81.3	8.5	100.0	6.7	54.5	11.4	79.8	8.1
Vitamin C										
Ages 1 – 2	73.6	11.0	59.8	9.0	n/a	n/a	102.1	21.3	101.7	20.8
3	73.1	7.9	n/a	n/a	89.8	8.6	62.8	13.0	72.8	9.8
4	91.7	7.2	n/a	n/a	88.8	6.1	88.0	14.5	88.5	6.3
5	91.2	10.0	n/a	n/a	101.5	13.7	70.4	7.7	89.4	9.1
6 – 10	95.7	15.8	n/a	n/a	n/a	n/a	n/a	n/a	96.3	20.2
All Ages	85.9	5.3	83.6	12.0	94.3	6.9	76.8	7.0	86.5	5.2

**Exhibit C.20
(continued)**

	Children Receiving Care in:									
	All Children		Family Day Care		Head Start Centers		Child Care Centers		All Centers	
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err
Calcium										
Ages 1 – 2	46.2	4.5	43.7	7.0	n/a	n/a	51.9	6.1	51.4	6.0
3	48.7	2.6	n/a	n/a	62.0	4.5	41.3	4.5	48.9	2.9
4	55.6	3.6	n/a	n/a	62.0	2.2	43.4	7.6	55.8	4.4
5	56.1	9.2	n/a	n/a	62.9	2.2	34.2	10.0	51.7	6.9
6 – 10	60.2	18.4	n/a	n/a	n/a	n/a	n/a	n/a	54.9	25.4
All Ages	53.4	4.0	55.8	5.4	62.3	1.6	40.7	6.5	52.7	4.2
Iron										
Ages 1 – 2	31.7	3.5	25.2	4.1	n/a	n/a	45.3	8.9	45.2	8.7
3	33.4	1.6	n/a	n/a	37.5	2.7	28.1	2.9	31.5	2.2
4	39.6	4.2	n/a	n/a	44.0	3.9	29.5	6.8	39.2	4.8
5	38.0	6.3	n/a	n/a	43.0	2.3	26.2	8.7	36.4	5.1
6 – 10	30.4	6.7	n/a	n/a	n/a	n/a	n/a	n/a	23.5	8.1
All Ages	37.0	3.3	36.9	3.5	42.8	2.3	29.8	5.4	37.0	3.6
Sample Size										
Ages 1 – 2	62		26		2		34		36	
3	173		20		100		53		153	
4	525		21		436		68		504	
5	440		13		366		61		427	
6 – 10	54		24		8		22		30	
All Ages	1200		80		904		216		1120	

n/a = Fewer than 25 child observations.

Note: School-age children (six- to ten-year-olds) not included in part-day tabulations.

Exhibit C.21

Mean Macronutrient, Cholesterol, and Sodium Content of All CACFP Meals and Snacks Consumed by Children in Care Four to Eight Hours per Day by Age Group

	Children Receiving Care in:									
	All Children		Family Day Care Centers		Head Start Centers		Child Care Centers		All Centers	
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err
Percent of Energy from Fat (%)										
Ages 1 – 2	33.6	1.4	35.3	1.5	n/a	n/a	30.2	1.7	30.3	1.6
3	29.4	1.4	n/a	n/a	30.7	1.1	29.2	1.6	29.7	1.1
4	29.6	0.9	n/a	n/a	29.9	0.7	29.0	2.1	29.6	0.8
5	29.3	1.3	n/a	n/a	31.6	1.0	25.3	1.7	29.1	1.3
6 – 10	30.6	3.9	n/a	n/a	n/a	n/a	n/a	n/a	29.6	5.8
All Ages	29.3	1.3	n/a	n/a	31.6	1.0	25.3	1.7	29.1	1.3
Percent of Energy from Saturated Fat (%)										
Ages 1 – 2	15.3	0.7	16.0	0.8	n/a	n/a	13.9	0.9	13.9	0.9
3	12.3	0.5	n/a	n/a	13.5	0.5	12.0	0.7	12.6	0.4
4	12.6	0.5	n/a	n/a	13.2	0.3	11.6	1.0	12.7	0.4
5	12.2	0.7	n/a	n/a	13.5	0.6	9.8	0.9	12.1	0.7
6 – 10	14.4	2.3	n/a	n/a	n/a	n/a	n/a	n/a	15.1	3.3
All Ages	12.2	0.7	n/a	n/a	13.5	0.6	9.8	0.9	12.1	0.7
Percent of Energy from Carbohydrates (%)										
Ages 1 – 2	51.9	1.9	49.9	2.1	n/a	n/a	56.2	2.2	55.9	2.2
3	56.3	1.6	n/a	n/a	53.7	0.9	56.7	2.3	55.6	1.3
4	56.0	1.6	n/a	n/a	54.6	0.9	57.8	4.1	55.6	1.6
5	56.4	2.2	n/a	n/a	52.3	1.4	63.2	3.2	56.6	2.3
6 – 10	57.8	6.1	n/a	n/a	n/a	n/a	n/a	n/a	60.2	8.9
All Ages	56.4	2.2	n/a	n/a	52.3	1.4	63.2	3.2	56.6	2.3
Percent of Energy from Protein (%)										
Ages 1 – 2	16.4	0.5	16.7	0.6	n/a	n/a	15.8	0.8	15.9	0.8
3	15.9	0.7	n/a	n/a	17.1	0.6	15.7	1.1	16.2	0.8
4	16.1	0.7	n/a	n/a	17.2	0.3	15.1	1.8	16.5	0.8
5	16.2	0.9	n/a	n/a	17.6	0.5	13.9	1.6	16.1	1.0
6 – 10	14.5	2.4	n/a	n/a	n/a	n/a	n/a	n/a	13.8	3.3
All Ages	16.2	0.9	n/a	n/a	17.6	0.5	13.9	1.6	16.1	1.0

Exhibit C.21
(continued)

	Children Receiving Care in:									
	All Children		Family Day Care Centers		Head Start Centers		Child Care Centers		All Centers	
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err
Cholesterol (mg)										
Ages 1 – 2	56.9	5.4	55.1	7.0	n/a	n/a	60.0	9.2	60.5	9.0
3	67.4	7.0	n/a	n/a	98.3	23.2	53.2	7.1	69.9	9.0
4	73.5	5.9	n/a	n/a	85.0	5.3	55.2	10.2	75.1	5.8
5	70.0	13.0	n/a	n/a	83.7	4.0	38.2	16.3	65.9	11.2
6 – 10	67.5	15.7	n/a	n/a	n/a	n/a	n/a	n/a	46.7	17.5
All Ages	70.0	13.0	n/a	n/a	83.7	4.0	38.2	16.3	65.9	11.2
Sodium (mg)										
Ages 1 – 2	692.7	59.1	616.9	100.6	n/a	n/a	845.1	94.9	847.3	92.8
3	781.0	54.4	n/a	n/a	897.0	67.5	678.2	76.3	759.0	59.0
4	906.1	73.7	n/a	n/a	961.7	55.6	766.6	157.0	897.2	87.7
5	893.1	149.9	n/a	n/a	1007.7	62.5	574.6	223.6	838.5	129.2
6 – 10	817.4	200.6	n/a	n/a	n/a	n/a	n/a	n/a	655.5	274.8
All Ages	893.1	149.9	n/a	n/a	1007.7	62.5	574.6	223.6	838.5	129.2
Sample Size										
Ages 1 – 2	62		26		2		34		36	
3	173		20		100		53		153	
4	525		21		436		68		504	
5	440		13		366		61		427	
6 – 10	54		24		8		22		30	
All Ages	440		13		366		61		427	

n/a = Fewer than 25 child observations.

Note: School-age children (six- to ten-year-olds) not included in part-day tabulations.

Exhibit C.22

Mean Energy and Nutrient Intake from All CACFP Meals and Snacks Consumed by Children in Care Eight or More Hours per Day by Age Group

	Children Receiving Care in:				
	All Children	Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
Total Energy (kcal)					
Ages 1 – 2	653	687	n/a	562	562
3	709	781	n/a	662	660
4	793	800	854	778	788
5	839	877	n/a	830	827
1 – 5	743	763	750	722	724
Macronutrients					
Total Fat (gm)					
Ages 1 – 2	22.7	24.1	n/a	19.1	19.1
3	25.0	28.3	n/a	22.8	22.8
4	26.2	25.6	29.5	26.3	26.7
5	30.1	32.3	n/a	29.6	29.4
Saturated Fat (gm)					
Ages 1 – 2	9.7	10.3	n/a	8.1	8.1
3	10.7	11.9	n/a	9.7	9.8
4	11.4	11.1	13.5	11.4	11.6
5	13.5	12.7	n/a	13.8	13.7
Carbohydrate (gm)					
Ages 1 – 2	90.6	95.0	n/a	78.7	78.7
3	95.1	102.8	n/a	90.8	89.9
4	110.2	113.7	110.0	107.3	107.6
5	111.4	114.7	n/a	110.5	110.4
Protein (gm)					
Ages 1 – 2	24.6	25.6	n/a	21.7	21.7
3	28.4	31.8	n/a	25.9	26.0
4	32.3	31.8	39.6	31.8	32.7
5	34.5	35.8	n/a	34.2	34.0
Vitamins and Minerals					
Vitamin A (mcg RE)					
Ages 1 – 2	411	438	n/a	339	339
3	467	581	n/a	393	389
4	529	472	535	577	572
5	628	677	n/a	618	613
1 – 5	501	519	462	487	485
Vitamin C (mg)					
Ages 1 – 2	37	34	n/a	47	47
3	40	40	n/a	40	41
4	54	45	49	61	60
5	55	57	n/a	54	54

**Exhibit C.22
(continued)**

	All Children	Children Receiving Care in:			All Centers
		Family Day Care Homes	Head Start Centers	Child Care Centers	
1 – 5	46	41	48	50	50

**Exhibit C.22
(continued)**

	All Children	Children Receiving Care in:			
		Family Day Care Homes	Head Start Centers	Child Care Centers	All Centers
Calcium (mg)					
Ages 1 – 2	504	540	n/a	406	406
3	541	618	n/a	485	489
4	646	645	747	633	647
5	694	633	n/a	718	714
1 – 5	588	600	634	572	576
Iron (mg)					
Ages 1 – 2	4.9	5.0	n/a	4.5	4.5
3	5.0	5.9	n/a	4.4	4.3
4	5.5	5.7	5.5	5.3	5.3
5	5.5	6.4	n/a	5.3	5.3
1 – 5	5.2	5.6	4.6	4.9	4.9
Other Dietary Constituents					
Cholesterol (mg)					
Ages 1 – 2	83	89	n/a	69	69
3	91	108	n/a	81	80
4	90	85	108	91	93
5	98	104	n/a	94	95
Sodium (mg)					
Ages 1 – 2	978	1009	n/a	876	876
3	1123	1234	n/a	1054	1047
4	1223	1153	1314	1270	1276
5	1244	1322	n/a	1228	1219
Number of Child Observations (Unweighted)					
Ages 1 – 2	256	146	0	110	110
3	218	68	14	136	150
4	201	54	25	122	147
5	170	42	18	110	128
1 – 5	845	310	57	478	535

n/a = Fewer than 25 child observations.

Note: For macronutrients, cholesterol, and sodium, aggregation across age groups has been limited to five-year-olds and six- to ten-year-olds (see Chapter Two).

Exhibit C.23

**Mean Percentage of the RDA Provided in All Meals and Snacks Consumed by Children
in Care Eight or More Hours per Day by Age Group**

	Children Receiving Care in:										
	All Children		Family Day Care		Head Start Centers		Child Care Centers		All Centers		
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	
Total Energy											
Ages 1 – 2	50.2%	1.6	52.8%	2.1	n/a	n/a	43.3%	3.0	43.3%	3.0	
3	54.5	1.8	60.0	2.5	n/a	n/a	50.9	3.4	50.7	3.1	
4	44.1	2.7	44.4	3.0	47.4%	2.7	43.2	3.6	43.8	3.3	
5	46.6	3.4	48.7	3.4	n/a	n/a	46.1	3.6	45.9	3.6	
1 – 5	49.5	1.6	52.6	1.9	47.0	2.7	46.6	2.6	46.6	2.4	
Protein											
Ages 1 – 2	153.7	5.8	160.3	7.9	n/a	n/a	135.7	7.5	135.7	7.5	
3	177.2	7.4	198.4	15.9	n/a	165.1	161.7	10.8	162.7	10.1	
4	134.7	9.6	132.4	8.9	165.1	19.2	132.3	12.9	136.4	12.7	
5	143.5	10.9	149.0	13.6	n/a	n/a	142.5	11.6	141.8	12.1	
1 – 5	154.6	4.7	163.5	7.5	160.5	16.2	145.5	8.4	146.6	8.5	
Vitamin A											
Ages 1 – 2	102.8	6.4	109.5	9.0	n/a	n/a	84.7	6.5	84.7	6.5	
3	116.8	9.7	145.3	22.8	n/a	n/a	98.2	11.0	97.2	10.0	
4	105.8	9.3	94.4	10.4	107.1	11.3	115.3	18.7	114.3	17.2	
5	125.7	21.5	135.4	21.4	n/a	n/a	123.6	25.1	122.6	24.5	
1 – 5	112.1	6.1	118.3	8.0	99.3	10.6	107.1	13.3	106.5	12.8	
Vitamin C											
Ages 1 – 2	92.7	7.5	84.0	6.9	n/a	n/a	116.3	12.9	116.3	12.9	
3	100.9	8.2	100.3	14.1	n/a	n/a	100.3	10.9	101.3	10.2	
4	119.1	9.5	101.0	14.1	107.9	23.6	136.3	14.7	132.7	12.6	
5	121.2	24.8	127.0	16.6	n/a	n/a	119.5	32.7	119.3	30.8	
1 – 5	106.3	6.6	95.7	7.3	111.4	9.5	116.3	11.0	115.9	10.2	

**Exhibit C.23
(continued)**

	Children Receiving Care in:										
	All Children		Family Day Care		Head Start Centers		Child Care Centers		All Centers		
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	
Calcium											
Ages 1 – 2	63.0%	3.6	67.5%	4.7	n/a	n/a	50.7%	4.7	50.7%	4.7	
3	67.7	3.3	77.2	5.1	n/a	n/a	60.7	4.3	61.1	3.9	
4	80.7	7.4	80.6	6.2	93.3%	8.4	79.1	9.8	80.9	9.4	
5	86.7	9.1	79.1	6.9	n/a	n/a	89.8	10.4	89.2	10.5	
1 – 5	72.8	4.4	73.7	3.7	79.3	8.3	71.5	6.6	72.1	6.4	
Iron											
Ages 1 – 2	48.7	2.7	49.9	3.6	n/a	n/a	45.4	4.9	45.4	4.9	
3	49.8	2.9	59.3	5.5	n/a	n/a	43.6	4.0	43.3	3.6	
4	54.8	4.4	56.7	9.3	55.4	4.4	53.1	3.7	53.4	2.8	
5	55.3	5.8	63.7	8.1	n/a	n/a	53.4	6.2	52.7	5.9	
1 – 5	51.6	1.8	55.0	3.1	46.3	6.4	48.8	2.8	48.6	2.6	
Number of Child Observations (Unweighted)											
Ages 1 – 2	256		146		0		110		110		
3	218		68		14		136		150		
4	201		54		25		122		147		
5	170		42		18		110		128		
1 – 5	845		310		57		478		535		

n/a = Fewer than 25 child observations.

Note: School-age children (six- to ten-year-olds) not included in full-day tabulations.

Exhibit C.24

Mean Macronutrient, Cholesterol, and Sodium Content of All Meals and Snacks Consumed by Children in Care Eight or More Hours per Day by Age Group

	Children Receiving Care in:										
	All Children		Family Day Care		Head Start Centers		Child Care Centers		All Centers		
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	
Percent of Energy from Fat (%)											
Ages 1 – 2	30.9	0.5	31.4	0.6	n/a	n/a	29.7	0.9	29.7	0.9	
3	31.4	1.0	32.4	0.9	n/a	n/a	30.3	1.5	30.6	1.4	
4	29.7	0.8	28.7	1.8	31.0	0.5	30.4	0.5	30.4	0.4	
5	32.4	0.8	32.4	1.1	n/a	n/a	32.6	1.3	32.4	1.2	
Percent of Energy from Saturated Fat (%)											
Ages 1 – 2	13.2	0.3	13.5	0.4	n/a	n/a	12.5	0.6	12.5	0.6	
3	13.5	0.5	13.7	0.7	n/a	n/a	13.1	0.7	13.3	0.6	
4	12.9	0.4	12.4	0.8	14.1	0.2	13.1	0.4	13.2	0.3	
5	14.5	0.8	12.9	0.8	n/a	n/a	15.1	0.9	15.0	0.9	
Percent of Energy from Carbohydrate (%)											
Ages 1 – 2	55.8	0.6	55.5	0.7	n/a	n/a	56.6	1.6	56.6	1.6	
3	54.1	1.3	53.1	1.4	n/a	n/a	55.2	1.8	54.8	1.8	
4	55.7	1.1	57.0	2.3	52.1	1.8	55.2	0.6	54.8	0.7	
5	52.7	1.1	53.2	1.1	n/a	n/a	52.4	1.8	52.5	1.6	
Percent of Energy from Protein (%)											
Ages 1 – 2	15.2	0.4	15.0	0.5	n/a	n/a	15.6	0.7	15.6	0.7	
3	16.0	0.5	16.0	1.0	n/a	n/a	15.8	0.5	16.0	0.6	
4	16.3	0.5	15.9	0.8	18.2	1.4	16.3	0.5	16.5	0.6	
5	16.7	0.6	16.3	1.3	n/a	n/a	16.8	0.7	16.8	0.6	

**Exhibit C.24
(continued)**

	Children Receiving Care in:										
	All Children		Family Day Care		Head Start Centers		Child Care Centers		All Centers		
	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	Mean	Std Err	
Cholesterol (mg)											
Ages 1 – 2	83.2	7.2	88.6	9.7	n/a	n/a	68.7	3.9	68.7	3.9	
3	91.5	6.2	108.1	12.2	n/a	n/a	80.7	5.4	80.1	5.0	
4	89.5	8.3	84.8	14.7	107.5	2.2	91.0	10.0	93.1	8.4	
5	97.6	8.7	104.4	16.1	n/a	n/a	94.3	9.4	95.4	9.0	
Sodium (mg)											
Ages 1 – 2	973.1	28.8	1009.0	39.3	n/a	n/a	876.1	51.5	876.1	51.5	
3	1122.8	62.8	1234.1	119.7	n/a	n/a	1054.1	71.1	1046.6	65.9	
4	1223.0	46.5	1152.9	85.1	1313.8	132.1	1270.1	45.3	1275.6	39.1	
5	1243.7	63.5	1322.2	81.9	n/a	n/a	1227.8	58.2	1218.6	64.7	
Number of Child Observations (Unweighted)											
Ages 1 – 2	256		146		0		110		110		
3	218		68		14		136		150		
4	201		54		25		122		147		
5	170		42		18		110		128		

n/a = Fewer than 25 child observations.

Note: School-age children (six- to ten-year-olds) not included in full-day tabulations.

Appendix D

Study Design

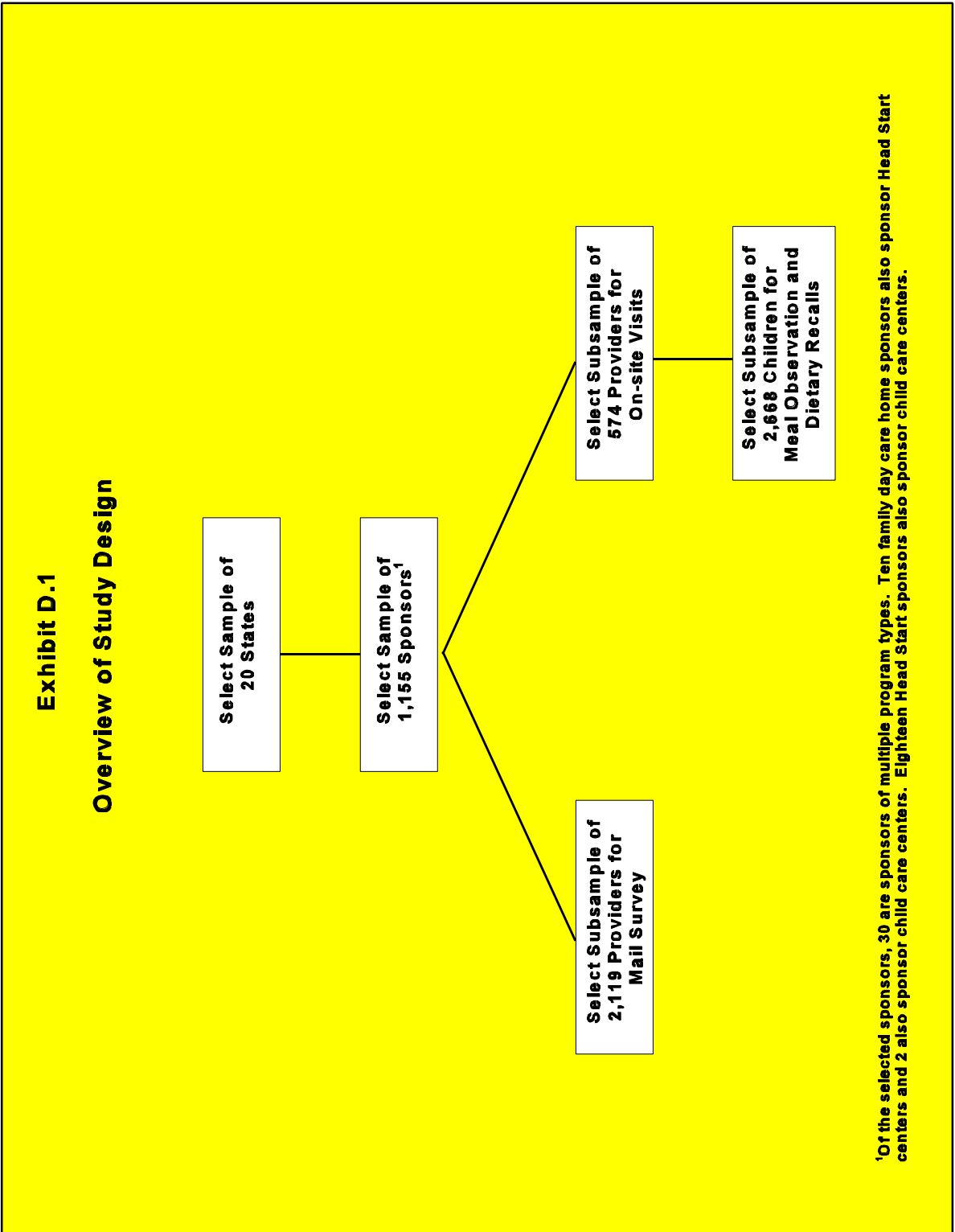
Appendix D presents a nontechnical summary of the study design for the Early Childhood and Child Care Study. A discussion of the procedures that were used to identify, select, and recruit study participants is presented in Appendix F, which also discusses survey implementation and response rates.

A multistage cluster sample design was used in this study to take advantage of the nested hierarchy of the populations of interest. The hierarchical structure is as follows: each State administers the CACFP through sponsors; sponsors¹ in turn administer the program through child care providers; child care providers, which may include family day care homes, child care centers, and Head Start centers, care for children; and finally, participating children are served CACFP-reimbursable meals and snacks by providers. Consequently, the sample was processed in four stages:

- Stage 1: Selection of States;
- Stage 2: Selection of sponsors;
- Stage 3: Selection of child care providers; and
- Stage 4: Selection of children and families.

An overview of the sample design structure for the Early Childhood and Child Care Study is shown in Exhibit D.1. Each stage of sample selection is discussed in the following sections.

¹For the purposes of this study, independent child care centers are considered sponsors.



STAGE 1: SELECTION OF STATES

The study was conducted in a nationally representative sample of 20 States. The sampling frame comprised the 48 contiguous States and the District of Columbia. Alaska and Hawaii were excluded because they account for a very small percentage of providers and participating children and the cost of collecting on-site data in these States was prohibitive.

The sample of States was selected with probability proportional to the number of CACFP meals served at homes and centers in each State. That is, States serving relatively large numbers of meals had a greater probability of being included in the sample than States serving relatively small numbers of meals. To avoid the increase in sampling variances that would result from leaving the inclusion of large States to chance, eight States with relatively large numbers of meals served were included in the sample with certainty. These large States had programs that were at least 2.5 times as large as the national average. Other States were grouped into 12 strata of approximately equal size according to region, the relative importance of homes versus centers, the relative importance of Head Start, and the ratio of reimbursements to meals served. One State was then selected from each stratum with probability proportional to the measure of size. This resulted in a sample that included States from each of the seven FCS regions (Exhibit D.2).

Exhibit D.2	
States Included in Study Sample by FCS Region	
FCS Region	States
Mid-Atlantic	Maryland
Midwest	Michigan, Minnesota, Ohio, Illinois , Indiana
Mountain Plains	Kansas , Iowa, Missouri
Northeast	Massachusetts, Maine, New York
Southeast	Georgia, Mississippi, Tennessee, North Carolina
Southwest	Texas , New Mexico
Western	California , Washington

Note: States in bold were included in the sample with certainty.

STAGE 2: SELECTION OF SPONSORS

A second-stage sample of sponsoring agencies was selected from the sample of 20 States. Sponsoring agencies were stratified by type of provider agency (homes, Head Start centers, and child care centers), and within each stratum, sponsors were selected with probability proportional to size (i.e., agencies that sponsor relatively large numbers of providers had greater probability of selection than sponsoring agencies with fewer providers).² As with States, the largest sponsors were selected with certainty in order to reduce the sampling variance.

An initial sample of 180 family day care sponsors, 419 Head Start center sponsors, and 596 child care center sponsors was drawn. Since State agencies do not distinguish between independent (i.e., self-sponsoring) child care centers (ICCCs) and sponsoring organizations that sponsor more than one center, the ICCCs were treated as sponsors for purposes of sampling at the sponsor level. The sample of 596 sponsors of child care centers included 431 ICCCs and 165 “true” sponsors. All of the sampled sponsors (including the ICCCs) were included in the Study of Sponsors and Providers.

STAGE 3: SELECTION OF CHILD CARE PROVIDERS

A third-stage sample of child care providers was selected from within each of the sampled sponsoring agencies. These providers were selected with probability proportional to size. That is, providers receiving relatively high monthly reimbursements for meals served in the CACFP had a greater probability of selection than providers receiving lower monthly meal reimbursements. A total sample of 872 homes, 1,063 Head Start centers, and 758 child care centers (including 376 ICCCs) was selected at this stage, and all were included in the Study of Sponsors and Providers.

²Practical considerations led to the use of the number of providers (within each stratum) as the measure of size. It was easier for States to provide counts of each type of provider for each sponsoring agency than other potential measures of size such as the number of meals or reimbursements by type of provider.

STAGE 4: SELECTION OF CHILDREN AND FAMILIES

The fourth and final stage of sampling involves the selection of children (and their families) to be included in the Study of Children and Families. The sample of children was selected from a subsample of the providers included in the third-stage sample. Geographic clustering was used in the selection of this subsample of providers in order to reduce data collection costs associated with site visits to observe children. To accomplish this, providers were aligned by ZIP code and then a sample of providers was selected using probability proportional to size. A total of 239 homes, 169 Head Start centers, and 166 child care centers was selected for the Study of Children and Families.

Family Day Care Homes

The selection of a sample of children from homes was straightforward. Because the number of children enrolled in homes is usually quite low, we attempted to include all children from the sample of homes. However, in cases where more than 10 children were enrolled in a home, we selected a random sample of 10 children for inclusion in the study.

Child Care Centers and Head Start Centers

Because child care centers and Head Start centers are much larger than homes, the process of sampling children in centers was somewhat more complicated. Most centers divide the children into age-specific groups (classes), with infants almost always cared for separately in child care centers. Consequently, the need to observe in-care food consumption made it impractical to select a random sample of children from across the centers as the sampled children might end up in different rooms during meal times. (Infants are almost always fed in a separate room.) To deal with this situation, an intermediate stage of sampling was used in centers—an “age-specific” group. If infants were cared for at a center, one infant was sampled and a sample of five children from one other age group were selected. If there were no infants, six children were selected from a single age group. The sample included a total of 576 children in homes, 1,188 children in Head Start centers, and 904 children in child care centers.

Appendix E

Weighting Methodology

Sampling for the Early Childhood and Child Care Study followed a multistage, multiphase design. Consequently, weights were developed for multiple sampling units, resulting in six distinct weights for data analysis. This appendix identifies the weights required for tabulating data and explains how those weights were developed.

The weights are named with the variable W and subscripts are used to denote the sample to which they apply. For example, W_{sponsor} is the weight that corresponds to the Sponsor Survey. We use Q to denote a sampling probability and add a subscript to denote where that probability applies. For example, Q_j denotes probability of selection for the j^{th} State, and Q_{ij} denotes the conditional probability of selection for the i^{th} sponsor in the j^{th} State, given that the j^{th} State was selected for the sample. These sampling probabilities were adjusted for nonresponse and other factors. The adjusted sampling probabilities are denoted by P with subscripts that match their Q counterparts. This and additional notation used in this appendix are summarized below.

- W W denotes a sampling weight. A subscript is added to indicate the survey to which that weight applies. For example, W_{sponsor} is the weight for the Sponsor Survey.
- Q Q denotes the conditional sampling probability. Subscripts indicate the sampling stage at which the probability applies. For example, $Q_{i|h}$ denotes the conditional probability of selection for the i^{th} provider given that the sample was of the h^{th} provider type and was drawn from the j^{th} State.
- P P denotes the conditional sampling probability after applying an adjustment for nonrespondents and other special sampling issues. Subscripts conform to conventions established with Q .
- h Subscript that denotes the type of sponsor (family day care home sponsor, Head Start center sponsor, or child care center sponsor).
- i Subscript that denotes the i^{th} sponsor given the sponsor type (h) and State (j).
- j Subscript that denotes the j^{th} State.
- k Subscript that denotes the k^{th} program in the full provider sample given the State (j), sponsor type (h), and specific sponsor (i).

- m* Subscript that denotes the m^{th} program in the on-site provider sample given the State (j), sponsor type (h), sponsor (i), and selection into the full program sample (k). Programs selected for on-site observations were a subset of all programs in the full provider sample.
- c* Subscript that denotes the child selected for study given the State (j), sponsor type (h), sponsor (i), and selection into the on-site provider sample.

Preparing each of the weights described in this appendix required a development cycle. The first step was to assign a weight that was the inverse of the sampling probability: $1/Q$. The second step was to adjust the sampling probability for various special conditions. For example, Massachusetts was used for the pretest, and this required adjusting the sampling probability somewhat. The third step was to make nonresponse adjustments to these sampling probabilities. Generally, this was done by stratifying respondents and nonrespondents into reasonably homogenous cells and then inflating the inverse of the conditional sampling probabilities for respondents within each cell to account for missing observations from nonrespondents within that same cell. As a final step, when the resulting weight was unreasonably large, we truncated the inflation factor and used a proportional spreading procedure so that the weights yielded the number in the population. The resulting adjusted version of Q was P , and the final weight was based on P .

SPONSOR WEIGHTS

States were the primary sampling units. Eight States were selected with certainty and another twelve States were selected with probability proportional to size. Call the probability of selection Q_j . There were no nonrespondents among the States, so there was no need for nonresponse adjustments to Q_j ; hence $P_j=Q_j$.

Within States, sponsors were stratified by type of provider sponsored (FDCHs, child care centers, and Head Start centers), and sponsors were then selected with probability proportional to size. Call this conditional probability of selection $Q_{i|hj}$, where h designates the type of sponsor and j designates the State. The sampling probability $Q_{i|hj}$ has to be adjusted for nonrespondents. To explain this adjustment, let $Q_{i|hj}$ represent the original, unadjusted conditional sampling probability. We stratified the sponsors by type of sponsor and then by State groups and number of providers to form cells. Let

$\sum_R Q_{i/hj}$ represent the sum of the sampling probabilities for all respondents within a cell, let $\sum_N Q_{i/hj}$ represent the sum of the sampling probabilities for all nonrespondents within that same cell, and define $A_{i/hj} = \sum_R Q_{i/hj} / (\sum_R Q_{i/hj} + \sum_N Q_{i/hj})$. Then $P_{i/hj} = Q_{i/hj} A_{i/hj}$.

Each sampled sponsor was asked to complete a Sponsor Survey. Tabulation of data from the Sponsor Survey requires the weight $W_{\text{sponsor}} = 1/(P_{i/hj} P_j)$. When selecting the sponsor sample, independent child care centers (ICCCs) were treated as sponsors. This choice was necessitated because the State lists of sponsors did not distinguish between “true” sponsors and ICCCs, but in fact ICCCs are child care providers, not sponsors. For them, $W_{\text{sponsor}} = 0$, or equivalently, the ICCCs are excluded from any tabulations at the sponsor level. These ICCCs do enter the provider sample, where they are assigned appropriate weights for purposes of tabulation.

PROVIDER AND MENU WEIGHTS

From the sponsor sample, we next sampled child care providers (the full provider sample) and asked them to answer a Provider Survey. Tabulation of the Provider Survey requires the weight W_{provider} . Providers were also asked to complete a Menu Survey and a Food Preparer Interview. To adjust for differences in the nonresponse patterns for the Provider Survey, the Menu Survey, and the Food Preparer Interview, we developed one additional weight: W_{menu} . This weight is intended for use with both the Menu Survey and the Food Preparer Interview.

The provider and menu weights would be identical except that their response patterns differed somewhat and, consequently, so did the nonresponse-adjusted final weights. Given this similarity, we only discuss the provider weights. The provider sample was drawn from sample sponsors only. The conditional probability of selection for a provider was larger for small sponsors and smaller for large ones, assuring that providers from small sponsors would not be underrepresented in the sample.

Let $Q_{k/hij}$ represent the conditional probability of selection for the k^{th} provider given the State, sponsor, and sponsor type. $P_{k/hij}$ reflects the adjustment for nonrespondents. Except for ICCCs, nonresponse adjustments were done by stratifying the sample by type of sponsor, then by whether they were public or private (with or without a corporate affiliate in the latter case), by type of sponsoring organization (school district, public social service agency,

etc.), by percentage of revenue from CACFP reimbursement, and by whether or not they planned menus. The stratification varied somewhat by type of provider. Because nonresponding ICCCs had no corresponding sponsor, the nonresponse adjustments for ICCCs were based exclusively on State groupings with no more than two States per group. Then $W_{\text{provider}} = 1/(P_{k/hij} P_{i/hj} P_j)$.

WEIGHTS FOR ON-SITE OBSERVATIONS

A subset of the full provider sample was selected for the on-site observations (the on-site provider sample). From that subset, we selected children and observed their meal consumption, interviewed their parents about their meal consumption while not in child care, and interviewed their parents to obtain household characteristics. Selection into the on-site provider group resulted in three additional surveys and three new weights. The weight W_{meals} is suitable for tabulating data about on-site meal consumption, the weight W_{recall} is used for tabulating data from the recall interviews, and the weight $W_{\text{household}}$ applies to household interviews.

While children in FDCHs are usually fed together, children in centers tend to be fed in small groups whose composition is homogenous with respect to age. To allow the observers at centers to watch the food consumption of the sampled children, we first chose a group of noninfant children and then selected six children from that group. (If the center served infants, we instead selected one infant and five children from the chosen non-infant group.) In FDCHs, we simply selected six non-infant children (if the number of eligible children was as many as six), or five non-infants and one infant (if any eligible infants were enrolled). Children ineligible to be sampled included infants who were exclusively breastfed, children who were not enrolled for both of the scheduled observation days, and siblings of sample members. The first two groups were deemed outside of scope. The siblings were represented by other children enrolled with the same provider, i.e., by increasing the child weights of the other children in the same group proportionally.

Let $P_{m/hijk}$ represent the adjusted probability that the m^{th} program was selected for on-site observation given that the k^{th} program of the i^{th} sponsor of sponsor type h in the j^{th} State was selected for the provider survey, and let $P_{c/hijkm}$ represent the adjusted probability that a child was selected given that

a provider appeared in the on-site provider sample. Then the weight is $W = 1/(P_{c/hijkm} P_{m/hijk} P_{k/hij} P_{i/hj} P_j)$. As stated earlier, there are distinct versions of W for meal observations, recalls, and families.

Several nonresponse adjustments are required. The probability that a provider is selected into the sample, conditional on its sponsor's selection, is $Q_{m/hijk} Q_{k/hij}$. The nonresponse adjustment procedure is identical to that used earlier to adjust $Q_{k/hij}$. However here the respondents and nonrespondents are only those programs that were selected for the on-site sample, and the stratification was less complicated than for the nonresponse adjustment to the full provider sample because of the smaller number of on-site providers. The nonresponse adjustment corresponding to $Q_{c/hijkm}$ looks quite different from the nonresponse adjustment for other selection probabilities. Instead of stratifying the data into cells based on sponsor characteristics, we conducted all nonresponse adjustments within a provider. Call the intended sample size of non-infants N_i , and the observed sample size N_o . When N_o was less than N_i , we adjusted the preadjusted sampling probability $Q_{c/hijkm}$ to get $P_{c/hijkm} = Q_{c/hijkm} N_o / N_i$. (In one instance, none of the sampled children were present to be observed—that is, N_o was equal to zero. In this case, the provider was collapsed with a similar provider and the nonresponse adjustment was repeated.) A similar, but somewhat simpler procedure, was used for infant children.

The analysis of meals consumed in care is intended to describe *children in care on a typical day*—not all children enrolled in care. Hence, children who were selected into the sample but absent on one or both observation days were not nonrespondents for purposes of constructing the corresponding weights (W_{meals}), but rather outside of scope. Because no attempt was made to contact the parents of children who were absent on both days, however, these families were deemed nonrespondents in constructing the household weights ($W_{household}$).

Appendix F

Study Implementation

SUMMARY

Meeting the research objectives of the Early Childhood and Child Care Study required the use of a variety of data collection instruments, to obtain information from several categories of respondents, and the direct observation of children's meals. The study design incorporated two interrelated studies—a Study of Sponsors and Providers and a Study of Children and Families. Exhibit F.1 links the data collection strategy to each of the study objectives. This appendix provides a detailed description of survey instrumentation, study implementation (including the recruiting of study participants), and data collection activities. Finally, it shows the disposition of the study sample.

At the outset it is important to present an overview of the response rates for the various components of the study. While the response rates for the Study of Sponsors and Providers were good, the response rates for the Study of Children and Families were relatively low.

Sponsors and Providers

Sponsoring agencies were asked to complete a self-administered mail survey. Response rates for this survey ranged from 83 percent for family day care sponsors to 72 percent for Head Start sponsors and 71 percent for child care center sponsors.

Providers were asked to complete two self-administered mail surveys. In addition, an attempt was made to conduct a telephone interview with the individual with primary responsibility for food preparation (food preparer). Among family day care homes, 91 percent completed at least one of the three surveys. Similarly, 97 percent of Head Start centers and 92 percent of child care centers completed at least one of the three surveys. Response rates for each of the three surveys always exceeded 80 percent.

Exhibit F.1

Data Collection Strategy by Study Objective

Objective	Data Collection Strategy
Study of Sponsors and Providers	
Describe CACFP program characteristics.	• Mail survey of sponsors.
	• Mail survey of providers.
Examine the nutrient content of meals offered in participating homes and centers.	• Mail survey of providers to collect descriptions of meals offered for a five-day period.
Assess the nutrition knowledge and food service practices of providers.	• Telephone/in-person interview of food preparers to assess nutrition knowledge and obtain information on menu planning, food purchasing, and food preparation practices.
Study of Children and Families	
Describe the characteristics of participating children and their families.	• Telephone interview with parents to collect demographic information.
Determine the contribution of CACFP meals and snacks consumed to participating children's nutrient intake while in care and over 24 hours. ¹	• On-site observation of meals and snacks consumed in child care. • Telephone interviews with parents regarding foods and beverages consumed while child was not in care. ¹

¹As discussed below, response rates for the parent interviews conducted to obtain information on children's intake while not in care were unacceptably low, raising the issue of potential nonresponse bias. For this reason, data on children's out-of-care consumption, and therefore nutrient intake over 24 hours, have not been analyzed.

Children and Families

In this component of the study, a sample of children at participating child care sites was to be observed on two separate days during a target week. Parents were scheduled to be interviewed on the day following each observation to provide information on what the child ate when not in child care on the observation day (Dietary Recall Interview). During one of the interviews with parents, a Household Survey was to be administered to obtain information on household characteristics.

The Study of Children and Families proved to be problematic. The primary problem was reaching parents prior to the target week in order to gain their cooperation, obtain permission to observe their children, and schedule the post-observation interviews. Although we were able to contact and schedule observations for 80 percent of the sample of children in homes, we were only able to schedule observations for 58 percent of the sample of children in Head Start centers and 62 percent of the sample of children in child care centers. The difficulty in contacting parents during the recruiting phase effectively capped the overall response rates for the Study of Children and Families.

Absenteeism was also a serious problem in all three child care settings. Some children scheduled to be observed were not in care on one or both observation days. In homes, 91 percent of the children scheduled for observations were observed on one of the scheduled days; only 67 percent, however, were observed on both scheduled days. In Head Start centers the figures were 95 percent and 72 percent, respectively, and in child care centers, 90 percent and 73 percent, respectively. Overall response rates for the child observations (i.e., the proportion of eligible children that were observed at least once) were 72 percent for homes, 55 percent for Head Start centers, and 56 percent for child care centers. Note that since the analysis of meals consumed in care is intended to describe *children in care on a typical day*—not all children enrolled in care—children who were selected into the sample but absent on one or both observation days were not nonrespondents for purposes of constructing the corresponding weights (W_{meals}), but rather outside of scope.

Finally, there was a problem reaching parents to conduct the post-observation interviews. Nonresponse to the post-observation interviews further reduced overall response rates for the Dietary

Recall Interviews to 58 percent for homes, 36 percent for Head Start centers, and 39 percent for child care centers. These response rates were deemed to be unacceptably low, so the information obtained in the Dietary Recall Interviews has not been used in this study.

INSTRUMENTATION

The study employed three self-administered surveys, three interviews, and an observation protocol. Each is briefly described below.

Sponsor Survey

The self-administered Sponsor Survey collected descriptive information on the characteristics of the sponsoring agency, such as agency type (e.g., government entity versus community agency), size, and structure; number and type of programs sponsored; and nutrition education and training programs offered to the staff.

Provider Survey

The Provider Survey had three versions: one for homes, another for sponsored centers, and a third for independent centers.¹ The surveys collected information on provider characteristics (i.e., the number and ages of children served); weeks, days, and hours of operation; meals provided (i.e., breakfast, lunch, or dinner; and morning, afternoon, and/or evening snacks); funding sources; and nutrition education. Center instruments included questions on the types of child care or early childhood programs offered. The Provider Survey was generally self-administered. However, in some cases, a field observer conducted the survey if the provider had been unable to complete it prior to the observation visit.

¹While family day care providers must be sponsored in order to participate in the CACFP, child care centers may participate either under the aegis of a sponsoring agency or as independent centers.

Menu Survey

The Menu Survey collected information on meals *offered* to children in care over a five-day period. This information included the name and description of all foods and beverages offered and the age groups to whom each item was offered. If recipes were readily available, providers were asked to include information on the ingredients used and the preparation techniques followed. The Menu Survey was self-administered. In some cases, providers in the on-site sample were assisted in completing the Menu Survey by field observers.

Food Preparer Interview

Information on the nutrition knowledge, food preparation, and purchasing practices of providers was collected through the Food Preparer Interview. The interview addressed issues such as the food preparer's knowledge of nutrition, including awareness of strategies for implementing the *Dietary Guidelines for Americans*; menu planning; food purchasing; and meal preparation. Most Food Preparer Interviews were conducted by telephone. However, food preparers in the on-site sample were interviewed in person during the site visit.

Meal Observation

To gather information on foods *consumed* by children in the child care setting, meal observations were conducted on two separate days during the target week (i.e., the week covered in the Menu Survey). Prior to meal service, field observers weighed representative samples of each food to be served. During meal time, observers estimated the amount of food each child received and the amount of food left over using visual estimation techniques.²

²Information on food intake of sampled infants was collected through a vehicle that combined elements of both the child observations and the Menu Survey. The person responsible for feeding the infant recorded the kind and amount of foods and beverages consumed. Detailed descriptions of foods (and ingredients) were gathered by the field observer.

Dietary Recall Interview

To gather information on children's food consumption outside of care, Dietary Recall Interviews were conducted with parents. Parents were asked to describe foods and beverages consumed by the child while not in child care, during the specific 24-hour period which included the child care meal observation.³ Interviews were conducted by telephone within two days of the observation day.

Household Interview

Information on characteristics of families of children participating in the CACFP was collected through the Household Interview. This instrument gathered data such as age of the child, race and ethnicity of the child and the family, family participation in other Federal assistance programs, and household size and income. The interview was conducted by telephone, usually in tandem with one of the Dietary Recall Interviews.

STUDY IMPLEMENTATION

The study was conducted in a nationally representative sample of 20 States. These States were selected with probability proportional to size, based on the size of the CACFP in each state in Fiscal Year 1994. Food and Consumer Service Regional Offices and State agencies were contacted in January 1994 to assemble the information needed to select the samples of sponsors and providers. Actual data collection activities began in January 1995 and continued through June 1995. This section describes the procedures used in recruiting sampled sponsors, providers, and households, as well as the administration of survey instruments.

Recruiting Study Participants

To construct the samples of sponsors and providers, the State agency responsible for the administration of the CACFP in each of the 20 sampled States was asked to furnish lists of agencies sponsoring each of the three types of CACFP providers: family day care, Head Start centers, and

³For children age 10 and older, the Dietary Recall Interview was conducted with the child rather than the parent.

child care centers. A sample of sponsors was selected from each of these lists.⁴ State agencies were then provided with the lists of selected sponsors in their State and requested to furnish a list of providers associated with each sponsor, including the dollar value of each provider's October 1993 claim for reimbursement. The claim information was requested as a measure of program size. Only 2 of the 20 States were able to furnish provider-level information. In the other 18 States, sponsors were contacted directly for provider data. Most sponsors were able to supply the information; however, some were not able to furnish it. Some sponsors did not maintain the information requested, others did not have it in an easily retrievable form.

The recruiting phase of the study required gaining the cooperation of sponsors, providers, and households. Recruiting activities for each are described in the following three sections.

Sponsors. Recruiting activities began with a series of sponsor contacts in the summer of 1994:

- A sponsor mailing including:
 - an individually signed letter on study stationery;
 - a brief overview of the study;
 - a toll-free telephone number for inquiries; and
 - a request for a list of sponsored providers in States where the administering agency was unable to furnish lists of providers.
- A telephone followup to:
 - ensure receipt of materials;
 - encourage sponsors to support the study;
 - respond to questions about the study; and
 - prompt sponsors to return provider lists.

⁴Independent child care centers were included on the lists of center sponsors, as State agencies do not distinguish between independent centers and sponsoring organizations.

Following receipt of the provider lists, a sample of providers was selected for the Study of Sponsors and Providers and a subsample of these providers was selected for the Study of Children and Families. Sponsors were notified of this selection and asked to help secure the cooperation of sampled providers. In particular, sponsors were asked to contact sampled providers *before* we contacted them.

Providers. Provider recruiting was conducted on a rolling basis. Each provider was assigned its own “target week” during which it was to complete the Menu Survey. Each provider had the following contacts:

- Approximately six weeks before the scheduled target week, a mailing with:
 - an overview of the study and a cover letter;
 - target-week information;
 - a Menu Survey; and
 - a Provider Survey.

- Two weeks after the mailing, a first followup telephone call to:
 - confirm receipt of materials;
 - ensure understanding of survey questions and requirements;
 - identify appropriate respondents for each survey instrument;
 - confirm the target week or, when necessary, negotiate a new target week; and
 - to assess the likelihood of the provider's completing the survey without further prompting.

- One week prior to the target week, a second telephone call to:
 - reassess the provider's willingness and ability to complete the Provider Survey and Menu Survey during the target week; and
 - to schedule an appointment to complete the Food Preparer Interview during the target week.

For the subsample of providers included in the Study of Children and Families, the recruiting phase was somewhat more complex. Providers were asked to furnish information about families and children and to allow observers to visit on two nonconsecutive days during the target week (Monday and Thursday or Tuesday and Friday). In addition to these activities, Head Start centers and child care centers were asked to supply the names and ages of each group of children at the center. This information was then used to select a sample of children for observation.

Households. Gaining parent cooperation was the final step in recruiting. Household recruiting included the following activities:

- Providers were asked to distribute a brochure explaining the study to parents in the selected group and, in the case of family day care, to all parents. The brochure included an implied consent form (i.e., parents were asked to return the form if they did *not* want their names and telephone numbers released).
- Providers were asked to forward parent names and telephone numbers.
- Parents were subsequently contacted by telephone and asked to participate in the study. It was explained to parents that participation included:
 - allowing their child to be observed at mealtime on two separate days;
 - recording foods consumed by the child while not in care on the two observation days;
 - completing two Dietary Recall Interviews, one following each observation day; and
 - completing the Household Interview.

Once parents of sampled children had agreed to participate in the study, the site was scheduled for on-site visits. The original data collection plan called for scheduling the target week, receiving names of parents, and scheduling interviews during the planned week. However, receiving the parent lists in time to schedule interviews prior to the target week proved to be problematic. Delays by the provider in returning the parent information often required changing the target week to a later date. Consequently, we altered our procedures so that the target weeks were not assigned until after the parent lists were received. This alternate plan provided more time for scheduling parent interviews

prior to the target week. Despite this, we were still unable to reach many parents prior to the target week.

Data Collection Activities

Data for the Study of Sponsors and Providers were collected by mail surveys, telephone interviews, and in-person interviews. Information for the Study of Children and Families was gathered through on-site visits and telephone interviews.

The Study of Sponsors and Providers. Sponsor Surveys were mailed to sampled sponsors in January 1995. In addition to the survey, the mailing included an introductory letter and study overview; information about the toll-free help number; and a business reply envelope for return of the survey. Sponsors whose surveys were not returned on schedule were contacted by telephone at biweekly intervals and asked to return the survey. A few surveys were ultimately conducted by telephone.

As indicated above, each provider in the sample was assigned a target week for completing the Menu Survey. The target weeks were spread out over a four-month period, January 1995 through May 1995. The Menu and Provider surveys were mailed to providers several weeks prior to the target week. A brochure, *Guidelines for Describing Foods*, accompanied the Menu Survey. This brochure detailed the information to be provided about each food offered. In the 1988 Study of the Child Care Food Program, illiteracy proved to be an obstacle to completion of survey instruments, particularly for the family day care provider population. For this study, a linguist reviewed and revised the Menu Survey and the Provider Survey to meet the needs of adults with low literacy skills.

To ensure completion of the surveys and to provide assistance as needed, a series of provider contacts were made. A target-week call was made during the target week to:

- prompt the provider to complete the Menu Survey;
- assist the provider, if necessary, in completing the Menu Survey;
- conduct the Food Preparer Interview; and
- to remind the provider to return the materials at the end of the week.

A post-target-week call was made to prompt providers who had not returned surveys.

Additional reminder telephone calls were made at biweekly intervals until all survey materials were received. When providers had misplaced business reply envelopes, they were instructed to return materials by Federal Express, charged to Abt Associates Inc. An incentive of \$25.00 for return of a completed Menu Survey was offered to nonresponding providers. This incentive was offered in recognition of the significant time commitment required for completion of the survey. As a gesture of good will, responding providers working under the same sponsor as the nonresponding providers were also sent incentive payments.

The Study of Children and Families. Each provider in this component of the study was visited by a field observer on two separate days during the target week, Monday and Thursday or Tuesday and Friday.⁵ During each of these visits, the field observer weighed reference portions of all foods offered and estimated the amounts of food taken and left over by sampled children. Children were observed for all meals and snacks they consumed. To facilitate observations, group size was limited to six children. To avoid reactive influences on food consumption, centers were asked to have sampled children sit together during meals and snack times for several days prior to the first observation.

While on-site, the field observer provided technical assistance as needed, to help the provider complete the Menu Survey. He/she also interviewed the food preparer and, if the Provider Survey had not been completed, interviewed the center director or FDCH provider.

To gather information on food consumed while children were not in child care, two Dietary Recall Interviews were conducted with parents.⁶ The Household Interview was conducted in tandem with one of the Dietary Recall Interviews. Prior to the Dietary Recall Interviews, parents were sent a

⁵As in the Study of Sponsors and Providers, the subsample of providers included in this component were assigned a target week between January 1995 and June 1995. Providers were asked to complete the Menu Survey and the Provider Survey during the target week.

⁶For children age 10 and older, the Dietary Recall Interviews were conducted with the child rather than the parent.

packet of materials to assist them in the interview. These materials included a log in which to record the child's food intake as well as a 2-dimensional food model chart to use in estimating amounts of food consumed.

The Dietary Recall Interviews were scheduled to be conducted the evening following the day of observation (e.g., on Tuesday evening for a Monday observation). Repeat attempts were made to conduct the Dietary Recall Interview with parents who were not available at the scheduled time. However, interviews were not attempted if two days had elapsed since the day of observation because of concern about deterioration in respondents' abilities to recall information.

A number of parents did not have access to telephones and were therefore unable to participate in the Dietary Recall Interview and the Household Interview. To address this situation, field observers visited providers and intercepted parents as they were dropping off or picking up their children. The parents were offered a \$10 incentive to call us at our toll-free number to complete the telephone interviews.

DISPOSITION OF THE STUDY SAMPLE

The Early Childhood and Child Care Study included numerous survey instruments that collected data from a variety of respondents. Providers were responsible for completing several different instruments, children in the Study of Children and Families were to be observed on two separate days, and two Dietary Recall Interviews were to be conducted with parents of observed children. Because there were multiple occasions for sample members to “complete” a study instrument or protocol, it is necessary to consider response rates separately for each instrument. Response rates for each of the various study instruments are described in the following sections.

The discussion is framed in terms of the hierarchical nature of the sample (i.e., the sample of providers is nested within the sponsor sample, and the sample of children is nested within the provider sample) and the three types of providers (family day care homes, Head Start centers, and child care centers) included in the study.

It is important to point out that, at each level of the sampling frame (sponsors, providers, and children), some sampled units were found to be ineligible for inclusion in the study. Reasons for ineligibility included:

- **Sponsors:** Sampled sponsors were considered ineligible for the study if they no longer sponsored (or were incorrectly listed by the State as a sponsor of) the type of provider (homes, Head Start centers, or child care centers) for which they were selected or if they were no longer a CACFP sponsor.
- **Providers:** Sampled providers were considered ineligible for the study if they no longer participated (or were not currently participating) in the CACFP or were not in operation during the data collection period.
- **Children:** Sampled children were considered ineligible for the study if they did not regularly attend child care on both of the scheduled observation days (Monday and Thursday or Tuesday and Friday), had a sibling that was included in the sample,⁷ or were being breastfed.

Family Day Care Homes

Exhibit F.2 displays the disposition of each component of the family day care sample—sponsors, providers, and children.

⁷Only one child from each family was included in the study.

Exhibit F.2 ("Presentations" - KID-F2.WPG) goes here

Family Day Care Sponsors. A total of 180 FDCH sponsors⁸ was initially selected into the study sample. Of these, 2 were ineligible for the study, leaving a total of 178 eligible FDCH sponsors. Of the 178 eligible sponsors, 152 (85%) supplied provider lists and 26 (15%) did not. Of the 152 sponsors providing lists, 148 (97%) completed the Sponsor Survey, representing 83% of the total eligible sponsor sample.⁹

Family Day Care Providers. A sample of 872 family day care homes was selected from all of the homes sponsored by the 152 eligible FDCH sponsors that provided lists. This sample was then randomly divided into two subsamples: 633 homes were allocated to the mail survey subsample, and 239 homes were allocated to the on-site subsample. Of the initial sample, 177 homes in the mail survey subsample and 81 homes in the on-site subsample were found to be ineligible for the study. This left a total of 456 sampled homes eligible for the mail survey and 158 homes eligible for the on-site study.

Of the 158 sampled homes that were eligible for the on-site study, 52 refused to allow site visits but agreed to participate in the mail component. This increased the number of homes eligible for the mail survey from 456 to 508 and decreased the on-site sample from 158 to 106. While most of the eligible homes in each subsample completed all three survey instruments, some completed only one or two. The number completing each combination of instruments is shown in the Venn diagrams in Exhibit F.2. Response rates for each instrument are shown in Exhibit F.5.

Family Day Care Children. Each of the 106 eligible homes that agreed to participate in the on-site study provided lists of enrolled children. From these lists, an initial sample of 576 children was selected for observations and Dietary Recall Interviews; of these, 153 were found to be ineligible, leaving an eligible sample of 423 children. Of the eligible children, 337 were scheduled for

⁸Of the 180 FDCH sponsors, 12 are also included in the samples of Head Start sponsors or child care center sponsors.

⁹All of the sponsors of multiple program types (FDCHs, Head Start centers, and child care centers) completed the Sponsor Survey. The survey returns of these sponsors are reported again under each appropriate program type.

observations. Of those not scheduled, most (84%) were not scheduled because their parents could not be reached.

Absenteeism was a serious problem in all three child care settings. In the family day care setting, of the 337 children for whom observations were scheduled, only 226 (67%) were present for two observations. An additional 80 (24%) were present for one, but not both, observations. When children were not present for the observation, no attempt was made to conduct the Dietary Recall Interview with parents.

Frequently, parents were unavailable for the scheduled telephone interview and, despite repeated attempts, the Dietary Recall Interviews were not completed for some of the observed children. Exhibit F.2 shows the number of children observed once, twice, and not at all, and the number of Household Interviews completed. Response rates for each component are shown in Exhibit F.5.

Head Start Centers

Exhibit F.3 presents the disposition of the samples of sponsors, providers, and children for the Head Start center segment of the study sample.

Head Start Center Sponsors. An initial sample of 419 Head Start center sponsors was selected for participation in the study; of these, 1 was found to be ineligible, leaving a total eligible sample of 418 sponsors.¹⁰ Provider lists were received from 333 (80%) of the 418 sponsors. The Sponsor Survey was completed by 301 (90%) of these sponsors, representing 72 percent of the eligible sponsor sample.

¹⁰Of the 418 Head Start center sponsors, 28 are also included in the samples of FDCH or child care center sponsors.

Exhibit F.3 ("Presentations" - KID-F3.WPG) goes here

Head Start Center Providers. An initial sample of 1,063 Head Start centers was selected from among the eligible 333 sponsors who had provided lists. This initial sample was then randomly divided into the two subsamples: 894 centers were allocated to the mail survey subsample and 169 centers were allocated to the on-site subsample. Of the 894 centers in the mail survey subsample, 87 were found to be ineligible, leaving a total of 807 eligible centers for this component. Similarly, of the initial sample of 169 centers in the on-site study subsample, 12 were ineligible, leaving a total of 157 centers eligible for this component of the study.

As in the case of family day care homes and child care centers, some (12) Head Start centers refused to allow on-site visits but agreed to participate in the mail survey component of the study. This increased the number of Head Start centers eligible for the mail survey from 807 to 819 and reduced the number for the on-site study from 157 to 145. The Venn diagrams in Exhibit F.3 show the number of eligible providers in each study component that completed various combinations of the three survey instruments. Response rates for each instrument are shown in Exhibit F.5.

Head Start Center Children. An initial sample of 1,188 children was selected from among the 145 Head Start centers that agreed to participate in the on-site study. Of the initial sample of children, 58 were found to be ineligible, leaving a sample of 1,130 eligible children for this component of the study. Of the eligible sample of 1,130 children, 659 were scheduled for observations. Of those not scheduled, most (79%) were not scheduled because parents could not be reached.

Of the 659 children scheduled for observations, 476 (72%) were present and observed on the two scheduled nonconsecutive days. Another 149 (23%) were present on just one observation day. Exhibit F.3 shows the number of children observed once, twice, and not at all, and Household Interviews completed for these children. Response rates are shown in Exhibit F.5.

Child Care Centers

The disposition of the child care center study component is shown in Exhibit F.4.

Exhibit F.4 ("Presentations" - KID-F4.WPG) goes here

Child Care Center Sponsors. A total of 596 sponsors of child care centers was initially sampled for participation in the study; of these 165¹¹ are sponsoring organizations and 431 operate as self-sponsored independent centers. Of the 165 sponsoring organizations, 144 (87%) supplied provider lists; independent centers were not asked to provide lists as they are self-sponsored, single units. Sponsor Surveys were completed by 117 (81%) of the sponsors that had provided lists, representing 71% of the sponsors; 2 sponsors were found to be ineligible.

Child Care Center Providers. From all of the child care centers sponsored by the 144 sponsors that supplied provider lists, a sample of 382 child care centers was initially selected for participation in the study. Because centers may operate as independent entities, we also selected a sample of 376 child care centers for whom there is no sponsor, yielding a total of 758 centers. This sample was then randomly divided into two subsamples; 592 centers were allocated to the mail survey component and 166 centers were allocated to the on-site component.

Of the 166 centers initially included in the on-site sample, 25 were found to be ineligible, leaving a total of 141 centers eligible for this component of the study. As with the FDCH and Head Start provider samples, a number of providers selected for the on-site component refused to allow site visits but agreed to participate in the mail component (20 centers). This increased the child care center mail sample from 538 centers to 558 centers and decreased the on-site sample from 141 centers to 121 centers. As shown in the Venn diagrams in Exhibit F.4, the majority of providers in both components completed all three survey instruments. Response rates for each instrument are shown in Exhibit F.5.

¹¹Of the 165 child care sponsors, 20 are also included in the samples of FDCH or Head Start center sponsors.

Child Care Center Children. A sample of 904 children was initially selected from among the 121 child care centers that participated in the on-site study. Of these, 86 were found to be ineligible, leaving a sample of 818 eligible children. Observations were scheduled with 507 of the 818 eligible children. Among children not scheduled, most (83%) were not included because their parents could not be reached.

Of the 507 children scheduled for observation, two observations were conducted with 370 (73%) children; another 87 children (17%) were present for just one observation. Exhibit F.4 shows the number of children observed once, twice, and not at all, and Household Interviews completed for these children. Response rates are shown in Exhibit F.5.

Exhibit F.5				
Response Rates for Sponsors, Providers, and Children				
	All Providers	Family Day Care Homes	Head Start Centers	Child Care Centers
Sponsors				
Provider Lists	83%	85%	80%	87%
Sponsor Survey				
All eligible sponsors	74	83	72	71
Sponsors supplying provider lists	90	97	90	81
Providers				
Provider Survey	90	87	93	88
Menu Survey	87	82	92	84
Food Preparer Interview	89	86	92	87
Children and Households				
Observations ¹	59	76	54	57
Household Interview	39	58	35	39
Dietary Recall Interviews				
At least 1 interview	41	58	36	39
Two interviews	19	30	15	19

¹Note that since the analysis of meals consumed in care is intended to *describe them in care on a typical day*—not all children enrolled in care—children who were selected into the sample but absent on one or both observation days were not nonrespondents for purposes of constructing the corresponding weights (W_{meals}), but rather outside of scope. The response rate for child observations is equal to:

$$\text{Number of Child-Days Observed} \div [(2 \times \text{Number of Eligible Children}) - \text{Child-Days Absent}]$$

FOLLOWUP SURVEY OF NONRESPONDERS

One of the principal goals of the Early Childhood and Child Care Study was to collect reliable income data for FCS' legislative initiatives that involve the CACFP. A key FCS initiative is implementing the CACFP provisions of the Personal Responsibility and Work Opportunity Act of 1996 (P.L. 104-193). Household incomes of (a) providers who operate family day care homes and (b) families of CACFP children play pivotal roles in FCS' proposals to improve operations and hold down costs. While the response rates to the Provider Surveys were quite good (Exhibit F.5), ranging from 87 percent for FDCHs to 93 percent for Head Start centers, the response rates for the Household Survey were unacceptably low, ranging from 35 percent for Head Start centers to 58 percent for FDCHs. The primary reason for the low response rates for the Household Survey was the inability to reach parents by telephone during the recruitment phase of the study and within two days of the meal observations rather than parents' refusal to participate. Therefore, a Followup Survey of all nonresponders to the original Household Survey was conducted in an effort to raise response rates to a level sufficient for FCS to make critical budgetary estimates on welfare reform issues.

The Followup Survey focused narrowly on household income, household size, and participation in the WIC and food stamps programs. The Followup Survey was conducted between December

1996 and April 1997 and collected retrospective data for the period corresponding to the original Household Survey (Spring 1995).

Data Collection Procedures

No sampling was employed in the Followup Survey. Rather, attempts were made to contact all nonresponders to the original Household Survey. An intensive effort was made to locate and contact the nonresponders. The data collection for the Followup Survey used a combination of telephone, mail, and in-person surveys. The procedures used to locate and contact the nonresponders are described below.

Locating Respondents. As indicated above, the primary reason for nonresponse to the original Household Survey was the inability to reach respondents by telephone. While we had addresses for nearly all nonresponders, we had telephone numbers for only 30 percent of nonresponders. Therefore, our initial efforts were directed towards obtaining current telephone numbers and addresses for the nonresponders. The entire sample file of nonresponders was sent through the National Change of Address Directory to obtain the most current known addresses. An *advance mailing*, describing the study and the purpose for conducting the Followup Survey, was sent to all nonresponders. This advance mailing asked respondents to fill out an information sheet giving their current telephone number and address and return it in an enclosed Business Reply Envelope. Respondents were also given the option of calling a toll-free 800 number to supply the necessary information.¹² A \$1 incentive was included in the advance mailing. The advance mailing also informed respondents that they would receive an additional \$5 after completing the survey.

Tracking Procedures. Several steps were taken to locate those nonresponders whose advance mailings were returned as undeliverable as well as to locate those households that did not return the mailing or call the toll-free number. The first step was *telematching* the nonresponder file against an electronic version of all telephone listings throughout the United States. The next sources were

¹²An attempt was made to administer the survey over the telephone to those people calling in on the toll-free number.

Credit Bureau of Information and *Trans Union* searches. Both of these sources allowed us to search for individuals who have applied for credit. These searches sometimes provided new telephone numbers, addresses, and social security numbers.

Telephone Survey. The field period for the telephone effort was approximately 10 weeks. Calls were made at diverse times in the evenings (between 5:00 p.m. and 9:00 p.m. respondent time) and on weekends (Saturday 11:00 a.m.–5:00 p.m., Sunday 2:00 p.m.–9:00 p.m.). Those cases that were consistently “no answer” in the evenings and on weekends were also attempted during daytime hours Monday through Friday. No set limit was made on the number of attempts made on each case; rather, all non-final cases were reviewed on a daily basis to determine the next step for reaching the household.

Mail Survey. All households for which we did not have a telephone number along with all households who could not be reached in the telephone survey were included in the mail survey. These cases were sent a letter explaining the study and the purpose of the Followup Survey along with self-administered questionnaire. As in the case of the advance mailing, respondents were given the option of calling a toll-free 800 number to provide the requested information. The letter also reminded respondents that they would receive \$5 if they returned the questionnaire or called the toll-free number to provide the information.

Field Component. All cases that could not be reached in the telephone survey and did not respond to the mail survey were assigned to field interviewers. Field interviewers attempted to locate prospective respondents and conduct in-person or telephone interviews. When necessary, field interviewers contacted child care providers that participated in the study to obtain locating information.

Response Rates

Exhibit F.6 summarizes the response rates for the Followup Survey. The response rates for the Followup Survey were sufficiently large to bring the overall response rates up to acceptable levels. When combined with the responses from the original Household Survey, the Followup Survey brought the overall response rate up to 82 percent. The combined response rate ranged from a high of 90 percent for FDCHs to a low of 80 percent for child care centers.

Exhibit F.6				
Sample Size, Number of Completed Interviews, and Response Rates				
	All Providers	Mode of Care		
		FDCHs	Head Start Centers	Child Care Centers
Number of eligible households for original survey	2,371	423	1,130	818
Total number of household interviews originally completed ¹	1,181	284	495	402
Number of remaining nonresponders	1,190	139	635	416
Response rate for Followup Survey	65%	71%	66%	60%
Number of completed interviews in Followup Survey	770	98	420	252
New total number of completed interviews	1,951	382	915	654
New total response rate for survey	82%	90%	81%	80%

¹Includes 224 respondents to earlier nonresponse survey.

Appendix G

Reference Tables for Approximate Confidence Intervals

Appendix G provides reference tables for calculating the approximate confidence intervals for the estimates presented in this report. Assuming that the population is large, a 95 percent confidence interval for a population proportion P using a sample proportion p based on a simple random sample of n units from this population is given by

$$p \pm 1.96\sqrt{\frac{p(1-p)}{n}} . \quad (1)$$

If the sample is selected using a multistage design, then the variance of the sample proportion is larger than the variance under simple random sampling. The variance under a multistage design is usually estimated by multiplying the variance under simple random sampling by a value known as the design effect (*deff*). The design effect is the ratio of the variance obtained from the complex survey sample to the variance of the estimate obtained from a simple random sample of the same size. Under a multistage design, the 95 percent confidence interval is given by

$$p \pm 1.96\sqrt{deff}\sqrt{\frac{p(1-p)}{n}} . \quad (2)$$

The exhibits presented in this appendix provide approximate confidence intervals for population proportions for each of the provider types. Exhibits G.1a through G.1c provide confidence intervals for characteristics of children. Exhibits G.2a through G.2c provide confidence intervals for characteristics of homes and centers. Exhibits G.3a through G.3c provide confidence intervals for characteristics of sponsoring agencies (presented in Volume I). These intervals were obtained by first computing the variance under simple random sampling and then multiplying the variance by an average design effect for each of the provider types. The size of the confidence interval is presented for various sample sizes and estimated proportions. The value used as the square root of the average design effect for computing the confidence intervals is given at the bottom of each exhibit. The average design effect was computed in each instance as the average across several variables of ratio

of the variance under the design, estimated using SUDAAN, to the variance under simple random sampling, estimated using equation (1).

These tables can also be used to estimate the confidence intervals for sample sizes and proportions that do not exactly correspond to the values given in the exhibits. Use the column that approximates the estimated proportion and then use the row that most closely approximates the sample size upon which the sample estimate is based to determine the approximate size of the confidence interval for the population proportion that is being estimated. For example, if the estimated percentage of child care centers with a certain characteristic is 31 percent and this is based on a sample of 290 (see Exhibit G.2a), then the confidence interval for the population percentage is obtained by taking 31 ± 8.7 . Consequently, we have 95 percent confidence that the population proportion is contained in the interval 22.3 to 39.7 percent.

A 95 percent confidence interval for a sample mean is given by

$$\bar{x} \pm 1.96 \text{ se}(\bar{x}) \quad (3)$$

where $\text{se}(\bar{x})$ is the standard error of the sample estimate of the mean. Note that the standard errors presented in this report incorporate the design effect.

Exhibit G.1a

**Confidence Intervals for Proportions Based on a Sample from
Children in FDCHs**

Sample Size	Percentage of Sample with Characteristic				
	10% or 90%	20% or 80%	30% or 70%	40% or 60%	50%
50	±14.1	±18.8	±21.6	±23.1	±23.6
100	10.0	13.3	15.2	16.4	16.6
200	7.0	9.4	10.8	11.5	11.7
300	5.7	7.7	8.8	9.4	9.6
400	5.0	6.7	7.7	8.1	8.3
500	4.4	5.9	6.8	7.3	7.5
600	4.1	5.5	6.2	6.7	6.8

A value of **1.70** was used as the square root of the average design effect for the sample of FDCH children in computing the confidence intervals.

Exhibit G.1b

**Confidence Intervals for Proportions Based on a Sample from
Children in Head Start Centers**

Sample Size	Percentage of Sample with Characteristic				
	10% or 90%	20% or 80%	30% or 70%	40% or 60%	50%
50	±16.4	±21.8	±25.0	±26.7	±27.3
100	11.6	15.4	17.7	18.9	19.3
200	8.2	10.9	12.5	13.3	13.6
300	6.7	8.9	10.2	10.9	11.1
400	5.8	7.7	8.8	9.4	9.6
500	5.2	6.9	7.9	8.4	8.6
600	4.7	6.3	7.2	7.7	7.9

A value of **1.97** was used as the square root of the average design effect for a sample of Head Start children in computing the confidence intervals.

Exhibit G.1c

**Confidence Intervals for Proportions Based on a Sample
from Children in Child Care Centers**

Sample Size	Percentage of Sample with Characteristic				
	10% or 90%	20% or 80%	30% or 70%	40% or 60%	50%
50	±14.6	±19.5	±22.4	±23.9	±24.3
100	10.3	13.7	15.8	16.9	17.2
200	7.3	9.8	11.1	11.9	12.2
300	5.9	8.0	9.2	9.8	10.0
400	5.1	6.9	7.9	8.4	8.6
500	4.6	6.2	7.1	7.5	7.7
600	4.2	5.7	6.5	6.9	7.0

A value of **1.76** was used as the square root of the average design effect for a sample of children in child care centers in computing the confidence intervals.

Exhibit G.2a

**Confidence Intervals for Proportions Based on
a Sample from FDCH Providers**

Sample Size	Percentage of Sample with Characteristic				
	10% or 90%	20% or 80%	30% or 70%	40% or 60%	50%
50	±13.9	±18.5	±21.2	±22.7	±23.2
100	9.8	13.1	15.0	16.1	16.4
150	8.0	10.7	12.3	13.1	13.4
200	6.9	9.3	10.6	11.4	11.6
250	6.2	8.3	9.5	10.2	10.4
300	5.7	7.6	8.7	9.3	9.5
400	4.9	6.6	7.5	8.0	8.2
500	4.4	5.9	6.7	7.2	7.3

A value of **1.67** was used as the square root of the average design effect for the sample of FDCH providers in computing the confidence intervals.

Exhibit G.2b

**Confidence Intervals for Proportions Based on a
Sample from Head Start Centers**

Sample Size	Percentage of Sample with Characteristic				
	10% or 90%	20% or 80%	30% or 70%	40% or 60%	50%
50	±12.6	±16.8	±19.3	±20.6	±21.0
100	8.9	11.9	13.6	14.5	14.8
150	7.3	9.7	11.1	11.9	12.1
200	6.3	8.4	9.6	10.3	10.5
250	5.6	7.5	8.6	9.2	9.4
300	5.1	6.9	7.9	8.4	8.6
400	4.4	5.9	6.8	7.3	7.4
500	4.0	3.5	6.1	6.5	6.6
800	3.1	4.2	4.8	5.1	5.2

A value of **1.51** was used as the square root of the average design effect for a sample of Head Start centers in computing the confidence intervals.

Exhibit G.2c

Confidence Intervals for Proportions Based on a Sample
from Child Care Centers

Sample Size	Percentage of Sample with Characteristic				
	10% or 90%	20% or 80%	30% or 70%	40% or 60%	50%
50	±10.5	±14.0	±16.1	±17.2	±17.5
100	7.4	9.9	11.4	12.1	12.4
150	6.1	8.1	9.3	9.9	10.1
200	5.2	7.0	8.0	8.6	8.8
250	4.7	6.3	7.2	7.7	7.8
300	4.3	5.7	6.6	7.0	7.1
400	3.7	4.9	5.7	6.1	6.2
500	3.3	4.4	5.1	5.4	5.5
600	3.0	4.0	4.6	4.9	5.0

A value of **1.26** was used as the square root of the average design effect for a sample of child care centers in computing the confidence intervals.

Exhibit G.3a

**Confidence Intervals for Proportions Based on
a Sample from FDCH Sponsors**

Sample Size	Percentage of Sample With Characteristic				
	10% or 90%	20% or 80%	30% or 70%	40% or 60%	50%
50	±16.8	±22.4	±25.6	±27.4	±27.9
100	11.8	15.8	18.1	19.3	19.7
200	8.4	11.2	12.8	13.7	14.0
300	6.8	9.1	10.5	11.2	11.4
400	5.9	7.9	9.1	9.7	9.9
500	5.3	7.1	8.1	8.7	8.8
600	4.8	6.5	7.4	7.9	8.1

A value of **2.02** was used as the square root of the average design effect for the sample of FDCH sponsors in computing the confidence intervals.

Exhibit G.3b

**Confidence Intervals for Proportions Based on a
Sample from Head Start Sponsors**

Sample Size	Percentage of Sample with Characteristic				
	10% or 90%	20% or 80%	30% or 70%	40% or 60%	50%
50	±12.4	±16.5	±18.9	±20.2	±20.6
100	8.7	11.7	13.4	14.3	14.6
200	6.2	8.3	9.5	10.1	10.3
300	5.0	6.7	7.7	8.3	8.4
400	4.4	5.8	6.7	7.1	7.3
500	3.9	5.2	6.0	6.4	6.5
600	3.6	4.7	5.5	5.8	6.0

A value of **1.49** was used as the square root of the average design effect for a sample of Head Start sponsors in computing the confidence intervals.

Exhibit G.3c

**Confidence Intervals for Proportions Based on a Sample
from Child Care Center Sponsors**

Sample Size	Percentage of Sample with Characteristic				
	10% or 90%	20% or 80%	30% or 70%	40% or 60%	50%
50	±10.1	±13.4	±15.4	±16.4	±16.8
100	7.1	9.5	10.9	11.6	11.8
200	5.0	6.7	7.7	8.2	8.4
300	4.1	5.5	6.3	6.7	6.8
400	3.5	4.7	5.4	5.8	5.9
500	3.2	4.2	4.9	5.2	5.3
600	2.9	3.9	4.4	4.7	4.8

A value of **1.21** was used as the square root of the average design effect for a sample of child care center sponsors in computing the confidence intervals.

Appendix H

Reliability of Visual Estimation of Food Intake

The Early Childhood and Child Care Study collected information on the types and amounts of food consumed by children while in care using visual estimation. This method was chosen because it is less likely to interrupt children's meal routines and affect food intake than methods requiring actual weighing or measuring of food portions. Although prior research suggests that trained observers can achieve high levels of accuracy in estimating food intake (Comstock 1981; Thompson et al. 1987; Simons-Morton 1991), there was some concern that the observers' reliability might deteriorate over the study's extended field period (22 weeks).¹ Because of this concern, a substudy was conducted to examine the reliability of the visual estimation technique used in this study and to see if the reliability deteriorated over the extended field period.

The first section of this appendix describes the methodology used in the reliability substudy, including training of field observers and validators, data collection, and analyses used to assess reliability. The second section includes a summary of results and conclusions.

METHODOLOGY

Training of Field Observers and Validators

Two groups of people were trained in the visual estimation procedures to be used in this study. The first group consisted of the 60 field observers that would be conducting the actual data collection. The second group consisted of two people with previous experience in visual estimation of food intake who would serve as validators for the reliability substudy. The validators were used to establish a criterion in the field against which the reliability of the field observers could be assessed.

¹Bolland et al. (1990) found that observers' reliability deteriorated after training and suggested either periodic retraining or minimizing the time between training and data collection. It is important to note, however, that observers in the Bolland study received only 10 minutes of training in visual estimation of food intake. Observers in the Early Childhood and Child Care Study received at least 8 hours of training.

Field observers received a minimum of eight hours training in visual estimation techniques conducted by registered dietitians. Because of the large number of field observers, this training was conducted in groups of 20. Training included weighing and measuring foods to establish reference portion sizes; visual estimation of portion sizes served to or taken by children; and visual estimation of the amounts of food left over. Real foods, rather than food models or pictures, were used to teach field observers to recognize portion sizes and estimate plate waste. The training also included a dry run in an actual child care setting and a group debriefing.²

The training of the validators was far more intensive. Each validator received 12 hours of training conducted by registered dietitians, including several hours of one-on-one training. This training included extensive amounts of practice and testing. The validators were given immediate feedback on their accuracy after each practice/testing session. At the end of training, the two validators were tested to establish their reliability. The test and its results are described later in this appendix.

Data Collection

The validators accompanied selected field observers on visits to child care sites and double coded all dietary data collected during these site visits. These site visits took place between four and 19 weeks after the field observers were trained. A total of 36 field observers were included in the reliability substudy, with observations being conducted on a total of 157 children.

Prior to each meal or snack served during a site visit, the validator and field observer independently weighed and measured reference portions of each food to be offered.³ During each meal or snack, validators and field observers each recorded the types and amounts of foods selected and consumed by each child.

²The large number of field observers being trained precluded intensive one-on-one practice and feedback.

³See Appendix A for a more detailed description of the observation protocol.

Analysis

The reliability analysis was based on the nutrient content of the meals consumed by the 157 children observed during the 36 site visits. Following the procedures described in Appendix A, the Food Intake Analysis System (FIAS) was used to calculate the nutrient content of the food consumed by each sampled child. The analysis was based on the nutrient content of all meals and snacks consumed by each child while in care on the observation day. The reliability analysis included the following nutrients: total energy, protein, vitamin A, thiamin, riboflavin, niacin, vitamin B₆, folate, vitamin B₁₂, vitamin C, calcium, phosphate, magnesium, iron, and zinc.

Measures. Three measures were used to assess the reliability of the field observers.

- **Mean differences** between the nutrient content of meals and snacks recorded by field observers and validators. This measure provides an indication of the potential *bias* in the field observers' measures. Do field observers systematically over or under report the amount of nutrients consumed by children by a meaningful amount?
- **Mean absolute differences** between the nutrient content of meals and snacks recorded by field observers and validators. This measure provides an indication of the *precision* of the field observers' estimates. The mean absolute difference does not allow overestimates by some observers to offset underestimates by other observers. For example, if a field observer overestimates food energy by 15 percent on two children and underestimates food energy by 10 percent and 20 percent in two other children, then the mean absolute error is 15 percent, indicating that on average the field observer misses the mark by 15 percent. In this example, there is no indication of potential bias since the mean difference is 0 percent.
- **Pearson correlation coefficients** between the nutrient content as measured by field observers and validators provides another indication of the degree of association between the two measures.

Establishing Reliability of the Validators

The validators were tested at the end of the training to establish the accuracy of their visual estimates. Six meals or snacks were prepared, each of which contained between two and six individual food items, for a total of 20 individual food items. Each of the validators estimated the portion sizes of

the 20 food items, and the nutrient content of these estimates was compared with the results obtained from actual weighing of each food item (the “gold standard”) using the three measures described above.

Changes in Reliability over the Field Period

Linear regression models were used to determine if the field observers’ reliability deteriorated over the extended field period. The dependent variable in this analysis was the absolute difference between nutrient intake recorded by validators and field observers. Separate regressions were run for each of the 15 nutrients included in the analysis. Three explanatory variables were included in these models:

- **Number of days elapsed since field observer training.** If field observers’ reliability deteriorates over time, then one would expect the magnitude of the absolute difference between validator and field observer estimates to increase with the number of days elapsed since field observer training.
- **Number of children observed.** One would expect the number of children observed during a site visit to affect the difficulty of conducting the meal observations. The more children being observed, the less attention the observer can devote to each child.
- **Experience conducting meal observations.** Experience may be expected to improve the accuracy of meal observations. The number of previous site visits conducted by the field observer was included as a measure of experience.

RESULTS

Reliability of Validators’ Estimates

Exhibit H.1 compares the validators’ estimates to the gold standard, or weighed portion sizes. Examination of the mean differences (weighed minus validator’s estimates) and mean percentage differences indicates that the validators tended to underestimate portion sizes slightly. For the first validator, 13 of the 15 mean differences were positive (underestimates). Similarly, for the second validator, 9 of the 15 mean differences were positive. While this indicates a potential

Exhibit H.1

“Gold Standard” and Validators’ Estimates of the Nutrient Content of Foods

Nutrients	Weighed Samples	First Validator's Estimates	Second Validator's Estimates	Differences for Validator 1 (weighed minus validator estimates)				Differences for Validator 2 (weighed minus validator estimates)			
	Mean	Mean	Mean	Mean Diff	% Diff	Mean Abs Diff	% Abs Diff	Mean Diff	% Diff	Mean Abs Diff	% Abs Diff
Total Energy (kcal)	334.47	320.11	327.83	14.37	4.3%	31.24	9.3%	6.64	2.0%	31.07	9.3%
Protein (gm)	11.56	11.30	11.45	.26	2.2	.96	8.3	.11	1.0	2.04	17.6
Vitamin A (mcg RE)	161.48	152.27	157.33	9.22	5.7	19.07	11.8	4.15	2.6	24.12	14.9
Thiamin (mg)	.27	.26	.26	.02	7.4	.02	7.4	.01	3.7	.02	7.4
Riboflavin (mg)	.34	.34	.34	.00	--	.04	11.8	-.01	-2.9	.04	11.8
Niacin (mg NE)	2.89	2.65	2.74	.24	8.3	.31	10.7	.15	5.2	.35	12.1
Vitamin B ₆ (mg)	.19	.18	.19	.01	5.3	.03	15.8	.01	5.3	.03	15.8
Folacin (mcg)	46.21	46.50	44.29	.29	-6	4.54	9.8	1.92	4.2	3.14	6.8
Vitamin B ₁₂ (mcg)	.57	.56	.59	.01	1.8	.07	12.3	-.02	-3.5	.09	15.8
Vitamin C (mg)	17.5	16.49	16.62	1.02	5.8	2.79	15.9	.89	5.1	1.93	11.0
Calcium (mg)	179.39	185.30	189.20	-5.91	-3.3	18.04	10.1	-9.81	-5.5	33.8	18.8
Phosphorus (mg)	224.38	221.90	227.70	2.49	1.1	22.32	9.9	-3.32	-1.5	33.06	14.7
Magnesium (mg)	34.63	33.61	34.67	1.01	2.9	3.90	11.3	-.04	-1	3.64	10.5
Iron (mg)	2.17	2.02	2.08	.15	6.9	.20	9.2	.09	4.1	.15	6.9
Zinc (mg)	1.22	1.21	1.22	.02	1.6	.11	9.0	.00	--	.20	16.4

Note: Number of food items = 20

downward bias in the validators estimates, the magnitude of this bias is relatively small; all of the percentage differences were less than 9 percent.

Examination of the mean absolute differences indicates that the magnitude of the errors recorded by the validators was relatively small. All of the mean absolute differences were less than 19 percent. This is considerably less than the errors reported by Bolland et al. (1990). Bolland tested her observers immediately following a 10-minute training session and reported a mean absolute error of 51 percent. The greater relative accuracy of the validators in this study probably reflects the more intensive training they received.

The correlation between the gold standard and validators' estimates were quite high (Exhibit H.2). All of the correlations were at least .80. Mean correlations were .95 for the first validator and .92 for the second validator. These correlations are consistent with those reported by other investigators (Thompson et al., 1987).

These analyses indicate that the validators achieved a sufficiently high degree of accuracy in visual estimation of portion sizes to serve as the criterion in the field against which the reliability of the field observers could be assessed.

Reliability of Field Observers' Estimates

Exhibit H.3 compares the field observers' and validators' estimates. The mean differences show a clear pattern. Using the validators' estimates as a benchmark, the field observers consistently overestimated the amount of food consumed by children. However, the magnitude of the overestimation is relatively small; the mean percentage difference is less than 7.5 percent for all of the 15 nutrients examined. Furthermore, the true differences are probably even smaller because, as shown above, the validators themselves tended to slightly underestimate portion sizes. Only for calcium, and, to a lesser extent, phosphorus, did the validators tend to overestimate nutrient amounts. In all other nutrients, the field observers' error relative to the validators' estimates tended to counterbalance the validators' small error relative to the weighed portion sizes. Hence, the potential bias in the field observers' estimates is probably quite small.

Exhibit H.2

**Correlations Between “Gold Standard” and Validators' Observations
of Nutrient Content of Foods**

Nutrient	Pearson Correlation Coefficient¹	
	Validator 1	Validator 2
Total Energy (kcal)	.94	.93
Protein (gm)	.96	.80
Vitamin A (mcg RE)	.98	.95
Thiamin (mg)	.95	.97
Riboflavin (mg)	.91	.89
Niacin (mg NE)	.91	.90
Vitamin B ₆ (mg)	.97	.94
Folate (mcg)	.99	1.00
Vitamin B ₁₂ (mcg)	.96	.93
Vitamin C (mg)	.97	.99
Calcium (mg)	.95	.89
Phosphorus (mg)	.93	.83
Magnesium (mg)	.87	.92
Iron (mg)	.97	.98
Zinc (mg)	.96	.83
Average Correlation	.95	.92

Note: Number of food items = 20

¹All associations significant at the $p \leq .001$ level.

The magnitude of the mean absolute differences between field observers' and validators' estimates is also relatively small (Exhibit H.3). The percent absolute differences ranged from 17 percent to 23 percent. These are somewhat larger than the absolute differences between the validators and the gold standard, which ranged from 7 percent to 19 percent. This probably reflects the more intensive training received by the validators (and possibly, level of experience). However, the magnitude of the errors recorded by the field observers is still considerably less than those reported by Bolland.

Correlations between validator and field observer estimates are shown in Exhibit H.4. The correlations range from .84 to .94, with an overall mean correlation of .90. These correlations indicate a high degree of agreement between validators and field observers. These analyses indicate that the average level of reliability of the field observers over the course of the field effort was quite good.

Reliability of the Field Observers over the Field Period

Exhibit H.5 presents the results of the regression analysis. The results clearly show that the field observers' reliability did not deteriorate over the course of the extended field effort. In only one of the 15 regression models (zinc) is the number of days elapsed since field observer training statistically significant at the .05 level of confidence.

There is some evidence that the number of children being observed (at one time) affects the accuracy of the observations. In six of the models (thiamine, riboflavin, niacin, vitamin B₆, folate, and iron) the number of children being observed had a significant positive relationship to the absolute difference between field observers' and validators' estimates.

There is also some evidence that practice reduces the size of the observation errors. The coefficient of the number of previous site visits conducted is always negative, providing some indication that experience reduces the magnitude of errors. However, the coefficient is statistically significant at the .05 level of confidence in only 3 of the 15 regressions.

Exhibit H.3

Differences Between Field Observers' and Validators' Estimates of Nutrient Intake

Nutrients	Overall Means		Differences (validator minus observer)			
	Observers	Validators	Mean Difference	% Diff	Mean Abs Diff	% Abs Diff
Total Energy (kcal)	590.65	548.29	-42.36	-7.2%	97.53	17.8%
Protein (gm)	23.49	22.14	-1.35	-6.1	3.91	17.7
Vitamin A (mcg RE)	381.77	357.31	-24.46	-6.4	83.37	23.3
Thiamin (mg)	0.55	0.52	-0.02	-3.6	.10	19.2
Riboflavin (mg)	0.85	0.80	-0.05	-5.9	.15	18.8
Niacin (mg NE)	5.40	5.12	-0.27	-5.0	1.13	22.1
Vitamin B6 (mg)	0.60	0.58	-0.02	-3.3	.11	19.0
Folacin (mcg)	87.41	83.87	-3.54	-4.0	19.47	23.2
Vitamin B12 (mcg)	1.48	1.38	-0.09	-6.1	.29	21.0
Vitamin C (mg)	40.32	37.36	-2.96	-7.3	8.67	23.2
Calcium (mg)	458.19	425.80	-32.38	-7.1	84.21	19.8
Phosphorus (mg)	492.73	464.62	-28.11	-5.7	80.28	17.3
Magnesium (mg)	95.55	90.50	-5.05	-5.3	14.86	16.4
Iron (mg)	4.32	4.25	-0.06	-1.4	.97	22.8
Zinc (mg)	2.85	2.68	-0.17	-6.0	.49	18.3

Note: Number of children observed = 157

Exhibit H.4

**Correlations Between Validator and Field Observer
Estimates of Nutrient Intake**

Nutrient	Pearson Correlation Coefficient¹
Total Energy (kcal)	.90
Protein (gm)	.91
Vitamin A (mcg RE)	.89
Thiamin (mg)	.90
Riboflavin (mg)	.89
Niacin (mg NE)	.88
Vitamin B ₆ (mg)	.94
Folate (mcg)	.86
Vitamin B ₁₂ (mcg)	.89
Vitamin C (mg)	.84
Calcium (mg)	.90
Phosphorus (mg)	.92
Magnesium (mg)	.92
Iron (mg)	.89
Zinc (mg)	.90
Average Correlation	.90

Note: Number of children observed = 157

¹All associations significant at the $p \leq .001$ level.

Exhibit H.5

Regression Results Predicting Overall Absolute Differences Between Validator and Observer Estimates of Nutrient Intake

Nutrients	Predictor Statistics									
	Overall Model Prob> F	Elapsed Days			Average Number of Children Observed			Number of Sites Observed Previously		
		Coeff	Std Err	Prob> T	Coeff	Std Err	Prob> T	Coeff	Std Err	Prob> T
Total Energy (kcal)	.10	.32	.26	.22	10.07	6.17	.10	-26.94	15.03	.08
Protein (gm)	.65	.01	.01	.39	.20	.27	.46	-.21	.21	.30
Vitamin A (mcg RE)	.00	.07	.33	.83	6.22	7.72	.42	-65.62	18.81	.00
Thiamin (mg)	.10	.00	.00	.45	.02	.01	.03	-.02	0.02	.27
Riboflavin (mg)	.05	.00	.00	.58	.02	.01	.04	-.04	.02	.07
Niacin (mg NE)	.01	.00	.00	.30	.26	.09	.00	-.22	.21	.28
Vitamin B ₆ (mg)	.01	.00	.00	.09	.03	.01	.00	-.02	.02	.41
Folate (mcg)	.18	.01	.07	.90	3.82	1.76	.03	-2.06	4.29	.63
Vitamin B ₁₂ (mcg)	.11	.00	.00	.93	.01	.02	.63	-.12	.05	.03
Vitamin C (mg)	.81	-.03	.05	.51	-.37	1.15	.75	2.37	2.79	.40
Calcium (mg)	.28	-.13	.25	.59	7.90	5.96	.19	-14.60	14.52	.32
Phosphorus (mg)	.21	.04	.22	.86	4.94	5.21	.34	-22.74	12.70	.08
Magnesium (mg)	.56	.02	.04	.66	1.24	.97	.20	-1.36	2.37	.57
Iron (mg)	.00	.00	.00	.63	.23	.07	.00	-.56	.18	.00
Zinc (mg)	.02	-.40	.20	.04	-3.03	4.67	.52	-14.21	11.37	.21

Note: Number of children observed = 157

CONCLUSIONS

After receiving intensive training, including at least eight hours devoted to the visual estimation of portion sizes, field observers attained a high level of reliability in conducting visual estimation of food consumed by children in child care. There is no evidence that reliability deteriorated over the 22-week field period. Hence, it does not appear that retraining is warranted over the course of an extended field period provided that field observers are adequately trained at the outset. Finally, there is some evidence that field observers' accuracy decreases as increasing numbers of children are observed. While the results of this study suggest that field observers can accurately estimate the amount of food consumed by up to six children in a child care setting, the design of future studies should carefully consider the number of children being observed.

References

- Bolland, J.E., J.A. Yuhas and T.W. Bolland (1990). Improved accuracy of estimating food quantities up to four weeks after training. *J Am Diet Assoc* 90:1402–1407.
- Comstock, E., R. St. Pierre and Y. Mackiernan (1981). Measuring individual plate waste. *J Am Diet Assoc* 79:290–296.
- Simons-Morton, B. and T. Baranowski (1991). Observation in assessment of children’s dietary practices. *J of School Health* 61:204–207.
- Thompson, C.H., M.K. Head, and S.M. Rodman (1987). Factors influencing accuracy in estimating plate waste. *J Am Diet Assoc* 87:1219–1220.