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United States
Department of
Agriculture

Food and
Nutrition
Service

Office of
Analysis and
Evaluation

Child Nutrition Program Operations Study

Second Year Report

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Associates Inc.

***Child Nutrition Program
Operations Study: Second
Year Report***

Contract No. FNS-53-3198-7-32

Authors:

Robert St. Pierre
Mary Kay Fox
Michael Puma
Frederic Glantz
Marc Moss

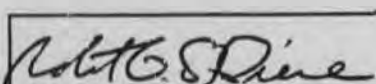
June 1992

Prepared by:

Abt Associates Inc.
55 Wheeler Street
Cambridge, MA 02138

Prepared for:

John Endahl
USDA/FNS/OAE
3101 Park Center Drive
Alexandria, VA 22302


Contract Manager


Quality Control Reviewer

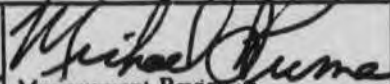

Management Reviewer

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ACKNOWLEDGEMENTS

The Child Nutrition Program Operations Study is a large long-term undertaking which requires the ongoing cooperation of food service personnel in school districts across the country and of program administrators in all States. Special thanks are due to all of the School Food Service Managers, State Child Nutrition Directors, State Distributing Agents, and other personnel who have helped with this study.

Members of the Education Information Advisory Committee (EIAC), Food and Nutrition Service Subcommittee, of the Council of Chief State School Officers have spent substantial time and effort reviewing instruments for this study and discussing study plans with school and state personnel. Key EIAC members include Karol Richardson from the Illinois State Board of Education, John Raftery from the Massachusetts State Department of Education, Tom Freeman from the Oklahoma State Department of Education, Kathy Kuser from the New Jersey Department of Education, and Carol Axtman from the South Dakota Department of Education and Cultural Affairs.

The study is also assisted by an Advisory Panel consisting of several experts. These persons include Susal Gilroy, School Food Service Manager from the San Diego Unified Schools, Jack Fowler, a sampling statistician from the University of Massachusetts, Jack Nelson, State Distributing Agent from Virginia, and John Raftery, State Child Nutrition Director from Massachusetts.

Staff of the Office of Analysis and Evaluation, Food and Nutrition Service, U.S. Department of Agriculture are responsible for oversight of the project. As Project Officer, John Endahl oversees all planning, implementation, and reporting activities of the study.

Finally, several staff members at Abt Associates Inc. play important roles in the project. Key staff include Robert St. Pierre (Project Director), Mary Kay Fox (Senior Analyst), Michael Puma (Senior Analyst), Frederic Glantz (Senior Analyst), Jean Layzer (Director of Field Operations), Michael Battaglia (Sampling Statistician), Marc Moss (Senior Analyst), Ellen Lee (Data Base Manager), Diane Stoner (Survey Director), Lyria Boast (Research Assistant), and Tracy Olcott (Project Secretary).

CHILD NUTRITION PROGRAM
OPERATIONS STUDY
SECOND YEAR REPORT

EXECUTIVE SUMMARY

STUDY BACKGROUND

Under contract to the Food and Nutrition Service (FNS) of the U.S. Department of Agriculture, Abt Associates Inc. (AAI) of Cambridge, MA is conducting a multi-year study of the Child Nutrition Programs. This report presents findings from the second year of the study.

THE CHILD NUTRITION PROGRAMS

The school-based Child Nutrition programs operate in every State in the Nation. They include the National School Lunch Program (NSLP), the School Breakfast Program (SBP), the Food Donation Program (FDP), the Special Milk Program (SMP), and the Nutrition Education and Training Program (NET). State Administrative Expense (SAE) funding is provided for the NSLP, SBP, and SMP as well as for the Child and Adult Care Food Program (CACFP).

Administered by FNS, these programs represent an annual investment of over \$4 billion of Federal funds to establish, maintain, and operate non-profit school lunch and breakfast programs for the benefit of the Nation's school children.

PURPOSE OF THE STUDY

To manage the Child Nutrition programs effectively, FNS collects and analyzes information from annual State-level management reports. However, because these State-level reports vary considerably in both format and content, FNS is unable to rely on this source for all of its ongoing information needs. FNS also has many one-time information needs to address current policy issues.

Consequently, FNS contracted with AAI to collect information from School Food Authorities (SFAs) through annual surveys to obtain information on issues that are of interest to FNS. Compared with the alternative of conducting several special-purpose studies, the implementation of an ongoing data collection capability reduces FNS' information collection costs, lessens overall respondent burden, and reduces the length of time required to obtain the needed data.

RESEARCH APPROACH

The Child Nutrition Program Operations Study is designed to collect data from States and participating SFAs through annual telephone surveys during School Years (SY) 1988-89, 1989-90, and 1990-91 and through on-site visits during SY 1989-90 and 1991-92. The specific information needs for each data collection effort are defined by FNS staff. The surveys provide a "snapshot" of administrative structure and, for selected research items that are included in all three of the annual surveys, an assessment of year-to-year changes in program operations.

Data collected in the annual SFA surveys are to produce national estimates as well as estimates for the following subgroups of SFAs:

- public SFAs,
- private SFAs,
- SFAs that participate in both the NSLP and SBP,
- SFAs that participate only in the NSLP,
- SFAs that serve 60 percent or more lunches free or at a reduced-price (these SFAs are eligible to receive an extra two cents reimbursement for each meal served in the NSLP) and
- SFAs that serve 59 percent or fewer lunches free or at a reduced-price.

In Year Two of the study, the telephone survey of SFA managers yielded 1,359 completed interviews for a 78 percent response rate. Potential nonresponse bias was counteracted by weighting the responding sample to make the number of lunches served nationally match FNS' known universe counts for all SFAs and separately for SFAs that serve over and under 60 percent free or reduced-price lunches. Most of the findings from the second year survey are referenced to SY 1989-90. However, some of the findings rely on end-of-year data, and hence reference the previous year (SY 1988-89).

The second year of the study also included on-site meal observations conducted in 20 SFAs for the purpose of collecting information on meals offered to, selected by and consumed by students participating in the NSLP and SBP. The 20 SFAs were purposively selected--10 were considered to have exemplary food service programs and 10 were considered to be typical (non-exemplary) SFAs.¹ Typical SFAs were selected to roughly match

¹/The 10 exemplary SFAs were selected from a pool of approximately 70 SFAs that were nominated by FNS headquarters and regional office staff, the American School Food Service Association and State Child Nutrition Program Directors. All nominated "exemplary" SFAs had initiated steps to reduce the level of fat, cholesterol and/or sodium in school meals.

exemplary SFAs in terms of percentage of meals served free or at a reduced price, total enrollment, region, and kitchen configuration.

Three representative schools within each of the 20 SFAs (two elementary schools and one middle/secondary school) were included in the on-site meal observations, for a total of 60 schools. In each school, meal service was observed for five consecutive days and detailed data were collected on meals offered (meals that were made available to children on the day of observation), meals selected (actual food selections were observed for approximately 60 children at each meal), and meals consumed (at each meal, plate waste was observed for 12 of the 60 selected children).

FINDINGS

The major findings for the second year of the study are grouped into the following areas: participation in the NSLP and SBP, meal prices and meal costs, Food Donation Program operations, Child Nutrition labeling, technical assistance, and food and nutrient composition of NSLP and SBP meals.

PARTICIPATION IN THE NSLP AND SBP

FNS has an ongoing interest in measuring and understanding participation in the Child Nutrition Programs because Federal subsidies are tied to the number of meals actually served. This study acquired data on the number of meals served in each year in the NSLP and SBP during SY 1987-88 (Year One Survey) and SY 1988-89 (Year Two Survey) and used these data to compute National estimates of the number of meals served as well as student-level participation rates. The study also evaluated year-to-year changes.

Estimated NSLP Participation. An estimated 4.0 billion lunches were served to school children in both SY 1987-88 and SY 1988-89. In each year, almost all of the lunches (about 98 percent) were served in public schools. Exhibit 1 shows the number and percentage of lunches served to children who qualified for free, reduced-price, and paid meals in SY 1988-89. The percentages are virtually identical to data for SY 1987-88. In each year, approximately 40 percent of all lunches were served free of charge to children from low-income families, about 7 percent were served at a reduced price, and about 53 percent were served to children who paid full price for their lunch. In both years, the distribution of NSLP meals by eligibility category varies by type of SFA. Public SFAs, SFAs that participate in both the NSLP and SBP, large SFAs, and SFAs that serve 60 percent or more free or reduced-price lunches were significantly more likely to serve free meals. Conversely, private SFAs, SFAs that do not

Exhibit 1

**Total NSLP Participation
(SY 1988 - 89)**

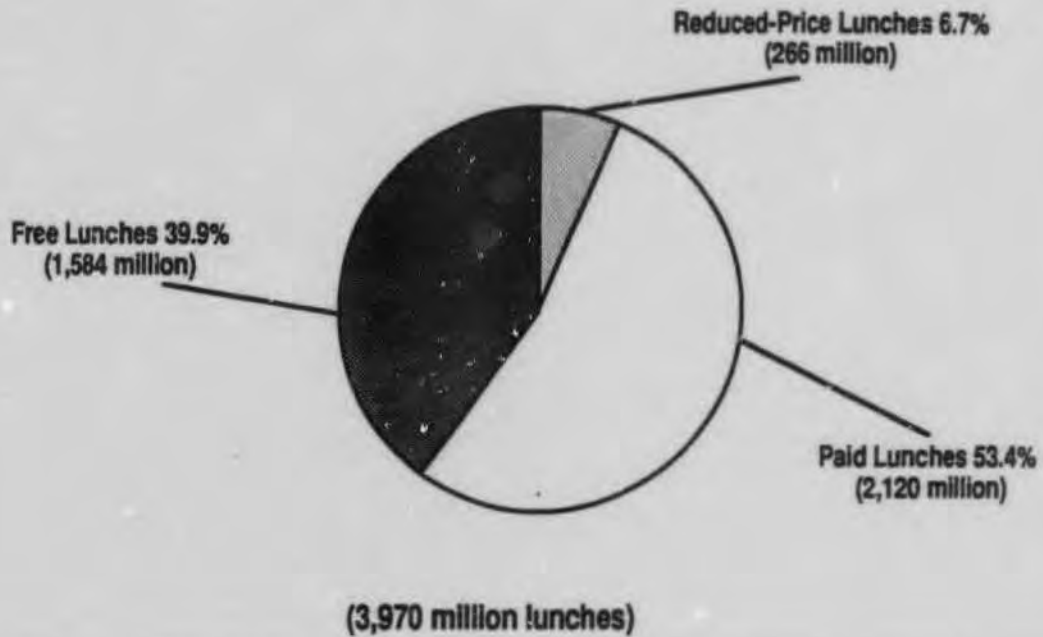
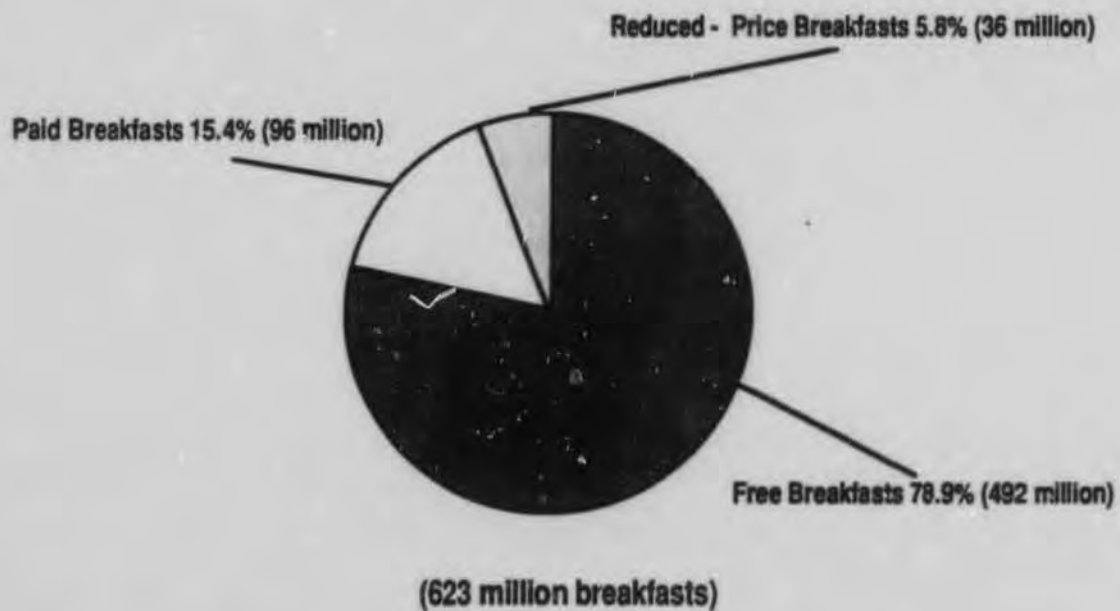


Exhibit 2

**Total SBP Participation
(SY 1988 - 89)**



participate in the SBP, small and medium-sized SFAs and SFAs that serve fewer than 60 percent free or reduced-price lunches served a higher proportion of paid meals--over 60 percent of the lunches served in these SFAs were paid meals.

Estimated SBP Participation. An estimated 604 million school breakfasts were served to school children in SY 1987-88 and about 623 million breakfasts were served in SY 1988-89. The difference between the two years is not statistically significant. The percentage of breakfasts served in public vs. private SFAs and in SFAs of varying sizes was consistent across the two years. In each year, over 98 percent of all breakfasts were served in public SFAs, and about 75 percent were served in large SFAs.

Exhibit 2 shows the number and percentage of breakfasts served to children who qualified for free, reduced-price and paid meals in SY 1988-89. The pattern is comparable to that seen in SY 1987-88--in both years, approximately 80 percent of all breakfasts were served free or at a reduced price.

There are several indicators that show growth in the SBP over the last few years. Data from this study show that the estimated number of SFAs offering the SBP increased from 3,867 in SY 1987-88 (26.9 percent of all SFAs) to 4,274 in SY 1988-89 (33.3 percent of all SFAs). This increase in the number of SFAs offering the SBP has been accompanied by an increase in the number of schools offering the SBP within the average SFA: 6.9 schools per SFA offered the SBP in SY 1987-88 and 7.0 schools per SFA offered the SBP in SY 1988-89. Data from FNS indicate that the SBP was made available to an increasing proportion of school children in each of the school years from 1984-85 (32.8 percent of all school children had the SBP available) through 1988-89 (40.4 percent).

Clearly, the number of SFAs offering the SBP is growing. However, with only two years worth of data from the present study, it is not possible to draw definitive conclusions about the pattern of SBP growth for subgroups of SFAs. This issue will be addressed in more detail in the third report from this study.

NSLP Student Participation Rates. The participation rate for students approved for free meals is defined as the number of meals served during the year to all students approved for free meals divided by the number of meals that would have been provided if all students approved for free meals had received a meal each day. The participation rate for students approved for reduced-price meals is similarly defined as the number of meals served during the year to all students approved for reduced-price meals divided by the number of meals that would have been provided if all students approved for reduced-price meals had received a meal each day. Finally, the participation rate for students who pay full price is defined as the number of meals

served during the year to all students not approved for either free or reduced-price meals divided by the number of meals that would have been provided if all students who pay full price had received a meal each day.

Exhibit 3 shows that overall student participation in the NSLP was estimated to be 60.2 percent for SY 1988-89. That is, on an average day, 60.2 percent of the students who had the NSLP available to them actually participated in the program. This estimate is not significantly different from the figure reported for the first year of the present study (59.1 percent). Moreover, it is very close to the participation rate of 59.4 percent which can be calculated from FNS' administrative data.^{1/} It is somewhat less than the rate of 65.9 percent reported by the National Evaluation of School Nutrition Programs, but that rate failed to account for absenteeism.^{2/}

Exhibit 3 also shows SY 1988-89 NSLP participation rates for children in each income-eligibility category. Participation rates did not differ significantly from SY 1987-88. In both years, participation among children approved for free meals approached 90 percent. Reduced-price participation rates were somewhat lower at approximately 70 percent, and paid NSLP participation was lower still at about 47 percent. This pattern is consistent with findings from other studies.

In examining overall participation rates across types of SFAs, significantly higher rates of student participation were found in SFAs offering the SBP, small SFAs, and SFAs that serve 60 percent or more free or reduced-price lunches. In addition, participation rates were significantly higher in elementary schools than in middle/secondary schools. On an average school day in both years of the study, over 70 percent of elementary school students selected an NSLP meal, compared to 48 percent of middle/secondary school students.

SBP Student Participation Rates. Exhibit 4 shows that the overall student participation rate in the SBP was estimated to be 20.6 percent for SY 1988-89. This figure is almost identical to the estimate of 20.8 percent calculated for SY 1987-88. It is also quite close to the estimate of 20.1 percent derived from FNS administrative data for SY 1988-89.^{3/} Exhibit 4 also shows

1/Annual Historical Review of FNS Programs: Fiscal Year 1989. USDA, Food and Nutrition Service, 1990.

2/Wellisch, J.B. et al., The National Evaluation of School Nutrition Programs: Final Report. Santa Monica, CA: Systems Development Corporation, 1983.

3/Annual Historical Review of FNS Programs: Fiscal Year 1989. USDA, Food and Nutrition Service, 1990.

Exhibit 3

**NSLP Student Participation Rates
(SY 1988 - 89)**

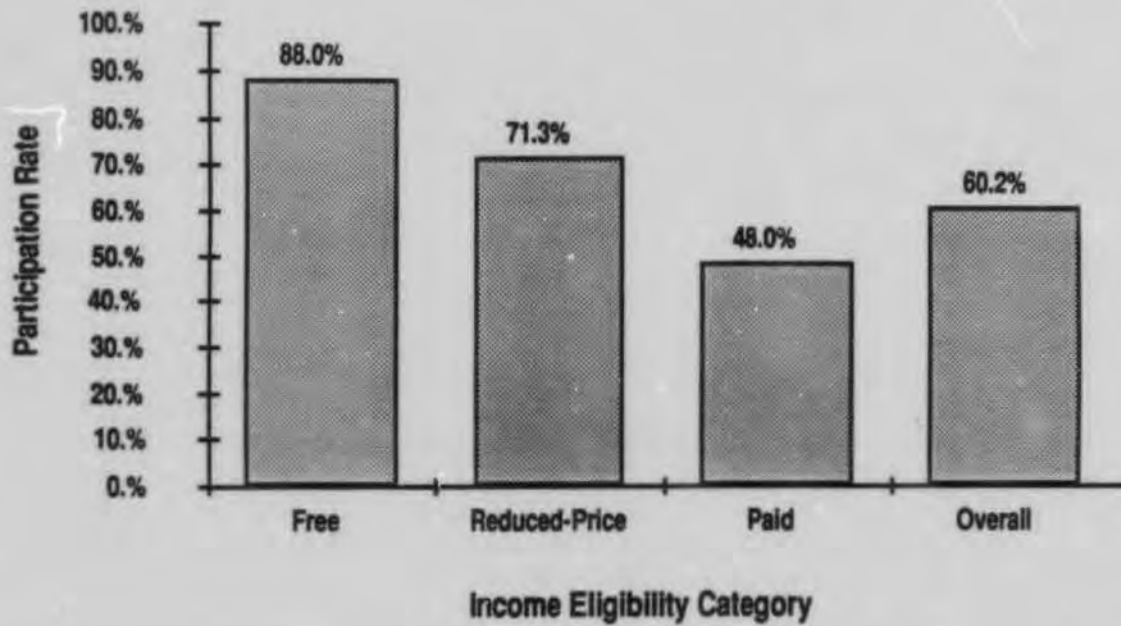
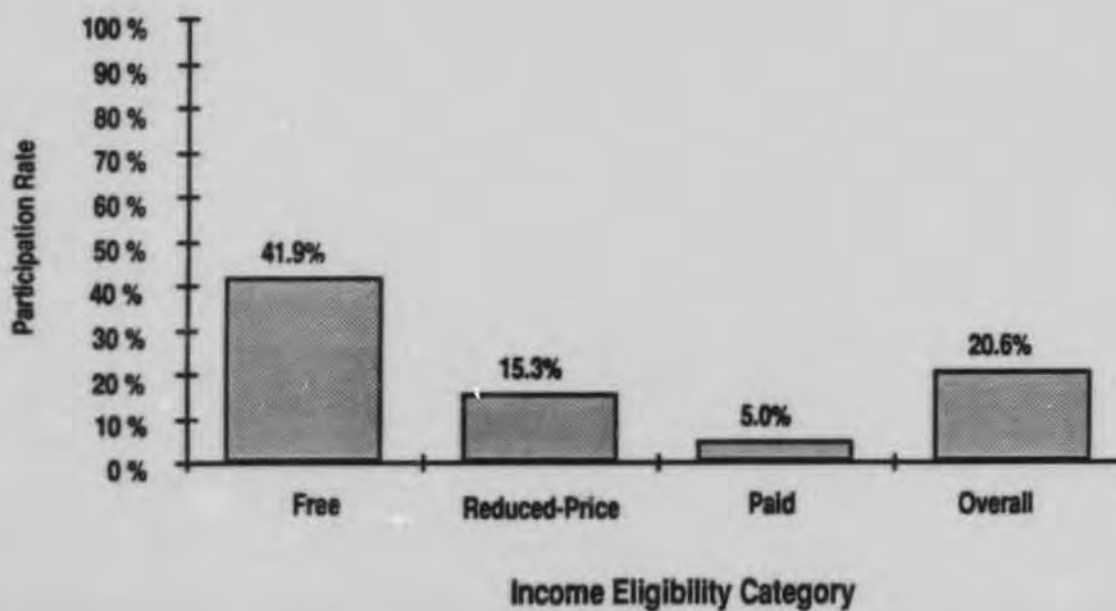


Exhibit 4

**SBP Student Participation Rates
(SY 1988 - 89)**



participation rates for SY 1988-89 by eligibility category. The data are quite consistent across years, indicating that SBP participation rates are highest for free meals (approximately 42 percent), and lowest for paid meals (about 5 percent).

MEAL PRICES AND MEAL COSTS

Previous research has shown that the price charged for an NSLP meal is a primary determinant of student participation decisions. This study acquired data on meal prices for SY 1988-89 and SY 1989-90. The study also examined the cost of producing an NSLP meal, as reported by SFAs, and evaluated year-to-year changes in meal prices and reported costs.

Meal Prices. The average price for a paid NSLP meal during SY 1989-90 was \$.95 in elementary schools, \$1.06 in secondary schools (Exhibit 5), and was \$1.00 across all schools. These prices are not significantly different from those charged in SY 1988-89 which were only two to three cents lower. Prices charged in SFAs that participate in the SBP and in SFAs that serve 60 percent or more free or reduced-price lunches were lower--in both elementary and middle/secondary schools--than prices in other SFAs.

Reduced-price lunches averaged \$.38 in both SY 1988-89 and SY 1989-90, with little variation across types of SFAs or across grade levels. In large part this is due to the Federally-set ceiling of \$.40 for a reduced-price lunch. The average price for an adult lunch in SY 1988-89 was \$1.55 in elementary schools and \$1.60 in middle/secondary schools. Adult prices were \$1.59 and \$1.63 in elementary and middle/secondary schools, respectively, during SY 1989-90. The year-to-year differences are not statistically significant. Adults pay higher prices in elementary schools in public SFAs, and in middle/secondary schools in SFAs that do not participate in the SBP.

The price charged for a paid SBP breakfast in SY 1989-90 was \$.50 in elementary schools and \$.52 in middle/secondary schools (Exhibit 6). SBP prices were lower in small SFAs than in large SFAs and in SFAs that serve 60 percent or more free or reduced-price lunches than in SFAs that serve less than 60 percent free or reduced-price lunches. Prices in SY 1989-90 did not differ significantly from SY 1988-89 prices, except for middle/secondary schools in small SFAs, where the price for a paid breakfast increased from \$.39 to \$.48. This serves to bring the prices paid in small SFAs more in line with prices paid in larger SFAs.

The average price of a reduced-price SBP breakfast was \$.26 with little variation across SFAs, grade levels or years of the study. Adult breakfast prices were about \$.75 in elementary schools and \$.82 in middle/secondary schools in both years of the study.

Exhibit 5

NSLP Meal Prices (SY 1989 - 90)

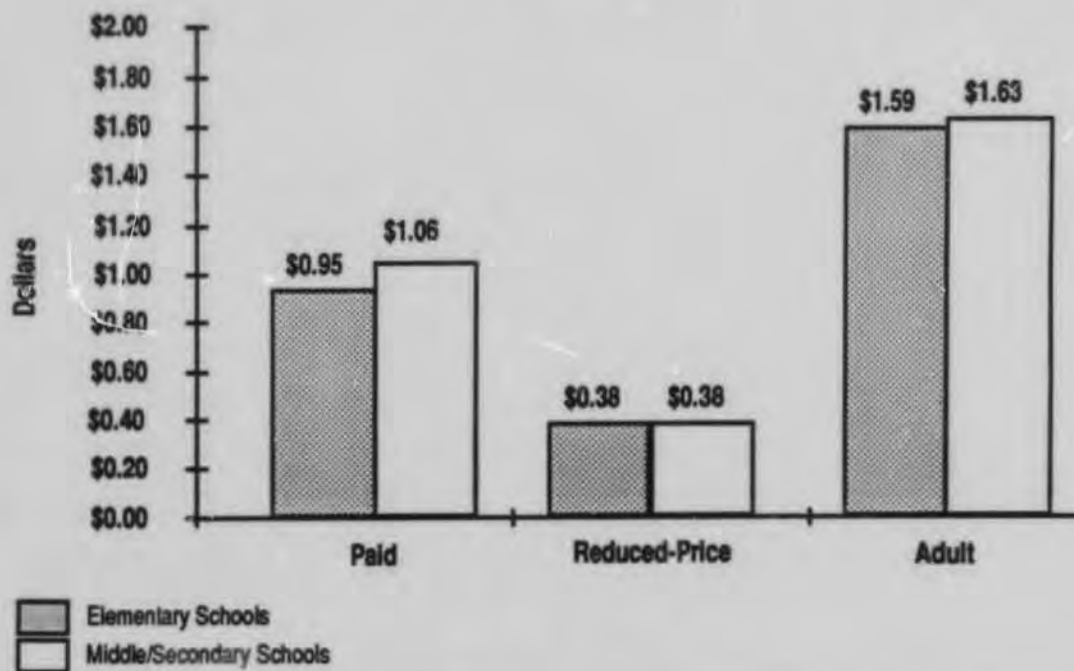
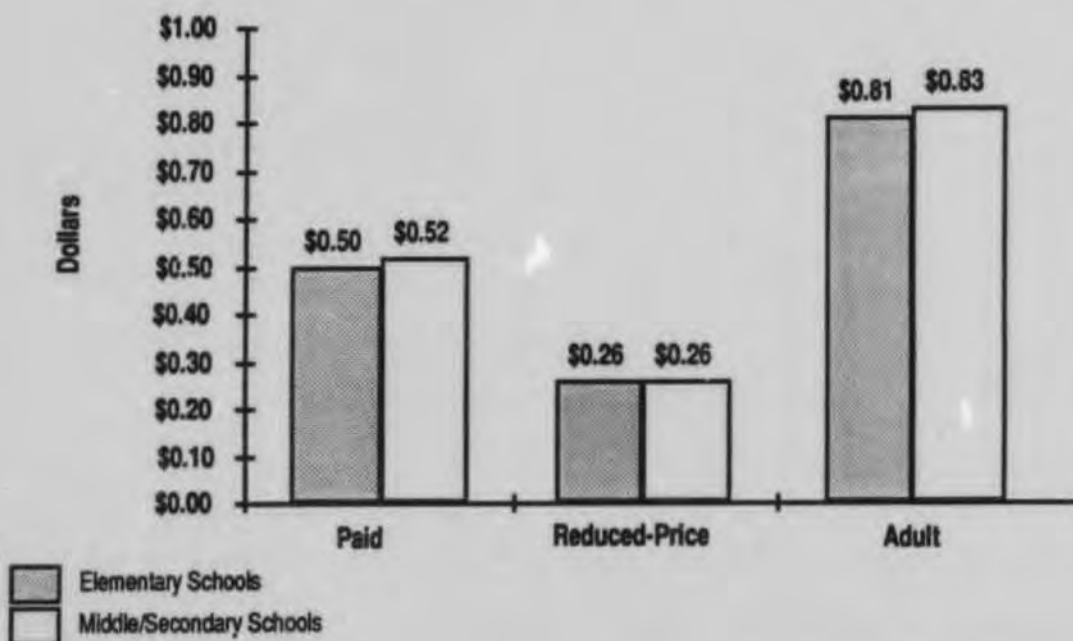


Exhibit 6

SBP Meal Prices (SY 1989 - 90)



Prices charged in some SFA subgroups did increase significantly between SY 1988-89 and SY 1989-90. The average price for an adult breakfast in elementary schools increased by \$.10 in small SFAs and \$.07 in SFAs that serve 60 percent or more free or reduced-price lunches. Middle/secondary school prices increased by \$.07 in medium-sized SFAs and \$.06 in SFAs that serve 60 percent or more free or reduced-price lunches. Given the magnitude and prevalence of the increases in adult breakfast prices, it seems clear that SFAs are more likely to raise the price of an adult breakfast than a student breakfast.

Reported Meal Costs. To determine the cost of producing an average NSLP meal, this study converted breakfasts, adult meals, and a la carte sales into NSLP lunch equivalents (LEQs). The conversion was based on an econometric model of the joint production process used to produce these various cafeteria outputs.

Exhibit 7 shows that the average SFA incurred costs of \$1.46 to produce an LEQ in SY 1988-89.^{1/} This is not significantly different than the SY 1987-88 figure of \$1.43 per LEQ. Average costs per LEQ were higher in large SFAs (\$1.65) than in small (\$1.28) or medium-sized (\$1.60) SFAs.

If the LEQ is used as the unit of analysis, rather than the SFA, the average cost of producing an LEQ in SY 1988-89 was \$1.67, not significantly different from the cost of \$1.62 in SY 1987-88.^{2/} The fact that the cost of producing a meal is higher when equal weight is given to each LEQ reflects the large number of meals produced in large SFAs, where reported costs per lunch are higher than in other SFAs.

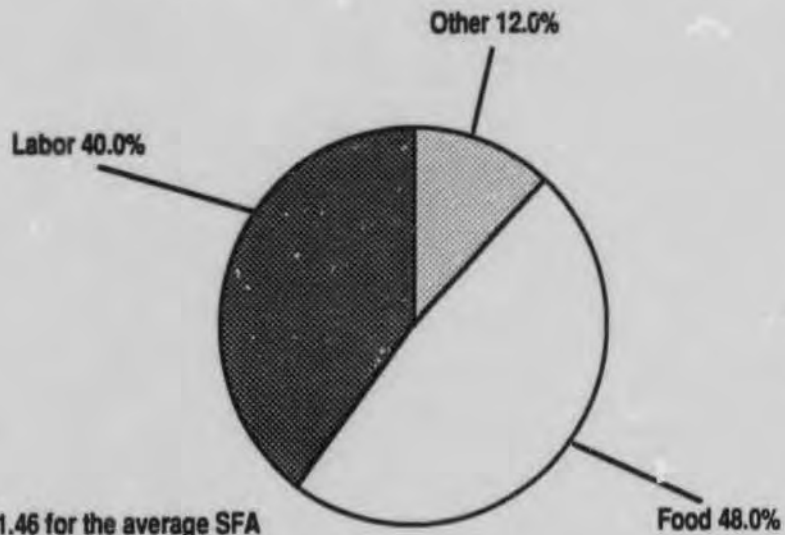
As one would expect, food and labor costs accounted for the vast majority of reported meal costs (Exhibit 7). Based on costs incurred by the average SFA, food costs, including the assigned value of donated commodities, accounted for about one-half of reported meal costs in both years, averaging \$.68 per LEQ in SY 1987-88 and \$.73 per LEQ in SY 1988-89. Labor costs accounted for almost 40 percent of reported costs in both years (\$.57 per LEQ). Neither food costs nor labor costs changed significantly between SY 1987-88 and SY 1988-89 with the exception that food costs rose by \$.06 per LEQ in medium-sized SFAs.

^{1/}Calculated as the average cost per LEQ across all SFAs in the nation, i.e., the SFA is the unit of analysis. This analysis gives equal weight to each SFA, regardless of size.

^{2/}Calculated as the average cost per LEQ across all LEQs served in the Nation, i.e., the LEQ is the unit of analysis. This analysis gives equal weight to each LEQ, and since most LEQs are produced in large SFAs, the results are dominated by the cost incurred in large SFAs.

Exhibit 7

**Cost of a School Lunch
(SY 1988 - 89)**



Total Cost = \$1.46 for the average SFA
Total Cost = \$1.67 for the average lunch

All other costs including supplies, contract services, capital expenditures, indirect charges by the school districts, and storage and transportation, represented only about 12 percent of SFA-reported costs (\$.18 per LEQ in SY 1987-88 and \$.16 per LEQ in SY 1988-89). Roughly the same distribution of cost is observed when the LEQ is the unit of analysis.

USDA subsidies to SFAs for the NSLP and SBP include both cash reimbursements and donated commodities. The reimbursement rate per free lunch was \$1.405 in SY 1987-88 and \$1.4625 in SY 1988-89. In addition, SFAs were eligible to receive \$0.12 per NSLP lunch in entitlement commodities during SY 1987-88 and \$.1225 during SY 1988-89 and, subject to availability, all the bonus commodities that could be used without waste (about \$0.08 per NSLP lunch). Therefore, the total USDA subsidy for free lunches averaged \$1.60 in SY 1987-88 (\$1.405 + \$0.12 + \$0.08) and \$1.66 in SY 1988-89 (\$1.4625 + \$0.1225 + \$0.08). This is about the same as the average reported cost of producing an LEQ (\$1.62 in SY 1987-88 and \$1.67 in SY 1988-89). It is, however, somewhat greater than the reported cost of producing an LEQ for the average SFA (\$1.43 in SY 1987-88 and \$1.46 in SY 1988-89).

FOOD DONATION PROGRAM (FDP)

The Child Nutrition Programs have historically acquired large amounts of surplus agricultural commodities through the FDP. This study obtained data on several aspects of FDP operations in order to help FNS improve the program.

Buy American Provision. The Commodity Distribution Reform Act of 1987 required that, whenever possible, school districts purchase food products that are produced or manufactured in the United States. Data from this study indicates that this provision has not been well communicated to SFA managers. Nearly half of those queried were not aware of this requirement, with small and private SFAs particularly unlikely to know about this provision. (This does not mean that SFAs are not purchasing food items made with American agricultural products.)

Excess Commodity Inventories and Commodity Transfers. The extent to which SFAs are maintaining excessive inventories of USDA-donated commodities has been a long-term area of concern for both FNS and the recipient agencies. Based on results from the SFA Manager Survey, about one-fourth of all SFAs were carrying more than a six-month supply of at least one USDA-donated commodity during SY 1989-90. Excess inventories were more likely to be found in public SFAs, large SFAs, low-poverty SFAs, and those participating in both the NSLP and the SBP.

Seven specific commodities accounted for two-thirds of the reported excesses: flour (20 percent of the SFAs with over six-

month inventories), peanut butter (11 percent), butter (11 percent), dates/raisins/figs (seven percent), honey (six percent), oil (six percent), and nuts (five percent).

One way that SFAs can avoid excess inventories is by transferring commodities to eligible public or private, non-profit organizations providing food assistance to low-income groups and individuals (e.g., food banks, homeless shelters, soup kitchens, etc.). In addition, SFAs are eligible to receive excess commodities from these agencies. This transfer mechanism is rarely utilized however, with only five percent of SFAs transferring donated commodities to another recipient agency, and about six percent receiving such transfers during SY 1989-90. The amount of these transfers was generally small with about two-thirds being valued under \$500.

Commodity Processing. There has been some concern that SFAs using processed end-products may not receive proper credit for value of the donated commodities included in the processed product. Beginning in SY 1989-90, program regulations require that processors indicate, on the invoice, the value of USDA-donated commodities contained in any processed end-product. Forty-five percent of the SFA managers surveyed reported receiving this information "all of the time." About one in four managers reported that they never received this information.

Delivery Systems. In recent years, FNS has made substantial efforts to develop new initiatives to reduce the cost of commodity distribution and to improve the quality of services received by SFAs. In particular, these efforts have focused on using commercial distributors by combining the distribution of commodities with deliveries of wholesale food purchases. Data from this study indicate that SFAs have taken advantage of such delivery systems. Fifty-five percent of SFAs receive donated commodities from commercial distributors either alone or along with purchased food items. Another 37 percent receive donated commodities through a system arranged by their State Distributing Agency -- either using a State-owned vehicle or through a commercial carrier -- and 28 percent use their own vehicles to pick up commodities from State-owned or contracted warehouses.

State Agency-Local SFA Interactions. In previous years, some SFAs have expressed dissatisfaction with the level of services received from their respective State Distributing Agents. By SY 1989-90, such concerns seem to have reached a very modest level. In the vast majority of instances, SFAs are well informed about delivery schedules and about the amounts and types of commodities to be received. When asked their opinion of the FDP in their respective States, most responded positively. Seventy-eight percent of SFA managers rated communications with State Distributing Agents as either excellent or very good, and 71 percent rated the overall performance of the commodity

distribution system (in SY 1989-90) as excellent or very good. About one-third of SFAs believe the program has improved in recent years and that communications with their State Distributing Agent have also improved. Only three percent noted any worsening in recent years.

CHILD NUTRITION LABELING

Child Nutrition (CN) Labeling is a voluntary technical assistance program that allows manufacturers, with appropriate Federal inspection, to make claims about the contribution of their products to NSLP and SBP meal pattern requirements. While the CN Labeling Program appears to be popular among SFA personnel and food industry representatives, FNS has several concerns. For this study, FNS requested information on SFA managers' awareness of the CN Labeling Program, the extent to which CN labels are required by SFAs, and SFA managers' opinions about potential benefits of the CN Labeling Program.

SFA Managers' Awareness of CN Labeling. More than one-third of SFA managers were not aware of the CN Labeling Program. Managers of public SFAs, SFAs offering both the NSLP and SBP, and large SFAs were most likely to be aware of the program. Managers of large SFAs appear to be the most familiar with CN Labeling (90 percent), while managers in private SFAs appear to be the least familiar with the program; only 37 percent of these managers were aware of CN Labeling.

Proportion of SFAs Requiring CN Labels. Approximately two-thirds of the SFA managers familiar with the CN Labeling Program required CN labels for one or more eligible food products in SY 1989-90. This requirement varied across SFA subgroups. For example, significantly more public SFAs required CN Labeling than private SFAs (68 percent vs. 44 percent). Requirements for CN labels were also more common in SFAs that offer the breakfast program and in high-poverty SFAs.

Among SFAs that required CN labels, 94 percent required labels for meat or poultry products and 80 percent required CN labels for seafood products. Less than half of the SFAs required CN labels for non-meat products and juice drinks.

SFA Managers' Opinions About CN Labeling. The most consistently held opinion about the benefits of CN Labeling is that it ensures that processed food products will meet USDA meal pattern requirements--90 percent of SFA managers agreed with this contention. SFA managers felt almost as confident about the ability of the CN Labeling Program to ensure standard food portion--81 percent of respondents agreed with this statement. Both of these opinions match the intent of the CN Labeling Program. However, the program does not address issues of food

quality, hence, it is surprising that half of the SFA managers believed that CN labels ensure higher food quality, and that 38 percent believed that CN-labeled products are nutritionally superior to other products.

Forty-two percent of SFA managers agreed that CN Labeling allows many vendors to bid for SFA business. However, only 22 percent of managers agreed that CN Labeling allowed them to purchase foods at lower prices. Once again, the program makes no claim that it will affect food prices.

Overall, almost two-thirds of SFA managers rated the CN Labeling Program as very important or important. However, 35 percent of the SFA managers who were aware of CN Labeling identified at least one disadvantage to the program. The disadvantage identified by most SFA managers is that CN-labeled products are more expensive (42 percent of those citing any disadvantages--about 14 percent of all respondents). Twenty-two percent felt that the program limits (rather than expands) the choice of vendors available to them. Eleven percent cited the fact that CN labels, in and of themselves, offer no guarantee of overall food or nutritional quality. Finally, some SFA managers (9 percent) felt that CN-labeled products are not readily available or are "hard to get".

TECHNICAL ASSISTANCE

FNS provides technical assistance materials to SFAs as a means of ensuring that programs operate effectively and efficiently, that they comply with Federal regulations and policies, and that nutritious, high-quality meals are served to school children. FNS develops technical assistance materials and, through its Regional Offices (FNSROs), provides technical assistance to State Agencies. State Agencies are, in turn, charged with providing technical and managerial assistance to local SFAs.

This study included a limited number of questions specifically designed to obtain feedback from SFA managers on four recent commodity-related technical assistance materials: 1) the quarterly Commodity Foods newsletter, 2) Facts About USDA Commodities (a set of fact sheets providing storage, handling, preparation and cooking information for each of the 70 commodity foods purchased by USDA), 3) USDA Quantity Recipes for School Food Service, and 4) Nutritive Value of USDA-Donated Commodities, a booklet providing detailed information on the nutrient composition of USDA commodities. SFA managers were asked whether they, or someone else in their SFA, had received the materials and, for the last three publications, were asked to rate the usefulness of the materials.

Commodity Foods Newsletter. Two-thirds of SFA managers indicated that they, or someone in their district, had been receiving the Commodity Foods newsletter.

Facts About USDA Commodities. Sixty-eight percent of SFA managers indicated that they, or someone in their district, had received this publication. Ninety percent or more of managers in all types of SFAs rated the material either somewhat useful or very useful.

USDA Quantity Recipes for School Food Service. Approximately three-quarters of all SFA managers had received the recipes. Managers of SFAs that participate in the SBP and managers of large SFAs were more likely to have received the recipe packet than managers of other SFAs. Fifty-eight percent of the managers that acknowledged receipt of the recipes rated them as very useful; 36 percent felt that they were somewhat useful. Managers of SFAs that participate in the SBP and high-poverty SFAs found the recipes to be particularly useful.

Perceived Value of USDA-Donated Commodities. Fewer SFA managers acknowledged receipt of this material than of the three other technical assistance materials examined in this study. Overall, just over half (53 percent) of the SFA managers reported receiving the publication. Twenty-seven percent indicated that neither they nor anyone else in their district had received the material, and 20 percent did not know whether it had been received. The vast majority of managers who had received the material found it to be useful. Thirty-five percent rated it as very useful and 60 percent rated it somewhat useful.

FOOD AND NUTRIENT COMPOSITION OF NSLP AND SBP MEALS

This study examined the food and nutrient composition of NSLP and SBP meals at three levels: (1) as offered by participating schools, (2) as selected by participating students, and (3) as actually consumed by participating students. At each level, the total nutrient content was compared to the Recommended Dietary Allowances for essential nutrients. The nutrient density and fat, cholesterol and sodium content of meals was also examined. For each portion of the analysis, differences between elementary and middle/secondary schools were evaluated.^{1/}

^{1/}As described previously, on-site meal observations were conducted in 20 purposively selected SFAs--ten were considered to be exemplary programs and ten were considered to be typical (non-exemplary). The ten exemplary SFAs were selected from a pool of approximately 70 SFAs that were nominated by FNS headquarters and regional office staff, the American School Food Service Association and State Child Nutrition Program Directors. All nominated "exemplary" SFAs had initiated steps to reduce the

Food-level analyses were also performed to answer specific research questions posed by FNS. These concerned the choices available to students participating in the NSLP and SBP (i.e., how often students have the option to choose between two or more food items within a major meal component category), the particular types of foods offered to students, and the foods that students tend to select and waste most frequently. FNS was also interested in how many and which food items students select under the offer-versus-serve (OVS) option.¹ Finally, the prevalence and extent of a la carte food service was examined.

Nutrient Composition of NSLP Meals. Meals Offered: The average NSLP meal offered in middle/secondary schools in SY 1989-90 provided greater amounts of calories and almost all nutrients than the average NSLP meal offered in elementary schools. This is not surprising since the NSLP meal pattern suggests serving larger portions to older children, in recognition of their increased nutrient needs.

Program regulations state that NSLP meals should provide, on average, one-third of students' daily nutrient needs. The average lunch offered in elementary schools met this goal for 4-6 year olds and 7-10 year olds. It also met the goal for older students for all nutrients except calories (29 percent) and vitamin B₆ (28 percent) for 11-14 year old males, and iron (28 percent) for 11-14 year old females.

The average lunch offered in middle/secondary schools provided approximately one-third of the RDA for almost all nutrients for the approximate age and sex groups. The only appreciable exceptions were calories (27 percent), vitamin B₆ (27 percent), and magnesium (26 percent) for 15-18 year old males.

Program guidelines encourage schools to provide larger portions or additional servings to older students whose nutritional needs are greater. These findings reinforce the importance of that policy and suggest that schools need to be conscious of the differential needs of the students they serve. They must

level of fat, cholesterol and/or sodium in school meals. It turned out, however, that some the "typical" schools had undertaken similar actions. No significant differences were detected, at any level, between meals in exemplary SFAs and meals in typical SFAs. Therefore, all of the analyses discussed in this report were conducted on the pooled sample of observations.

¹/Regulations for both the NSLP and SBP stipulate a particular meal pattern that must be offered to students, including the types of food (meal components) and quantities of food. Under the OVS option, which is mandatory in middle/secondary schools and optional (at the discretion of the SFA) in elementary schools, students are permitted to refuse up to two of five NSLP meal components and one of four SBP meal components.

maintain adequate flexibility when serving meals so that older students can indeed receive the additional food they need to meet the program goal of approximately one-third of the RDA.

The average NSLP meal offered in both elementary and middle schools was high in nutritional quality and well-balanced across a number of key nutrients. The average lunch offered in elementary schools provided more calories than needed by the youngest students and fewer calories than needed by the oldest male students. The mix of foods, however, was well-selected and nutrient dense. The data suggest that the portions actually served to students could be adjusted slightly to meet their differing caloric needs, and both groups would still receive one-third of the RDA for most nutrients examined in this study. The only exceptions are vitamin B₆ for 7-10 year olds and 11-14 year old males, and iron for 11-14 year-old females. The low iron density of the average NSLP meal relative to the iron requirement for 11-14 year-old females was the most significant shortfall. The Index of Nutritional Quality (INQ) score of 0.85 indicates that the target RDA for iron could not be met for this group of students with the average NSLP meal offered in elementary schools unless the RDA for calories was exceeded.

The average lunch offered in middle/secondary schools provided slightly less calories than needed by male students and more calories than needed by female students. The foods offered, however, were high enough in nutrient density that portions for each group of students could be adjusted slightly to better meet caloric needs without compromising total nutrient intake. The average lunch offered was somewhat low in nutrient density for vitamin B₆, magnesium and iron for some student groups. Again, the most significant shortfall was iron density for female students. The INQ score of 0.86 indicates that the average NSLP meal offered in middle/secondary schools met the RDA target for iron for these students only because it exceeded the RDA for calories.

The mean proportion of calories from fat was approximately 38 percent for the average meal offered in both elementary and middle/secondary schools. The Dietary Guidelines recommend 30 percent or less of calories from fat.^{1/} The mean proportion of calories from saturated fat was approximately 15 percent for both

^{1/}Fat and saturated fat content are evaluated in light of the Dietary Guidelines for Americans, recommendations which are issued jointly by the U.S. Department of Agriculture and the U.S. Department of Health and Human Services. Cholesterol and sodium content are compared to standards from the National Research Council's publication, Diet and Health, because the Dietary Guidelines do not provide quantified goals for these nutrients. The NRC Guidelines are not endorsed by the USDA, and are included in this report solely as reference points to assist the reader in interpreting the data.

schools; the recommended level is less than or equal to ten percent. NSLP meals were high in sodium when compared to recommendations from the National Research Council's Diet and Health report.

Meals Selected: The nutrient content of the average NSLP meal as selected did not differ significantly from the nutrient content of the average meal offered. This finding indicates that students are selecting meals that include all or most of the components contained in the pattern NSLP meal. The average meal selected in middle/secondary schools contained significantly greater amounts of calories and all nutrients, except carbohydrate and vitamin A, than the average meal selected in elementary schools.

In evaluating the proportion of RDAs contributed by the average NSLP meal as selected, a target range of intake was identified for each school type based on the RDAs for the groups of students included in the school population.^{1/} The average NSLP meal selected in both elementary and middle/secondary schools met or exceeded the target range for all nutrients examined. In some instances, the average meal contained less than one-third of the RDA for a particular nutrient for a particular group of students. If these students indeed consumed the "average" meal, then they would not receive one-third of the RDA for these nutrients. In the absence of actual data on how particular age- and sex-groups selected NSLP meals, however, it is not possible to determine how the meals selected by these students might differ from the "average" NSLP meal.

The nutrient density of meals as selected in both elementary and middle/secondary schools was similar to the nutrient density of the average meals offered. This suggests that most students selected meals that included all of the NSLP meal components. Iron density for female students remained the only appreciable problem at both school levels. INQ scores for iron for the average meal as selected were consistently higher than for the average meal offered (0.88 vs. 0.85 for elementary schools and 0.92 vs. 0.86 for middle/secondary schools.) This suggests that students who omitted one or more of the NSLP meal components in

^{1/}This approach was necessary because the average meal as selected (and consumed), as defined in this study, represents the nutrient content of the meals selected by the average student in each school averaged across five days in a selected week. The sample included children of different ages and sexes, both of which are important factors in judging nutritional adequacy. It is not possible, therefore, to identify with certainty specific groups of students who may be selecting (or consuming) meals that provide less than one-third of the RDA for a given nutrient. This issue is discussed in detail in Chapter VII of the full report. (FNS is collecting age- and sex-specific data through the Special Nutrition Dietary Assessment Study.)

the meals they selected tended to include iron-rich foods and exclude other foods. Because age- and sex-specific data are not available, however, it is impossible to determine the iron density of the meals actually selected by the students with the greatest iron requirements (females 11 years old or older.)

The average meal selected in both elementary and middle/secondary schools, like the average meal offered, exceeded the Dietary Guidelines recommendations for total fat and saturated fat. The average meal selected was also high in sodium when compared to NRC recommendations, especially in middle/secondary schools. Cholesterol levels in the average meals selected compared favorably with NRC recommendations.

Meals Consumed. The mean nutrient content of the average meal consumed was consistently lower than the nutrient content of the average meal selected in both elementary and middle/secondary schools. This indicates that, in general, students did not consume all of the foods they selected. This was particularly true in elementary schools.

None of the nutritional differences between the average meal consumed and the average meal selected in middle/secondary schools reached statistical significance. In elementary schools, however, the average meal consumed was significantly lower in calories and all nutrients than the average meal selected. On average, elementary school students wasted about 23 percent of the nutrients contained in the meals they had selected. Middle/secondary school students wasted about nine percent of the available nutrients.

The average lunch consumed by children in elementary schools exceeded the target range for protein, vitamin C, riboflavin and phosphorus (i.e., it provided more than one-third of the RDA for these nutrients for all age/sex groups). The levels of vitamin A, thiamin, niacin, calcium and magnesium were within the target range, but older students would have to consume more than is included in the "average" NSLP meal in order to meet their needs for these nutrients. Calories, vitamin B₆ and iron levels were below the target range. Thus, the average meal as consumed did not provide one-third of the RDA for these nutrients for the majority of elementary school children. This finding is comparable to results of other studies which have indicated that levels of calories, vitamin B₆ and iron may be low in NSLP meals consumed by elementary school children.

The nutrient content of the average NSLP meal consumed in middle/secondary schools exceeded the target range for protein, vitamin C, thiamin, riboflavin, niacin, calcium and phosphorus. It was within the target range for magnesium and iron, although the previous caveat about greater needs for older students

applies here also. The average NSLP meal consumed by middle/secondary students was below the target range for calories, vitamin A and vitamin B₆. The findings for calories and vitamin B₆ are consistent with those noted for NSLP meals consumed in elementary schools and with other studies of NSLP meals. The apparent shortfall of vitamin A in NSLP meals as consumed has also been noted in previous studies.

When viewed in concert, the results of the three analyses (i.e., NSLP meals as offered, selected and consumed) indicate that meals planned in accordance with program guidelines and offered to students are successful in meeting the program goal of one-third of the RDA. Further, the nutrient content of meals selected by students, even under the OVS option, are, with few exceptions within the target range for calories and all nutrients. Significant nutritional shortfalls arise only in the meals actually consumed by students, particularly at the elementary school level. Thus, the key to ensuring that students receive approximately one-third of their daily nutritional needs from an NSLP meal is to increase the likelihood that students actually consume the meals they select. It is also important to ensure that the oldest students in each school have the ability to receive larger or additional portions of food.

While the average NSLP meal consumed by students may have been low in total calories, the mix of foods included was high in nutritional quality and well-balanced. Iron density for female students was the most notable potential problem. Food waste had little effect on levels of fat, cholesterol and sodium. The average lunch consumed in both elementary and middle/secondary schools exceeded Dietary Guidelines recommendations for total fat and saturated fat. The average meal was also high in sodium. While the average elementary school lunch came close to meeting the NRC recommendation for sodium, this was primarily due to the fact that students wasted almost 25 percent of the foods they received.

Food Availability, Selection and Consumption. Foods Offered: Students in middle/secondary schools had a greater number of choices for all NSLP meal component categories, except breads/bread alternates and desserts, than students in elementary schools. In both elementary and middle/secondary schools, students had the greatest number of options when it came to choosing milk. In most cases, three or more types of milk were offered. The types of milk offered most frequently were, in descending order, low-fat (unflavored) milk, flavored milk, and whole milk.

Most schools also offered students a choice of fruits or juices. Fifty-four percent of the meals offered in elementary schools included two or more types of fruit or juice, as did 73 percent

of the meals offered in middle/secondary schools. A wide variety of fruits were offered to students in both types of schools, with canned fruits offered more than fresh fruits.^{1/} Dried fruits were offered infrequently in both types of schools.

Students tended to have fewer options in choosing vegetables. Forty-eight percent of the meals in elementary schools and 35 percent of middle/secondary school meals either offered vegetables only as part of a combination item (e.g., pasta with sauce, salad bars, chef salad, etc.) or offered only one vegetable choice.

Of all the major meal components, students had the fewest options when it came to selecting a main entree. This was particularly true for elementary schools, where fifty percent of the meals offered included only one entree. In middle/secondary schools, on the other hand, only 29 percent of meals were limited to one entree. The specific entrees offered most frequently in elementary schools were pizza (22 percent of all meals offered), hot dogs and corn dogs (19 percent), and peanut butter and jelly sandwiches (13 percent). In middle/secondary school meals, hamburgers and cheeseburgers were the most common entree (39 percent of all meals), followed by pizza (27 percent), and hot dogs and corn dogs (24 percent). Hamburgers and cheeseburgers were offered in middle/secondary school meals about four times more often than in elementary school meals (39 percent vs. nine percent).

Across all schools, almost half of the meals did not include a separate bread or bread alternate offering. This finding is not as surprising as it may seem, since the majority of entrees offered in the NSLP were combination items that included a bread/bread alternate component--for example, hamburgers (the bun), sandwiches (the bread) and pizza (the crust).

Finally, dessert items that did not contribute to meeting the meal pattern requirement were included in reimbursable meals only 31 percent of the time.

Foods Selected: The majority of students observed in this study selected meals that included all five NSLP meal components. Elementary school students were more likely to select meals with all components (68 percent) than middle/secondary school students (55 percent). Only six percent of elementary school students and 10 percent of middle/secondary school students selected a reimbursable meal that contained only three of the five required components. The meal component most frequently omitted in meals

^{1/}The timing of meal observation (in mid-March) may have limited the number of SFAs offering fresh fruit.

that did not contain all five components was the second fruit and/or vegetable.

While over 25 different meal component combinations were encountered, four combinations accounted for two-thirds of the meals selected. The most common type of meal in elementary schools, representing more than one-third of all NSLP meals, consisted of milk, two fruit and vegetable choices and a meat/bread combination entree. Considering the most common foods offered and selected in elementary schools, an example of the actual meal represented by this combination would be flavored milk, fresh apple, french fries and a slice of pizza.

The most common meal selected in middle/secondary schools included milk, one fruit or vegetable, and a meat/bread combination entree (22 percent of all meals selected). Given the foods most often offered and selected in these schools, this translates into flavored milk, french fries, and either a slice of pizza, a hamburger or a cheeseburger.

A la carte items were available in the same serving line as reimbursable meals in over half of the schools in the sample. Eighty percent of middle/secondary schools had at least some a la carte items available as did 58 percent of elementary schools.^{1/} Both the number and variety of a la carte items offered in middle/secondary schools was significantly greater than in elementary schools.

Food Consumed. Overall, elementary school students consumed about three-quarters of the lunch foods they selected, and middle/secondary school students consumed almost 90 percent of the foods they selected. The particular foods that elementary school students wasted more often than middle/secondary school students were, in descending order, salads, rolls and milk.

Nutrient Composition of SBP Meals. Meals Offered: The level of calories and nutrients in the average SBP meal as offered did not differ significantly for elementary and middle/secondary schools. This finding is not surprising in view of the fact that SBP guidelines specify only one meal pattern (i.e., types and amounts of food) for all students in grades K-12.

The average breakfast offered in elementary schools supplied one-fourth or more of the RDA for all nutrients for 4-6 year olds, 7-

^{1/}For this study, field staff collected information on the types of a la carte items that were available in the same serving line as the reimbursable meals that were being observed. These data undoubtedly underestimate the prevalence of a la carte items in schools, since a la carte items were frequently available elsewhere in the cafeteria or school.

10 year olds and 11-14 year olds.^{1/} The average elementary school breakfast also supplied 25 percent of daily calorie needs for 4-6 year old students, but fell short of this level for 7-10 year olds (23 percent), 11-14 year old females (21 percent) and 11-14 year old males (19 percent). The average breakfast offered in middle/secondary schools provided approximately one-fourth of students' calorie and nutrient needs as well, with three exceptions: calories (21 percent) for 11-14 year old males and calories (17 percent) and magnesium (18 percent) for 15-18 year old males.

Breakfasts offered in both elementary and middle/secondary schools were high in nutritional quality and balanced across a number of key nutrients. While the overall caloric value of SBP meals may have been somewhat low, the meals were high in nutrient density, supplying in excess of 30 percent of the RDA for most nutrients examined.

The average breakfast offered in elementary and middle/secondary schools provided approximately 30 percent of total calories from fat, the level recommended by the Dietary Guidelines. The level of saturated fat, however, exceeded the Dietary Guidelines recommendation of 10 percent of calories in both elementary (14 percent) and middle/secondary (13 percent) schools. The amount of cholesterol and sodium in average SBP meals were within acceptable ranges.

Meals Selected: The nutrient content of the average SBP meal selected did not differ significantly from the nutrient content of the average meal offered. This indicates that most students selected meals that included all of the SBP meal components.

In assessing the percent RDA contribution for average meals selected and consumed, the target level concept, described in the preceding discussion of NSLP meals, was used. The average breakfast selected in elementary schools met or exceeded the target range for all nutrients except calories. Students aged 4-6 would receive 25 percent of the RDA for calories from the "average" elementary school breakfast. All other elementary school students, however, would not. The level ranges from 18 percent of the RDA for 11-14 year old males to 22 percent of the RDA for 7-10 year olds. The available data do not indicate, however, how the meals selected by these students may differ from the average. Given the USDA's policy of encouraging schools to serve larger portions or additional foods to older students, it is possible that these students would in fact select meals that

^{1/}Program regulations do not specify a target RDA level for SBP meals. Twenty-five percent of the RDA was used as a target in these analyses.

provide more calories than the average SBP meal, and thereby satisfy their increased caloric needs.

The average SBP meal selected in middle/secondary schools met or exceeded the target range for all nutrients except magnesium. The calorie level of the average breakfast was also below the target range in middle/secondary schools. Female middle/secondary school students selecting the average breakfast would receive almost one-fourth of their daily caloric needs; male students would not.

The average breakfast selected by elementary and middle/secondary school students was well-balanced in terms of total calories and relative nutrient density. The nutrient density of the average meal selected varied little from the nutrient density of the average meal offered. The average breakfast selected in elementary and middle/secondary schools contained approximately 30 percent of calories from total fat, in keeping with the Dietary Guidelines recommendation, but exceeded the Dietary Guidelines recommendation for saturated fat. Cholesterol and sodium content were within acceptable ranges.

Meals Consumed: The nutrient content of SBP meals consumed in elementary and middle/secondary schools was consistently lower than the nutrient content of the meals selected, indicating that, in general, students did not consume all of the foods they selected. The magnitude of the differences was consistently higher for elementary schools where, on average, students did not consume about 24 percent of the nutrients that were contained in the meal they had selected (compared to nine percent for middle/secondary schools).

Despite the nutrient losses associated with food waste, the average breakfast consumed in elementary schools exceeded the target nutrient range for vitamin C, thiamin and riboflavin. It was within the target range for protein, vitamin A, niacin, vitamin B₆, calcium, phosphorus, magnesium and iron. However, older students (11-14 year olds) would need to consume a meal containing greater amounts of these nutrients than the "average" meal in order to satisfy one-fourth of their daily nutrient needs. The average SBP meal consumed in elementary schools failed to provide 25 percent of daily caloric needs for even the youngest students (4-6 year olds).

The average breakfast consumed in middle/secondary schools exceeded the target range for protein, vitamin A, vitamin C, thiamin, riboflavin, calcium, phosphorus and iron. It fell below the target range for calories and magnesium and just reached the lowest limit of the target range for niacin and vitamin B₆.

Plate waste had little effect on the nutrient density or fat, cholesterol and sodium content of SBP meals. While the average SBP meal consumed in elementary and middle/secondary schools may have been somewhat low in calories, students received concentrated amounts of nutrients in every calorie they consumed. Further, the breakfasts contained appropriate levels of fat, cholesterol and sodium. They exceeded recommended levels of saturated fat.

Food Availability, Selection and Consumption. Foods Offered: Data from this study indicate that students are offered relatively few choices in SBP meals. Twenty-two percent of elementary schools did not even offer students a choice of milk. Almost three-quarters of the breakfasts observed included only one choice to meet the fruit/juice/vegetable meal requirement. This was almost always orange juice.

The number of options available for bread/bread alternates were also limited. Thirty-five percent of the breakfasts in elementary schools and 40 percent of the breakfasts in middle/secondary schools offered two bread/bread alternates. In most schools, however, students had to take both of these items in order to select a breakfast that fully complied with meal pattern requirements.^{1/} Cold cereal and toast were the most common offerings. Forty-five percent of elementary schools and 31 percent of middle/secondary schools offered only one bread/bread alternate. In some cases, this was complemented by a meat/meat alternate offering. In many other cases, however, this one offering was counted as two servings of a bread/bread alternate following program guidelines. This happened most frequently for muffins and doughnuts.

Ment and meat alternates were offered in only half of the breakfasts observed. Middle/secondary schools offered meat selections more frequently than elementary schools.

Foods Selected: Under the OVS option, students can refuse one of the four items indicated in a pattern meal. In this study, more than 80 percent of the students in schools with the OVS option selected a breakfast meal that included all four of the SBP meal pattern components. The meal component omitted most often by students selecting a three-item breakfast was the second bread/bread alternate or meat/meat alternate.

Fifteen meal component combinations were encountered. Five combinations accounted for 90 percent of all breakfasts. The most common breakfast in both school types, representing over

^{1/}Schools can offer two meat/meat alternates or one bread and one meat instead of two bread/bread alternates; however, only about half of all schools offered meat or meat alternates.

half of all SBP meals, consisted of milk, fruit juice, and a bread/bread alternate. Considering the foods most commonly offered and selected, an example of an elementary school meal represented by this combination would be flavored milk, orange juice, and either toast or cold cereal. In middle/secondary schools, the meal would be similar: flavored milk and orange juice with either cold cereal or a doughnut.

A la carte items were generally not available at the breakfast meal in the schools included in this study. None of the elementary schools offered a la carte breakfast items, and less than one-third of middle/secondary schools did so.

Foods Consumed: Elementary school students consumed, on average, 69 percent of the foods they selected. Middle/secondary school students consumed over 80 percent of the foods they selected. Milk and fruit had the highest plate waste.

PART 1:
STUDY BACKGROUND

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I. INTRODUCTION

This report presents findings from the second year (Year Two) of the Child Nutrition Program Operations Study. This multi-year study is being conducted by Abt Associates Inc. (AAI) of Cambridge, Massachusetts under contract to the Food and Nutrition Service (FNS) of the U.S. Department of Agriculture (USDA).

The report consists of five major parts. Part 1 is comprised of this introductory chapter which provides background information on the Child Nutrition Program Operations Study. The purpose and objectives of the study are reviewed as well as the overall design of the study, its component surveys and the major research issues addressed in Year Two. Data collection strategies are also described. The chapter concludes with a discussion of the approach utilized in analyzing and reporting data. Additional details on study methodology as well as discussions specific to Year One of the study are contained in the Year One report.^{1/}

Part 2 presents major findings from the Year Two SFA Manager Survey. Chapter II presents findings related to program participation; Chapter III focuses on meal prices and meal costs; Chapter IV presents information on issues related to the Food Donation Program; Chapter V presents findings related to Child Nutrition Labeling; and, finally, technical assistance issues are discussed in Chapter VI.

Part 3 focuses on findings from on-site observations of meals in a cross-section of SFAs. Chapter VII presents findings related to the food and nutrient composition of meals in the National School Lunch Program (NSLP) as offered to, selected by and consumed by participating students. Chapter VIII presents comparable data for meals in the School Breakfast Program (SBP).

Part 4 presents detailed tables that support some of the discussions presented in Part 3 of the report. Finally, Part 5 contains a variety of appendices, including copies of survey and observation instruments, analysis of non-response bias, and the methodology used in weighting data to produce national estimates.

^{1/}St.Pierre, R.G., M.K. Fox, M. Puma, F. Glantz, and M. Moss. Child Nutrition Program Operations Study: First Year Report. Cambridge, MA: Abt Associates Inc., 1991.

PURPOSE AND OBJECTIVES OF THE STUDY

Administered by FNS, the school-based Child Nutrition Programs operate in every state in the nation, and represent an annual investment of over \$4 billion of public funds to establish, maintain, and operate non-profit school lunch and breakfast programs for the benefit of the Nation's school children.^{1/} To manage these programs effectively, FNS collects and analyzes information from State-level management reports. However, because these State-level reports vary considerably in both format and content, FNS is unable to rely on this data source for all of its information needs.

Consequently, FNS contracted with AAI to conduct a series of three annual surveys of approximately 1,700 SFAs to obtain information on issues that are of interest to FNS. Compared with the alternative of conducting several special-purpose studies, the implementation of an ongoing survey capability reduces FNS' information collection costs, lessens overall respondent burden, and reduces the length of time necessary to obtain required data.

The study has three overall objectives:

- 1) provide general descriptive information on the characteristics of the school-based Child Nutrition Programs required either for the preparation of program budgets (e.g., the forecasting of program participation and program costs), or to answer commonly asked questions related to issues such as meal costs, student participation, and SFA food service practices;
- 2) provide data on various aspects of program administration to inform the preparation of program regulations and reporting requirements; and
- 3) provide data that will support the training and technical assistance needs of SFAs.

In some cases the data required to meet these three objectives requires that information be collected from SFAs or States on an ongoing basis in order to observe changes over time. In other instances, the desire for information is a one-time need where

^{1/}The school-based Child Nutrition Programs include the National School Lunch Program (NSLP), the School Breakfast Program (SBP), the Food Donation Program (FDP), the Special Milk Program (SMP), and the Nutrition Education and Training Program (NET). State Administrative Expense (SAE) funding is provided for the NSLP, SBP and SMP as well as for the Child and Adult Care Food Program (CACFP).

the interest is in describing or assessing a specific aspect of the Child Nutrition Programs. In either case, the primary goal is to provide FNS with information for specific functions such as budget projections, analysis of legislative options, design of regulations, or the development of technical assistance materials.

STUDY DESIGN

The Child Nutrition Program Operations Study is designed to collect data from States and participating SFAs on issues that are currently, or are likely to be, the focus of FNS' policy making process. Data collection for the study spans three school years (SY 1988-89, 1989-90, and 1990-91), with specific information needs for each annual survey defined by FNS staff. The surveys provide a "snapshot" of administrative structure and procedures in a particular year and, for selected research items that are included in each annual survey, an assessment of year-to-year changes in program operations.

Study Components

Three distinct data collection components comprise the Child Nutrition Program Operations Study: (1) State Agency Survey, (2) SFA Manager Surveys, and (3) On-Site Meal Observations. Each of these components is described below. Exhibit I.1 summarizes the data collection schedule.

State Agency Survey. The research issues identified for Year One of the study required that data be collected from every State regarding a variety of issues including commodity processing and distribution, monitoring of commodity inventories, SFA utilization of Food Service Management Companies (FSMCs) and vended meals, and technical assistance and training. To collect this information, Directors of Child Nutrition Programs and State Distributing Agencies in all 50 States were contacted and asked to complete a brief telephone interview. All of these data were collected during Year One of the study; no State Agency questions are included in Years Two or Three of the study.

SFA Manager Surveys. The SFA Manager Surveys represent the largest component of the Child Nutrition Program Operations Study. Three annual surveys of a stratified sample of 1,740 SFAs are being conducted, in the spring of each year, to gather data on a wide variety of program operations issues.^{1/} During Year One of the study, both telephone and mail instruments were utilized in surveying SFA managers because of the amount of historical program data that was requested (e.g., meal prices for previous five school years; meal counts, enrollment, etc.

^{1/}A detailed description of the stratification and sampling plans used in selecting SFAs is provided in the Year One Report.

Exhibit I.1

Child Nutrition Program Operations Study:
Study Components and Data Collection Schedule

Study Component	Spring 1989 (Year One)	Spring 1990 (Year Two)	Spring 1991 (Year Three)
State Agency Survey	X		
SFA Manager Survey ¹			
- Telephone Survey	X	X	X
- Mail Survey	X		
On-Site Meal Observations		X	

¹During Year One of the study, both telephone and mail survey instruments were utilized to collect data from SFA Managers. SFA Manager Surveys for Years Two and Three of the study include only telephone surveys.

for two school years). Data collection from SFA Managers in Years Two and Three of the study is limited to telephone surveys. Specific research issues addressed in the Year Two survey are described later in this chapter.

On-Site Meal Observations. The objective of the on-site meal observations is to provide FNS with timely information on the food and nutrient content of meals offered to, selected by, and consumed by students participating in the NSLP and SBP. A representative sample of participating students was observed in 20 purposively-selected SFAs during Year Two (SY 1989-90).

Ten of the SFAs were selected because they were considered to have exemplary food service programs in that they had initiated steps to reduce the levels of fat, cholesterol and/or sodium in school meals.^{1/} Ten additional (non-exemplary or typical) SFAs were selected to roughly match (matched pairs) the exemplary SFAs in terms of percentage of NSLP meals served free or at a reduced price, total enrollment, region and kitchen configuration. Five of these typical SFAs are participating as grantees in FNS' menu modification demonstration grants program. The remaining five typical SFAs were selected from SFAs participating in the Child Nutrition Program Operations Study. Exhibit I.2 summarizes characteristics of the SFAs included in the On-Site Meal Observations. On average, the exemplary SFAs are larger and serve fewer free and reduced-price meals. This degree of mis-match is not unexpected because of the constraints on selecting the typical SFAs (i.e., five were included because they were recipients of menu modification demonstration grants). Given that the on-site meal observations are an exploratory part of this study, the observed degree of mismatch should not cause undue concern.

A total of 60 schools, 3 schools within each of the 20 SFAs (two elementary schools and one middle/secondary school), were included in the meal observations. Field staff observed meal service in these 60 schools for 5 consecutive days and collected detailed data on meals offered (meals that were made available to children on the day of observation), meals selected (actual food selections were observed for approximately 60 children at each meal), and meals consumed (at each meal, plate waste was observed for 12 of the 60 selected children).

Year Two Research Issues

Each research issue in the Child Nutrition Program Operations Study is categorized as being either longitudinal or cross-sectional in nature. Longitudinal data are being collected during each year of the study, in order to assess year-to-year changes in program operations. Cross-sectional issues, on the

^{1/}The 10 exemplary SFAs were selected from a pool of approximately 70 SFAs that were nominated as exemplary by FNS headquarters and Regional Office staff, the American School Food Service Association, and State Child Nutrition Directors.

Exhibit 1.2

Characteristics of SFAs Included in
On-Site Meal Observations
(SY 1989-90)

Exemplary SFAs	Percent of Total NSLP Meals Served Free or at a Reduced Price (SY 1988-89)	SFA Enrollment	FNS Region
1	9%	9,819	Midwest
2	58	108,719	Southeast
3	12	91,650	MidAtlantic
4	25	72,217	Southeast
5	19	11,056	Western
6	3	3,300	Northeast
7	25	72,994	Southwest
8	16	36,999	Southwest
9	32	50,813	Western
10	6	24,652	Mtn. Plain
(Mean)	21%	48,222	

Typical SFAs	Percent of Total NSLP Meals Served Free or at a Reduced Price (SY 1988-89)	SFA Enrollment	FNS Region
1	11%	11,331	Midwest
2	47	21,561	Southwest
3	25	3,569	Midwest
4	42	44,319	Southeast
5	14	13,367	Western
6	2	2,806	Northeast
7	40	43,616	Midwest
8	70	3,758	Southwest
9	70	37,000	Western
10	34	58,626	Mtn. Plain
(Mean)	35%	23,995	

other hand, are defined on an annual basis and collected only in the associated annual SFA Manager Survey. The annual SFA Manager Surveys are, therefore, constructed in a modular fashion, with a common set of questions to be asked in each year of the study (the longitudinal research issues) and separate modules added in individual years to address identified research priorities (the cross-sectional issues).

Research issues for Year Two of the study were identified by FNS. Research priorities and associated survey instruments were also reviewed and approved by members of the Education Information Advisory Committee (EIAC), Food and Nutrition Subcommittee of the Council of Chief State School Officers. Research issues for Year Two of the Child Nutrition Program Operations Study are summarized in Exhibit I.3.

DATA COLLECTION: YEAR TWO

Data collection for Year Two of the Child Nutrition Program Operations Study involved two separate activities: the Year Two SFA Manager Survey and On-Site Meal Observations.

Year Two SFA Manager Survey

A telephone survey was used to collect data on the research issues identified for Year Two of the study (see Exhibit I.3). A copy of the survey instrument is included in Appendix A.

A mailing was prepared for each of the 1,740 SFAs selected for the three-year survey effort. (Each of these SFAs had previously been contacted during the Year One data collection). The mailing included a personalized letter that reintroduced the study and solicited SFA participation. It also included a summary of the specific types of historical data to be collected, so that respondents could assemble and organize this material ahead of time. The mailing was sent out about three weeks before telephone interviews were scheduled to begin.

Telephone interviews began in Spring 1990 and continued over a period of two months. At the conclusion of this two-month period, the response rate was not as high as desired, so a strategy was utilized to collect selected data elements for non-responding SFAs from State Agency directors. An abbreviated survey instrument was prepared by eliminating questions on SFA income and expenses, child nutrition labeling, technical assistance and Food Donation Program operations. State Agency directors were contacted by mail and asked to supply the data included in the abbreviated survey for each of the non-responding SFAs in their respective States. AAI staff made numerous follow-up telephone calls to State Agencies to encourage participation.

Year Two Research Issues

YEAR TWO SFA MANAGER SURVEY -- LONGITUDINAL RESEARCH ISSUES¹Participation

- Overall, free, reduced and paid NSLP participation rates (separately for elementary and middle/secondary schools) in SY 1988-89
- Overall, free, reduced and paid SBP participation rates (separately for elementary and middle/secondary schools) in SY 1988-89
- Change in participation rates over time (between SY 1987-88 and SY 1988-89) for the NSLP, SBP

Meal Prices

- Average prices charged for full, reduced and adult lunches in SY 1989-90
- Average prices charged for full, reduced and adult breakfasts in SY 1989-90

- Change in meal prices over time: SY 1988-89 to SY 1989-90

Annual Revenues (SY 1988-89)Annual Expenditures (SY 1988-89)YEAR TWO SFA MANAGER SURVEY -- CROSS-SECTIONAL RESEARCH ISSUES²Food Donation ProgramBuy American

- SFA awareness of "Buy American" provision
- Methods/procedures used by SFAs to implement this requirement

Commodity Inventory and Redonation

- Presence of 6 month-supply commodity inventories over past summer, by product
- Reasons for surplus commodities
- Prevalence of SFAs "transferring out" commodities to other agencies, by product and agency
- Prevalence of SFAs "transferring in" commodities from other agencies, by product and agency

Processing

- Use of commercial distributors to purchase processed end-products
- SFA knowledge/tracking of value of discounts/rebates due them

Delivery Systems

- Methods used by SFAs to deliver commodities to school districts
- Point of receipt for commodity delivery at local school district level
- Extent of SFA knowledge re: commodity availability or delivery schedule
- Extent of SFA knowledge re: types and quantities of commodities to be received or picked up
- Extent of SFA advance notification re: changes in delivery/distribution schedules
- SFA managers' rating of overall communication between SFAs and State Distributing Agents (SDA); assessment of change in communication over past few years
- Extent of correct/appropriate paperwork from State Distributing Agents re: commodity deliveries
- SFA Managers' rating of overall performance of commodity distribution system in SY 1989-90, and compared to previous years

- continued -

¹Longitudinal research issues were included in the Year One SFA Manager Mail Survey and are also included in the Year Two and Year Three SFA Manager Surveys.

²Year Two cross-sectional research issues are included only in the Year Two SFA Manager Survey.

Exhibit 1.3
(continued)

YEAR TWO SFA MANAGER SURVEY — CROSS-SECTIONAL RESEARCH ISSUES (cont'd)¹

Technical Assistance

"Commodity Foods" Newsletter

- SFA receipt of newsletter
- Suggestions for improvement

Other Technical Assistance Materials²

- SFA receipt of material
- SFA managers' rating of usefulness

Child Nutrition (CN) Labeling

- SFA manager awareness
- Extent to which SFAs require CN labels for meat or poultry, seafood, meat alternates and juice drinks
- Use of competitive bids for foods that could have CN labels; requirements re: CN labeling in bid specifications
- Percentage of commercially-purchased entree items with CN labels in SY 1989-90

Child Nutrition (CN) Labeling (cont'd.)

- SFA managers' opinions on whether CN labeling ensures standard portions, ensures high quality foods, allows SFAs to purchase foods at reduced prices, ensures that products meet USDA meal pattern requirements, allows increased numbers of vendors to bid for SFA business, ensures nutritionally-superior products
- Factors influencing SFA managers' opinions on CN labeling
- SFA managers' perceptions re: advantages/disadvantages of CN labeling
- SFA managers' assessment of importance of CN labeling

ON-SITE MEAL OBSERVATIONS

NSLP and SBP Meals Offered

- Nutrient content
- Proportion of RDA provided
- Comparison to USDA/DHHS Dietary Guidelines for Americans
- Availability of choices within major meal component categories
- Specific foods being offered
- Differences between elementary and middle/secondary schools
- Differences between exemplary and typical SFAs

NSLP and SBP Meals Selected

- Nutrient content
- Proportion of RDA provided
- Comparison to USDA/DHHS Dietary Guidelines for Americans
- Number and type of meal components included in meals selected by students under the offer-versus-serve (OVS) option³
- Specific foods most often selected by students
- Availability of a la carte food items in lines serving NSLP or SBP meals
- A la carte items most frequently available
- Differences between elementary and middle/secondary schools
- Differences between exemplary and typical SFAs
- Differences between meals offered and meals selected

- continued -

¹Year Two cross-sectional research issues are included only in the Year Two SFA Manager Survey.

²Specific materials: FNS-251: "Facts About USDA Commodities"; FNS-255: "Nutritive Value of USDA-Donated Commodities"; PA-1371: "Quantity Recipes for School Food Service."

³The offer-versus-serve (OVS) option stipulates that schools must offer meals planned in accordance with program meal pattern guidelines, but that students may decline up to two of the five required food items. The OVS option is required at the secondary school level and may be extended to elementary schools, at the discretion of the local school district.

Exhibit 1.3
(continued)

ON-SITE MEAL OBSERVATIONS (cont'd.)

NSLP and SBP Meals Consumed

- Nutrient content
 - Proportion of RDA provided
 - Comparison to USDA/DHHS Dietary Guidelines for Americans
 - Type and amount of plate waste
 - Differences between exemplary and typical SFAs
 - Differences between meals selected and meals consumed
-

All cross-sectional data elements were gathered with reference to SY 1989-90, the school year during which the survey took place. SFA managers were able to answer these questions with respect to SFA operations in place for that school year. Some of the longitudinal data elements (e.g., meal prices, number of children approved for free or reduced-price meals) were also asked with reference to the current school year. However, some longitudinal data elements (e.g., meal counts, income and expenses, number of operating days) require that end-of-year figures be available, and so these items were gathered with reference to the preceding school year (SY 1988-89).

On-Site Meal Observations

The meal observations were designed to capture data on a full week's worth of school meals in each of 60 selected schools. In schools that participated in only the NSLP, lunch was observed for five days. In SFAs that offered both breakfast and lunch, lunch was observed for five days and breakfast was observed for four days. Because of the preparatory work involved in the meal observation protocol, it was not possible to observe breakfast on the first day.

For each of the five days on-site, data were collected on meals offered to children, meals selected by children (what children actually took/purchased from the available foods), and meals consumed (what the children actually ate.) Data collection procedures are briefly described below; additional details of the meal observation protocol are summarized in Appendix B. The analytic approaches used in aggregating the data to describe the average USDA meal as offered, selected and consumed are outlined in Chapter VII.

Meals Offered. Field staff collected detailed information on foods offered to children on each day of observation. When several options were available, i.e., different fruit, vegetable or entree choices, data were collected for all possible choices. This information included the type of food item, brand name and, when appropriate, preparation method. For foods prepared "from scratch," detailed recipes were collected. Data collectors were trained to carefully probe for details that could affect the fat or sodium content of foods, because these characteristics are of particular interest to FNS.

Average serving sizes for each food were determined by actually weighing, or measuring in the case of beverages, five portions of each food item served on a particular day. For self-serve items, observers established a reference portion for visual estimation after observing a number of children serve themselves with the available serving utensil. (See Appendix B for more information on the visual estimation methodology.)

The data collection instruments used in collecting these data are the Menu Record, the Recipe Form, and the Serving Size Computation Forms. Samples of all forms are provided in Appendix C.

Meals Selected. The focus of this portion of the observation was the reimbursable NSLP meal. To obtain data on which foods children select for inclusion in an NSLP meal, field staff observed and recorded the foods selected by approximately 60 children each day. Only reimbursable meals were included in the observations. The definition of a reimbursable meal depended on whether or not the school utilized the offer-vs-serve (OVS) option.^{1/} Thus, children in OVS schools who selected a meal that included fewer than 3 of the 5 required items were not included in the observations.

Observers positioned themselves at the cash register, or other strategic locations, and utilized the Food Selection and Plate Waste Record (see Appendix C) to record the foods actually taken by each child. All menu items eligible for inclusion in a reimbursable meal were recorded on these forms. Observers then recorded the number of servings (or fraction thereof) of each of the food items selected by each child chosen for observation.

Meals Consumed. During each meal observation period, observers tagged the tray of every fifth child they observed, for a total of 12 trays, in order to observe plate waste. Children whose trays were tagged were instructed to deposit their trays (including trash) in a designated area after they finished eating.

Upon completion of all meal observations, data collectors retrieved the tagged trays and visually estimated the amount of plate waste (see Appendix B for a description of the visual estimation methodology). These data were recorded in the appropriate columns on the Food Selection and Plate Waste Record (Appendix C). Waste was recorded as fractions of an average serving, i.e., 3/4 serving, 1/2 serving or 1/4 serving. For beverages, plate waste was actually measured, because the opaque nature of the typical serving containers made visual estimation impossible.

^{1/}A reimbursable meal is defined as one which includes five specific food items (milk, two fruit and/or vegetable choices, meat or meat alternate and bread or bread alternate) as specified in program regulations. The offer-versus-serve (OVS) option stipulates that schools must offer meals planned in accordance with these guidelines, but that students may decline up to two of the five required items. All secondary schools must offer the OVS option to students. The option may also be implemented in middle and elementary schools, at the discretion of the local school district.

Response Rates

Year Two SFA Manager Survey. The initial round of telephone interviews with SFA Managers yielded 1,120 completed interviews for a response rate of 64 percent. An additional 239 partially-complete interviews were obtained from State Agency directors and include key variables such as meal counts, enrollment, and numbers of children approved for free- and reduced-price meals, for a total of 1,359 surveys (a 78 percent overall response rate).

As previously described, the SFA Manager Survey includes both longitudinal and cross-sectional data elements. Because of differential item response, the number of cases available for longitudinal and cross-sectional analyses differs as described below.

- Longitudinal Data: During data review and cleaning, a total of 137 cases were excluded from the longitudinal data set because of missing or poor quality data for essential variables. Thus, the final number of SFAs included in the longitudinal data set is 1,221. The non-response analysis presented in Appendix D shows that non-responding SFAs tend to be smaller and to serve a higher percentage of free and reduced-price meals than responding SFAs. The weighting methodology described in Appendix E works to counteract this possible bias.
- Cross-Sectional Data: A total of 1,109 SFAs are included in the cross-sectional data set. The 239 surveys completed by State Agencies were automatically excluded, because State Agencies were asked only to supply responses to an abbreviated version of the survey instrument (see previous discussion regarding Year Two data collection.) Of the 1,120 fully completed telephone surveys, only 11 cases were excluded, bringing the total number of SFAs included in the cross-sectional data set to 1,109. The non-response analysis presented in Appendix D shows the same potential bias as the analysis for the longitudinal data set. Again, however, the weighting methodology works to counteract this potential bias.

On-Site Meal Observations. Observations were successfully completed in all 60 selected schools. However, the actual number of observations of meals offered, selected or consumed for which complete data were available for analysis varied slightly from planned estimates, as described below:

- NSLP meals: During the data editing process, three complete days of observation (one lunch meal in each of three schools) were excluded because of missing or inadequate data. Additional observations were excluded from both the meals selected data set (1 day--60 observations in 1 school) and the meals consumed data set (2 days--12 observations in each of 2 schools).

In addition, observations of food selection for some meals included fewer than 60 students. This occurred most often when students were being observed at a salad bar or other self-serve line. Because observers had to follow an individual child all the way through the line in order to record all food selections (and to determine if a reimbursable meal was in fact selected), the time involved in obtaining one complete observation was considerable. It was therefore impossible to obtain 60 complete observations in these situations.

Exhibit I.4 summarizes sample sizes for the analysis of NSLP meals as offered, selected and consumed.

- * SBP meals: Planned samples for SBP observations are smaller because some of the selected SFAs and schools did not offer breakfast, particularly at the middle/secondary school level. In addition, the breakfast meal was only observed for four days. Exhibit I.5 summarizes sample sizes for SBP meals.

DATA ANALYSIS AND REPORTING: YEAR TWO

The following section briefly describes the methodology used to weight the survey sample data to the national level and the general approach used in analyzing data from the Year Two SFA Manager Survey. Details on the approach used in examining the meal observation data are provided in Chapter VII.

Weighting Methodology

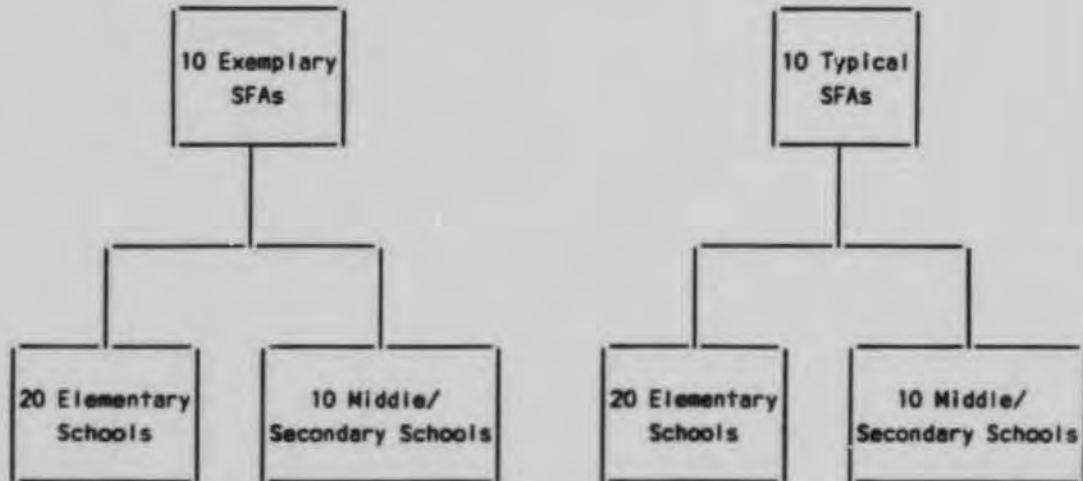
The Year Two SFA sample was weighted so that inferences could be drawn regarding the universe of all participating SFAs in the U.S. As previously described, the Year Two sample has two major components (longitudinal data elements and cross-sectional data elements) and each was weighted separately. The first component consists of the 1,222 SFAs that provided answers to the longitudinal questions. Longitudinal questions are those included in both the Year One and Year Two surveys. The second component consists of the 1,109 SFAs that provided answers to the cross-sectional questions. Cross-sectional questions are those that are only included in the Year Two survey. The number of SFAs providing longitudinal data is greater than the number that provided cross-sectional data, because selected longitudinal data elements were retrieved from State records for some of the SFAs that did not respond to the survey.

The weighting methodology involved adjustments to the reciprocal of the selection probability of each responding SFA. These adjustments compensate for SFA non-response. Additional adjustments were made to bring the weighted meal counts in the sample into agreement with FNS universe counts. Exhibits I.6 and I.7 summarize weighted and unweighted sample sizes for the Year One and Year Two longitudinal data set as well as the Year

Exhibit I.4

NSLP Meal Observation Sample

Schools:



Meals: After 5 days of observation:

	<u>Planned</u> ¹	<u>Actual</u>
<u>Offered:</u>	300	297
<u>Selected:</u>	18,000	16,571
<u>Consumed:</u>	3,600	3,470

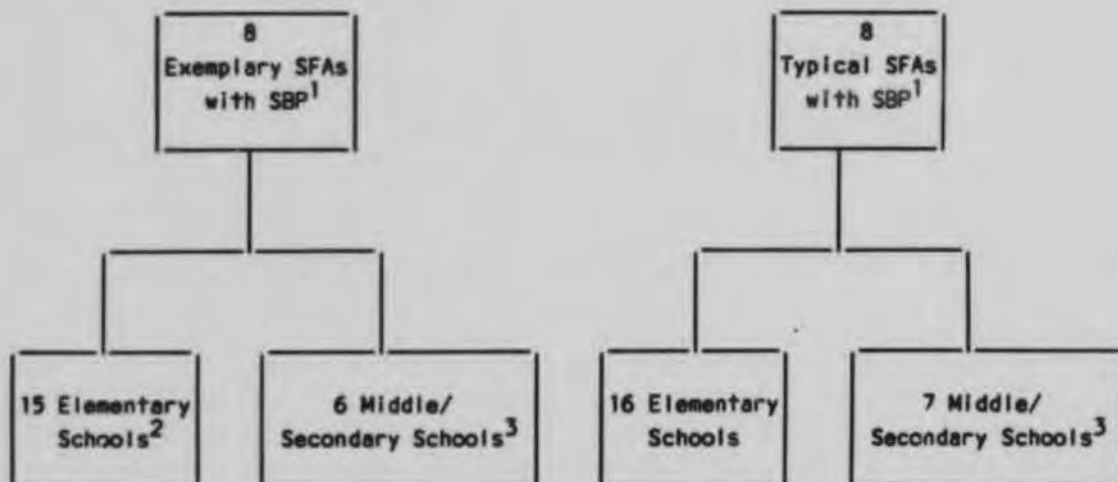
¹Planned meal observations:

- Offered : 60 schools * 5 days
- Selected: 60 schools * 5 days * 60 students
- Consumed: 60 schools * 5 days * 12 students

Exhibit 1.5

SBP Meal Observation Sample

Schools:



Meals: After 4 days of observation:

	<u>Planned⁴</u>	<u>Actual</u>
<u>Offered:</u>	176	176
<u>Selected:</u>	10,560	8,539
<u>Consumed:</u>	2,112	2,024

¹Two exemplary and two typical SFAs did not offer the SBP.

²In one exemplary SFA, the SBP was offered in one of the elementary schools but not the other.

³In two exemplary SFAs and one typical SFA, the SBP was not offered in the selected middle/secondary school.

⁴Planned meal observations:

-- Offered: 44 schools * 4 days

-- Selected: 44 schools * 4 days * 60 students

-- Consumed: 44 schools * 4 days * 12 students

Exhibit 1.6

Unweighted and Weighted Sample Sizes for Longitudinal Data Elements¹
(SY 1988-89 and SY 1989-90)

	Year One (SY 1988-89)			Year Two (SY 1989-90)		
	Unweighted N	Weighted N ²	Percent (of Weighted N)	Unweighted N	Weighted N ²	Percent (of Weighted N)
TOTAL SAMPLE	1,113	14,375	100%	1,222	12,834	100%
Type of SFA						
Public	977	11,284	78.5	1,110	10,161	79.2
Private	136	3,091	21.5	112	2,673	20.8
Participation in SBP						
NSLP and SBP	427	3,867	26.9	553	4,274	33.3
NSLP only	686	10,508	73.1	669	8,559	66.7
SFA Size						
Small (1-999)	294	7,067	49.1	274	5,897	46.0
Medium (1,000-4,999)	475	5,464	38.0	529	5,103	39.8
Large (5,000+)	344	1,844	12.9	419	1,834	14.3
SFA Poverty Level						
60% or more F&R	258	2,267	15.8	288	2,472	19.3
0-59% F&R	855	12,108	84.2	934	10,362	80.7

¹Longitudinal data include student participation rates for SY 1987-88 and SY 1988-89 (Chapter II) and meal prices (SY 1989-90) and meal costs (SY 1988-89) (Chapter III).

²The weighted number of SFAs is unequal in the two years because the sample was weighted to bring total lunch counts into agreement with FNS' known population totals.

Data Source: Year One SFA Manager Mail Survey and Year Two SFA Manager Survey.

Exhibit 1.7

Unweighted and Weighted Sample Sizes for
Year Two Cross-Sectional Data Elements¹
(SY 1989-90)

	Unweighted N	Weighted N	Percent (of Weighted N)
TOTAL SAMPLE	1,108	14,065	100%
Type of SFA			
Public	982	11,115	79.0
Private	126	2,950	21.0
Participation in SBP			
NSLP and SBP	497	4,398	31.3
NSLP only	611	9,667	68.7
SFA Size			
Small (1-999)	274	6,456	45.9
Medium (1,000-4,999)	478	5,832	41.5
Large (5,000+)	356	1,777	12.6
SFA Poverty Level ²			
60% or more F&R	244	1,880	14.2
0-59% F&R	791	11,373	85.8

¹Cross-sectional data include issues relating to the Food Donation Program (Chapter IV), Child Nutrition Labeling (Chapter V) and Technical Assistance (Chapter VI).

²Sample sizes for SFA poverty level subgroups vary from other subgroups because data on meal counts, needed to determine SFA poverty level, were missing for 73 cases (812 weighted cases).

Data Source: Year Two SFA Manager Survey.

Two cross-sectional data set. Details of the weighting methodology are presented in Appendix E.

Examining Exhibit I.6 shows that the weighted number of SFAs differs from Year One to Year Two. This is attributable to the fact that each year's weights were adjusted so that the weighted total lunch counts from this project agree with FNS' universe counts derived from State reports. Making this adjustment means that it is not possible for other weighted totals to agree with known population values (i.e., the number of SFAs in the country). This is the correct approach for the present study, since the key issue for FNS is to have the data weighted by meal counts rather than by number of SFAs.

General
Analytic
Approach

Analysis of the data collected from the SFA Manager Survey consists of straightforward crosstabulations of responses to the survey questions with accompanying descriptive statistics.^{1/}

Cross-Sectional Data. The cross-sectional data elements included in the SFA Manager Survey represent one-time information needs identified by FNS. These data cover some aspect of program operations or a particular area of technical assistance. Analysis of the cross-sectional data is, therefore, descriptive in nature, providing FNS with a "snapshot" of the operational issues examined in the survey. Responses for each survey item are tabulated and appropriate descriptive statistics are presented. When appropriate, verbatim quotations from the open-ended responses are used (without attribution) to illustrate trends and patterns in the data.

T-tests have been performed for selected variables to assess the statistical significance of differences between subgroups of SFAs. Rather than assuming that the study sample is a simple random sample of SFAs, the t-statistics have been adjusted to reflect the design effects associated with the use of a complex, stratified cluster sample.

Longitudinal Data. The longitudinal data elements represent FNS' ongoing information needs for purposes of budget forecasting and policy analysis. The longitudinal data set includes meal prices, information on meal counts, enrollment and attendance data and other key variables that define important aspects of program participation.

A key analytic issue for Year Two was which SFAs to include in the longitudinal data set. For Year One, all SFAs with valid data were accepted into the longitudinal data set (1,117 SFAs). To be included in the longitudinal data set an SFA had

^{1/}Methods used to derive more complex variables, such as participation rates and meal costs, are described in the appropriate chapters of Part 2 of this report.

to have valid data for at least the following variables which were necessary to compute student participation rates and lunch equivalents (LEQ), a central variable in the meal cost analysis:

- count of free lunches
- count of reduced-price lunches
- count of paid lunches
- count of total lunches
- count of children approved for free lunches
- count of children approved for reduced-price lunches
- count of enrolled children

The same decision rules have been used for the Year Two data set, yielding 1,222 cases with valid longitudinal data for Year Two. However, because 1,117 valid cases were obtained in Year One, an issue arose regarding how to make comparisons between the results of the Year One and Year Two surveys. Three approaches were possible:

- * Approach 1: Use only those cases that have valid data for both years. This is the most restrictive option in that it would result in the smallest number of cases in the data set. It would only include cases which are in the overlap between the 1,117 cases with valid Year One data and the 1,222 cases with valid Year Two data. A total of about 900 cases (with valid data for both years) meet the criterion for inclusion in such a longitudinal data set.

The advantages of this approach are: (a) it allows computation and use of a single set of weights for the two-year longitudinal analysis; and (b) it allows an examination of temporal changes for individual SFAs because data are available on the same SFAs for each year.

The disadvantages are: (a) it involves disregarding a substantial number of cases (approximately 20 percent of the Year One SFAs and 26 percent of the Year Two SFAs) that have data in one year but not in the other; and (b) it may result in substantial changes to the findings presented in the Year One report because of the use of different sampling weights and the exclusion of a relatively large number of sampled SFAs.

- * Approach 2: Use all valid SFAs obtained in each annual survey. In effect, this approach views the two surveys as independent samples from the same population, and would yield 1,117 SFAs for Year One and 1,222 SFAs for Year Two.

The main advantage of this approach is that all of the available data are used for each year. This is a substantial advantage because there are relatively large numbers of SFAs that responded in one year but not in the other.

The main disadvantage of this approach is that while it allows comparisons of group means from year to year, it does not allow evaluation of changes experienced by individual SFAs, because the data files will contain different cases.

- Approach 3: Impute data so that the same SFAs are available in each year. Using this approach would involve imputation of data for any SFA that exists in at least one year of the survey but not in another. This solution is used in many different types of longitudinal surveys, and it would yield the largest number of SFAs for this study. However, it would be very time-consuming to impute the data, given the large number of SFAs involved.

Considering the advantages and disadvantages of the available alternatives, the second approach was selected for the analyses presented in this report. It makes maximum use of the available data and will not result in changes to the Year One findings. While the inability to look at year-to-year changes on a case-by-case basis is a disadvantage, it is unlikely that there will be large (statistically significant and substantively important in absolute terms) year-to-year changes in the key measures being examined for this study: participation rates, meal prices, and meal costs. Therefore, examining year-to-year changes on a case-by-case basis is unlikely to be of great concern.

The analysis of the longitudinal data consists of tabulation and presentation of descriptive statistics for each variable for each of the two years. Crosstabulations similar to those described for the cross-sectional data have been prepared. Two sets of t-tests were performed: (1) t-tests to assess the significance of the differences between subgroups for Year One, e.g., to compare public SFAs with private SFAs, and (2) t-tests to assess the significance of the differences from subgroup to subgroup across years, e.g., to compare public SFAs in Year One with public SFAs in Year Two. To simplify the findings, no significance tests were done to assess the differences between subgroups for Year Two.

Tabular Presentations

In presenting the data, simple tabular displays are employed. Overall national estimates are included as well as subgroup estimates for each of the specific domains of the population considered in selecting the SFA sample:

- Public SFAs
- Private SFAs
- SFAs that participate in both the NSLP and SBP
- SFAs that participate in the NSLP only

- SFAs that serve 60 percent or more free or reduced-price lunches
- SFAs that serve 59 percent or fewer free or reduced-price lunches.

In addition, to allow examination of variation associated with the size of an SFA, a categorical variable has been created to define small, medium and large SFAs, based on the following ranges of total student enrollment for SY 1987-88 (Year One) or SY 1988-89 (Year Two):

- Small : 1 to 999 students
- Medium: 1,000 to 4,999 students
- Large : 5,000 or more students

For the most part, summary exhibits for each research issue include descriptive statistics for each of these SFA subgroups. For some variables, however, where little difference was noted among the various SFA subgroups, summary exhibits present data only for the full, combined sample.

Key exhibits present results of t-tests which compare subgroups of SFAs, i.e., public vs. private, NSLP-only vs. NSLP and SBP, SFAs that serve 60 percent or more free or reduced-price lunches vs. SFAs that serve 59 percent or fewer free or reduced-price lunches, and large vs. small and medium SFAs. Exhibits summarizing longitudinal data also report the results of t-tests between years, i.e., between values for SY 1987-88 and SY 1988-89. Because of the large number of t-tests calculated for this report, discussions are limited to variables that exhibit a difference between subgroups of SFAs or between years that is statistically significant at the .01 rather than at the more liberal .05 level. This approach compensates for the possibility of finding large numbers of comparisons significant by chance alone.

The reader will notice that some differences (either between subgroups of SFAs in the same year or year-to-year differences for the same subgroup of SFAs) appear to be "large" but are not statistically significant. This can occur because (1) there is a large amount of variation in the measure, (2) there is a relatively small sample size (e.g., this happens for private SFAs), and (3) as described above, the study is using a relatively conservative significance level.

The weighted sample sizes included in any given exhibit may vary for two reasons:

- Sample sizes for cross-sectional and longitudinal data sets are different, as described earlier in this chapter, so the total number of cases available for inclusion in a given

analysis will vary depending on the source of the data (see Exhibits I.6 and I.7).

- * The data required to compute SFA poverty level (annual free and reduced meal counts) were missing for 73 cases included in the cross-sectional data set (812 weighted cases). Thus, in exhibits presenting cross-sectional data, sample sizes for SFA poverty level subgroups vary from other subgroups.

Two sets of exhibits are presented in this report. Each chapter contains selected exhibits which present key statistics supporting the major findings. These exhibits are numbered consecutively from 1 to n within each chapter (e.g., Exhibit V.1 is the first exhibit in Chapter V). In addition, some chapters reference "extended tables" which contain additional statistics related to the discussion at hand. These extended tables are continued in Part 4 of the report so that they do not clutter the main presentation. They, too, are numbered consecutively within each chapter from 1 to n (e.g., Exhibit ET-VII.1 is the first extended table for Chapter VII).

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PART 2:
FINDINGS FROM THE YEAR TWO
SFA MANAGER SURVEY

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II. STUDENT PARTICIPATION IN THE NSLP AND SBP

This chapter presents estimates of participation in the NSLP and SBP for two school years: SY 1987-88 and SY 1988-89. Participation is examined at two levels: (1) total annual participation (number of meals served annually), and (2) student participation rates (the proportion of potential participants, overall and for each meal reimbursement category, that actually consume a school meal on an average school day).

BACKGROUND

FNS has an ongoing interest in measuring and understanding participation in the school-based Child Nutrition Programs because Federal subsidies are tied to the number of meals actually served. While FNS collects data on the number of meals served as part of the normal reporting requirements imposed on SFAs, the data available to FNS are aggregated at the State level. Alternatively, this survey offers disaggregated data to allow FNS to examine meal counts for subgroups of SFAs. Of additional interest is this study's ability to help FNS understand the factors that affect average student participation at the SFA level, and how school meal service activity responds to changes in Federal subsidies and meal prices. This information is of critical importance to the Agency's budgetary and regulatory responsibilities.

FNS has devoted substantial resources to collecting data on student participation in the Child Nutrition Programs as part of two National Evaluations of School Nutrition Programs.^{1/} In addition, sophisticated prediction models have been developed that allow FNS to estimate the effect of changes in Federal subsidies and meal prices on student participation. The primary difficulty with these models, however, has been their dependence on individual student data. Because FNS does not regularly collect such information, the Agency cannot readily update or refine these models over time without continually mounting very expensive data collection efforts. The data from the present study can help FNS develop a participation model based on infor-

^{1/}Wellisch, J.B., S.D. Hanes, L.A. Jordan, K.M. Maurer, and J.A. Vermeersch, The National Evaluation of School Nutrition Programs: Final Report. Santa Monica, CA: Systems Development Corporation, 1983 (referred to as NESNP-I).

Characteristics of the National School Lunch and School Breakfast Program Participants. USDA, Food and Nutrition Service, 1988 (referred to as NESNP-II).

mation that can be obtained on a regular basis from SFAs.^{1/} Collecting institutional-level data is far less expensive and, if properly combined with the student-level models, can be used to produce accurate predictions of responses to changes in the nature of the programs.

KEY RESEARCH ISSUES

To meet these data needs, this study provides for the collection of annual data on the number of NSLP and SBP meals served by eligibility category, and the number of students potentially able to participate in the NSLP and SBP. These data are used to address the following research questions:

- What is the level of participation in the NSLP and SBP?
- Does the pattern of participation (e.g., the percentage distribution of free, reduced, and paid meals served) and the rate of student participation vary by type of SFA?
- How do student participation rates vary for elementary and secondary schools?

Data on total annual participation and student participation rates for SY 1987-88 were presented in the Year One report from this study.^{2/} The current report includes data from both the first and second years of the study, and assesses the extent to which participation has changed over time. Results related to the total number of NSLP and SBP meals served (total annual participation) are presented first, followed by data on the average daily rate of student participation.

DATA AND VARIABLES

Data used to calculate total NSLP and SBP participation as well as student participation rates were collected as part of the Year One and Year Two SFA Manager Surveys. Data included annual meal counts of breakfasts and lunches served in SY 1987-88 (Year One Survey) and SY 1988-89 (Year Two Survey), by meal reimbursement category. The majority of SFA managers, and State Agencies where necessary, were able to provide this information. In a few instances, reported meal counts were for one month (typically October), rather than complete annual counts. These monthly counts were adjusted to reflect estimated annual

^{1/} Existing FNS management information systems collect data only at the State level.

^{2/} St. Pierre, R.G., M.K. Fox, M. Puma, F. Glantz, M. Moss, Child Nutrition Program Operations Study: First Year Report. Cambridge, MA: Abt Associates Inc., 1991.

totals by multiplying by a factor of 9. Responses from individual SFAs were then weighted and aggregated to produce national estimates of the number of meals served in the NSLP and SBP, the percentage of meals served in several different subgroups of SFAs, and the percentage distribution of free, reduced-price and paid meals.

Where possible, the weighted survey data were compared to results from prior research studies and FNS administrative data. Because the survey weights were ratio-adjusted to known population totals, based on FNS' administrative data, the resulting estimates for total NSLP and SBP meals compare closely to estimates derived from this source. (See Appendix E for details on the weighting methodology used in this study.)

Additional data collected in both surveys for the purposes of calculating student participation rates included total enrollment, the number of students approved for free and reduced-price meals, average daily attendance rates, and annual number of operating days. The reference year for these data, with the exception of annual number of operating days, was the year the surveys took place--SY 1988-89 for Year One and SY 1989-90 for Year Two. For the most part, these data were readily available from SFA records.

TOTAL ANNUAL PARTICIPATION

Estimated NSLP Participation

Data from the SFA Manager Survey indicate that nearly 4.0 billion lunches were served to school children in both SY 1987-88 and SY 1988-89 (Exhibit II.1). In each of these years, almost all lunches (about 98 percent) were served in public schools. In each year, most school lunches were served in SFAs that also offered the SBP (about 60-67 percent), in large SFAs (about 62 percent), and in SFAs that serve 59 percent or fewer free or reduced-price lunches (67 percent).

The only year-to-year change that is statistically significant is that the proportion of lunches served in schools that offer the SBP rose from 59.2 percent in SY 1987-88 to 67.4 percent in SY 1988-89. This is consistent with the trend indicated by FNS statistics which shows that the SBP has been made available to increasingly larger numbers of children over the past four years. In SY 1984-85, the SBP was available to 32.8 percent of all U.S. school children; in SY 1985-86, 34.7 percent; in 1986-87, 35.8 percent; in 1987-88, 38.3 percent; and in 1988-89, 40.8 percent.^{1/}

^{1/}Annual Historical Review of FNS Programs: Fiscal Year 1989, USDA, Food and Nutrition Service, 1990.

Exhibit 11.1

Annual NSLP Participation by Type of SFA:
Total Lunches
(SY 1987-88 and SY 1988-89)

	SY 1987-88 (n=4,002.1 million) Percent ¹	SY 1988-89 (n=3,970.2 million) Percent ¹	(SY1988-89)-(SY1987-88) Difference
TOTAL SAMPLE	100.0%	100.0%	-0.0%
Type of SFA			
Public	97.9	97.9	0.0
Private	2.1	2.1	0.0
Participation in SBP			
NSLP and SBP	59.2	67.4	8.2*
NSLP only	40.8	32.6	-8.2*
SFA Size			
Small (1-999)	7.8	6.7	-1.1
Medium (1,000-4,999)	30.8	29.6	-1.2
Large (5,000+)	61.4	63.7	2.3
Poverty Level of SFA			
High (60% or more F&R)	33.1	33.3	0.2
Low (0-59% F&R)	66.9	66.7	-0.2

¹Represents the percentage of total lunches.

*Year-to-year difference is statistically significant at the .01 level.

Note: Differences between subgroups of SFAs (e.g., public vs. private) were not tested for statistical significance since the number of meals served in a given type of SFA largely reflects the distribution of SFAs in the population.

Data Source: Year One and Year Two SFA Manager Surveys.

Exhibits II.2, II.3, and II.4 show the proportion of school lunches served nationally to children who receive free meals, children who receive reduced-price meals, and children who pay full price for their meals, respectively. In each year, about 40 percent of all lunches were served free of charge to children from low-income families, about 7 percent were served at a reduced price, and about 53 percent were served to children who paid full price for their lunch.

In SY 1987-88, the distribution of NSLP meals by eligibility category varies by type of SFA: public SFAs, SFAs that participate in both the NSLP and SBP, large SFAs, and SFAs with over 60 percent free or reduced-price lunches more likely to serve free meals. Conversely, private SFAs, SFAs that do not participate in the SBP, small and medium-sized SFAs and SFAs with less than 60 percent free or reduced-price lunches serve a higher proportion of paid meals--over 60 percent of the lunches served in these SFAs were paid meals.

The only year-to-year change that is statistically significant is that the relative proportion of free NSLP meals served in private SFAs increased while the proportion of paid NSLP meals decreased, by about 6 percent.^{1/}

Estimated SBP Participation

Data from the SFA Manager Surveys show that about 604 million school breakfasts were served to school children in SY 1987-88 and about 623 million breakfasts were served in SY 1988-89 (Exhibit II.5). The difference between the two years is not statistically significant. The percentage of breakfasts served in public vs. private SFAs and in SFAs of varying sizes was quite consistent across the two years. In each year, over 98 percent of all breakfasts were served in public SFAs, and about 75 percent were served in large SFAs. The percentage of breakfasts served in SFAs with over 60 percent free or reduced-price lunches appears to have decreased by about 5 percent (from 54 to 49 percent), but this difference is not statistically significant.

Exhibits II.6, II.7, and II.8 show the number of school breakfasts served in SY 1987-88 and SY 1988-89 to children who qualify for free meals, children who qualify for reduced-price meals, and children who pay full price for their meals. Overall, more than 80 percent of all breakfasts were served free or at a reduced price in each of the two years. The pattern was similar in each type of SFA.

The only between-group difference that is statistically significant is that medium-size SFAs serve significantly more paid breakfasts and significantly fewer free breakfasts than large SFAs. None of the year-to-year differences is statistically significant.

^{1/}It should be emphasized that private SFAs serve only about 2 percent of all NSLP meals.

Exhibit 11.2

Annual NSLP Participation by Type of SFA:
Free Lunches
(SY 1987-88 and SY 1988-89)

	<u>SY 1987-88</u> Percent ¹	<u>SY 1988-89</u> Percent ¹	<u>(SY1988-89)-(SY1987-88)</u> Difference
TOTAL SAMPLE	39.7%	39.9%	0.2%
Type of SFA			
Public	40.1*	40.1	0.0
Private	22.7	29.0	6.3*
Participation in SBP			
NSLP and SBP	51.9*	48.2	-3.7
NSLP only	22.1	22.6	0.5
SFA Size			
Small (1-999)	26.6*	30.3	3.7
Medium (1,000-4,999)	29.2*	29.9	0.7
Large (5,000+) [‡]	46.7	45.5	-1.2
Poverty Level of SFA			
High (60% or more F&R)	69.1*	68.7	-0.4
Low (0-59% F&R)	25.2	25.5	0.3

¹Represents the percentage of total lunches served free in a given subgroup. Sums to 100 percent across free, reduced-price (Exhibit 11.3) and paid lunches (Exhibit 11.4).

*Between-group or year-to-year difference is statistically significant at the .01 level. Between-group comparisons were done for Year One but not for Year Two.

[‡]Reference group used in comparisons: Large SFAs vs. Small SFAs; Large SFAs vs. Medium SFAs.

Data Source: Year One and Year Two SFA Manager Surveys.

Exhibit 11.3

Annual NSLP Participation by Type of SFA:
Reduced-Price Lunches
 (SY 1987-88 and SY 1988-89)

	<u>SY 1987-88</u> Percent ¹	<u>SY 1988-89</u> Percent ¹	<u>(SY1988-89)-(SY1987-88)</u> Difference
TOTAL SAMPLE	6.6%	6.7%	0.1%
Type of SFA			
Public	6.5	6.7	0.2
Private	9.1	8.5	-0.6
Participation in SBP			
NSLP and SBP	7.1	7.2	0.1
NSLP only	5.7	5.8	0.1
SFA Size			
Small (1-999)	6.6	6.1	-0.5
Medium (1,000-4,999)	6.2	6.6	0.4
Large (5,000+) [‡]	6.7	6.9	0.2
Poverty Level of SFA			
High (60% or more F&R)	7.8	8.0	0.2
Low (0-59% F&R)	5.9	6.1	0.2

¹Represents the percentage of total lunches served at reduced-price in a given subgroup. Sums to 100 percent across free (Exhibit 11.2), reduced-price, and paid lunches (Exhibit 11.4).

Note: None of the between-group or year-to-year differences is statistically significant. Between-group comparisons were done for Year One but not for Year Two.

[‡]Reference group used in comparisons: Large SFAs vs. Small SFAs; Large SFAs vs. Medium SFAs.

Data Source: Year One and Year Two SFA Manager Surveys.

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Exhibit 11.4

Annual NSLP Participation by Type of SFA:
Paid Lunches
(SY 1987-88 and SY 1988-89)

	SY 1987-88 Percent ¹	SY 1988-89 Percent ¹	(SY1988-89)-(SY1987-88) Difference
TOTAL SAMPLE	53.7%	53.4%	-0.3%
Type of SFA			
Public	53.4*	53.2	-0.2
Private	68.2	62.5	-5.7*
Participation in SBP			
NSLP and SBP	41.0*	44.6	3.6
NSLP only	72.2	71.7	-0.5
SFA Size			
Small (1-999)	66.9*	63.6	-3.3
Medium (1,000-4,999)	64.6*	63.5	-1.1
Large (5,000+) [‡]	46.6	47.6	1.0
Poverty Level of SFA			
High (60% or more F&R)	23.0*	23.3	0.3
Low (0-59% F&R)	68.9	68.5	-0.4

¹Represents the percentage of total lunches served paid in a given subgroup. Sums to 100 percent across free (Exhibit 11.2), reduced-price (Exhibit 11.3), and paid lunches.

*Between-group or year-to-year difference is statistically significant at the .01 level. Between-group comparisons were done for Year One but not for Year Two.

[‡]Reference group used in comparisons: Large SFAs vs. Small SFAs; Large SFAs vs. Medium SFAs.

Data Source: Year One and Year Two SFA Manager Surveys.

Exhibit 11.5

Annual SBP Participation by Type of SFA:
Total Breakfasts
 (SY 1987-88 and SY 1988-89)

	<u>SY 1987-88</u> (n=603.8 million) Percent ¹	<u>SY 1988-89</u> (n=623.3 million) Percent ¹	<u>(SY1988-89)-(SY1987-88)</u> Difference
TOTAL SAMPLE	100.0%	100.0%	0.0%
Type of SFA			
Public	99.1	98.3	-0.8
Private	0.9	1.7	0.8
SFA Size			
Small (1-999)	5.8	4.0	-1.8
Medium (1,000-4,999)	18.3	19.3	1.0
Large (5,000+)	75.9	76.7	0.8
Poverty Level of SFA			
High (60% or more F&R)	54.4	49.1	-5.3
Low (0-59% F&R)	45.6	50.9	5.3

¹Represents the percentage of total breakfasts.

Notes: Differences between subgroups of SFAs (e.g. public vs. private) were not tested for statistical significance since the number of meals served in a given types of SFA largely reflects the distribution of SFAs in the population.

None of the year-to-year differences is statistically significant.

Data Source: Year One and Year Two SFA Manager Surveys.

Exhibit 11.6

Annual SBP Participation by Type of SFA: Free Breakfasts (SY 1987-88 and SY 1988-89)

	<u>SY 1987-88</u> Percent ¹	<u>SY 1988-89</u> Percent ¹	<u>(SY1988-89)-(SY1987-88)</u> Difference
TOTAL SAMPLE	83.3%	78.9%	-4.4%
Type of SFA			
Public	83.4	79.0	-4.4
Private	71.4	73.1	1.7
SFA Size			
Small (1-999)	75.5	76.3	0.8
Medium (1,000-4,999)	73.6*	73.3	-0.3
Large (5,000+) [‡]	86.3	80.4	-5.9
Poverty Level of SFA			
High (60% or more F&R)	88.3	86.6	-1.7
Low (0-59% F&R)	77.4	71.4	-6.0

¹Represents the percentage of total breakfasts served free in a given subgroup. Sums to 100 percent across free, reduced-price (Exhibit 11.7), and paid breakfasts (Exhibit 11.8).

*Between-group or year-to-year difference is statistically significant at the .01 level. Between-group comparisons were done for Year One but not for Year Two.

[‡]Reference group used in comparisons: Large SFAs vs. Small SFAs; Large SFAs vs. Medium SFAs.

Data Source: Year One and Year Two SFA Manager Surveys.

Exhibit 11.7

Annual SBP Participation by Type of SFA:
Reduced-Price Breakfasts
 (SY 1987-88 and SY 1988-89)

	<u>SY 1987-88</u> Percent ¹	<u>SY 1988-89</u> Percent ¹	<u>(SY1988-89)-(SY1987-88)</u> Difference
TOTAL SAMPLE	5.2%	5.8%	0.6%
Type of SFA			
Public	5.1	5.7	0.6
Private	8.9	9.3	0.4
SFA Size			
Small (1-999)	7.1	6.4	-0.7
Medium (1,000-4,999)	6.4	7.3	0.9
Large (5,000+) [‡]	4.7	5.4	0.7
Poverty Level of SFA			
High (60% or more F&R)	4.7	5.2	0.5
Low (0-59% F&R)	5.6	6.3	0.7

¹Represents the percentage of total breakfasts served at a reduced-price in a given subgroup. Sums to 100 percent across free (Exhibit 11.6), reduced-price, and paid breakfasts (Exhibit 11.8).

Note: None of the between-group or year-to-year differences is statistically significant. Between-group comparisons were done for Year One but not for Year Two.

[‡]Reference group used in comparisons: Large SFAs vs. Small SFAs; Large SFAs vs. Medium SFAs.

Data Source: Year One and Year Two SFA Manager Surveys.

Exhibit 11.8

Annual SBP Participation by Type of SFA:
Paid Breakfasts
 (SY 1987-88 and SY 1988-89)

	<u>SY 1987-88</u> Percent ¹	<u>SY 1988-89</u> Percent ¹	<u>(SY1988-89)-(SY1987-88)</u> Difference
TOTAL SAMPLE	11.5%	15.4%	3.9%
Type of SFA			
Public	11.5	15.3	3.8
Private	19.6	17.6	-2.0
SFA Size			
Small (1-999)	17.4	17.3	-0.1
Medium (1,000-4,999)	20.0*	19.5	-0.5
Large (5,000+) [‡]	9.0	14.2	5.2
Poverty Level of SFA			
High (60% or more F&R)	6.9	8.2	1.3
Low (0-59% F&R)	17.0	22.2	5.2

¹Represents the percentage of total breakfasts served paid in a given subgroup. Sums to 100 percent across free (Exhibit 11.6), reduced-price (Exhibit 11.7) and paid breakfasts.

*Between-group or year-to-year difference is statistically significant at the .01 level. Between-group comparisons were done for Year One but not for Year Two.

[‡]Reference group used in comparisons: Large SFAs vs. Small SFAs; Large SFAs vs. Medium SFAs.

Data Source: Year One and Year Two SFA Manager Surveys.

There are several indicators which show that the SBP has grown over the past few years. Data presented in Exhibit I.6 showed that the estimated number of SFAs offering the SBP increased from 3,867 in SY 1987-88 (26.9 percent of all SFAs) to 4,274 in SY 1988-89 (33.3 percent of all SFAs). This increase in the number of SFAs offering the SBP has been accompanied by an increase in the number of schools offering the SBP within the average SFA: 6.9 schools per SFA offered the SBP in SY 1987-88, and 7.0 schools per SFA offered the SBP in SY 1988-89. Data presented in Exhibit II.1 show that the proportion of lunches served in schools that participate in the SBP increased from 59.2 percent in SY 1987-88 to 67.4 percent in SY 1988-89. Finally, data from FNS indicate that the SBP was made available to an increasing proportion of school children in each of the school years from 1984-85 (32.8 percent of all school children had the SBP available) through 1988-89 (40.8 percent).

Clearly, the SBP is growing. However, with only two years worth of data from the present study, it is not possible to draw definitive conclusions about the pattern of SBP growth for subgroups of SFAs. Hence, this issue will be addressed in more detail in the third report from this study.

Comparison with
FNS Administra-
tive Data

Exhibit II.9 summarizes annual NSLP participation for SY 1987-88 and SY 1988-89 as estimated in this study (see the column titled CNOPS Data) and as reported in FNS program data. Because of the way in which the survey weights were constructed, the estimates of the total number of meals served in each year agree quite well.

Exhibit II.10 provides a similar comparison of CNOPS and FNS administrative data for the SBP. The estimates of the total number of breakfasts served in each year agree quite well. The distribution of breakfasts by free, reduced-price, and paid meal categories also matches very well except for paid breakfasts, where CNOPS data show 2 percentage points fewer breakfasts served than FNS data in SY 1987-88 and 2 percentage points more breakfasts in SY 1988-89. These differences are not statistically significant, nor do they seem to be substantively meaningful.

STUDENT PARTICIPATION RATES

Student participation rates are defined as the ratio of the number of meals served during the year to the number of meals that could have been provided to eligible students. This section begins with a discussion of overall student participation rates. The overall participation rate computed for the full sample is then compared to estimates derived from FNS administrative data for the same time period. Next, participation rates for elementary and middle/secondary schools are discussed, and finally, separate participation rates for free, reduced-price and paid meals are presented.

Exhibit 11.9

Annual NSLP Participation:
Comparison of CNOPS and FNS Administrative Data:
(SY 1987-88 and SY 1988-89)

	SY 1987-88		SY 1988-89	
	CNOPS Data (n=4,002.1 million)	FNS Data ^{2,3} (n=4,000.4 million)	CNOPS Data (n=3,970.2 million)	FNS Data ^{2,3} (n=3,971.9 million)
	Percent ¹	Percent ¹	Percent ¹	Percent ¹
TOTAL	100.0%	100.0%	100.0%	100.0%
Free	39.7	40.5	39.9	40.2
Reduced-Price	6.6	6.5	6.7	6.6
Paid	53.7	53.0	53.4	53.2

¹Represents the percentage of total lunches.

²Data Source: FNS/PID/Monthly Program Report Summaries. National School Lunch Program, FY 1988 and FY 1989. USDA, Food and Nutrition Service, 1989 and 1990.

³CNOPS data are based on School Year (September-June) totals; FNS data are based on Fiscal Year (July-June) totals.

Exhibit 11.10

Annual SBP Participation:
Comparison of CNOPS and FNS Administrative Data:
(SY 1987-88 and SY 1988-89)

	SY 1987-88		SY 1988-89	
	CNOPS Data (n=603.8 million)	FNS Data ^{2,3} (n=604.9 million)	CNOPS Data (n=623.3 million)	FNS Data ^{2,3} (n=623.3 million)
	Percent ¹	Percent ¹	Percent ¹	Percent ¹
TOTAL	100.0%	100.0%	100.0%	100.0%
Free	83.3	81.7	78.9	80.9
Reduced-Price	5.2	5.0	5.8	5.3
Paid	11.5	13.3	15.4	13.8

¹Represents the percentage of total lunches.

²Data Source: FNS/PID/Monthly Report Summaries. National School Lunch Program, FY 1988 and FY 1989. USDA, Food and Nutrition Service, 1989 and 1990.

³CNOPS data are based on School Year (September-June) totals. FNS data are based on Fiscal Year (July-June) totals.

NSLP Student
Participation
Rates

Overall Student Participation Rates. Exhibit II.11 presents estimated student participation rates for the NSLP, summing across free, reduced-price, and paid meals. The national estimate for overall NSLP student participation is 59.1 percent in SY 1987-88 and 60.2 percent in SY 1988-89. That is, on an average day in both SY 1987-88 and SY 1988-89, about 60 percent of students who had the NSLP available to them actually participated in the program.

In examining overall participation rates across types of SFAs, significantly higher rates of student participation are found in SFAs offering the SBP, small SFAs, and SFAs that serve 60 percent or more free or reduced-price lunches. None of the year-to-year differences in overall student participation is statistically significant.

Comparison with FNS Administrative Data and with Data from NESNP. The estimated overall participation rates based on data from this study (59.1 percent in SY 1987-88 and 60.2 percent in SY 1988-89) agree quite well with the estimates of 59.4 percent and 58.4 percent reported by FNS for those same years.^{1/}

Comparing participation rates from the present study to the participation rates reported in the NESNP-I and NESNP-II studies is not so straightforward. There are several methodological difference between the two studies that affect participation rates:

- CNOPS estimates include both private and public schools while NESNP estimates are for public schools only.
- CNOPS estimates include data for kindergarten through grade 12, while NESNP estimates are for grades 1 through 12.
- CNOPS estimates are based on annual administrative data supplied by SFA managers while the main set of NESNP data are based on student reports of participation over the previous five days that the student was in school (NESNP also collected data from food service administrators).
- CNOPS estimates are based on data for the 1987-88 and 1988-89 school years, while NESNP estimates are based on data collected in 1980.

^{1/}Annual Historical Review of FNS Programs: Fiscal Year 1989. USDA, Food and Nutrition Service, 1990. FNS' participation rates are calculated by determining the average number of meals served (nine month average [Oct.-May] plus September) and dividing by program enrollment, using unrounded data.

Exhibit 11.11

NSLP Student Participation Rates by Type of SFA:

Total Lunches
(SY 1987-88 and SY 1988-89)

	<u>SY 1987-88</u>	Total Number of Potential Participants ¹ (Weighted)	<u>SY 1988-89</u>	Total Number of Potential Participants ¹ (Weighted)	<u>(SY1988-89)-(SY1987-88)</u> Difference
	Mean		Mean		
TOTAL SAMPLE	59.1%	41.1	60.2%	39.9	1.1%
Type of SFA					
Public	59.1	40.2	60.3	39.0	1.2
Private	57.9	0.8	56.1	0.9	-1.8
Participation in SBP					
NSLP and SBP	63.1*	22.7	62.6	25.8	-0.5
NSLP only	54.1	18.4	55.9	14.1	1.8
SFA Size					
Small (1-999)	68.8*	2.8	68.8	2.4	0.0
Medium (1,000-4,999)	60.4	12.4	60.8	11.7	0.4
Large (5,000+)*‡	57.5	25.9	59.2	25.8	1.7
Poverty Level of SFA					
High (60% or more F&R)	66.5*	12.1	63.3	12.7	-3.2
Low (0-59% F&R)	56.0	29.0	58.8	27.1	2.8

¹Millions of students.

*Between-group or year-to-year difference is statistically significant at the .01 level. Between-group comparisons were done for Year One but not for Year Two.

‡Reference group used in comparisons: Large SFAs vs. Small SFAs; Large SFAs vs. Medium SFAs.

Data Source: Year One and Year Two SFA Manager Surveys.

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- CNOPS estimates are based on data for entire school years, while NESNP estimates are based on data collected in October through December.
- CNOPS estimates are based on average daily attendance (absences are accounted for) while NESNP estimates are based on total school enrollment (absences are not accounted for).

Given these differences in methodology, it is not surprising that we find some differences in the participation rates reported by the two studies. A summary of the two sets of findings is shown in Exhibit II.12. The CNOPS data show a total participation rate of about 60 percent while the NESNP student report data show a total participation rate of about 66 percent. A difference of this magnitude can almost completely be explained if the NESNP data are adjusted by an attendance rate factor of 93.7 percent for all schools in the United States for school year 1980-81.^{1/} Multiplying the NESNP-I rate of 65.7 percent by .937 yields an adjusted rate of 61.6 percent, much closer to the CNOPS estimate. In addition, NESNP also collected a set of data from school administrators, which ought to be comparable to the CNOPS data. The total participation rate calculated from data taken from the NESNP administrator reports was 61.4 percent, which closely matches both the CNOPS estimate and the NESNP student estimate when adjusted for attendance.

Variation by Grade Level. Past research has demonstrated that participation rates differ for students of different ages, with younger children participating more frequently than older children.

Data from the present study support that finding, indicating that participation rates are significantly higher in elementary schools than in middle/secondary schools (Exhibit II.13). On an average school day in both years of the study, over 70 percent of elementary school students selected an NSLP meal, compared to 48 percent of middle/secondary school students. These estimates are lower than the figures available from NESNP-I, which showed that participation rates were 75.7 percent in grades 1-3, 74.5 percent in grades 4-6, 66.9 percent in grades 7-9, and 47.9 percent in grades 10-12.

Free Lunch Student Participation Rates. The estimated NSLP participation rate for children approved for free lunches is 89.7 percent in SY 1987-88 and 88.0 percent in SY 1988-89 (Exhibit I-14). This is consistent with findings from other studies, including NESNP-I (85.4 percent) and NESNP-II (91.8 percent).

^{1/}U.S. Department of Education, National Center for Educational Statistics, Digest of Educational Statistics, 1989, p. 54.

Exhibit II.12

NSLP Student Participation Rates:
CNOPS and NESNP

	CNOPS		NESNP-I		NESNP-II
	SY 1987-88	SY 1988-89	Student Reports	Administrator Reports	Student Reports
TOTAL	59.1%	60.2%	65.7%	61.4%	65.9%
Free	89.7	88.0	85.4	---	91.8
Reduced-Price	73.0	71.3	81.5	---	83.4
Paid	45.6	48.0	57.6	---	54.7

Exhibit II.13

NSLP Student Participation Rates in Elementary and Middle/Secondary Schools: Total Lunches (SY 1987-88 and SY 1988-89)

	<u>SY 1987-88</u> ¹ Mean	<u>SY 1988-89</u> ¹ Mean	<u>(SY1988-89)-(SY1987-88)</u> Difference
Elementary Schools	71.6%*	71.4%	-0.2%
Middle Secondary Schools	48.7	48.4	-0.3

¹Based on the subset of SFAs that provided enrollment and meal count data separately for elementary and middle/secondary schools.

*Difference between elementary and middle/secondary schools is statistically significant at the .01 level.

Note: Neither of the year-to-year differences is statistically significant.

Data Source: Year One and Year Two SFA Manager Surveys.

Exhibit II.14

NSLP Student Participation Rates by Type of SFA:
Free Lunches
 (SY 1987-88 and SY 1988-89)

	<u>SY 1987-88</u>	Total Number of Potential Participants ¹ (Weighted)	<u>SY 1988-89</u>	Total Number of Potential Participants ¹ (Weighted)	<u>(SY1988-89)-(SY1987-88)</u> Difference
	Mean		Mean		
TOTAL SAMPLE	89.7%	10.6	88.0%	10.8	-1.7%
Type of SFA					
Public	89.8	10.5	88.1	10.6	-1.7
Private	83.6	0.1	84.2	0.2	0.6
Participation in SBP					
NSLP and SBP	90.2	8.1	88.5	8.7	-1.7
NSLP only	88.3	2.5	85.7	2.0	-2.6
SFA Size					
Small (1-999)	89.5	0.6	89.3	0.5	-0.2
Medium (1,000-4,999)	89.7	2.4	86.3	2.4	-3.4
Large (5,000+) [‡]	89.8	7.6	88.4	7.8	-1.4
Poverty Level of SFA					
High (60% or more F&R)	89.8	6.1	89.6	6.1	-0.2
Low (0-59% F&R)	89.7	4.5	86.0	4.7	-3.7*

¹Millions of students.

*Between-group or year-to-year difference is statistically significant at the .01 level. Between-group comparisons were done for Year One but not for Year Two.

[‡]Reference group used in comparisons: Large SFAs vs. Small SFAs; Large SFAs vs. Medium SFAs.

Data Source: Year One and Year Two SFA Manager Surveys.

A high level of participation (over 80 percent) is observed for free lunches in both years for each of the subgroups of SFAs assessed in this study. None of the between-group differences was found to be statistically significant.

The only year-to-year change that is statistically significant is that participation among students approved for free meals in low-poverty SFAs decreased, by about 4 percent, between SY 1987-88 and SY 1988-89.

Reduced-Price Student Participation Rates. NSLP participation among children approved for reduced-price lunches is consistently lower than participation rates for free lunches, but higher than participation rates for children who pay full price for their NSLP meals. The estimated NSLP participation rate for all students approved for reduced-price meals is 73.0 percent in SY 1987-88 and 71.3 percent in SY 1988-89 (Exhibit II.15). This is not a statistically significant change. These participation rates are lower than those reported by NESNP-I (81.5 percent) and NESNP-II (83.4 percent).

In general, reduced-price participation rates for both years were over 70 percent and were similar among different types of SFAs, with the exception of small SFAs. Reduced-price participation is higher in small SFAs than in large SFAs.

Paid Meal Student Participation Rates. Participation among children who must pay full price for an NSLP meal is markedly lower than participation for children who are approved for free or reduced-price meals. An estimated 45.6 percent of children who pay full price purchased a reimbursable school lunch on an average school day in SY 1987-1988 and an estimated 48.0 percent did so in SY 1988-89 (Exhibit II.16). This year-to-year difference is not statistically significant. These rates are lower than those reported by NESNP-I (57.6 percent) and NESNP-II (54.7 percent).

Paid NSLP participation rates did differ significantly among SFAs of varying sizes. Paying students in small and medium-sized SFAs participate more frequently than comparable students in large SFAs. This is most likely attributable to the fact that students in small- and medium-size SFAs are more likely to be elementary school children and that all children in these SFAs have fewer options available to them at meal time.

Paid NSLP participation was also significantly higher in SFAs that serve 59 percent or fewer free or reduced-price lunches than in SFAs that serve 60 percent or more free or reduced-price lunches. None of the year-to-year differences in the participation rates of children who pay full price for NSLP meals is statistically significant.

Exhibit II.15

NSLP Student Participation Rates by Type of SFA:
Reduced-Price Lunches
 (SY 1987-88 and SY 1988-89)

	<u>SY 1987-88</u>	Total Number of Potential Participants ¹ (Weighted)	<u>SY 1988-89</u>	Total Number of Potential Participants ¹ (Weighted)	<u>(SY1988-89)-(SY1987-88)</u> Difference
	Mean		Mean		
TOTAL SAMPLE	73.0%	2.2	71.3%	2.3	-1.7%
Type of SFA					
Public	72.8	2.1	71.3	2.2	-1.5
Private	80.0	0.1	71.6	0.1	-8.4
Participation in SBP					
NSLP and SBP	72.3	1.4	70.8	1.6	-1.5
NSLP only	74.4	0.8	72.5	0.6	-1.9
SFA Size					
Small (1-999)	79.5*	0.2	77.0	0.1	-2.5
Medium (1,000-4,999)	74.2	0.6	72.7	0.6	-1.5
Large (5,000+)*‡	71.8	1.4	70.2	1.5	-1.6
Poverty Level of SFA					
High (60% or more F&R)	69.2	0.9	68.3	0.9	0.9
Low (0-59% F&R)	75.7	1.3	73.4	1.3	-2.3

¹Millions of students.

*Between-group or year-to-year difference is statistically significant at the .01 level. Between-group comparisons were done for Year One but not for Year Two.

‡Reference group used in comparisons: Large SFAs vs. Small SFAs; Large SFAs vs. Medium SFAs.

Exhibit II.16

NSLP Student Participation Rates by Type of SFA:
Paid Lunches
(SY 1987-88 and SY 1988-89)

	<u>SY 1987-88</u>	Total Number of Potential Participants ¹	<u>SY 1988-89</u>	Total Number of Potential Participants ¹	<u>(SY1988-89)-(SY1987-88)</u>
	Mean	(Weighted)	Mean	(Weighted)	Difference
TOTAL SAMPLE	45.6%	28.5	48.0%	26.6	2.4%
Type of SFA					
Public	45.9	27.6	48.0	26.0	2.1
Private	38.6	0.9	48.1	0.6	9.5
Participation in SBP					
NSLP and SBP	43.7	13.4	46.7	15.3	3.0
NSLP only	47.4	15.2	49.8	11.3	2.4
SFA Size					
Small (1-999)	61.8*	2.1	60.8	1.7	-1.0
Medium (1,000-4,999)	51.5*	9.4	53.1	8.5	1.6
Large (5,000+) [‡]	40.5	17.1	44.1	16.4	3.6
Poverty Level of SFA					
High (60% or more F&R)	35.9*	5.1	34.0	5.5	-1.9
Low (0-59% F&R)	47.8	23.4	51.7	21.1	3.9

¹Millions of students.

*Between-group or year-to-year difference is statistically significant at the .01 level. Between-group comparisons were done for Year One but not for Year Two.

[‡]Reference group used in comparisons: Large SFAs vs. Small SFAs; Large SFAs vs. Medium SFAs.

Data Source: Year One and Year Two SFA Manager Surveys.

SBP Participi- pation Rates

Because of missing data, the overall student participation rate for the SBP could only be calculated for a subset of about three-quarters of the SFAs offering the program. Based on data for this reduced sample, it is estimated that 20.8 percent of students enrolled in schools offering the SBP participated on an average day in SY 1987-88, and 20.6 percent participated in SY 1988-89. (Exhibit II.17) This estimate is almost identical to the estimate of 20.7 percent derived from FNS' administrative data for SY 1987-88, and is quite close to FNS' estimate of 20.1 percent for SY 1988-89.¹ Further, it agrees with the NESNP-II estimate of 18.3 percent for the 1983-84 school year.

Data on differences in SBP participation rates by meal reimbursement category are also presented in Exhibit II.17. These data must, however, be viewed as very tentative because only about one-third of SFAs offering the SBP were able to provide information on the number of children eligible for breakfasts by eligibility category. The data are quite consistent across years, indicating that SBP participation rates are highest for free meals in each year (43.2 and 41.9 percent, respectively), lower for reduced-price meals (14.9 and 15.3 percent, respectively), and lowest for paid meals (4.3 and 5.0 percent, respectively). The year-to-year differences are not statistically significant. These participation rates are quite close to the NESNP-II rates of 44.3 percent for free breakfasts, 14.6 percent for reduced-price breakfasts, and 5.1 percent for paid breakfasts.

¹/Annual Historical Review of FNS Programs: Fiscal Year 1989. USDA, Food and Nutrition Service, 1990.

Exhibit 11.17

SBP Participation Rates by
Meal Reimbursement Category
(SY 1987-88 and SY 1988-89)

	<u>SY 1987-88¹</u> Mean	<u>SY 1988-89¹</u> Mean	<u>(SY1988-89)-(SY1987-88)</u> Difference
TOTAL	20.8%	20.6%	-0.2%
Free	43.2	41.9	-1.3
Reduced-Price	14.9	15.3	0.4
Paid	4.3	5.0	0.7

¹In both years, the total participation rate was calculated for a subset (approximately 75 percent) of the SFAs offering the program. Free, reduced-price and paid participation rates were calculated for a subset comprised of about one-third of all SFAs offering the program.

Data Source: Year One and Year Two SFA Manager Surveys.

III. MEAL PRICES AND REPORTED MEAL COSTS

This chapter addresses issues related to meal prices and reported meal costs in SFAs participating in the NSLP and SBP. The chapter is organized into two sections. The first describes the prices charged for meals in the NSLP and SBP, including both student and adult meals. The second section of the chapter focuses on meal costs in the NSLP. The estimated average cost of producing an NSLP meal is reported, and variations in meal costs across SFAs are explored.

BACKGROUND

Previous research has shown that the price charged for an NSLP meal is a primary determinant of student participation decisions.^{1/} It is also known that payments collected from students represent a major source of revenue for school food service programs.

FNS' need for meal price information is largely related to its concern about program costs and participation. To determine the likely effects of, for example, a subsidy change in the NSLP or SBP, FNS needs to know whether such a change is likely to affect the prices charged to students, which could lead to a change in student participation and, ultimately, affect the total cost of the program. Those within FNS who are responsible for predicting participation five years in the future need to know the extent to which price changes occur independent of policy changes. Finally, the Agency needs to understand the relationship between meal pricing and SFA characteristics.

This study also examines the costs of producing NSLP lunches as reported by SFAs.^{2/} The cost elements included in the analysis are food costs (commercial purchases and USDA donated commodities), labor costs, and other miscellaneous costs.

^{1/}Wellisch, J.B., Hanes, S.D., Jordan, L.A., Maurer, K.M., Vermeersch, J.: The National Evaluation of School Nutrition Programs: Final Report. Santa Monica, CA: Systems Development Corporation, 1983.

^{2/}The production of NSLP lunches is financed through Federal cash subsidies and donated commodities, State and local subsidies, and revenues from the sales of NSLP lunches, a la carte items, and other food sales to children and teachers.

KEY RESEARCH ISSUES

To provide FNS with information on the prices charged for full-price, reduced-price, and adult lunches and breakfasts, this study addresses the following questions:

- What is the average price charged for full-price, reduced-price, and adult lunches in SY 1989-90?
- What is the average price charged for full-price, reduced-price, and adult breakfasts in SY 1989-90?
- How have prices changed from SY 1988-89 to SY 1989-90?

To provide information on the costs of producing an NSLP lunch, the chapter addresses three additional questions:

- What is the cost of producing an NSLP lunch and how are these costs distributed across the major cost components?
- How have the costs of providing an NSLP lunch changed from SY 1987-88 to SY 1988-89?
- How do total Federal subsidies compare to the cost of producing NSLP lunches?

DATA AND VARIABLES

Information on meal prices for SY 1988-89 was requested in the Year One SFA Manager Mail Survey. Respondents were asked to indicate the prices charged for paid and reduced-price student meals (lunches and breakfasts) as well as adult meals in elementary and middle/secondary schools at the start of SY 1988-89. Respondents were also asked to report any mid-year price changes that occurred. Similar questions on meal prices for SY 1989-90 were included in the Year Two SFA Manager Survey. The average (unweighted) of the prices from elementary and secondary schools was calculated and is presented in this report as "all schools."

The Year One and Year Two SFA Manager Surveys also requested information on income and expenses for SY 1987-88 and SY 1988-89, respectively. These data were utilized in the analysis of NSLP meal costs. The variables constructed from these data are described in the subsequent section of this chapter that focuses on NSLP meal costs.

MEAL PRICES

This section presents national estimates of the prices charged by SFAs participating in the NSLP and SBP during SY 1988-89 and SY 1989-90. Average prices charged in different types of SFAs

are compared and the statistical significance of differences among subgroups of SFAs and year-to-year changes are noted.^{1/} Prices for the NSLP and SBP are discussed separately, beginning with the NSLP.

NSLP Paid Lunches

The average price for a full-price NSLP meal, across all schools and SFAs, was 98 cents in SY 1988-89 and \$1.00 in SY 1989-90 (Exhibit III.1). This difference is not statistically significant. Paid lunch prices do vary by grade level. The average price in elementary schools was 93 cents in SY 1988-89 and 95 cents in SY 1989-90; for middle/secondary schools the average price was about 10 cents higher at \$1.03 in SY 1988-89 and \$1.06 in SY 1989-90. The year-to-year differences are not significant.

There is also some variation in meal pricing in different types of SFAs. Specifically, prices charged in SFAs that participate in the SBP and in SFAs that serve 60 percent or more free or reduced-price lunches are significantly lower--in both elementary and middle/secondary schools--than prices in other SFAs. None of the year-to-year differences within SFA subgroups is statistically significant. The standard deviation of a full-price lunch, across all subgroups and for both years, is about 20 cents. This indicates that there is substantial amount of variation in the prices students pay for full-price NSLP meals.

Exhibit III.2 shows how the average price of an NSLP paid lunch in SY 1989-90 changes when the unit of analysis is the NSLP meal (each lunch has the same weight) instead of the SFA (each SFA has the same weight). Large SFAs charge higher prices and serve many more lunches than small SFAs, hence the mean lunch price calculated using the NSLP meal as the unit of analysis is marginally higher (\$1.02) than the mean lunch price calculated using the SFA as the unit of analysis (\$1.00).

NSLP Reduced-Price Lunches

The average price for a reduced-price lunch in both SY 1988-89 and SY 1989-90, across all schools and SFAs, was 38 cents (Exhibit III.3). There is little variation in this figure across different types of SFAs, with average prices ranging between 36 and 38 cents for a reduced-price lunch. There were no significant changes in the price of a reduced-price lunch from SY 1988-89 to SY 1989-90. Due to the Federally-set ceiling on the price of a reduced-price lunch, the standard deviation of the price for a reduced-price lunch is much smaller than for the price of a paid lunch--about 6 cents per reduced-price lunch compared to 20 cents for a paid lunch. This means that there is relatively little variation in the price of a reduced-price lunch within any of the subgroups examined in this study.

^{1/}The unweighted sample sizes are quite small for some subgroups of SFAs, especially middle/secondary schools in private SFAs. Estimates are not provided when unweighted cell sizes fall below 30 SFAs.

Exhibit III.1

Average NSLP Meal Prices for Paid Lunches
in Elementary and Secondary Schools:
SY 1988-89 and SY 1989-90

	Elementary			Middle/ Secondary			All Schools		
	SY 1988-89 (a)	SY 1989-90 (b)	(b-a)	SY 1988-89 (c)	SY 1989-90 (d)	(d-c)	SY 1988-89 (e)	SY 1989-90 (f)	(f-e)
TOTAL SAMPLE	\$0.93	\$0.95	\$.02	\$1.03	\$1.06	\$.03	\$0.98	\$1.00	\$.02
Type of SFA									
Public	0.93	0.95	.02	1.02	1.06	.04	0.97	1.01	.04
Private	0.93	0.93	.00	na	na	na	0.99	0.98	-.01
Participation in SBP									
NSLP and SBP	0.87*	0.91	.04	0.96*	1.01	.05	0.91*	0.96	.05
NSLP only	0.95	0.97	.02	1.06	1.09	.03	1.00	1.02	.02
SFA Size									
Small (1-999)	0.92	0.92	.00	1.01	1.01	.00	0.96	0.96	.00
Medium (1,000-4,999)	0.94	0.97	.03	1.03	1.09	.06	0.99	1.03	.04
Large (5,000+)*	0.94	0.96	.02	1.06	1.08	.02	1.00	1.03	.03
Poverty Level of SFA									
60% or more F&R	0.85*	0.89	.03	0.87*	0.93	.06	0.88*	0.92	.04
0-59% F&R	0.94	0.96	.02	1.06	1.10	.04	0.99	1.02	.03

*Between-group or year-to-year difference is statistically significant at the .01 level. Between-group comparisons were done for Year One but not for Year Two.

*Reference group used in group comparisons: Large SFAs vs. Small SFAs; Large SFAs vs. Medium SFAs.

na: Unweighted sample size less than 30

Data Source: Year One and Year Two SFA Manager Survey.

Exhibit III.2

Average NSLP Meal Prices for Paid Lunches
Using Two Different Units of Analysis
(SY 1989-90)

	Unit of Analysis	
	SFA ¹	NSLP Meal ²
Total Sample	\$1.00	\$1.02
Type of SFA		
Public	1.01	1.02
Private	0.98	1.04
Participation in SBP		
NSLP and SBP	0.96	1.01
NSLP only	1.02	1.04
SFA Size		
Small (1-999)	0.96	0.97
Medium (1,000-4,999)	1.03	1.04
Large (5,000+)	1.03	1.02
Poverty Level of SFA		
60% or more F&R	0.92	0.90
0-59% F&R	1.02	1.04

Data Source: Year Two SFA Manager Survey

¹Average price across all SFAs in the nation. Equal weight is given to each SFA, regardless of size.

²Average price across all lunches served in the nation. Equal weight is given to each lunch, hence the average price is dominated by the prices charged by large SFAs.

Exhibit III.3

Average NSLP Meal Prices for Reduced-Price Lunches
In Elementary and Middle/Secondary Schools
(SY 1988-89 and SY 1989-90)

	Elementary Schools			Middle/Secondary Schools			All Schools		
	SY 1988-89 (a)	SY 1989-90 (b)	(b-a)	SY 1988-89 (c)	SY 1989-90 (d)	(d-c)	SY 1988-89 (e)	SY 1989-90 (f)	(f-e)
TOTAL SAMPLE	\$0.38	\$0.38	\$0.00	\$0.38	\$0.38	\$0.00	\$0.38	\$0.38	.00
Type of SFA									
Public	0.38	0.38	.00	0.38	0.38	.00	0.38	0.38	.00
Private	0.38	0.38	.00	na	na	na	0.38	0.38	.00
Participation in SBP									
NSLP and SBP	0.36	0.37	.01	0.36	0.37	.01	0.36	0.37	.01
NSLP only	0.38	0.38	.00	0.38	0.39	.01	0.38	0.38	.00
SFA Size									
Small (1-999)	0.38	0.38	.00	0.38	0.39	.01	0.38	0.38	.00
Medium (1,000-4,999)	0.38	0.38	.00	0.38	0.38	.00	0.38	0.38	.00
Large (5,000+)‡	0.36	0.36	.00	0.37	0.36	-.01	0.37	0.36	-.01
Poverty Level of SFA									
High (60% or more F&R)	0.37	0.37	.00	0.38	0.38	.00	0.38	0.38	.00
Low (0-59% F&R)	0.38	0.38	.00	0.38	0.38	.00	0.38	0.38	.00

Note: None of the between-group or year-to-year differences is statistically significant. Between-group comparisons were done for Year One but not for Year Two.

‡Reference group used in comparisons: Large SFAs vs. Small SFAs; Large SFAs vs. Medium SFAs.

na: Unweighted sample size less than 25 SFAs.

Data Source: Year One and Year Two SFA Manager Surveys.

Adult Lunches

The average price for an adult lunch in SY 1988-89, across all SFAs, was \$1.55 in elementary schools and \$1.60 in middle/secondary schools (Exhibit III.4). Adult prices were \$1.59 and \$1.63 in elementary and middle/secondary schools, respectively, during SY 1989-90, however, the year-to-year changes are not statistically significant. Adults do pay significantly higher prices in elementary schools in public SFAs, and in middle/secondary schools in SFAs that do not participate in the SBP.

As might be expected, the variation in lunch prices charged to adults is greater than the variation in prices charged to children. The standard deviation of the price of an adult lunch is about 27 cents, compared to about 20 cents for a paid student lunch. This large degree of variation in the price of an adult lunch helps explain why some of the year-to-year differences noted in Exhibit III.4 are not statistically significant.

SBP Paid Breakfasts

The average price of an SBP paid breakfast is about 50 cents (Exhibit III.5), with little difference between prices in elementary and middle/secondary schools or between prices charged in SY 1988-89 and SY 1989-90. Both small SFAs and SFAs that serve 60 percent or more free or reduced-price lunches charge lower prices for full price breakfasts in middle/secondary schools than do large SFAs or SFAs that serve 59 percent or fewer free or reduced-price lunches.

SBP prices increased significantly from SY 1988-89 to SY 1989-90 for middle/secondary schools in small SFAs: from 39 cents to 47 cents. This serves to bring the prices paid in small SFAs more in line with prices paid in larger SFAs. None of the other year-to-year differences is statistically significant.

SBP Reduced- Prices Breakfasts

Data on prices charged for reduced-price breakfasts are displayed in Exhibit III.6. Prices are unvarying across SFA subgroups and from Year One to Year Two. On average, SFAs charge 26 cents for a reduced-price breakfast. Between SY 1988-89 and SY 1989-90, the average price in private elementary schools dropped significantly from 27 cents to 23 cents, but this change does not seem to be a particularly large or important change in absolute terms.

There is a relatively small amount of variation in the price of a reduced-price breakfast--the standard deviation is only about 6 cents per meal.

Adult Breakfasts

Adult breakfast prices for SY 1988-89 and SY 1989-90 are summarized in Exhibit III.7. The average adult breakfast in SY 1988-89 cost 74 cents in elementary schools and 76 cents in middle/secondary schools. In SY 1989-90, the average price of an adult breakfast was 81 cents and 83 cents in elementary and middle/secondary schools, respectively. These year-to-year changes were not statistically significant for the total sample.

Exhibit III.4

Average NSLP Meal Prices for Adult Lunches
In Elementary and Middle/Secondary Schools:
SY 1988-89 and SY 1989-90

	Elementary			Middle/Secondary			All Schools		
	SY 1988-89	SY 1989-90		SY 1988-89	SY 1989-90		SY 1988-89	SY 1989-90	
	(a)	(b)	(b-a)	(c)	(d)	(d-c)	(e)	(f)	(f-e)
TOTAL SAMPLE	\$1.55	\$1.59	\$.04	\$1.60	\$1.63	\$.03	\$1.56	\$1.60	\$.04
Type of SFA									
Public	1.59*	1.65	.06	1.61	1.65	.04	1.59*	1.65	.06
Private	1.38	1.34	-.04	na	na	na	1.44	1.37	-.07
Participation in SBP									
NSLP and SBP	1.56	1.63	.07	1.54*	1.63	.09	1.56	1.63	.07
NSLP only	1.55	1.58	.03	1.63	1.64	.01	1.56	1.58	.02
SFA Size									
Small (1-999)	1.48	1.46	-.01	1.57	1.52	-.05	1.50	1.48	-.02
Medium (1,000-4,999)	1.61	1.68	.07	1.61	1.68	.07	1.61	1.69	.08
Large (5,000+)*	1.62	1.69	.07	1.64	1.71	.07	1.63	1.70	.07
Poverty Level of SFA									
60% or more F&R	1.61	1.66	.05	1.62	1.65	.03	1.61	1.67	.06
0-59% F&R	1.54	1.58	.04	1.60	1.62	.02	1.55	1.58	.03

*Between-group or year-to-year difference is statistically significant at the .01 level. Between-group comparisons were done for Year One but not for Year Two.

*Reference group used in group comparisons: Large SFAs vs. Small SFAs; Large SFAs vs. Medium SFAs.

na: Unweighted sample size less than 30.

Data Source: Year One and Year Two SFA Manager Survey.

Exhibit III.5

Average SBP Meal Prices for Paid Breakfasts
in Elementary and Middle/Secondary Schools:
SY 1988-89 and SY 1989-90

	Elementary			Secondary			All Schools		
	SY 1988-89	SY 1989-90		SY 1988-89	SY 1989-90		SY 1988-89	SY 1989-90	
	(a)	(b)	(b-a)	(c)	(d)	(d-c)	(e)	(f)	(f-e)
TOTAL SAMPLE	\$0.48	\$0.50	\$.02	\$0.50	\$0.52	\$.02	\$0.49	\$0.51	\$.02
Type of SFA									
Public	0.48	0.50	.02	0.50	0.52	.02	0.49	0.51	.02
Private	0.56	0.50	-.06	na	na	na	0.55	0.51	-.04
SFA Size									
Small (1-999)	0.44	0.46	.02	0.39*	0.48	.09*	0.44*	0.48	.04
Medium (1,000-4,999)	0.49	0.50	.01	0.51	0.52	.01	0.50	0.51	.01
Large (5,000+)*	0.51	0.53	.02	0.55	0.56	.01	0.53	0.54	.01
Poverty Level of SFA									
60% or more F&R	0.45	0.46	.01	0.43*	0.45	.02	0.45*	0.46	-.01
0-59% F&R	0.50	0.52	.02	0.53	0.56	.03	0.51	0.53	.02

*Between-group or year-to-year difference is statistically significant at the .01 level. Between-group comparisons were done for Year One but not for Year Two.

*Reference group used in group comparisons: Large SFAs vs. Small SFAs; Large SFAs vs. Medium SFAs.

na: Unweighted sample size less than 30.

Data Source: Year One and Year Two SFA Manager Survey.

Exhibit III.6

Average SBP Meal Prices for Reduced-Price Breakfasts
In Elementary and Middle/Secondary Schools:
SY 1988-89 and SY 1989-90

	Elementary			Secondary			All Schools		
	SY 1988-89	SY 1989-90		SY 1988-89	SY 1989-90		SY 1988-89	SY 1989-90	
	(a)	(b)	(b-a)	(c)	(d)	(d-c)	(e)	(f)	(f-e)
TOTAL SAMPLE	\$0.25	\$0.26	\$0.01	\$0.25	\$0.26	\$0.00	\$0.26	\$0.26	\$0.00
Type of SFA									
Public	0.25	0.26	.01	0.25	0.26	.01	0.25	0.26	.01
Private	0.27	0.23	-.04	na	na	na	0.27	0.23	-.04
SFA Size									
Small (1-999)	0.25	0.26	.01	0.23	0.26	.03	0.25	0.26	.01
Medium (1,000-4,999)	0.26	0.26	.00	0.25	0.26	.01	0.26	0.26	.00
Large (5,000+) [†]	0.26	0.26	.00	0.26	0.26	.00	0.26	0.26	.00
Poverty Level of SFA									
60% or more F&R	0.25	0.25	.00	0.24	0.25	.01	0.25	0.25	.00
0-59% F&R	0.26	0.26	.00	0.26	0.27	.01	0.26	0.26	.00

*Group difference statistically significant at $p \leq .01$ level.

[†]Reference group used in group comparisons: small vs. large; medium vs. large.

na: Unweighted sample size less than 30.

Data Source: Year One and Year Two SFA Manager Survey.

Exhibit III.7

Average SBP Meal Prices for Adult Breakfasts in Elementary and Middle/Secondary Schools (SY 1988-89 and SY 1989-90)

	Elementary Schools			Middle/Secondary Schools			All Schools		
	SY 1988-89 (a)	SY 1989-90 (b)	(b-a)	SY 1988-89 (c)	SY 1989-90 (d)	(d-c)	SY 1988-89 (e)	SY 1989-90 (f)	(f-e)
TOTAL SAMPLE	\$0.74	\$0.81	\$.07	\$0.76	\$0.83	\$.07	\$0.75	\$0.82	\$.07
Type of SFA									
Public	0.73	0.80	.07	0.75	0.83	.08*	0.74	0.82	.08*
Private	na	na	na	na	na	na	na	na	na
SFA Size									
Small (1-999)	0.72	0.82	.10*	0.67	0.80	.13	0.73	0.86	.13
Medium (1,000-4,999)	0.73	0.78	.05	0.76	0.83	.07*	0.74	0.79	.05
Large (5,000+)‡	0.78	0.83	.05	0.82	0.86	.04	0.79	0.84	.05
Poverty Level of SFA									
High (60% or more F&R)	0.76	0.83	.07*	0.76	0.82	.06*	0.78	0.83	.05*
Low (0-59% F&R)	0.73	0.80	.07	0.75	0.84	.09	0.74	0.82	.08

*Between-group or year-to-year difference is statistically significant at the .01 level. Between-group comparisons were done for Year One but not for Year Two.

‡Reference group used in comparisons: Large SFAs vs. Small SFAs; Large SFAs vs. Medium SFAs.

na: Unweighted sample size less than 30 SFAs.

Data Source: Year One and Year Two SFA Manager Surveys.

There is little variation in adult breakfast prices across SFA subgroups. Prices charged in some of the SFA subgroups did, however, increase significantly between SY 1988-89 and SY 1989-90. The average price for an adult breakfast in elementary schools increased by 10 cents in small SFAs and 7 cents in SFAs that serve 60 percent or more free or reduced-price lunches. Middle/secondary school prices increased by 7 cents in medium-sized SFAs and 6 cent in SFAs that serve 60 percent or more free or reduced-price lunches. Given the magnitude and prevalence of the increases in adult breakfast prices, it seems clear that SFAs are more likely to raise the price of an adult breakfast than a student breakfast.

As might be expected, the variation in adult breakfast prices is greater than the variation in student prices. The standard deviation of the price of an adult breakfast is about 20 cents, compared to 14 cents for a paid student breakfast. This large degree of variability explains why some of the year-to-year differences noted in Exhibit III.7 are not statistically significant.

NSLP MEAL COSTS AND SUBSIDIES

Data and Variables

This analysis is based on the reported operating expenses of SFAs. The sample includes 991 SFAs that provided detail on their income and expenses for SY 1987-88 in the Year One SFA Manager Mail Survey and 1180 SFAs that provided similar detail for SY 1988-89 in the Year Two Survey. The reported costs reflect the actual expenditures (or cash outlays) made by SFAs plus the assigned value of USDA donated commodities received.

In addition to items that are charged to the SFA budget, SFAs often use resources for which they are not charged. Examples of resources that are often not charged to the SFA's account include cafeteria and kitchen space, the use of school district facilities to store food and supplies, the use of school district personnel and equipment to transport USDA donated commodities, and the time spent by school district administrative staff on food service administrative tasks. To the extent that SFAs use resources that are not charged to the SFA's account, reported costs will understate the full cost of SFA operations.

The following variables were constructed from the information provided in the Year One and Year Two Surveys:

Total SFA reported cost. Equal to the sum of total SFA expenditures and the assigned value of donated commodities.

Total food cost. Equal to the sum of commercial food purchases and the assigned value of donated commodities.

Total labor cost. Total salaries and fringe benefits charged to the SFA account.

Other SFA costs. Includes all other costs charged to the SFA account.

To determine the cost of producing an NSLP meal, it is necessary to separate the costs attributable to these reimbursable meals from the cost attributable to other food items produced by SFAs. The inherent problem in allocating meal production is the issue of joint production. School meal production involves the preparation and service of a range of meals and food items, including NSLP lunches, SBP breakfasts, a la carte items, adult meals, and so on. Clearly, these different types of meals require different amounts and kinds of food as well as different amounts of labor for preparation and serving. The problem is that the different meals are produced jointly. There is no separate accounting for the resources used in the production of the various meals and food items.

To address the issue of joint production, this study converted breakfasts, adult meals, and a la carte sales into NSLP lunch equivalents (LEQs). The algorithm used was based on an econometric model of the joint production process, and is described in detail in the report prepared for the first year of this study.^{1/} SFA-reported costs were divided by the estimate of the number of LEQs produced to obtain an estimate of the reported cost per NSLP lunch.

Cost of
Producing an
NSLP Lunch

Exhibit III.8 presents a summary of costs per LEQ for SY 1987-88 and SY 1988-89 using both SFAs and NSLP meals as the unit of analysis. Across all SFAs, the average SFA-reported cost of producing an NSLP lunch was \$1.43 in SY 1987-88 and \$1.46 in SY 1988-89.^{2/} The difference between the two years is not statistically significant. Similarly, there were no significant year-to-year differences in the average cost of producing an NSLP lunch among any of the different subgroups of SFAs examined in this study. However, average costs per LEQ are higher in large SFAs than in small or medium-size SFAs.

Reported costs ranged from less than \$1.00 per LEQ to over \$2.00 per LEQ, and the variation in reported costs was relatively large. In both SY 1987-88 and SY 1988-89 about one-third of all SFAs had reported costs that were below \$1.30 per LEQ, another

^{1/}St.Pierre, R., M.K. Fox, M. Puma, F. Glantz, and M. Moss. Child Nutrition Program Operations Study: First Year Report. Cambridge, MA: Abt Associates, 1991.

^{2/}Calculated as the average cost per LEQ across all SFAs in the nation, i.e., the SFA is the unit of analysis. This analysis gives equal weight to each SFA, regardless of size.

Exhibit III.8

Total Cost per LEQ
(SY 1987-88 and SY 1988-89)

	SFA is Unit of Analysis			NSLP Meal Unit of Analysis		
	SY 1987-88 (a)	SY 1988-89 (b)	Difference (b-a)	SY 1987-88 (c)	SY 1988-89 (d)	Difference (d-c)
TOTAL SAMPLE	\$1.43	\$1.46	\$0.03	\$1.62	\$1.67	\$0.05
Participation in SBP						
NSLP and SBP	1.18	1.25	0.07	1.62	1.67	0.05
NSLP only	1.53	1.57	0.04	1.63	1.67	0.04
SFA Size						
Small (1-999)	1.30*	1.28	-0.02	1.40	1.33	-0.07
Medium (1000-4999)	1.52*	1.60	0.08	1.52	1.57	0.05
Large (5000+) [‡]	1.65	1.65	0.00	1.71	1.76	0.05
Poverty Level of SFA						
60% or more F&R	1.33	1.41	0.08	1.71	1.85	0.14
0-59.9% F&R	1.45	1.47	0.02	1.59	1.58	-0.01

*Between-group or year-to-year difference is statistically significant at the .01 level.
Between group comparisons were done for Year One but not for Year Two.

[‡]Reference group used in comparisons: Large SFAs vs. Small SFAs; Large SFAs vs. Medium SFAs.

Note: Means for public vs. private SFAs are not presented due to the large amount of missing data for private SFAs.

Data Source: Year One and Year Two SFA Manager Mail Surveys.

third had reported costs between \$1.30 and \$1.60, and the final third had reported costs of over \$1.60 per LEQ (Exhibit III.9).

When the unit of analysis is NSLP meals, the average reported cost of producing an NSLP lunch is calculated as \$1.62 in SY 1987-88 and \$1.67 in SY 1988-89.^{1/} The two different methods of calculating the cost of producing a lunch thus yield different answers. This reflects the large number of meals served in the small number of large SFAs where reported costs are significantly higher. Over 60 percent of the lunches served in SY 1987-88 were served in large school districts with enrollments over 5,000.

As one would expect, food and labor costs account for the vast majority (about 88 percent) of reported costs in both years (Exhibit III.10). Based on costs incurred by the average SFA, food costs (including the assigned value of donated commodities) accounted for about one-half of reported costs in both SY 1987-88 and SY 1988-89 (averaging \$0.68 per LEQ in SY 1987-88 and \$0.73 per LEQ in SY 1988-89). Labor costs accounted for almost 40 percent of reported costs in both years (\$0.57 per LEQ). Neither food costs nor labor costs changed significantly between Year One and Year Two, with the exception that food costs rose by 6 cents per LEQ in medium-sized SFAs.

All other costs, including supplies, contract services, capital expenditures, indirect charges by the school district, and storage and transportation, represented only about 12 percent of SFA reported costs (averaging \$0.18 per LEQ in SY 1987-88 and \$0.16 in SY 1988-89). This year-to-year difference is not statistically significant. In large SFAs, the total for other costs decreased from SY 1987-88 to SY 1988-89 by 5 cents per LEQ. Roughly the same distribution of costs is observed when the LEQ is the unit of analysis.

Federal
Subsidies and
Meal Costs

USDA subsidies include both cash reimbursements and donated commodities. The reimbursement rate for free lunches was \$1.405 in SY 1987-88 and \$1.4625 in SY 1988-89. In addition, SFAs were eligible to receive \$0.12 per NSLP lunch in entitlement commodities during SY 1987-88 and \$.1225 during SY 1988-89 and, subject to availability, all the bonus commodities that could be used without waste. The average value of bonus commodities received per meal during this period was about \$0.08. Therefore, the total USDA subsidy for free lunches averaged \$1.60 (\$1.405 + \$0.12 + \$0.08) in SY 1987-88 and \$1.66 in SY 1988-89 (\$1.4625 + \$0.1225 + \$0.08).

^{1/}Calculated as the average cost per LEQ across all LEQs served in the Nation, i.e., the LEQ is the unit of analysis. This analysis gives equal weight to each LEQ, and since most LEQs are produced in large SFAs, the results are dominated by the cost incurred in large SFAs.

Exhibit III.9

Distribution of SFAs by Reported Cost Per LEQ
(SY 1987-88 and SY 1988-89)

Reported Cost Per LEQ	Percent of SFAs (SY 1987-88)	Percent of SFAs (SY 1988-89)
\$0.00 - < 1.00	12.1%	15.4%
\$1.00 - < 1.10	6.3	6.5
\$1.10 - < 1.20	7.6	6.2
\$1.20 - < 1.30	8.4	8.2
\$1.30 - < 1.40	7.3	8.0
\$1.40 - < 1.50	11.0	10.1
\$1.50 - < 1.60	13.5	12.0
\$1.60 - < 1.70	11.2	10.3
\$1.70 - < 2.00	17.6	13.7
\$2.00 or More	4.9	9.5
Total All SFAs	100%	100%

Data Source: Year One and Year Two SFA Manager Mail Surveys.

Exhibit III.10

Meal Cost Components Per LEQ
(SY 1987-88 and SY 1988-89)

	Food Costs ¹			Labor Costs			Other Costs		
	SY 1987-88 (a)	SY 1988-89 (b)	(b-a)	SY 1987-88 (c)	SY 1988-89 (d)	(d-c)	SY 1987-88 (e)	SY 1988-89 (f)	(f-e)
TOTAL SAMPLE	\$0.68	\$0.73	\$0.05	\$0.57	\$0.57	\$0.00	\$0.18	\$0.16	-\$0.02
Participation in SBP									
NSLP & SBP	0.55	0.63	0.08	0.46	0.49	0.03	0.17	0.13	-0.04
NSLP only	0.73	0.78	0.05	0.61	0.62	0.01	0.18	0.17	-0.01
SFA Size									
Small (1-999)	0.63*	0.66	0.03	0.50*	0.48	-0.02	0.17*	0.14	-0.03
Medium (1000-4999)	0.72	0.78	0.06*	0.62*	0.65	0.03	0.17*	0.17	0.00
Large (5000+) [‡]	0.74	0.79	0.05	0.67	0.67	0.00	0.24	0.19	-0.05*
Poverty Level of SFA									
60% or more F&R	0.63	0.73	0.10	0.51	0.53	0.02	0.19	0.16	-0.03
0-59% F&R	0.69	0.73	0.04	0.58	0.59	0.01	0.18	0.16	-0.02

¹Includes the assigned value of USDA donated commodities.

*Between-group or year-to-year difference is statistically significant at the .01 level. Between-group comparisons were done for Year One but not for Year Two.

[‡]Reference group used in comparisons: Large SFAs vs. Small SFAs; Large SFAs vs. Medium SFAs.

Note: Means for public vs. private SFAs are not presented due to the large amount of missing data for private SFAs.

Data Source: Year One and Year Two SFA Manager Mail Surveys.

This is roughly equivalent to the average reported cost of producing a lunch (\$1.62 for SY 1987-88 and \$1.67 for SY 1988-89). It is, however, somewhat greater than the reported cost of producing a meal for the average SFA (\$1.43 for SY 1987-88 and \$1.46 for SY 1988-89).

IV. THE FOOD DONATION PROGRAM

This chapter presents findings on Food Donation Program (FDP) operations at the SFA level. Issues include knowledge of the "Buy American" provision, commodity inventories, commodity processing, and delivery systems.

BACKGROUND

The FDP involves the donation and distribution of surplus agricultural commodities to a variety of eligible agencies. Through the Child Nutrition Programs, schools receive the majority of donated commodities. Schools derive a substantial amount of financial assistance from commodities and, for the most part, support the need to provide an outlet for domestic agricultural products. However, over the years there have been frequent requests from local administrators to change and improve the program to better meet the needs of school food service programs. The Commodity Distribution Reform Act of 1987 (P.L. 100-237) enacted numerous procedural changes designed to improve program operations and service to SFAs. Key provisions of this legislation focused on 1) encouraging SFAs to purchase, whenever possible, only food products produced in the U.S.; and (2) improving State Distributing Agents' communication and overall performance.

In recent years, USDA has made a considerable effort to improve the FDP. Product changes have been made, delivery procedures improved, the use of commercial vendors to deliver donated foods has increased, and technical assistance has been provided to allow States and SFAs to make better use of donated foods and to lower the costs of storage. The need for program refinement continues, as does the need for appropriate data to inform decisionmaking in this area. Specific FDP-related issues identified as priorities for Year Two of the Child Nutrition Program Operations Study include the "Buy-American" provision, excess commodity inventories, procedures used to document the value of donated commodities used in the manufacture of processed end-products, and SFAs' satisfaction with several aspects of current commodity delivery systems.

Section 3(h) of the Commodity Distribution Reform Act requires that recipient agencies purchase, whenever possible, only food products produced in the United States. This provision went into effect on January 8, 1988, the date of enactment of the law. There is considerable interest from Congress and the General Accounting Office (GAO) on how this provision is currently being implemented. GAO, in a very limited survey, indicated that two of three States examined had implemented the

Buy American requirements; however, only limited monitoring to determine compliance had taken place. FNS currently has no data on the purchasing practices of local recipient agencies as they apply to foreign versus U.S.-produced products. Without such information FNS cannot be responsive to Congressional requests on this issue.

Regarding commodity inventories, FNS needs specific information on the types of commodities that SFAs are holding in excessive amounts (i.e., a 6-month inventory or more). This information will be used in making purchasing and allocation decisions. For example, if the study showed that frozen pitted tart cherries were consistently found in excess, FNS might use this information to reduce the amount of purchase of this commodity or allocate these purchases to some other use. There is no existing uniform reporting or data collection system available for this type of information.

The Food Security Act of 1985 allows school districts to transfer donated commodities to another public or private, non-profit organization, i.e., foodbanks, to provide nutrition assistance to individuals in low-income groups. School districts may not be notifying their State Distributing Agents of the transfer of donated commodities to local agencies servicing low-income groups. Thus, donated commodities may be being transferred to food banks, homeless shelters, or other eligible agencies without being reported to FNS. FNS need to know if excess commodities are normally transferred to other recipient agencies, the amount and type of food transferred, and the type of agencies receiving these commodity transfers.

Beginning in SY 1989-90, program regulations require that processors and distributors indicate, on the invoice, the value of USDA-donated commodities contained in processed end-products. The invoice can show that the end-product was sold at a discount equivalent to the value of the donated commodities or indicate that the recipient agency is eligible for a refund in that amount. FNS must determine the degree of compliance of processors and distributors with the new requirement. Data from the Year One SFA Manager Survey indicated that prior to the implementation of these new regulations the value of the commodities passed through to the SFAs was not apparent. Information collected in the Year Two Survey will assist the Agency in determining if the current requirements and monitoring activities are adequate to ensure that school districts know the value of the donated commodities found in processed end-products.

Finally, in regard to commodity delivery systems, FNS needs to know if recent initiatives to improve communication and overall performance of State Distributing Agents have been effective. In the past, recipient agencies registered a number of complaints about their inability to receive pertinent information in a timely manner. Specifically, they were

concerned about their failure to receive details on commodities, the availability of commodities, and the distribution and delivery schedules of commodities. USDA has attempted to improve communications between individuals at the Federal, State and local levels. A quarterly newsletter is now written by FNS and mailed directly to each SFA to keep them apprised of recent developments.

In addition, the voluntary standards for State Distributing Agents specify that they provide timely delivery schedules and purchase information to recipient agencies. USDA is required to provide not less than 60 days advance notice to recipient agencies and States of the types and quantities of commodities to be distributed. USDA needs to know how effective these implemented changes have been with regard to enhancing communications between the State Distributing Agents and the recipient agencies, and to determine if further modifications are warranted.

KEY RESEARCH ISSUES

The following research questions were developed to address FNS-identified priorities:

- Are SFAs implementing the "Buy American" provision?
- Do SFAs maintain excess inventories of USDA commodities? For which commodities? Why?
- Do SFAs transfer commodities to other eligible agencies? Do SFAs receive donated commodities from other recipient agencies? Which agencies? Which commodities? How much?
- Do SFAs receive appropriate notification of the value of USDA-donated commodities contained in processed end-products purchased through commercial distributors?
- How are commodities delivered to SFAs? Do SFAs receive appropriate notification about availability and distribution of commodities?
- How do SFA Managers feel about communication between local agencies and State Distributing Agents and the overall performance of the FDP? Have communications and/or overall performance improved over the past several years?

DATA AND VARIABLES

Information on SFA-level operations was gathered through the Year Two SFA Manager Telephone Survey. SFA managers were asked about their knowledge of the Buy American provision and procedures used to ensure compliance. They were also asked if

they currently maintain more than a six-month inventory of donated commodities. If so, they were asked to identify the commodities, indicate the reasons for the excess supplies and whether they made any attempt to transfer excess inventories to other eligible recipient agencies.

The survey also included questions about SFA use of commodity processing and how the value of commodities used was reported by the vendor. In addition, the survey included extensive questions about methods used to deliver USDA commodities to SFAs and SFA Managers' receipt of appropriate notification about availability and delivery of donated commodities. Finally, the survey asked SFA managers about their overall impressions of FDP operations in their respective State and their satisfaction with communications from their State Distributing Agent.

BUY AMERICAN PROVISION

The Commodity Distribution Reform Act of 1987 required that, whenever possible, school districts purchase food products that are produced or manufactured in the United States. Data from this study indicates, however, that this provision has not been well communicated to SFA managers (Exhibit IV.1). Nearly half of those queried were not aware of this requirement, with small and private SFAs particularly unlikely to know about this provision. Although this does not mean that SFAs are not purchasing food items made with American agricultural products, it indicates that more needs to be done to emphasize the importance of the "Buy American" provision and the Agency's commitment to this policy.

EXCESS COMMODITY INVENTORIES AND COMMODITY TRANSFERS

Excess Inventories

The extent to which SFAs are maintaining excessive inventories of USDA-donated commodities has been a long-term area of concern both for FNS and the recipient agencies. Storing large inventories can impose substantial costs on SFAs and other recipients of donated foods, and can increase the likelihood of spoilage and waste.

As shown in Exhibit IV.2, about one-fourth of all SFAs were carrying more than a six-month supply of at least one USDA-donated commodity during SY 1989-90. Such excessive supplies were more likely to be found in public SFAs, large SFAs, SFAs that serve 59 percent or fewer free or reduced-price lunches, and those participating in both the NSLP and the SBP.

Among those SFAs reporting donated commodity inventories in excess of a six-month supply, seven commodities accounted for two-thirds of the positive responses: flour (20 percent of the SFAs with over six-month inventories), peanut butter (11 percent), butter (11 percent), dates/raisins/figs (7 percent),

Exhibit IV.1

SFA Managers' Awareness of the
"Buy American" Provision
(SY 1989-90)

	Awareness of Buy American Provision		Total SFAs (Weighted)
	Yes	No	
TOTAL SAMPLE	55%	45%	14,065
Type of SFA			
Public	59*	41	11,115
Private	38	62	2,950
Participation in SBP			
NSLP and SBP	63*	37	4,398
NSLP only	51	49	9,667
SFA Size			
Small (1-999)	42*	58	6,456
Medium (1,000-4,999)	61*	39	5,832
Large (5,000+)*	81	19	1,777
SFA Poverty Level			
60% or more F&R	53	47	1,880
0-59% F&R	55	45	11,373

*Group difference is statistically significant at the .01 level.

‡Reference group used in comparisons: Large SFAs vs. Small SFAs; Large SFAs vs. Medium SFAs.

Data Source: Year Two SFA Manager Survey.

Exhibit IV.2

Proportion of SFAs With More Than
Six-Month Supply of Donated Commodities
(SY 1989-90)

	More Than Six-Month Supply?			Total SFAs (Weighted)
	Yes	No	Don't Know	
TOTAL SAMPLE	26%	71%	3%	14,065
Type of SFA				
Public	29*	68	3	11,115
Private	15	80	5	2,950
Participation in SBP				
NSLP and SBP	33*	64	3	4,398
NSLP only	23	74	3	9,667
SFA Size				
Small (1-999)	25*	71	4	6,456
Medium (1,000-4,999)	26*	71	2	5,832
Large (5,000+)*	32	65	3	1,777
SFA Poverty Level				
60% or more F&R	22*	75	2	1,880
0-59% F&R	28	69	3	11,373

*Group difference is statistically significant at the .01 level.

‡Reference group used in comparisons: Large SFAs vs. Small SFAs; Large SFAs vs. Medium SFAs.

Data Source: Year Two SFA Manager Survey.

honey (6 percent), oil (6 percent), and nuts (5 percent). Other frequently reported commodities were cornmeal, cheese, and shortening. The majority of excess inventories, then, are a combination of Group B, Section 416 entitlement commodities (flour, peanut butter, oils, peanut granules, roasted peanuts and cheese), and Group B bonus commodities (butter, cornmeal, flour).

When asked why they were storing such large inventories, almost four out of ten SFAs reported that the particular commodity either was unpopular with the children or was currently being "under-utilized" in the preparation of school meals. The commodities most often cited in these two categories were, in descending order, oats/oatmeal, canned pork, vegetables, dates/raisins/figs, prunes, rice, honey, beans, and cornmeal. Efforts by FNS and State Distributing Agents to assist SFA managers find creative ways to use these commodities might help reduce the incidence of excess supplies. Other reasons given for the excess inventories included: commodity was delivered too late (19 percent) -- most often associated with bread products, fish, and fruit juice; intentional decision by SFA manager (19 percent) -- most often associated with cheese, canned fruit, oil, beef, nuts, butter, and shortening; and, an error in ordering (6 percent) -- most often associated with dried eggs, poultry, peanut butter, cornmeal, shortening and flour.

Commodity Transfers

One way that SFAs can avoid excess inventories is by transferring commodities to eligible public or private, non-profit organizations providing food assistance to low-income groups and individuals (e.g., food banks, homeless shelters, soup kitchens, etc.). In addition, SFAs are eligible to receive excess commodities from these agencies. As shown in Exhibits IV.3 and IV.4, however, this transfer mechanism is rarely used, with only five percent of SFAs transferring donated commodities to another recipient agency, and about six percent receiving such transfers during SY 1989-90.^{1/} In most instances the amount of these transfers was generally small with about two-thirds being valued under \$500.

With regard to the transfer of commodities from SFAs, managers were asked to identify recipient agencies, other than schools, to which they shipped excess inventories of donated commodities. The most frequently identified recipient agencies were prisons/jails, charitable organizations, camps for children, and programs for senior citizens (Exhibit IV.5). With

^{1/}Transfer of donated commodities may also occur between schools in a given school district, or between separate school districts. This series of questions asked SFA managers specifically about commodity transfers to and from non-school-related agencies.

Exhibit IV.3

Proportion of SFAs that Transferred Excess
Donated Commodities to Other Eligible Agencies
(SY 1989-90)

	<u>Transferred Excess Donated Commodities?</u>			Total SFAs (Weighted)
	Yes	No	Don't Know	
TOTAL SAMPLE	5%	94%	1%	14,065
Type of SFA				
Public	6*	93	1	11,115
Private	1	99	0	2,950
Participation in SBP				
NSLP and SBP	8*	92	0	4,398
NSLP only	4	95	1	9,667
SFA Size				
Small (1-999)	4*	95	1	6,456
Medium (1,000-4,999)	5	94	1	5,832
Large (5,000+)‡	8	92	0	1,777
SFA Poverty Level				
60% or more F&R	2*	97	1	1,880
0-59% F&R	6	94	1	11,373

*Group difference is statistically significant at the .01 level.

‡Reference group used in comparisons: Large SFAs vs. Small SFAs; Large SFAs vs. Medium SFAs.

Data Source: Year Two SFA Manager Survey.

Exhibit IV.4

Proportion of SFAs that Received Excess
Donated Commodities from Other Eligible Agencies
(SY 1989-90)

	<u>Received Excess Donated Commodities?</u>			Total SFAs (Weighted)
	Yes	No	Don't Know	
TOTAL SAMPLE	6%	93%	1%	14,065
Type of SFA				
Public	7*	92	1	11,115
Private	2	98	0	2,950
Participation in SBP				
NSLP and SBP	5	94	1	4,398
NSLP only	6	93	1	9,667
SFA Size				
Small (1-999)	3*	96	1	6,456
Medium (1,000-4,999)	7	92	1	5,832
Large (5,000+)*	9	89	2	1,777
SFA Poverty Level				
60% or more F&R	6	94	1	1,880
0-59% F&R	6	93	1	11,373

*Group difference is statistically significant at the .01 level.

‡Reference group used in comparisons: Large SFAs vs. Small SFAs; Large SFAs vs. Medium SFAs.

Data Source: Year Two SFA Manager Survey.

Exhibit IV.5

Recipients and Sources of Transferred Commodities
(SY 1989-90)

Type of Agency	Commodities Transferred To (Percent) ¹	Commodities Received From (Percent) ¹
Jails/Prisons	30.4%	6.7%
Charitable Organizations	27.2	46.8
Camps	14.4	11.9
Elderly/Senior Citizen Programs	13.1	4.1
Other Government Agencies	9.1	8.8
Day Care Centers	0.3	12.6
Other	4.4	1.0
Don't Know	1.0	8.2
Total SFAs (Weighted)	712	803

¹Ns and percentages reflect those SFAs that either transferred or received excess donated commodities.

Data Source: Year Two SFA Manager Survey.

regard to the transfer of commodities to SFAs, charitable organizations, day care centers and camps for children are the most likely sources.

COMMODITY PROCESSING

As shown in Exhibit IV.6, nearly half of all SFAs purchased from a commercial distributor at least one processed end-product made with USDA-donated commodities during SY 1989-90. Large SFAs, public SFAs, SFAs that participate in both the NSLP and SBP, and low-poverty SFAs were more likely to make such purchases than other SFAs.

SFA use of processed end-products has raised some concern that SFAs may be subjected to fraudulent practices, particularly the improper crediting of the commodity value toward the price of the end-product. Beginning in SY 1989-90, program regulations require that processors indicate, on the invoice, the value of USDA-donated commodities contained in processed end-products. When SFA managers were asked, in the spring of 1990, how often vendors reported the value of donated commodities on the invoice, 45 percent of SFA managers reported receiving this information "all of the time." This appears to be a significant improvement from Year One of the study, when 99 percent of SFA managers were unable to answer questions related to the value of donated commodities in processed end-products.^{1/}

Still, about one in four managers reported that they never received this information on their invoices. About 38 percent of these reported receiving information on discounts (or rebates) from their vendors through some other means, 17 percent from "rebate forms," and 11 percent received the information directly from their State Distributing Agent.

DELIVERY SYSTEMS

In recent years, FNS has made substantial efforts to develop new initiatives to both reduce the cost of commodity distribution and improve the quality of services received by SFAs. In particular, these efforts have focused on using commercial distributors for this purpose by combining the distribution of commodities with deliveries of wholesale food purchases.

As shown in Exhibit IV.7, SFAs have taken advantage of such delivery systems. Fifty-five percent of SFAs receive donated commodities from commercial distributors either alone or along

^{1/}St.Pierre, R., M.K. Fox, M. Puma, F. Glantz and M. Moss. Child Nutrition Program Operations Study: First Year Report. Cambridge, MA: Abt Associates, 1991.

Exhibit IV.6

Proportion of SFAs Purchasing Processed
End Products Made With USDA Commodities
(SY 1989-90)

	Purchase of Processed End Products			Total SFAs (Weighted)
	Yes	No	Don't Know	
TOTAL SAMPLE	46%	52%	2%	14,065
Type of SFA				
Public	53*	44	3	11,115
Private	18	81	1	2,950
Participation in SBP				
NSLP and SBP	55*	44	1	4,398
NSLP only	42	55	3	9,667
SFA Size				
Small (1-999)	26*	70	4	6,456
Medium (1,000-4,999)	59*	40	1	5,832
Large (5,000+)*	74	25	0	1,777
SFA Poverty Level				
60% or more F&R	42*	55	4	1,880
0-59% F&R	46	52	2	11,373

*Group difference is statistically significant at the .01 level.

‡Reference group used in comparisons: Large SFAs vs. Small SFAs; Large SFAs vs. Medium SFAs.

Data Source: Year Two SFA Manager Survey.

Exhibit IV.7

Proportion of SFAs Using Different Methods
of Delivering USDA Donated Commodities
(SY 1989-90)

	Public SFAs	Private SFAs	All SFAs	Total SFAs (Weighted)
Commercial distribution where USDA commodities are delivered by a commercial distributor to school districts directly as part of a delivery of commercially purchased foods.	25%	27%	25%	3,560
Commercial distribution where USDA commodities are delivered by a commercial distributor to school districts but are <u>not</u> combined with the delivery of commercially purchased foods.	32	23	30	4,220
Commercial carrier arranged by the State where USDA commodities processed end products are delivered by a commercial trucking firm to school districts.	17	9	16	2,192
State-operated distribution where USDA commodities are delivered by a State-operated vehicle to school districts.	7	14	8	1,158
Direct delivery of USDA commodities to school districts from USDA suppliers arranged for by the State Distributing Agency.	14	9	13	1,836
Recipient Agency pick-up of USDA commodities from a State-owned or contracted central warehouse or regional distribution point.	28	25	28	3,881
Other type of distribution system.	3	10	5	651

Columns total more than 100 percent because of multiple responses.

Data Source: Year Two SFA Manager Survey.

with purchased food items. Another 37 percent receive donated commodities through a system arranged by their State Distributing Agency -- either using a State-owned vehicle or through a commercial carrier -- and 28 percent use their own vehicles to pick up commodities from State-owned or contracted warehouses. Public SFAs are more likely than private SFAs to use commercial distributors, while private SFAs are more likely than public SFAs to have commodities delivered to them by State-operated vehicles.

As Exhibit IV.8 illustrates, USDA commodities are most often delivered to individual schools or food preparation sites within an SFA (53 percent) as opposed to a central district warehouse (34 percent).

STATE AGENCY-LOCAL SFA INTERACTIONS

In previous years, some SFAs have expressed dissatisfaction with the level of services received from their respective State Distributing Agents, particularly with regard to advance notification about the types and quantities of commodities to be received by the SFA and the schedule of shipments or deliveries. As shown in Exhibit IV.9, such concerns seem to have reached a very modest level. In the vast majority of instances, SFAs are well informed about delivery schedules, and the amounts and types of commodities to be received. In fact, when asked about their opinion of the FDP in their respective States, most responded positively. Seventy-eight percent of SFA managers rated communications with State Distributing Agents as either excellent or very good, and 71 percent rated the overall performance of the commodity distribution system (in SY 1989-90) as excellent or very good (Exhibit IV.10). About one-third of SFAs believe the program has improved in recent years and that communications with their State Distributing Agent have also improved (Exhibit IV.11). Only three percent noted any worsening in recent years.

Exhibit IV.8

Commodity Delivery Sites within Local School Districts
(SY 1989-90)

	Percent of SFAs	Total SFAs (weighted)
Individual Schools/ Food Preparation Sites	53%	7,479
Central Warehouse	34	4,815
Both	8	1,075
Don't Know	3	370
Other	2	326

Data Source: Year Two SFA Manager Survey

Exhibit IV.9

SFA Manager Knowledge of Commodity
Delivery or Pick-Up
(SY 1989-90)

	Always	Most of the Time	Sometimes	Never	Don't Know or Not Applicable
Knowledge of when commodities are delivered or available for pick-up	75%	15%	4%	3%	4%
Knowledge of types and quantities of commodities to be received or picked up	74	18	4	2	3
Advance knowledge of changes in delivery or distribution schedules	57	22	6	5	10
Frequency with which bill of lading or invoice correctly reflects commodities received	65	29	0	0	5

Data Source: Year Two SFA Manager Survey.

Exhibit IV.10

SFA Managers' Opinions about FDP
Operations in Their States
(SY 1989-90)

	Excellent	Very Good	Satisfactory	Fair	Poor	Don't Know or Not Applicable
How would you rate the overall communications between you and your state Distributing Agent?	35%	43%	13%	2%	2%	4%
How would you rate the overall performance of the commodity distribution system this year? ^{1/}	27	44	16	7	1	4

^{1/} Respondents were instructed to focus on the effectiveness of the distribution system rather than the availability of commodities when answering this question.

Data Source: Year Two SFA Manager Survey.

Exhibit IV.11

SFA Managers' Rating of FDP
Operations in Their States
as Compared with Previous Years
(SY 1989-90)

	Much Better	Better	About the Same	Worse	Much Worse	Don't Know or Not Applicable
Have communications between you and your State Distributing Agency changed in the past few years?	14%	24%	50%	1%	1%	10%
How would you rate the overall performance of the commodity distribution system this year as compared with previous years? ^{1/}	14	17	54	2	1	12

^{1/}Respondents were instructed to focus on the effectiveness of the distribution system rather than the availability of commodities when answering this question.

Data Source: Year Two SFA Manager Survey.

V. CHILD NUTRITION LABELING

BACKGROUND

Child Nutrition (CN) Labeling is a voluntary technical assistance program that FNS has operated since the early 1970s. Formal regulations for the program were published in 1984.^{1/} The intent of these regulations was to establish product eligibility, establish a warranty against audit claims for products that are CN labeled, and to authorize the Secretary of Agriculture to issue guidance materials on the CN Labeling Program.

The CN Labeling Program allows manufacturers, with appropriate Federal inspection, to make claims about the contribution of their products to NSLP and SBP meal pattern requirements. The program is limited to three general types of products: juice drinks, juice drink products, and foods which contribute to the meat/meat alternate component of the meal pattern. Under the program, the manufacturer's recipe or product formulation is reviewed to determine the contribution a serving of commercially prepared product makes to meal pattern requirements, and the CN label statement is reviewed to ensure its accuracy. Exhibit V.1 illustrates what a typical CN label includes.

The CN Labeling Program is popular among SFA personnel and food industry representatives. FNS has several concerns, however, and requires data that will provide a better understanding of how the program currently operates in SFAs. Such data will facilitate FNS' administration of the program, provide insight into the impact of CN labels on food costs, food purchases and competition for SFA business, and allow Agency staff to respond to external inquiries regarding CN labels.

KEY RESEARCH ISSUES

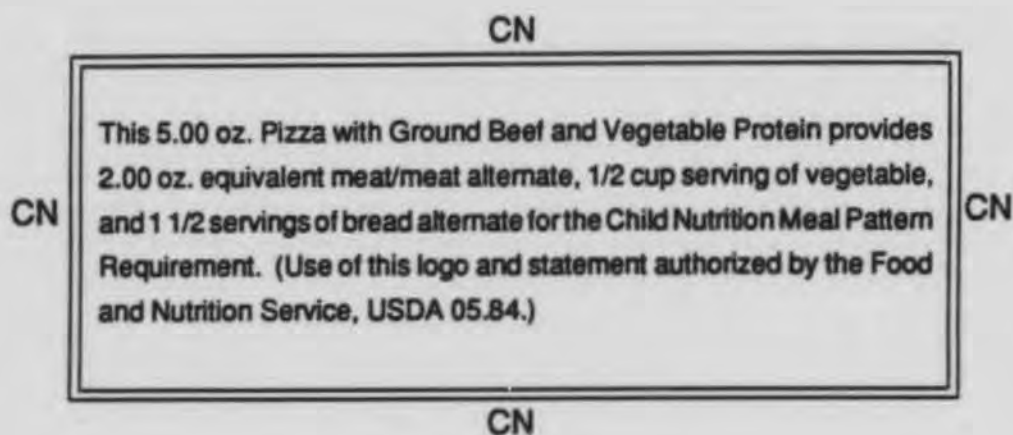
Specific research issues for this portion of the study included:

- What proportion of SFA managers are aware of the CN Labeling Program?
- Do SFAs require CN labels for eligible products? Does the requirement for CN labels vary for different types of products?

^{1/} 7 CFR Part 210, Appendix C.

Exhibit V.1

Sample CN Label¹



¹Source: "The USDA Child Nutrition Labeling Program." A brochure developed by the National Frozen Food Association and USDA, Food and Nutrition Service, Nutrition and Technical Services Division

- To what extent do SFAs include CN Labeling as a part of bid specifications for food purchasing?
- How do SFA managers feel about the CN Labeling Program--what are the perceived advantages and disadvantages?
- How important is the CN Labeling Program to SFA managers?

DATA AND VARIABLES

Data to address the research issues outlined above were collected in the Year Two SFA Manager Survey. Answers were tabulated and appropriate descriptive statistics summarizing the results are presented in the following section.

CN LABELING

SFA Managers' Awareness of CN Labeling

Although CN Labeling has been in existence since the early 1970s, and formal regulations were issued in 1984, it appears that more than one-third of SFA managers are not aware of the program (Exhibit V.2). Managers of public SFAs, SFAs offering both the NSLP and SBP, and large SFAs are most likely to be aware of the program. Managers of large SFAs appear to be the most familiar with CN Labeling (90 percent), while managers in private SFAs appear to be the least familiar with the program; only 37 percent of these managers were aware of CN Labeling.

Proportion of SFAs Requiring CN Labels

SFA managers familiar with CN Labeling were asked whether they required CN labels for any eligible products purchased in SY 1989-90. If CN labels were required, managers were asked specifically about requirements for different types of products: meat or poultry, seafood, non-meat products (e.g., eggs, cheese, beans, etc.), and juice drinks.

Approximately two-thirds of the the SFA managers familiar with the CN Labeling Program required CN labels for one or more eligible food products in SY 1989-90 (Exhibit V.3). There is, however, variation among subgroups of SFAs. For example, the proportion of public SFAs that require CN Labeling is significantly higher than for private SFAs (68 percent vs. 44 percent). Similarly, requirements for CN labels are significantly more common in SFAs that offer the breakfast program and in SFAs that serve 60 percent or more free or reduced-price lunches.

Among SFAs that do require CN labels, 94 percent require labels for meat or poultry products and 80 percent require CN labels for seafood products (Exhibit V.4). CN labels are required less frequently for non-meat products and juice drinks. Less than half of the SFAs that require CN labels require them for these products.

Exhibit V.2

SFA Managers' Awareness of CN Labeling
(SY 1989-90)

	SFA Manager Aware of CN Labeling?		Total SFAs (Weighted)
	Yes	No	
TOTAL SAMPLE	62‡	38‡	14,065
Type of SFA			
Public	68*	32	11,115
Private	37	63	2,950
Participation in SBP			
NSLP and SBP	79*	21	4,398
NSLP only	54	46	9,667
SFA Size			
Small (1-999)	45*	55	6,456
Medium (1,000-4,999)	71*	29	5,832
Large (5,000+)‡	90	10	1,777
SFA Poverty Level			
60% or more F&R	67	33	1,880
0-59% F&R	63	37	11,373

*Group difference is statistically significant at the .01 level.

‡Reference group used in comparisons: Large SFAs vs. Small SFAs; Large SFAs vs. Medium SFAs.

Data Source: Year Two SFA Manager Survey.

Exhibit V.3

Proportion of SFAs That Are Aware of CN Labeling and That Require CN Labeling for One or More Foods Products (SY 1989-90)

	<u>Require CN Label?</u>			Total SFAs (Weighted)
	Yes	No	Don't Know	
TOTAL SAMPLE	65%	33%	2%	8,669
Type of SFA				
Public	68*	30	2	7,578
Private	44	56	0	1,091
Participation in SBP				
NSLP and SBP	76*	24	0	3,467
NSLP	58	40	3	5,202
SFA Size				
Small (1-999)	68	27	5	2,927
Medium (1,000-4,999)	62	38	0	4,148
Large (5,000+)*	66	34	0	1,594
Poverty Level of SFA				
60% or more F&R	76*	24	0	1,258
0-59% F&R	62	36	2	7,160

*Group difference is statistically significant at the .01 level.

‡Reference group used in comparisons: Large SFAs vs. Small SFAs; Large SFAs vs. Medium SFAs.

Ns and percentages reflect SFA managers that had knowledge of CN Labeling.

Data Source: Year Two SFA Manager Survey.

Exhibit V.4

Proportion of SFAs Requiring CN Labels
for Various Food Items
(SY 1989-90)

	Proportion of SFAs Requiring CN Labels for:				Total SFAs (Weighted)
	Meat or Poultry	Seafood	Non-Meat Products	Juice Drinks	
TOTAL SAMPLE	94%	80%	42%	47%	5,627
Type of SFA					
Public	94	79	42	50	5,151
Private	99	92	44	23	476
Participation in SBP					
NSLP & SBP	98	86	33	53	2,622
NSLP	91	76	50	42	3,005
SFA Size					
Small (1-999)	90	87	60	49	2,001
Medium (1,000-4,999)	96	75	36	49	2,572
Large (5,000+)	97	82	24	38	1,054
SFA Poverty Level					
60% or more F&R	98	92	57	57	950
0-59% F&R	93	79	39	46	4,469

Ns and percentages reflect SFAs where manager had knowledge of CN Labeling and that required CN Labeling for at least one product during SY 1989-90.

Data Source: Year Two SFA Manager Survey.

SFA Managers'
Opinions About
CN Labeling

SFA managers' opinions about CN Labeling were assessed in several different ways. First, respondents were read a list of statements about potential positive effects of the CN Labeling Program, and were asked to indicate whether they felt the statement was true or false. Managers were also asked to list specific advantages (in addition to those identified in the preceding true/false statements) and disadvantages of using CN-labeled foods. Next, managers were asked to rate the overall importance of CN Labeling. Finally, SFA managers were asked to identify the specific events or individuals who most influenced their overall opinion about CN Labeling.

Exhibit V.5 summarizes SFA managers' opinions about potential benefits of CN Labeling. The most consistently held opinion about the benefits of CN Labeling is that it ensures that processed food products will meet USDA meal pattern requirements--90 percent of SFA managers agreed with this contention. SFA managers feel almost as confident about the ability of the CN Labeling Program to ensure standard food portions--81 percent of respondents agreed with this statement. Both of these opinions match the intent of the CN labeling program.

While most SFA managers agree that CN labels help ensure that processed food products meet program meal component and portion size requirements, many do not believe that the program has any direct impact on food quality. This is consistent with the intent of the program, which focuses strictly on compliance with NSLP meal guidelines, and does not address issues of quality or price. Given this background, it is surprising that half of the SFA managers agreed with the statement that CN labels ensure higher food quality and that 38 percent agreed that CN-labeled products are nutritionally superior to other products.

Fewer than half of SFA managers familiar with CN Labeling feel that the program has had a significant impact on food purchasing or food costs. Forty-two percent of SFA managers agreed that CN Labeling allows many vendors to bid for SFA business. However, only 22 percent of managers agreed that CN Labeling allowed them to purchase foods at lower prices. Once again, the program makes no claim that it will lead to changes in food prices.

SFA managers were asked to identify other specific benefits that they attribute to the CN Labeling Program mentioned (i.e., in addition to the potential benefits mentioned above), but none was identified. Managers were also given an opportunity to identify disadvantages to the use of CN labels. Thirty-five percent of the SFA managers who were aware of CN Labeling identified at least one disadvantage. The disadvantage identified by most SFA managers is that CN-labeled products are more expensive (42 percent of those citing any disadvantages--about 14 percent of all respondents) (Exhibit V.6). Moreover, 22 percent feel that the program limits (rather than expands) the choice of vendors available to them. Eleven percent of

Exhibit V.5

SFA Managers' Opinions About Potential
Benefits of CN Labeling
(SY 1989-90)

Potential Benefit	True	False	Don't Know
Ensures that products meet meal pattern requirements	90%	9%	1%
Ensures standard portions	81	15	4
Ensures higher quality	50	47	3
Allows many vendors to bid for SFA business	42	45	12
CN-labeled products are nutritionally better than others	38	55	8
Allows SFAs to purchase foods at lower prices	22	71	7
Total SFAs (Weighted)			8,669

Ns and percentages reflect SFA managers that had knowledge of CN Labeling.

Data Source: Year Two SFA Manager Survey.

Exhibit V.6

Disadvantages of CN Labeling Identified by SFA Managers
(SY 1989-90)

Disadvantages	Proportion of SFA Managers
More Expensive	42%
Limits Choice of Vendors	22
No Assurance of Quality/Nutrition	11
Hard to Get/Not Available	9
Other	16
Total SFAs (Weighted)	3,410

Ns and percentages reflect SFA managers that had knowledge of CN Labeling and identified one or more disadvantage.

Totals to more than 100 percent because respondents could list more than one disadvantage.

Data Source: Year Two SFA Manager Survey.

those who identified specific disadvantages cited the fact that CN labels, in and of themselves, offer no guarantee of overall food or nutritional quality. A unique perspective on CN-labeled foods that emerged from this line of questioning is that some SFA managers (9 percent) feel that CN-labeled products are not readily available or are "hard to get."

After having the opportunity to discuss the advantages and disadvantages of CN Labeling, SFA managers were asked to evaluate the overall importance of the program to their SFA. Overall, almost two-thirds of SFA managers rated the program as very important or important (Exhibit V.7).

Within SFA subgroups, responses were quite variable. Among SFAs that require CN labels, public and private SFAs view the program quite differently. Almost one-quarter of private SFA managers feel that the program is not important to their district, compared to only 7 percent of public SFA managers. Similarly, while 42 percent of the SFAs that participate in both the NSLP and SBP rated the program as very important, less than one quarter of the managers of NSLP-only SFAs felt the same way. Fourteen percent of these (NSLP-only) managers rated the program as not important, compared to three percent of managers in SFAs that participate in the SBP. Managers of high-poverty SFAs, as a group, appear to have the most favorable opinion of the CN Labeling Program. Fifty-three percent of these managers rated the program as very important, and only three percent feel that it is unimportant.

Finally, in order to understand how SFA managers' opinions may have been affected by external forces, managers were asked to identify the single factor (or individual(s)) that most influenced their opinions about CN Labeling. As Exhibit V.8. illustrates, the two primary factors influencing SFA managers' opinions are personal experience (39 percent) and comments from their respective State Child Nutrition Directors (33 percent).

Exhibit V.7

SFA Managers' Opinions About the
Importance of CN Labeling
(SY 1989-90)

<u>How important is the CN Labeling Program to your district?</u>					
	Very Important	Important	Somewhat Important	Not Important	Total SFAs (Weighted)
TOTAL SAMPLE	30%	32%	29%	9%	8,669
Type of SFA					
Public	32	31	29	7	7,578
Private	16	37	23	24	1,091
Participation in SBP					
NSLP and SBP	42	27	28	3	5,202
NSLP only	22	35	29	14	3,467
SFA Size					
Small (1-999)	34	32	20	14	2,927
Medium (1,000-4,999)	27	30	35	8	4,148
Large (5,000+)	30	37	27	6	1,594
Poverty Level of SFA					
60% or more F&R	53	16	28	3	1,258
0-59% F&R	26	34	29	11	7,160

Ns and percentages reflect SFA managers that had knowledge of CN Labeling.

Data Source: Year Two SFA Manager Survey.

Exhibit V.8

Factors Influencing SFA Managers'
Opinions About CN Labeling
(SY1989-90)

Factor	Proportion of SFA Managers
Direct personal experience	39%
Comments from State Child Nutrition Director	33
Comments by food manufacturers or distributors	11
Comments from other school personnel	10
Don't Know	2
Other	4
Total SFAs (Weighted)	8,669

Ns and percentages reflect SFA managers that had knowledge of CN Labeling.

Data Source: Year Two SFA Manager Survey.

VI. TECHNICAL ASSISTANCE

BACKGROUND

FNS provides technical materials to SFAs as a means of ensuring that programs operate effectively and efficiently, that they comply with Federal regulations and policies, and that nutritious, high-quality meals are served to school children. FNS develops technical assistance materials and, through its Regional Offices (FNSROs), provides technical assistance to State Agencies. State Agencies are, in turn, charged with providing technical and managerial assistance to local SFAs.

Year One of the Child Nutrition Program Operations Study included a detailed survey of the training and technical assistance currently being provided to SFAs as well as the areas in which SFAs perceive technical assistance needs. This information will be used by FNS program operations personnel in determining how to deploy the limited resources available in this area.

In the Year Two Survey, a limited number of items were included specifically to obtain feedback from SFA Managers on recent commodity-related technical assistance materials.

KEY RESEARCH ISSUES

The specific Year Two research questions related to technical assistance include:

- Have SFAs received technical assistance materials from FNS?
- Have SFAs found these technical assistance materials to be useful?

SFA Managers were queried about four specific materials:

- the quarterly Commodity Foods newsletter;
- Facts About USDA Commodities (a set of fact sheets providing storage, handling, preparation and cooking information for each of the 70 commodity foods purchased by USDA);
- USDA Quantity Recipes for School Food Service; and

- Nutritive Value of USDA-Donated Commodities, a booklet providing detailed information on the nutrient composition of USDA Commodities.

DATA AND VARIABLES

Data were collected from SFA Managers through the Year Two SFA Manager Survey. Responses were weighted and tabulated. T-tests were performed when appropriate to assess differences among the various subgroups of SFAs.

COMMODITY FOODS NEWSLETTER

USDA recently began mailing the quarterly Commodity Foods newsletter to all participating SFAs to keep them apprised of developments in the Food Donation Program. SFA managers were asked whether anyone in their school district has been receiving the newsletter. Overall, two-thirds of SFA managers responded affirmatively (Exhibit VI.1). Approximately one-third of SFAs, however, may not be receiving the newsletter. Twenty-one percent of the respondents indicated that no one in their district received the newsletter, and 13 percent did not know whether anyone received it. This pattern was fairly consistent across the various SFA subgroups, however, SFAs that participate in both the NSLP and SBP were more likely to report not receiving the newsletter than SFAs that participate in only the NSLP.

SFAs managers were asked whether they had any specific suggestions to offer for improving the newsletter. Only 10 percent of those who receive the newsletter had any specific suggestions to offer. The suggestions mentioned most frequently included: (1) print the newsletter more frequently; respondents suggested a monthly newsletter, (2) include more recipes that show how to use commodity foods, particularly the more "unusual" or "obscure" foods like dried figs and dates, and (3) use a smaller, easier-to-read format (several managers suggested an 8 1/2" x 11" magazine-style format rather than the current newspaper layout).

OTHER TECHNICAL ASSISTANCE PUBLICATIONS

Facts About USDA Commodities

This publication, which includes fact sheets providing storage, handling, preparation and cooking information for each of the 70 commodities purchased by USDA, was produced by FNS and made available to SFAs through their respective State Agencies. Sixty-eight percent of SFA managers indicated that they, or someone in their district, had received this publication (Exhibit VI.2). Private SFAs were less likely to have received the publication than public SFAs (61 percent vs. 70 percent, respectively).

Exhibit VI.1

SFA's Receipt of Commodity Foods Newsletter
(SY 1989-90)

	<u>SFA Received Commodity Foods Newsletter</u>			Total SFAs (Weighted)
	Yes	No	Don't Know	
TOTAL SAMPLE	66%	21%	13%	14,065
Type of SFA				
Public	65	22	13	11,115
Private	67	19	14	2,950
Participation in SBP				
NSLP and SBP	61*	29	11	4,398
NSLP only	68	18	14	9,667
SFA Size				
Small (1-999)	67	17	16	6,456
Medium (1,000-4,999)	64	26	10	5,832
Large (5,000)‡	70	20	10	1,777
SFA Poverty Level				
60% or more F&R	63	28	8	1,880
0-59% F&R	65	21	14	11,373

*Group difference is statistically significant at the .01 level.

‡Reference group used in comparisons: Large SFAs vs. Small SFAs; Large SFAs vs. Medium SFAs.

Data Source: Year Two SFA Manager Survey.

Exhibit VI.2

SFA's Receipt of Facts About USDA Commodities
(SY 1989-90)

	<u>SFA Received Facts About USDA Commodities</u>			Total SFAs (Weighted)
	Yes	No	Don't Know	
TOTAL SAMPLE	68%	19%	13%	14,065
Type of SFA				
Public	70*	15	15	11,115
Private	61	31	8	2,950
Participation in SBP				
NSLP and SBP	67	18	15	4,398
NSLP only	69	19	12	9,667
SFA Size				
Small (1-999)	65	20	15	6,456
Medium (1,000-4,999)	70	17	12	5,832
Large (5,000)‡	70	20	10	1,777
SFA Poverty Level				
60% or more F&R	71	20	9	1,880
0-59% F&R	67	19	14	11,373

*Group difference is statistically significant at the .01 level.

‡Reference group used in comparisons: Large SFAs vs. Small SFAs; Large SFAs vs. Medium SFAs.

Data Source: Year Two SFA Manager Survey.

Managers who reported receiving Facts About USDA Commodities were asked their opinion about its usefulness; their responses are summarized in Exhibit VI.3. Ninety percent or more of managers in all types of SFAs felt that the material was either somewhat useful or very useful. The pattern of response was similar across the various SFA subgroups. It is worth noting, however, that a greater proportion of managers in large SFAs (the heaviest users of commodity foods) thought Facts About USDA Commodities was very useful (41 percent of large SFAs vs. 31-33 percent in small and medium-size SFAs).

USDA Quantity
Recipes for
School Food
Service

This package of standardized, quantity recipes that make use of commodity foods was recently updated by FNS and sent directly to all SFAs. Approximately three-quarters or more of managers in all types of SFAs reported that the recipes had been received (Exhibit VI.4). However, managers in 22 percent of SFAs either did not receive the recipes or did not know whether they had been received. Managers of SFAs that participate in the SBP, and managers of large SFAs were more likely to have received the recipe packet than managers of other SFAs.

When asked about the usefulness of the quantity recipes, managers who had received them tended to respond favorably. Fifty-eight percent of these managers felt that the recipes were very useful (Exhibit VI.5), while 36 percent felt that they were somewhat useful. As Exhibit VI.5 shows, managers of SFAs that participate in the SBP and SFAs that serve 60 percent or more free or reduced-price lunches found these recipes to be particularly useful.

Nutritive
Values of
USDA-Donated
Commodities

This publication, which includes detailed nutrient composition information for all commodities, was sent to all State Agencies for distribution to local SFAs. Fewer SFA managers acknowledged receipt of this material than any of the three other technical assistance materials examined in this study (Exhibit VI.6). Overall, just over half (53 percent) of the SFA managers reported receiving Nutritive Values of USDA-Donated Commodities. Twenty-seven percent indicated that neither they nor anyone else in their district had received the material, and 20 percent did not know whether it had been received. There was little variation in this pattern across SFA subgroups; however, managers in SFAs that serve 60 percent or more free or reduced-price lunches were more likely to have received the recipes than managers in SFAs that serve 59 percent or fewer free or reduced-price lunches.

Again, the vast majority of managers who had received the material found it to be useful (Exhibit VI.7). Across all types of SFAs, 35 percent found the material to be very useful and 60 percent found it somewhat useful. There were some differences within SFA subgroups in terms of whether they found the information to be very useful or somewhat useful. In particular, managers of public SFAs, SFAs that participate in the SBP, large SFAs, and SFAs that serve 60 percent or more free or reduced-price lunches rated the material as "very useful" more often than managers of other types of SFAs.

Exhibit VI.3

SFA Managers' Opinions About Usefulness of
Facts About USDA Commodities
(SY 1989-90)

	Very Useful	Somewhat Useful	Not Useful	Don't Know	Total SFAs (Weighted)
TOTAL SAMPLE	33%	63%	2%	2%	9,578
Type of SFA					
Public	33	64	3	0	7,770
Private	32	59	1	8	1,808
Participation in SBP					
NSLP and SBP	36	63	2	0	2,937
NSLP only	32	63	3	2	6,641
SFA Size					
Small (1-999)	31	63	3	3	4,224
Medium (1,000-4,999)	33	65	2	0	4,111
Large (5,000)	41	56	3	0	1,243
SFA Poverty Level					
60% or more F&R	36	59	5	0	1,344
0-59% F&R	34	62	2	2	7,565

Ns and percentages reflect SFAs that reported receiving Facts About USDA Commodities.

Note: None of the between-group differences is statistically significant.

Data Source: Year Two SFA Manager Survey.

Exhibit VI.4

SFA's Receipt of USDA Quantity Recipes
for School Food Service
(SY 1989-90)

	<u>SFA Received USDA Quantity Recipes</u> <u>for School Food Service</u>			Total SFAs (Weighted)
	Yes	No	Don't Know	
TOTAL SAMPLE	78%	11%	11%	14,065
Type of SFA				
Public	80	11	10	11,115
Private	72	13	14	2,950
Participation in SBP				
NSLP and SBP	85*	9	6	4,398
NSLP only	75	13	13	9,667
SFA Size				
Small (1-999)	76*	10	14	6,456
Medium (1,000-4,999)	77*	13	9	5,832
Large (5,000)‡	87	11	2	1,777
SFA Poverty Level				
60% or more F&R	80	10	10	1,180
0-59% F&R	77	12	11	11,373

*Group difference is statistically significant at the .01 level.

‡Reference group used in comparisons: Large SFAs vs. Small SFAs; Large SFAs vs. Medium SFAs.

Data Source: Year Two SFA Manager Survey.

Exhibit VI.5

SFA Managers' Opinions About Usefulness of USDA Quantity Recipes
For School Food Service
(SY 1989-90)

	Very Useful	Somewhat Useful	Not Useful	Total SFAs (Weighted)
TOTAL SAMPLE	58%	36%	5%	10,961
Type of SFA				
Public	58	37	5	8,837
Private	61	33	5	2,125
Participation in SBP				
NSLP and SBP	64*	32	4	3,742
NSLP only	55	39	6	7,220
SFA Size				
Small (1-999)	60	34	6	4,914
Medium (1,000-4,999)	57	38	4	4,509
Large (5,000)‡	57	37	6	1,539
SFA Poverty Level				
60% or more F&R	64*	27	8	1,499
0-59% F&R	58	37	5	8,740

*Group difference is statistically significant at the .01 level.

‡Reference group used in comparisons: Large SFAs vs. Small SFAs; Large SFAs vs. Medium SFAs.

Ns and percentages reflect SFAs that reported receiving USDA Quantity Recipes for School Food Service.

Data Source: Year Two SFA Manager Survey.

Exhibit VI.6

SFA's Receipt of Nutritive Values
of USDA-Donated Commodities
(SY 1989-90)

	<u>SFA Received Nutritive Values</u> <u>of USDA-Donated Commodities</u>			Total SFAs (Weighted)
	Yes	No	Don't Know	
TOTAL SAMPLE	53%	27%	20%	14,056
Type of SFA				
Public	53	27	20	11,115
Private	51	28	21	2,950
Participation in SBP				
NSLP and SBP	53	28	19	4,398
NSLP only	53	27	20	9,667
SFA Size				
Small (1-999)	51	25	24	6,456
Medium (1,000-4,999)	54	29	17	5,832
Large (5,000)‡	55	31	15	1,777
SFA Poverty Level				
60% or more F&R	58*	30	13	1,880
0-59% F&R	51	28	21	11,373

*Group difference is statistically significant at the .01 level.

‡Reference group used in comparisons: Large SFAs vs. Small SFAs; Large SFAs vs. Medium SFAs.

Data Source: Year Two SFA Manager Survey.

Exhibit VI.7

**SFA Managers' Opinions About Usefulness of
Nutritive Values of USDA-Donated Commodities
(SY 1989-90)**

	Very Useful	Somewhat Useful	Not Useful	Total SFAs (Weighted)
TOTAL SAMPLE	35%	60%	4%	7,393
Type of SFA				
Public	38*	58	4	5,901
Private	24	69	7	1,492
Participation in SBP				
NSLP and SBP	46*	52	1	2,311
NSLP only	30	64	6	5,082
SFA Size				
Small (1-999)	29*	64	6	3,299
Medium (1,000-4,999)	36*	62	2	3,129
Large (5,000)‡	53	41	5	965
SFA Poverty Level				
60% or more F&R	50*	41	9	1,082
0-59% F&R	33	63	3	5,766

*Group difference is statistically significant at the .01 level.

‡Reference group used in comparisons: Large SFAs vs. Small SFAs; Large SFAs vs. Medium SFAs.

Ns and percentages reflect SFAs that reported receiving Nutritive Values of USDA-Donated Commodities.

Data Source: Year Two SFA Manager Survey.

PART 3:
FINDINGS FROM ON-SITE
MEAL OBSERVATIONS

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FOOD AND NUTRIENT COMPOSITION OF NSLP AND SBP MEALS

SUMMARY OF FINDINGS

BACKGROUND

This study examined the food and nutrient composition of NSLP and SBP meals at three levels: (1) as offered by participating schools, (2) as selected by participating students, and (3) as actually consumed by participating students. At each level, the total nutrient content was compared to the Recommended Dietary Allowances for essential nutrients. The nutrient density and fat, cholesterol and sodium content of meals was also examined.^{1/}

Food-level analyses were also performed to answer specific research questions posed by FNS. These concerned the choices available to students participating in the NSLP and SBP (i.e., how often students have the option to choose between two or more food items within a major meal component category), the particular types of food offered to students, and the foods that students tend to select and waste most frequently. FNS was also interested in how many and which food items students select under the offer-versus-serve (OVS) option.^{2/} Finally, the prevalence and extent of a la carte food service was examined.

This section summarizes major findings related to the nutrient composition of NSLP and SBP meals. Chapters VII and VIII, which follow this summary, describe study procedures and findings, including the food-level analyses, in more detail. Chapter VII covers analyses of NSLP meals; SBP meals are discussed in Chapter VIII.

^{1/}Data were collected in mid-March, 1990. Sample selection and data collection procedures are described in Chapter I and Appendix B. It should be recalled (see Chapter I) that these data were collected in a sample of 20 SFAs which is not nationally representative. FNS is currently conducting the Special Nutrition Dietary Assessment Study which collects similar information in a nationally representative sample of SFAs.

^{2/}Regulations for both the NSLP and SBP stipulate a particular meal pattern that must be offered to students, including the types of food (meal components) and quantities of food. Under the OVS option, which is mandatory in middle/secondary schools and optional (at the discretion of the SFA) in elementary schools, students are permitted to refuse up to two of five NSLP meal components and one of four SBP meal components.

Nutrient Composition of NSLP Meals. Meals Offered: Program regulations state that NSLP meals should provide, on average, one-third of students' daily nutrient needs. The average lunch offered in elementary schools met this goal for 4-6 year olds and 7-10 year olds. It also met the goal for older students for all nutrients except calories (29 percent) and vitamin B₆ (28 percent) for 11-14 year old males, and iron (28 percent) for 11-14 year old females.

The average lunch offered in middle/secondary schools provided approximately one-third of the RDA for almost all nutrients for the appropriate age and sex groups. The only appreciable exceptions were calories (27 percent), vitamin B₆ (27 percent), and magnesium (26 percent) for 15-18 year old males.

Program guidelines encourage schools to provide larger portions or additional servings to older students whose nutritional needs are greater. These findings reinforce the importance of that policy and suggest that schools need to be conscious of the differential needs of the students they serve. They must maintain adequate flexibility when serving meals so that older students can indeed receive the additional food they need to meet the program goal of approximately one-third of the RDA.

The average NSLP meals offered in both elementary and middle schools were high in nutritional quality and well-balanced across a number of key nutrients. The average lunch offered in elementary schools provided more calories than needed by the youngest students and fewer calories than needed by the oldest male students. The mix of foods, however, was well-selected and nutrient dense. The data suggest that the portions actually served to students could be adjusted slightly to their differing caloric needs, and both groups would still receive one-third of the RDA for most nutrients examined in this study. The only exceptions are vitamin B₆ for 7-10 year olds and 11-14 year old males, and iron for 11-14 year-old females. The low iron density of the average NSLP meal relative to the iron requirement for 11-14 year-old females was the most significant shortfall. The INQ score of 0.85 indicates that the target RDA for iron could not be met for this group of students with the average NSLP meal offered in elementary schools unless the RDA for calories was exceeded.

The average lunch offered in middle/secondary schools provided slightly less calories than needed by male students and more calories than needed by female students. The foods offered, however, were high enough in nutrient density that portions for each group of students could be adjusted slightly to better meet caloric needs without compromising total nutrient intake. The average lunch offered was somewhat low in nutrient density for vitamin B₆, magnesium and iron for some student groups. Again, the most significant shortfall was iron density for female students. The INQ scores of 0.86 indicate that the average NSLP

meal offered in middle/secondary schools met the RDA target for iron for these students only because it exceeded the RDA for calories.

The mean proportion of calories from fat was approximately 38 percent for the average meal offered in both elementary and middle/secondary of schools. The Dietary Guidelines recommend 30 percent or less of calories from fat.^{1/} The mean proportion of calories from saturated fat was approximately 15 percent for both schools; the recommended level is less than or equal to ten percent. NSLP meals were high in sodium when compared to recommendations from the National Research Council's Diet and Health report.

Meals Selected: The nutrient content of the average NSLP meals as selected did not differ significantly from the nutrient content of the average meals offered. This finding indicates that most students selected meals that included all of the components contained in the pattern NSLP meal.

In evaluating the proportion of the RDA contributed by the average NSLP meal as selected, a target range of intake was identified for each school type based on the RDAs for the groups of students included in the school population.^{2/} The average NSLP meal selected in both elementary and middle/secondary schools met or exceeded the target range for all nutrients examined. In some instances, the average meal contained less than one-third of the RDA for a particular nutrient for a

^{1/}Fat and saturated fat content are evaluated in light of the Dietary Guidelines for Americans, recommendations which are issued jointly by USDA and the U.S. Department of Health and Human Services. Cholesterol and sodium content are compared to standards from the National Research Council's publication, Diet and Health, because the Dietary Guidelines do not provide quantified goals for these nutrients. The NRC Guidelines are not endorsed by the USDA, and are included in this report solely as reference points to assist the reader in interpreting the data.

^{2/}This approach was necessary because the average meal as selected (and consumed), as defined in this study, represents the nutrient content of the meals selected by the average student in each school averaged across five days in a selected week. The sample included children of different ages and sexes, both of which are important factors in judging nutritional adequacy. It is not possible, therefore, to identify with certainty specific groups of students who may be selecting (or consuming) meals that provide less than one-third of the RDA for a given nutrient. FNS is collecting age- and sex-specific data through the Special Nutrition Dietary Assessment Study. This issue is discussed in detail in Chapter VII.

particular group. If these students indeed consumed the "average" meal, then they would not receive one-third of the RDA for these nutrients. In the absence of actual data on how particular age- and sex-groups selected NSLP meals, however, it is not possible to determine how the meals selected by these students might differ from the "average" NSLP meal.

The nutrient density of meals as selected in both elementary and middle/secondary schools was very similar to the nutrient density of the average meals offered. This suggests that most students selected meals that included all of the NSLP meal components. Iron density for female students remained the only appreciable problem in both schools. INQ scores for iron for the average meal as selected were consistently higher than for the average meal offered (0.88 vs. 0.85 for elementary schools and 0.92 vs. 0.86 for middle/secondary schools.) This suggests that students who omitted one or more of the NSLP meal components in the meals they selected tended to include iron-rich foods and exclude other foods. Because age- and sex-specific data are not available, however, it is impossible to determine the iron density of the meals actually selected by the students with the greatest iron requirements (females 11 years old or older.)

The average meal selected in both elementary and middle/secondary schools, like the average meal offered, exceeded the Dietary Guidelines recommendations for total fat and saturated fat. The average meal selected was also high in sodium when compared to NRC recommendations, especially in middle/secondary schools. Cholesterol levels in the average meals selected compared favorably with NRC recommendations.

Meals Consumed. The mean nutrient content of the average meal consumed was consistently lower than the nutrient content of the average meal selected in both elementary and middle/secondary schools. This indicates that, in general, students did not consume all of the foods they selected. This was particularly true in elementary schools.

None of the nutritional differences between the average meal consumed and the average meal selected in middle/secondary schools reached statistical significance. In elementary schools, however, the average meal consumed was significantly lower in calories and all nutrients than the average meal selected. On average, elementary school students wasted about 23 percent of the nutrients contained in the meals they had selected. Middle/secondary school students wasted about 9 percent of the available nutrients.

The average lunch consumed by children in elementary schools exceeded the target range for protein, vitamin C, riboflavin and phosphorus (i.e., it provided more than one-third of the RDA for these nutrients for all age/sex groups). The levels of vitamin A, thiamin, niacin, calcium and magnesium were within the target

range, but older students would have to consume more than is included in the "average" NSLP meal in order to meet their needs for these nutrients. Calories, vitamin B₆ and iron levels were below the target range. Thus, the average meal as consumed did not provide one-third of the RDA for these nutrients for the majority of elementary school children. This finding is comparable to results of other studies which have indicated that levels of calories, vitamin B₆ and iron may be low in NSLP meals consumed by elementary school children.

The nutrient content of the average NSLP meal consumed in middle/secondary schools exceeded the target range for protein, vitamin C, thiamin, riboflavin, niacin, calcium and phosphorus. It was within the target range for magnesium and iron, although the previous caveat about greater needs of older students applies here also. The average NSLP meal consumed by middle/secondary students was below the target range for calories, vitamin A and vitamin B₆. The findings for calories and vitamin B₆ are consistent with those noted for NSLP meals consumed in elementary schools and with other studies of NSLP meals. The apparent shortfall of vitamin A in NSLP meals as consumed has also been noted in previous studies.

When viewed in concert, the results of the three analyses (i.e., NSLP meals as offered, selected and consumed) indicate that meals planned in accordance with program guidelines and offered to students are very successful in meeting the program goal of one-third of the RDA. Further, the nutrient content of meals selected by students, even under the OVS option, are, with few exceptions within the target range for calories and all nutrients. Significant nutritional shortfalls arise only in the meals actually consumed by students, particularly at the elementary school level. Thus, the key to ensuring that students receive approximately one-third of their daily nutritional needs from an NSLP meal is to increase the likelihood that students actually consume the meals they select. It is also important to ensure that the oldest students in each school have the ability to receive larger or additional portions of food.

While the average NSLP meals consumed by students may have been low in total calories, the mix of foods included was high in nutritional quality and well-balanced. Iron density for female students was the most notable potential problem. Food waste had little effect on levels of fat, cholesterol and sodium. The average lunch consumed in both schools exceeded Dietary Guidelines recommendations for total fat and saturated fat. The average meals were also high in sodium. The average elementary school lunch came very close to meeting the NRC recommendation for sodium, however, since this was primarily due to the fact that students wasted almost 25 percent of the foods they received, the finding is not entirely positive.

Nutrient Composition of SBP Meals. Meals Offered: The average breakfast offered in elementary schools supplied one-fourth or more of the RDA for all nutrients for 4-6 year olds, 7-10 year olds and 11-14 year olds.^{1/} The average elementary school breakfast also supplied 25 percent of daily calorie needs for 4-6 year old students, but fell short of this level for 7-10 year olds (23 percent), 11-14 year old females (21 percent) and 11-14 year old males (19 percent). The average breakfast offered in middle/secondary schools provided approximately one-fourth of students' calorie and nutrient needs as well, with three exceptions: calories (21 percent) for 11-14 year old males and calories (17 percent) and magnesium (18 percent) for 15-18 year old males.

Breakfasts offered in both elementary and middle/secondary schools were high in nutritional quality and balanced across a number of key nutrients. While the overall caloric value of SBP meals may have been somewhat low, the meals were very high in nutrient density, supplying in excess of 30 percent of the RDA for most nutrients examined.

The average breakfast offered in both elementary and middle/secondary schools provided approximately 30 percent of total calories from fat, the level recommended by the Dietary Guidelines. The level of saturated fat, however, exceeded the Dietary Guidelines recommendation of 10 percent of calories in both elementary (14 percent) and middle/secondary (13 percent) schools. The amount of cholesterol and sodium in average SBP meals were within acceptable ranges.

Meals Selected: The nutrient content of the average SBP meals selected did not differ significantly from the nutrient content of the average meals offered. This indicates that most students selected meals that included all of the SBP meal components.

In assessing the percent RDA contribution for average meals selected and consumed, the target level concept, described in the preceding discussion of NSLP meals, was used. The average breakfast selected in elementary schools met or exceeded the target range for all nutrients except calories. Students aged 4-6 would receive 25 percent of the RDA for calories from the "average" elementary school breakfast. All other elementary school students, however, would not. The level ranges from 18 percent of the RDA for 11-14 year old males to 22 percent of the RDA for 7-10 year olds. The available data do not indicate, however, how the meals selected by these students may differ from the average. Given USDA's policy of encouraging schools to serve larger portions or additional foods to older students, it

^{1/}Program regulations do not specify a target RDA level for SBP meals. Twenty-five percent of the RDA was used as a target in these analyses.

is possible that these students would in fact select meals that provide more calories than the average SBP meal, and thereby satisfy their increased caloric needs.

The average SBP meal selected in middle/secondary schools met or exceeded the target range for all nutrients except magnesium. The calorie level of the average breakfast was also below the target range in middle/secondary schools. Female middle/secondary school students selecting the average breakfast would receive almost one fourth of their daily caloric needs; male students would not.

The average breakfasts selected by both elementary and middle/secondary school students were well-balanced in terms of total calories and relative nutrient density. The nutrient density of the average meals selected varied little from the nutrient density of the average meals offered. The average meal selected in both elementary and middle/secondary schools contained approximately 30 percent of calories from total fat, in keeping with Dietary Guidelines recommendations, but exceeded the Dietary Guidelines recommendations for saturated fat. Cholesterol and sodium content were within acceptable ranges.

Meals Consumed: The nutrient content of SBP meals consumed in both elementary and middle/secondary schools was consistently lower than the nutrient content of the meals selected, indicating that, in general, students did not consume all of the foods they selected. The magnitude of the differences is consistently higher for elementary schools where, on average, students did not consume about 24 percent of the nutrients that were contained in the meal they had selected (compared to 9 percent for middle/secondary schools).

Despite the nutrient losses associated with food waste, the average breakfast consumed in elementary schools exceeded the target nutrient range for vitamin C, thiamin and riboflavin. It was within the target range for protein, vitamin A, niacin, vitamin B₆, calcium, phosphorus, magnesium and iron. However, older students (11-14 year olds) would need to consume a meal containing greater amounts of these nutrients than the "average" meal in order to satisfy one-fourth of their daily nutrient needs. The average SBP meal consumed in elementary schools failed to provide 25 percent of daily caloric needs for even the youngest students (4-6 year olds).

The average breakfast consumed in middle/secondary schools exceeded the target range for protein, vitamin A, vitamin C, thiamin, riboflavin, calcium, phosphorus and iron. It fell below the target range for calories and magnesium and just reached the lowest limit of the target range for niacin and vitamin B₆.

Plate waste had little effect on the nutrient density or fat, cholesterol and sodium content of SBP meals. While the average SBP meal consumed in both elementary and middle/secondary schools may have been somewhat low in calories, students received concentrated amounts of nutrients in every calorie they consumed. Further, the breakfasts contained appropriate levels of fat, cholesterol and sodium. They exceeded recommended levels of saturated fat.

VII. FOOD AND NUTRIENT COMPOSITION OF NSLP MEALS

This chapter presents results of the analysis of data gathered in the on-site meal observations. The analysis examines the food and nutrient composition of the average NSLP meal at three levels: (1) as offered by participating schools, (2) as selected by participating students, and (3) as actually consumed by participating students. At each level, the overall nutritional adequacy of the average NSLP meal is evaluated in light of the stated program goal of providing approximately one-third of the Recommended Dietary Allowances for essential nutrients. The nutrient density of average NSLP meals is examined, as well as the fat, cholesterol and sodium content. Finally, food-level analyses are presented which provide information on the types of food offered to students in the NSLP, the foods students typically select from those available, and the foods students tend to waste.

BACKGROUND

The National School Lunch Program was established in 1946 with two objectives: "...to safeguard the health and well-being of the Nation's children and to encourage the domestic consumption of nutritious agricultural commodities and other foods."^{1/} Approximately 88.5 percent of all elementary and secondary school students have the program available to them and, on an average day, about 24 million lunches are served.^{2/}

USDA provides two types of Federal assistance to schools serving NSLP meals: cash reimbursements and donated commodities. In order to be eligible for Federal reimbursement, lunches must comply with meal pattern requirements as set forth in program regulations. The meal pattern is designed to ensure "...that the nutrients of the lunch, averaged over a period of time, approximate one-third of the Recommended Dietary Allowances (RDA) for children in each age/grade group."^{3/} The pattern specifies both the components (types of food to be included in an NSLP meal), and quantities (minimum portions of food) to be served for children in various age groups. The current NSLP meal pattern requirements are summarized in Exhibit VII.1.

^{1/}National School Lunch Act of 1946, P.L. 79-396.

^{2/}Annual Historical Review of FNS Programs: Fiscal Year 1989. USDA, Food and Nutrition Service, 1990.

^{3/}7 CFR 245, Part 210.

Exhibit VII.1
NSLP Meal Pattern Requirements

Food Components	Food Items	Minimum Required Quantities		Recommended Quantities*	Specific Requirements
		Grades K-3 Ages 5-8 (Group III)	Grades 4-12 Age 9 and over (Group IV)	Grades 7-12 Age 12 and over (Group V)	
Meat or Meat Alternate (quantity of the edible portion as served)	A serving of one of the following or a combination to give an equivalent quantity:				• Must be served in the main dish or the main dish and only one other menu item.
	Lean meat, poultry, or fish	1-1/2 oz	2 oz	3 oz	• Vegetable protein products, cheese alternate products, and enriched macaroni with fortified protein may be used to meet part of the meat or meat alternate requirement.
	Cheese	1-1/2 oz	2 oz	3 oz	
	Large egg(s)	3/4	1	1-1/2	
	Cooked dry beans or peas	3/8 cup	1/2 cup	3/4 cup	
	Peanut butter or other nut or seed butters	3 Tbsp	4 Tbsp	6 Tbsp	
Vegetable or Fruit	2 or more servings of vegetables and/or fruits to total:	1/2 cup	3/4 cup	3/4 cup	• No more than one-half of the total requirement may be met with full-strength fruit or vegetable juice.
					• Cooked dry beans or peas may be used as a meat alternate or as a vegetable, but not as both in the same meal.
Bread or Bread Alternate	Servings of bread or bread alternate	8 per week	8 per week	10 per week	• Breads or bread alternates must be enriched or whole grains • Enriched macaroni with fortified protein may be used as a meat alternate or as a bread alternate, but not as both in the same meal.
	A serving is a slice of bread or an equivalent serving of biscuits, rolls, etc., or 1/2 cup of cooked rice, macaroni, noodles, other pasta products or cereal grains, or a combination of any of the above.	minimum of 1 serving per day	minimum of 1 serving per day	minimum of 1 serving per day	
Milk (as a beverage)	Fluid whole milk and fluid unflavored lowfat milk, skim milk, or buttermilk must be offered.	1/2 pint (8 fl oz)	1/2 pint (8 fl oz)	1/2 pint (8 fl oz)	

*Recommended (but not required) quantities for children 12 years of age and older.

Program regulations stipulate that students must be offered all five food items (meat/meat alternate, 2 fruit and/or vegetable choices, bread/bread alternate, and milk) each day. Under the Offer-vs-Serve (OVS) provision, introduced in 1975, largely in response to concerns about the amount of plate waste in the program, senior high students are allowed to refuse up to two of the five food items and still have the lunch qualify as a reimbursable meal.^{1/} Since 1981, the option has been extended, at the discretion of the SFA, to schools below the senior high level, and students may be permitted to decline either one or two of the five food items.

The nutritional value of NSLP meals was last studied in SY 1980-81, in the National Evaluation of School Nutrition Programs (NESNP-I).^{2/} A number of significant changes have occurred in the past decade that create the need for more current information. Primary changes include the increased use of processed food items in the NSLP, the availability of new foods in the marketplace, and new USDA commodities. In addition, the Recommended Dietary Allowances (RDAs), the standards traditionally used in evaluating nutritional adequacy have recently been updated, and the current standards for several nutrients are different than the 1980 standards.^{3/} Most significantly, the RDAs for vitamin B₆, iron and magnesium (nutrients frequently found to be low in school lunches) have decreased for several age groups. Standards for other key nutrients have also changed (increased or decreased) for some groups of children. The analyses presented in this report evaluate the nutritional quality of NSLP meals served in SY 1989-90 in light of the most recent recommendations for nutrient intake.

KEY RESEARCH ISSUES

The primary objective of this portion of the study is to examine the food and nutrient composition of NSLP meals at three levels:

- as offered, i.e., meals planned in accordance with program guidelines and made available to participating students;

^{1/} 7 CFR 245, Part 210. Senior high is defined by each State Educational Agency.

^{2/} Wellisch, J.B., S.D. Hanes, L.A. Jordan, K.M. Maurer, and J.A. Vermeersch. The National Evaluation of School Nutrition Programs: Final Report. Santa Monica, CA: Systems Development Corporation, 1983. (referred to as NESNP-I)

^{3/} National Research Council, Committee on Dietary Allowances. Recommended Dietary Allowances, tenth edition. Washington, D.C.: National Academy Press, 1989.

- as selected, i.e., the combination of foods actually selected by students from all the options available to them; and
- as consumed, i.e., the portions of food actually consumed by students.

A secondary objective is to examine potential nutritional differences between exemplary and typical SFAs and between elementary and middle/secondary schools.^{1/}

The following research questions were addressed for each level of analysis--meals as offered, selected and consumed:

- What is the nutrient content of the average NSLP meal?
- How does the nutrient content of the average NSLP meal compared to the program goal of one-third of the RDA?
- What is the nutrient density or quality of the average NSLP meal?
- What is the fat, saturated fat, cholesterol, and sodium content of the average NSLP meal?

Research questions were also posed to assess nutritional differences among NSLP meals as offered, selected and consumed:^{2/}

- Is the nutrient content of the average NSLP meal as selected significantly different from the nutrient content of the average meal offered?
- Is the nutrient content of the average NSLP meal consumed significantly different from the nutrient content of the average NSLP meal selected?

^{1/}Exemplary SFAs were reported to have initiated some efforts to decrease the amount of fat and/or sodium in school meals. The 10 exemplary SFAs were selected from a pool of 70 SFAs that were nominated by FNS Regional Office staff, the American School Food Service Association and directors of State Child Nutrition Programs (see Chapter I).

^{2/}The original plans for this study also included research questions designed to assess the nutritional impact of the OVS option by comparing the nutrient content of meals offered, selected and consumed in elementary schools with and without the OVS option. The final sample of elementary schools that was purported to not practice OVS was too small, however, (n = 12) to support meaningful analysis.

A number of additional research questions related to food availability, food selection and food consumption are also addressed within the appropriate analysis:

Meals offered

- How much choice is available to students, i.e., how often are students offered choices within a major meal component category?
- What specific foods are being offered to students in NSLP meals?
- Are there differences between elementary and middle/secondary schools in terms of the specific types and amounts of food offered to students?

Meals selected

- In the presence of the offer-vs-serve (OVS) option, how many of the five items included in the NSLP meal pattern do students select? Which items are refused (not selected) most often?
- Of the specific foods available in each meal component category, which do students select most often?
- Are there differences between elementary and middle/secondary schools in terms of the number or types of food items selected by students?
- How many schools offer a la carte items in the same serving line as NSLP meals? What food items are typically available on an a la carte basis?
- Does the availability of a la carte items vary by school type?
- What proportion of children select one or more a la carte items, in addition to their NSLP meal, when a la carte items are available?

Meals consumed

- How much of the food that students select in NSLP meals is actually consumed, in total, and by food type?
- Are there differences in food consumption between elementary and middle/secondary school students?

DATA AND VARIABLES

Data were gathered in mid-March, 1990. On-site meal observations were conducted in 60 schools within 20 SFAs. In each school, observations were conducted at lunch time for 5 consecutive days.^{1/} Two separate analyses (nutrient content and food composition) were undertaken at three different levels (meals offered, selected and consumed.) The following section summarizes the analytic approach and variables used in each analysis.

Nutrient Content Analysis

In structuring the nutrient content analysis, several key analytic issues were addressed: 1) defining the appropriate unit of analysis, 2) determining how to best aggregate the available meal observation data, 3) identifying key nutrients to be included in the analysis, as well as the nutrient data base to be used in determining nutrient content, and 4) identifying appropriate reference nutrient intake standards. Each of these issues, and the resolutions used in this study, are described below.

Unit of Analysis. As outlined in Chapter I, data were collected on 297 NSLP meals offered to students, 16,571 meals selected by participating students, and 3,470 meals as actually consumed. A key issue for this analysis was determining how to utilize these data to develop an appropriate measure of the average NSLP meal as offered, selected and consumed.

The NSLP meal pattern is designed "...so that the nutrients of the lunch, averaged over a period of time, approximate one-third of the Recommended Dietary Allowances for children of each age/grade group..."^{2/} Moreover, the National Research Council (NRC) specifically states that group feeding programs should endeavor to plan menus so that the appropriate portion of the RDA is provided in a 5 to 10 day menu rotation rather than in each individual day's menu.^{3/}

In light of the program regulations and NRC recommendations, the appropriate approach to evaluating the nutrient content of NSLP meals is to average across the five days of observation rather than consider the meals observed on each of the five days individually. Similarly, observations of meals selected or

^{1/}Basic data collection procedures and available sample sizes are described in Chapter I; a more detailed description of the observation methodology is included in Appendix B.

^{2/}7 CFR 245, Part 210.

^{3/}National Research Council, Committee on Dietary Allowances. Recommended Dietary Allowances, tenth edition, Washington, D.C.: National Academy Press, 1989.

consumed by individual students should also be averaged rather than evaluated individually. The unit of analysis, then, for evaluation of nutrient content of NSLP meals is the average meal offered, selected and consumed in each of the 60 schools.

Data Aggregation. The following section describes how the meal observation data were aggregated to determine daily, and then weekly, measures of the nutrient content of NSLP meals as offered, selected and consumed. The specific nutrients included in the analysis and the methods used to convert the meal observation data to nutrient equivalents are described in a subsequent section.

Meals Offered. The concept of "the average NSLP meal as offered" was perhaps the most challenging one in this analysis. To describe accurately the meals offered to participating children, all available menu options had to be taken into consideration. Many schools offer students a choice of items within an NSLP meal component category, for example a choice between whole milk, chocolate milk, low-fat milk and skim milk, or the choice of an apple, a banana or a glass of orange juice as one of the two fruit and vegetable selections. Moreover, some schools offer multiple complete meals, e.g., a salad bar, a hot lunch or a sandwich-based lunch. Sometimes these alternatives are packaged as discrete units or offered in separate serving areas; other times all options are available in one location and students can select any of the available food items, in any combination, as long as the meal selected meets the requirements for a reimbursable meal.

The three most common situations encountered, and the operational definitions used to define the average NSLP meal as offered are described below. Exhibit VII.2 provides examples of the first two situations.

- * Situation 1: Students are served one entree but have multiple choices for one or more of the other meal component categories. To reflect the full range of options available in this situation, the nutrient content of the typical meal was computed by first summing the nutrients for the meal components where only one option was available (in the example presented in Exhibit VII.2, hamburger (meat) and bun (bread)), and then adding the average nutrient content for the meal components where more than one choice was available (in this example milk, fruit and vegetable).
- * Situation 2: Students have multiple options available in all meal component categories. Because in these situations students could literally mix and match the available components to create a reimbursable meal, the nutrient content of the average meal was determined by summing the average nutrient content for each meal component category, as illustrated in Exhibit VII.2.

Exhibit VII.2

Examples of Food Availability in Selected Schools:
Situations Commonly Encountered in Data Collection and
Methods Used to Operationally Define
Nutrient Content of NSLP Meals "As Offered"

NSLP Meal Component	Food Items Available	Operational Definition of Nutrient Content of Meal Offered
<u>Situation 1</u>		
Milk	Whole milk Chocolate milk Lowfat milk	1. Determine average nutrient content of available milk choices. ¹
Meat/Meat Alternate Bread/Bread Alternate	Hamburger patty on bun	2. Determine nutrient content of hamburger on bun
Fruit/Vegetable	Canned pineapple Fresh orange	3. Determine average nutrient content of available fruit choices. ²
	French fries Cooked carrots	4. Determine average nutrient content of available vegetable choices.
		5. Add values determined in steps 1 through 4 to compute nutrient content of average meal as offered.
<u>Situation 2</u>		
Milk	Whole milk Lowfat milk Chocolate milk Skim Milk	1. Determine average nutrient content of available milk choices.
Meat/Meat Alternate Bread/Bread Alternate	Hamburger on bun Grilled ham and cheese Fish nuggets with biscuit	2. Determine average nutrient content of available entrees.
Fruit/Vegetable	Orange juice Canned pears Fresh apple	3. Determine average nutrient content of available fruit choices.
	Lettuce salad French fries	4. Determine average nutrient content of available vegetable choices.
		5. Add values determined in steps 1 through 4 to compute nutrient content of average meal as offered.

¹An alternative to use of the average of all available choices would have been to use the nutrient content of the food item most frequently selected. This approach was rejected, however, because it would have combined the separate concepts of meals offered and meals selected.

²NSLP meal pattern requirements specify that two fruits and/or vegetables must be included in a pattern meal. The decision to handle fruits and vegetables separately was based on the fact that most meals were actually offered to students this way, i.e., meals were most often merchandised so that fruits and vegetables were offered separately and students were encouraged to take one fruit and one vegetable. In the rare situations where either only fruits or only vegetables were offered, the average of all available options was determined, and this value was factored in to the total twice.

- * Situation 3: Students can select a meal from multiple, discrete serving areas (e.g., salad bar, hot lunch line, sandwich/deli bar). Prior to data collection, an agreement was reached by project staff at AAI and FNS that data collection logistics would not allow one observer to observe students selecting foods (and then track trays for measurement of plate waste) in more than one serving area on any given day. It was therefore decided that in these situations observations of the various types of meal service would be spread across the week, giving emphasis to the line(s) that the food service director indicated were most heavily used by students purchasing or receiving NSLP meals. Descriptions of foods offered on each day were therefore linked to the specific line being observed each day. While only one type of meal was observed each day, when these daily observations were averaged over the five day period, it created a reasonable representation of the average meal offered.

Exhibit VII.3 illustrates how daily meal observation data were combined across the five days of observation to determine the nutrient content of the average NSLP meal as offered in each school. As shown, the nutrient content of the average NSLP meal offered on each day in each school was first determined, using the approaches outlined above. The five daily "average meals" were then aggregated within each school to determine the nutrient content of the average NSLP meal offered in each school.

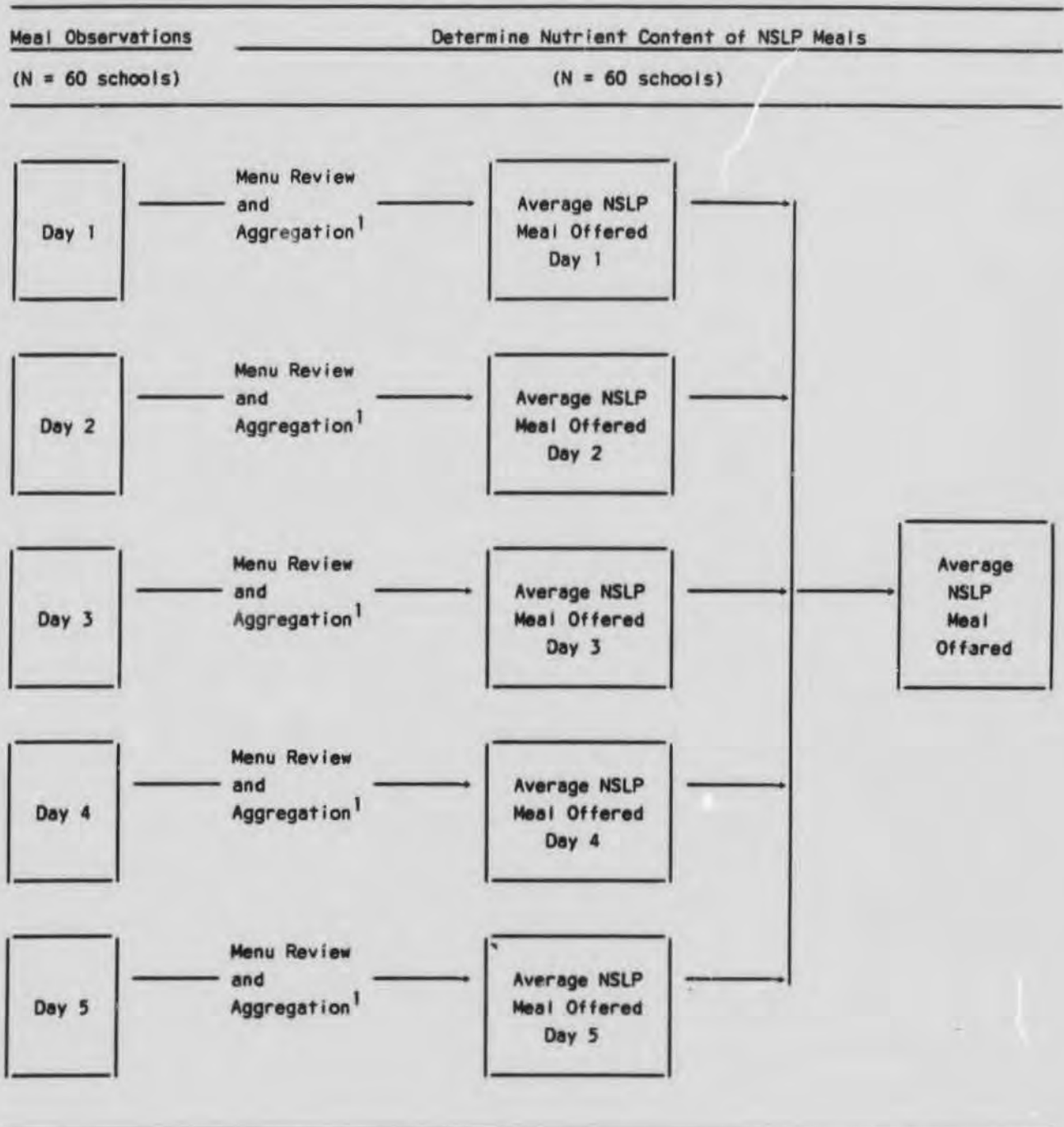
Meals Selected. To obtain data on which foods children select for inclusion in an NSLP meal, field staff observed and recorded the foods included in meals selected by up to 60 children each day in each of the 60 sample schools. Because the focus of the study is the NSLP meal, only reimbursable meals were included in the observations. The definition of a reimbursable meal depended on whether or not the school utilized the offer-vs-serve (OVS) option. Thus, children in OVS schools who selected a meal that included fewer than 3 of the 5 required items were not included in the observations.^{1/}

Exhibit VII.4 illustrates the process used to determine the nutrient content of the average NSLP meal as selected. The nutrient content of the average meal selected in each school on each day of observation was first determined by averaging across all student observations. These daily measures were then averaged across the five days of observation to determine the nutrient content of the average NSLP meal as selected in each school.

^{1/}A la carte items that students may have selected (e.g., chips, desserts, snack foods) were not recorded. Field staff did, however, note whether students took any a la carte items by using a simple check system--a check was recorded if any a la carte items were present on the tray, and left blank if no a la carte items were included.

Exhibit VII.3

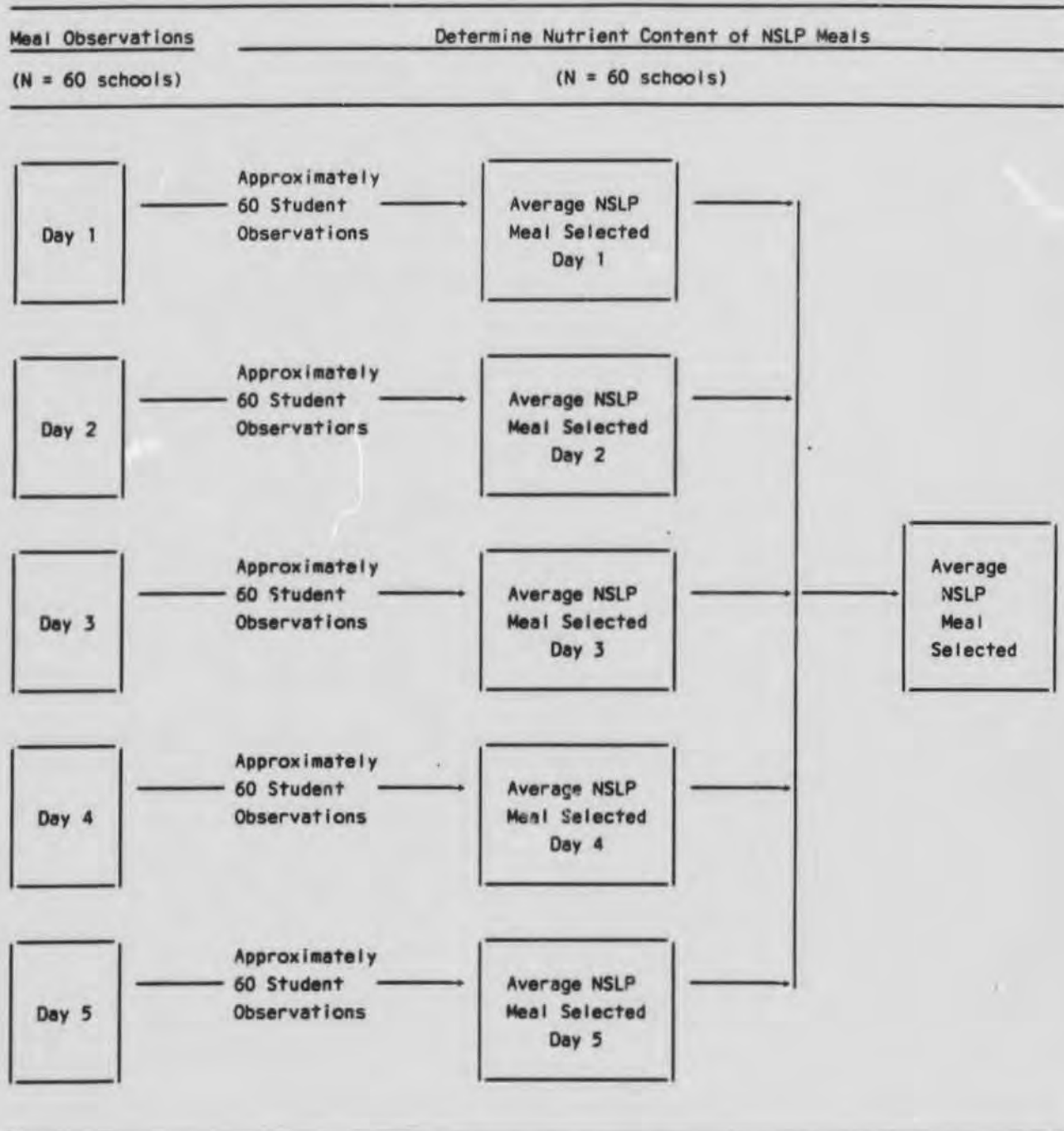
Determination of the Nutrient Content of the Average NSLP Meal Offered



¹See Exhibit VII.2.

Exhibit VII.4

Determination of the Nutrient Content of the Average NSLP Meal Selected



Meals Consumed. On each day of observation, the trays of 12 of the approximately 60 children whose food selection had been observed were examined for plate waste. The amount of each selected food item that was not consumed was visually estimated, as described in Appendix B. The nutrient content of the meal consumed by each of these children was determined by subtracting the nutrients contained in the portions of food that were wasted from the total nutrients contained in the meal selected:

$$\begin{array}{rcl} \text{Nutrients} & & \text{Nutrients} & & \text{Nutrients} \\ \text{in meal} & - & \text{in foods} & = & \text{in meal} \\ \text{selected} & & \text{wasted} & & \text{consumed} \end{array}$$

For each school, the data were averaged across observations to compute daily measures, and then across the five days of observation to compute the nutrient content of the average NSLP meal as consumed (Exhibit VII.5).

Determining Nutrient Content. Data on the specific food items and quantities included in NSLP meals as offered, selected, and consumed were converted into nutrient equivalents using the USDA-Human Nutrition Information Service (USDA-HNIS) Nutrient Data Base for Individual Food Intake Surveys, Version 4 (Survey data base). This data base has been used in many national nutrition surveys, including the 1977-78 and 1987 Nationwide Food Consumption Surveys, the 1985 Continuing Survey of Food Intakes by Individuals, and the most recent National Health and Nutrition Examination Surveys (Hispanic HANES, and NHANES III). It contains nutrient information on over 5,000 individual food items.

The Survey Data Base includes data on over 30 nutrients. The specific nutrients examined in this study, identified jointly by FNS and AAI, include:

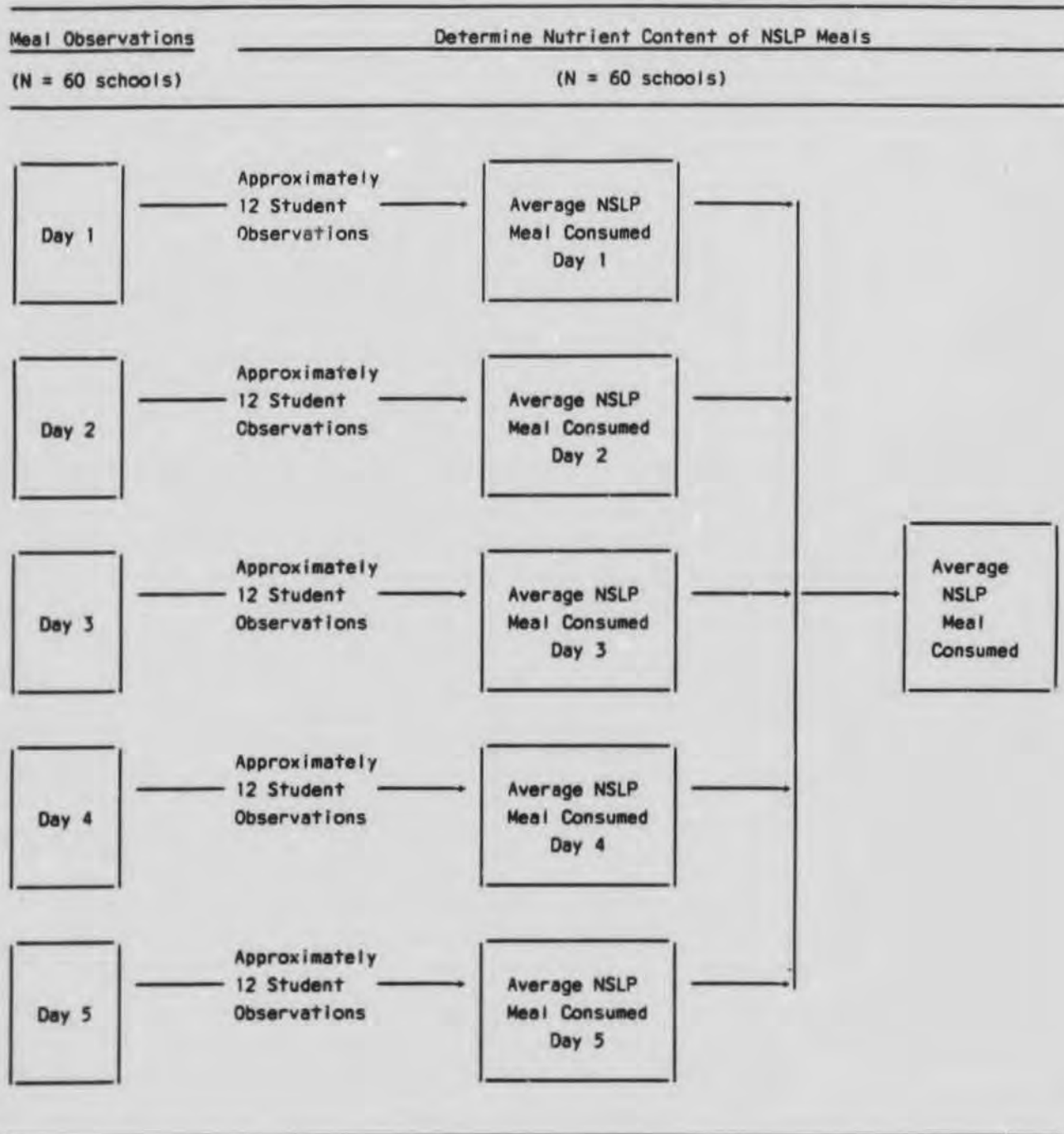
- | | |
|---------------------------|-------------------------------|
| • Total energy (calories) | • Thiamin (mg) |
| • Protein (gm) | • Riboflavin (mg) |
| • Total Fat (gm) | • Niacin (mg N.E.) |
| • Saturated Fat (gm) | • Vitamin B ₆ (mg) |
| • Cholesterol (mg) | • Calcium (mg) |
| • Total Carbohydrate (gm) | • Phosphorus (mg) |
| • Vitamin A (mcg RE) | • Magnesium (mg) |
| • Vitamin C (mg) | • Iron (mg) |
| | • Sodium (mg) |

This list includes nutrients traditionally examined in studies of school nutrition programs (including NESNP-I),^{1/} nutrients

^{1/}Wellisch, J.B., S.D. Hanes, L.A. Jordan, K. M. Maurer, and J.A. Vermeersch. The National Evaluation of School Nutrition Programs: Final Report. Santa Monica, CA: Systems Development Corporation, 1983.

Exhibit VII.5

Determination of the Nutrient Content of the Average NSLP Meal Consumed



that past research has demonstrated may be low in the school-age population in general or in particular subgroups, as well as the nutrients that are of greatest concern in the current U.S. diet, e.g., fats, cholesterol and sodium.

In creating analytic files for the nutrient analysis, each individual food item was linked to an appropriate item in the nutrient data base through use of a seven-digit code. The nutrient content of each serving of food, as offered, selected or consumed, was then computed using the observed portion size.

For items prepared "from scratch," nutrient content was determined by separately coding and analyzing detailed recipes that were collected in each school. The Recipe Analysis Program (RAP), a micro-computer-based software package developed jointly by USDA-HNIS and the University of Texas Health Science Center, School of Public Health, and based on the Survey Data Base, was utilized for these specialized analyses.

Comparing Nutrient Content to Recommended Standards. Once the nutrient content of the average NSLP meal was determined at all three levels (offered, selected and consumed), three different measures were computed to assess overall nutritional adequacy and quality. These included: percent contribution to Recommended Dietary Allowances (RDAs), indices of nutritional quality (INQs), and comparison to the Dietary Guidelines for Americans. Each is described below.

Percent Contribution to Recommended Dietary Allowances (RDAs). The RDAs are the accepted standard for determining the relative adequacy of mean nutrient intakes of population groups. As mentioned previously, regulations state that NSLP meals should, over time, provide approximately one-third of childrens' daily nutrient needs.

The most recent (1989) Recommended Dietary Allowances (see Appendix F) were used as reference standards. The proportion of the RDA provided in NSLP meals was evaluated for those nutrients that have established RDAs: protein, vitamin A, vitamin C, thiamin, riboflavin, niacin, vitamin B₆, calcium, phosphorus, magnesium and iron. Total energy content (calories) was also evaluated.

The nutrient content of the average NSLP meal as offered, selected and consumed was examined separately for elementary and middle/secondary schools. The average NSLP meal in each type of school was compared to appropriate age- and sex-group RDA values.^{1/} Thus, the nutrient content of the average NSLP meal

^{1/}The RDAs define separate, and frequently different, nutrient needs for 4-6 year olds, 7-10 year olds, 11-14 year old males, 11-14 year old females, 15-18 year old males and 15-18 year old females.

in elementary schools was compared to the RDAs for 4-6 year olds (grades K-1), 7-10 year olds (grades 1-5), 11-14 year old males and 11-14 year old females (grades 5, 6 and 7). Meals in middle/secondary schools were compared to RDAs for 11-14 year old males and 11-14 year old females (grades 7-9), and 15-18 year old males and 15-18 year old females (grades 10-12). The results of these analyses are interpreted in light of the stated program goal of providing approximately one-third of the RDAs for children in each age/grade group.

An important caveat must be made for interpretation of the results of these RDA comparisons for NSLP meals as selected and consumed. The data from this study describe meals consumed by "average students" as opposed to students whose age and sex are specifically known. It is not possible, therefore, to identify with certainty specific groups of students who may be selecting or consuming meals that provide less than one-third of the RDA for a given nutrient. This issue is discussed further in the section that reports findings from the meals selected analysis.

Indices of Nutritional Quality (INQs). The INQ was used to measure the nutrient density or nutritional quality of the average NSLP meal. The INQ measures the nutrient contribution of a meal relative to its caloric content.^{1/} The degree to which nutrients and calories are balanced provides a useful measure of the overall quality of NSLP meals.

An INQ was computed for each nutrient within each RDA age/sex group using the following equation:

$$\text{INQ} = \frac{\% \text{ RDA for nutrient in average NSLP meal}}{\% \text{ RDA for total calories in average NSLP meal.}}$$

An INQ of 1.0 or greater indicates that the meal is high in nutritional quality, i.e., calories and nutrients are optimally balanced. INQs of less than 1.0 indicate that the RDA for the nutrient of interest would not be met unless the RDA for calories was exceeded. INQ scores provide additional insight into how RDA standards are met, i.e., whether the total nutrient content of the average meal is influenced more by the total quantity or nutritional quality of foods included.

Dietary Guidelines for Americans. Several important aspects of nutritional quality are not addressed in the RDA standards. Specifically, the RDAs do not address fat (both quantity and type), cholesterol and sodium content. The excess consumption of these dietary constituents, which is characteristic of the typical U.S. diet, has been a major focus of public health initiatives in recent years. Approximately one dozen agencies

^{1/}Sorenson, W., Wyse, B., Wittwer, A. and Hansen, R.G. (1976). "An Index of Nutritional Quality for a Balanced Diet." Journal of the American Dietetic Association, 68: 236-242.

have issued dietary recommendations encouraging moderate intake of these nutrients. Prime among these is the Dietary Guidelines for Americans (hereafter referred to as the Dietary Guidelines) issued jointly by USDA and the U.S. Department of Health and Human Services (DHHS). The Dietary Guidelines, originally issued in 1980, were revised in 1985, and were again reissued in October, 1990. Exhibit VII.6 summarizes the most recent recommendations.

Currently, Child Nutrition Programs are not required to address the Dietary Guidelines in planning menus for the NSLP or SBP. However, USDA has encouraged School Nutrition Programs to consider them. The Menu Planning Guide for School Food Service highlights the Dietary Guidelines recommendations and encourages menu planners to keep fat, sugar and salt at a "moderate level."^{1/} The Department has recently identified incorporation of the Dietary Guidelines principles as a goal that school districts should be striving to meet by the year 2000.

In this report, the Dietary Guidelines are used as reference standards for evaluating the percent of calories from total fat and saturated fat in NSLP meals. The Dietary Guidelines do not include specific recommendations for sodium or cholesterol intake. The National Research Council (NRC) recommends that adults and children limit salt intake to 6 grams per day (equivalent to 2400 mg. of sodium), and dietary cholesterol intake to less than 300 mg. per day.^{2/} The NRC guidelines for sodium and cholesterol intake are not endorsed by USDA, but are presented in this report as reference points to assist the reader in interpreting the data.

Food-Level Analysis

Unit of Analysis. The primary objective of the food-level analysis is to provide FNS with up-to-date information on the types of food offered to, selected by, and consumed by children participating in the NSLP. In order to obtain this information it is necessary to focus not on the 5-day "average" NSLP meal used in the nutrient content analysis, but on each of the specific meals offered and, in the case of data on food selection and consumption, on each of the individual student-level observations.

^{1/}Menu Planning Guide for School Food Service. U.S. Department of Agriculture, Food and Nutrition Service, 1983.

^{2/}National Research Council, Food and Nutrition Board, Committee on Diet and Health. Diet and Health. Washington, D.C.: National Academy Press, 1989.

Exhibit VII.6

Dietary Guidelines for Americans¹

-
- Eat a variety of foods
 - Maintain healthy weight
 - Choose a diet low in fat, saturated fat, and cholesterol

GOALS:

fat - 30 percent or less of calories

saturated fat - less than 10 percent of calories

- Choose a diet with plenty of vegetables, fruits and grain products

GOALS:

vegetables - 3 or more servings

fruits - 2 or more servings

grains - 6 or more servings

- Use sugar only in moderation
 - Use salt and sodium only in moderation
 - If you drink alcoholic beverages, do so in moderation
-

¹Issued by the U.S. Departments of Agriculture and Health and Human Services, 1990.

Thus, for research questions related to foods included in NSLP meals as offered, the unit of analysis is the NSLP meal offered in each school on each day of observation (n=297).^{1/} For research issues related to food selection decisions and food consumption patterns, the unit of analysis is the NSLP meal as selected or consumed by each of the students observed.^{2/}

Data Aggregation. The meal observation data base includes approximately 1,400 unique food items, far too many for meaningful analysis. Consequently, a taxonomy was developed that aggregated food items into 6 major categories (based on the major NSLP meal component categories), 14 subgroups, and 101 specific types of food. The major categories and subgroups are listed in Exhibit VII.7. The complete taxonomy is provided in Exhibit ET-VII.1.

**General
Analytic
Approach**

Analysis of both the nutrient content and foodlevel data employs simple descriptive statistics, i.e., means, proportions, frequency distributions and the like. Statistics are calculated and presented separately for each of the three types of NSLP meals--offered, selected and consumed. Data are also stratified by school type (elementary and middle/secondary) and, in some cases, by SFA type (exemplary and typical).

T-tests or chi-square tests have been performed to test the statistical significance of selected differences between SFAs (exemplary and typical) and schools (elementary and middle/secondary). T-tests have also been used to evaluate the significance of differences in nutrient content between meals offered and meals selected, and between meals selected and meals consumed. Because of the large number of t-tests calculated in this analysis, discussions are limited to variables that exhibit a difference that is statistically significant at the .01 level rather than the more liberal .05 level. This approach compensates for the possibility of finding large numbers of comparisons significant by chance alone.

The decision to conduct significance tests at the .01 rather than the .05 level of significance was a compromise decision which offers the advantages of being more conservative than the

^{1/}Lunch was observed for 5 consecutive days in 60 schools, for a total of 300 meals offered. During analysis, three of these meals were excluded because of poor data quality, yielding 297 meals offered.

^{2/}On each day of observation, food selection was observed for approximately 60 children, and plate waste (food consumption) was observed for approximately 12 children. A total of 16,571 student meals were available for inclusion in the meals selected analysis; 3,470 student meals were included in the meals consumed analysis.

Exhibit VII.7

Major Categories and Subgroups in Food Group Taxonomy¹

Major Categories	Subgroups
Milk	None
Fruit	Fresh Fruit Canned Fruit Fruit Juice Dried Fruit Other
Vegetables ²	Raw Vegetables Cooked Vegetables Potatoes Beans, Legumes Soups
Breads/Bread Alternates ³	None
Entrees	Meat, Poultry or Fish ⁴ Meat and Bread Combinations - Sandwiches and burgers - Other Meat, Bread, Vegetable Combinations Meat, Vegetable Combinations
Desserts ⁵	None

¹Complete taxonomy listed in Exhibit ET-VII.1.

²Includes vegetables offered as a separate item, i.e., not included in combination items such as chef salad, tacos, taco salad, etc.

³Includes breads/bread alternates offered as a separate item, i.e., not included in combination items such as sandwiches, burgers, pizza, pasta dishes, etc.

⁴Meat, poultry, fish offered separately, i.e., not in combination items.

⁵Includes only desserts that were considered part of the reimbursable meal (i.e., not a la carte desserts) but did not contribute to satisfying any of the NSLP meal pattern requirements.

.05 level and being simple to understand and interpret. An alternative, and technically more appropriate, approach would be to apply Bonferroni's inequality, which requires no assumption of independence to establish the significance level for each set of estimates. If k estimates are tested simultaneously, the overall significance level of .05 can be preserved by testing each of the k estimates at the $.05/k$ level. In this way, the probability of getting one or more significant outcomes by chance alone can be no greater than .05.

For many of the nutrient content comparisons, 17 estimates are tested simultaneously, implying that an individual significance level of $.05/17$ ($= .003$) should be applied to each comparison. Because the 17 nutrients being examined are correlated, it is possible to adjust Bonferroni's inequality such that the individual tests for mean differences could reliably be done using a significance level of $.05/12$ ($= .004$) rather than $.05/17$ ($= .003$). However, either of these approaches has the disadvantage of being difficult for the average reader to understand, and leaves open the possibility of being more conservative than is necessary in a study which is basically exploratory in nature. This study is less concerned with testing specific hypotheses than with describing characteristics of the Child Nutrition Programs. Therefore, for the purposes of this study it was decided that use of the .01 significance level is acceptable given that it is reasonably conservative, is readily understandable, and will not result in ignoring findings which are of interest to FNS.

NSLP MEALS OFFERED

This section presents data on the food and nutrient composition of the average NSLP meal offered in elementary and middle/secondary schools in SY 1989-90.^{1/} First, the overall nutritional adequacy of the average meal offered in each type of school is evaluated in light of age- and sex-appropriate RDA standards and the program goal of providing approximately one-third of the RDA. Second, INQ scores are examined. Third, the content of the average NSLP meal offered is compared to the Dietary Guidelines recommendations. Finally, food-level analyses are presented and findings related to the types of food offered in NSLP meals are discussed.

Nutrient Content

As Exhibit VII.8 indicates, the average NSLP meal offered in middle/secondary schools in SY 1989-90 included more calories and more of all nutrients than the average NSLP meal offered in elementary schools. Differences are statistically significant

^{1/}For reasons that will be explained later in this chapter, data for exemplary and typical SFAs have been pooled for all analyses.

Exhibit VII.8

Mean Calorie and Nutrient Content
of the Average NSLP Meal Offered
in Elementary and Middle/Secondary Schools
(SY 1989-90)

	Elementary (n=40)	Middle/Secondary (n=20)	All Schools (n=60)
Calories	721*	808	750
Protein (gm)	30*	34	31
Total Fat (gm)	31	34	32
Saturated Fat (gm)	12	14	12
Cholesterol (mg)	84	99	89
Total Carbohydrate (gm)	84	94	87
Vitamin A (mcg R.E.)	324	369	339
Vitamin C (mg)	25*	36	28
Thiamin (mg)	.49*	.56	.51
Riboflavin (mg)	.76*	.86	.80
Niacin (mg N.E.)	6.09	6.77	6.32
Vitamin B ₆ (mg)	.47*	.54	.49
Calcium (mg)	476*	538	497
Phosphorus (mg)	561*	627	583
Magnesium (mg)	97	106	100
Iron (mg)	4.14*	4.79	4.36
Sodium (mg)	1,102*	1,341	1,182

*Difference between elementary and middle/secondary schools is statistically significant at the .01 level.

Data Source: On-Site Meal Observations.

for all nutrients except fat (total and saturated), carbohydrate, cholesterol, vitamin A, niacin and magnesium. These results are not surprising given that the NSLP meal pattern suggests use of increased food portions for older children in recognition of their increased nutrient needs (see Exhibit VII.1).

Percent
Contribution
to RDAs

When compared to the RDAs for the groups of children that typically attend each type of school, the average NSLP meal offered in both elementary and middle/secondary schools provided the program goal of approximately one-third of the RDA in almost all cases.^{1/} The average lunch offered in elementary schools supplied one-third or more of the RDA for all nutrients for 4-6 year olds and 7-10 year olds (Exhibit VII.9). It also supplied approximately one-third or more of the RDAs for older students with the following exceptions:

- calories (29 percent) and vitamin B₆ (28 percent) for 11-14 year old males; and
- iron (28 percent) for 11-14 year old females.

It is important to point out that these data are based on the average portions of food offered in each of the schools observed. (Portions were weighed as part of the observation protocol.) Program guidelines encourage schools to provide larger portions or additional servings to older students whose nutritional needs are greater. The importance of this policy is reinforced by the finding that the only nutrient shortfalls in the average meal offered occur for older students.

The average NSLP lunch offered in middle/secondary schools met the program goal of providing approximately one-third of the RDA for most nutrients for the appropriate age and sex groups (Exhibit VII.10). The only appreciable exceptions were:

- calories (27 percent), vitamin B₆ (27 percent), and magnesium (26 percent) for 15-18 year old males.

As will be seen later in this chapter, the average meal offered in middle/secondary schools includes larger food portions than the average meal offered in elementary schools, in keeping with program recommendations. Yet, potential nutrient shortfalls of the average meal offered were again noted for the oldest students in the school. This finding suggests that schools need to be conscious of the differential needs of the student populations they serve, and maintain adequate flexibility when serving meals so that older students can indeed receive the

^{1/}Any nutrient supplied at 32 percent or more of the RDA was judged to meet the goal of providing approximately 33 percent of the RDA.

Exhibit VII.9

Percentage of Recommended Dietary Allowances Provided in
the Average NSLP Meal Offered in Elementary Schools
(SY 1989-90)

	Nutrients In Meal Offered	Students 4-6 years		Students 7-10 years		Male Students 11-14 years		Female Students 11-14 years	
		One-Third Daily RDA	Percent Daily RDA	One-Third Daily RDA	Percent Daily RDA	One-Third Daily RDA	Percent Daily RDA	One-Third Daily RDA	Percent Daily RDA
Calories	721	600	40%	667	36%	833	29%	733	33%
Protein (gm)	30	8	125	9	108	15	67	15	65
Vitamin A (mcg R.E.)	324	167	65	233	46	333	32	267	40
Vitamin C (mg)	25	15	55	15	55	17	49	17	49
Thiamin (mg)	.49	.30	54	.33	49	.43	37	.36	44
Riboflavin (mg)	.76	.37	69	.40	63	.50	51	.43	59
Niacin (mg N.E.)	6.09	4.00	51	4.33	47	5.67	36	5.00	41
Vitamin B ₆ (mg)	.47	.37	43	.47	34	.57	28	.47	34
Calcium (mg)	476	267	60	267	60	400	40	400	40
Phosphorus (mg)	561	267	70	267	70	400	47	400	47
Magnesium (mg)	97	40	81	57	57	90	36	93	35
Iron (mg)	4.14	3.33	41	3.33	41	4.00	34	5.00	28

NOTE: NSLP goal is to provide approximately one-third of the RDA for all age groups.

Data Source: On-Site Meal Observations.

Exhibit VII.10

Percentage of Recommended Dietary Allowances Provided in
the Average NSLP Meal Offered in Middle/Secondary Schools
(SY 1989-90)

	Nutrients In Meal Offered	Male Students 11-14 years		Female Students 11-14 years		Male Students 15-18 years		Female Students 15-18 years	
		One-Third Daily RDA	Percent Daily RDA	One-Third Daily RDA	Percent Daily RDA	One-Third Daily RDA	Percent Daily RDA	One-Third Daily RDA	Percent Daily RDA
Calories	808	833	32%	733	37%	1000	27%	733	37%
Protein (gm)	34	15	76	15	74	20	58	15	78
Vitamin A (mcg R.E.)	369	333	37	267	46	333	37	267	46
146 Vitamin C (mg)	36	17	71	17	71	20	59	20	59
Thiamin (mg)	.56	.43	43	.37	51	.50	37	.37	51
Riboflavin (mg)	.86	.50	58	.43	66	.60	48	.43	66
Niacin (mg N.E.)	6.77	5.66	40	5.00	45	6.67	34	5.00	45
Vitamin B ₆ (mg)	.54	.57	32	.47	38	.67	27	.50	36
Calcium (mg)	538	400	45	400	45	400	45	400	45
Phosphorus (mg)	627	400	52	400	52	400	52	400	52
Magnesium (mg)	106	90	39	93	38	133	26	100	35
Iron (mg)	4.79	4.00	40	5.00	32	4.00	40	5.00	32

NOTE: NSLP goal is to provide approximately one-third of the RDA for all age groups.

Data Source: On-Site Meal Observations.

additional food they need to meet the program goal of approximately one-third of the RDA.

Indices of
Nutritional
Quality (INQs)

Exhibits VII.11 and VII.12 present INQs for the average meal offered in elementary and middle/secondary schools, respectively. INQ scores for the average meals offered in both types of schools met or exceeded 1.0 for almost all nutrients examined. This finding demonstrates that, overall, NSLP meals planned in accordance with program meal component guidelines were high in nutritional quality and balanced across a number of key nutrients.

The average lunch offered in elementary schools provided more calories than needed by the youngest students (40 percent and 36 percent of the RDA for 4-6 year olds and 7-10 year olds, respectively) and fewer calories than needed by the oldest male students (29 percent of the RDA.) (See Exhibit VII.9). The mix of foods, however, was well-selected and nutrient dense. The data suggest that the portions of food actually served to students could be adjusted slightly to meet their differing caloric needs, and both groups would still receive one-third of the RDA for most nutrients examined in this study. The only exceptions are vitamin B₆ for 7-10 year olds and 11-14 year old males, and iron for 11-14 year-old females. The low iron density of the average NSLP meal relative to the iron requirement for 11-14 year-old females was the most significant shortfall. The INQ score of 0.85 indicates that the target RDA for iron could not be met for this group of students with the average NSLP meal offered in elementary schools unless the RDA for calories was exceeded.

The average lunch offered in middle/secondary schools provided slightly less calories than needed by male students and more calories than needed by female students (see Exhibit VII.10). The foods offered, however, were high enough in nutrient density that portions for each group of students could be adjusted slightly to better meet caloric needs without compromising total nutrient intake. The average lunch offered was somewhat low in nutrient density for vitamin B₆, magnesium and iron for some student groups (see Exhibit VII.12). Again, the most significant shortfall was iron density for female students. The INQ scores of 0.86 indicate that the average NSLP meal offered in middle/secondary schools met the RDA target for iron for these students (see Exhibit VII.10) only because it exceeded the RDA for calories.

Comparison to
Dietary
Guidelines
for Americans

Exhibit VII.13 summarizes the mean proportion of calories provided by fat (both total fat and saturated fat), carbohydrate, and protein, as well as the mean cholesterol and sodium content of the average NSLP meal offered in elementary and middle/secondary schools.

Exhibit VII.11

Indices of Nutritional Quality (INQs) for the
Average NSLP Meal Offered in Elementary Schools
(SY 1989-90)

	INQs for Students 4-6 Years	INQs for Students 7-10 Years	INQs for Male Students 11-14 Years	INQs for Female Students 11-14 Years
Protein (gm)	3.12	3.00	2.31	1.97
Vitamin A (mcg R.E.)	1.62	1.28	1.10	1.21
Vitamin C (mg)	1.38	1.53	1.69	1.48
Thiamin (mg)	1.35	1.36	1.28	1.33
Riboflavin (mg)	1.72	1.75	1.76	1.79
Niacin (mg N.E.)	1.28	1.31	1.24	1.24
Vitamin B ₆ (mg)	1.08	0.94	0.97	1.03
Calcium (mg)	1.50	1.67	1.38	1.21
Phosphorus (mg)	1.75	1.94	1.62	1.42
Magnesium (mg)	2.02	1.58	1.34	1.06
Iron (mg)	1.02	1.14	1.17	0.85

NOTE: An INQ of 1.0 or more indicates that the meal is of high nutritional quality. INQs below 1.0 indicate that the meal will not provide 100% of the target level RDA (one-third) unless the target RDA for calories is exceeded.

Data Source: On-Site Meal Observations.

Exhibit VII.12

Indices of Nutritional Quality (INQs) for
the Average NSLP Meal Offered in Middle/Secondary Schools
(SY 1989-90)

	INQs for Male Students 11-14 Years	INQs for Female Students 11-14 Years	INQs for Male Students 15-18 Years	INQs for Female Students 15-18 Years
Protein (gm)	2.38	2.00	2.14	2.11
Vitamin A (mcg R.E.)	1.16	1.24	1.37	1.24
Vitamin C (mg)	2.22	1.92	2.19	1.59
Thiamin (mg)	1.34	1.38	1.37	1.38
Riboflavin (mg)	1.81	1.78	1.78	1.78
Niacin (mg N.E.)	1.25	1.22	1.26	1.22
Vitamin B ₆ (mg)	1.00	1.03	1.00	0.97
Calcium (mg)	1.41	1.22	1.67	1.22
Phosphorus (mg)	1.63	1.41	1.93	1.41
Magnesium (mg)	1.22	1.03	0.96	0.95
Iron (mg)	1.25	0.86	1.48	0.86

NOTE: An INQ of 1.0 or more indicates that the meal is of high nutritional quality. INQs below 1.0 indicate that the meal will not provide 100% of the target level RDA (one-third) unless the target RDA for calories is exceeded.

Data Source: On-Site Meal Observations.

Exhibit VII.13

Macronutrient, Cholesterol and Sodium Content of the Average
NSLP Meal Offered in Elementary and Middle/Secondary Schools
Compared to the Dietary Guidelines for Americans
(SY 1989-90)

	USDA/DHHS Dietary Guidelines for Americans	Elementary (n=40)	Middle/ Secondary (n=20)	All Schools (n=60)
Percent Calories from Fat	≤ 30.0	38.4	38.0	38.2
Percent Calories from Saturated Fat	< 10.0	14.8	15.0	14.9
Percent Calories from Carbohydrate	55.0-65.0 ¹	46.4	46.4	46.4
Percent Calories from Protein	5.0-15.0 ¹	16.8	17.0	16.9
Mean Cholesterol (mg)	n.q. ²	84	99	89
Mean Sodium (mg)	n.q. ²	1,102*	1,341	1,182

¹The USDA/DHHS Dietary Guidelines do not provide specific recommendations for the proportion of calories from carbohydrates and protein. RDAs for protein for school age children range from 5 to 8 percent of total calories. In general the average protein intake considerably exceeds the RDA. The National Research Council (NRC) report Diet and Health recommends maintaining total protein at levels lower than twice the RDA for all age groups and that the intake of carbohydrates be more than 55% of total calories. To achieve the recommended levels of calories from fat, carbohydrate and protein content would need to be in these ranges.

²Not quantified. There is no established Recommended Dietary Allowance or Estimated Safe and Adequate Intake for cholesterol or sodium. The Dietary Guidelines for Americans recommend choosing a diet low in cholesterol and use of salt and sodium only in moderation. The National Research Council (NRC) report Diet and Health recommends that adults and children limit salt intake to 6 grams per day, equal to 2400 mg. of sodium, and dietary cholesterol intake to less than 300 mg. per day.

*Difference between elementary and middle/secondary schools is statistically significant at the .01 level.

Data Source: On-Site Meal Observations.

As the exhibit illustrates, in SY 1989-90, the mean proportion of calories from total fat and saturated fat in the average NSLP meal offered in both elementary and middle/secondary schools exceeded the Dietary Guidelines recommendations. In both elementary and middle/secondary schools, the average NSLP meal as offered derived 38 percent of its calories from fat and about 15 percent of its calories from saturated fat. The Dietary Guidelines recommend levels of 30 percent (or less) and less than 10 percent, respectively.

The mean sodium content of NSLP meals offered in elementary schools was approximately 1100 mg., and the mean for middle/secondary schools was 1341 mg. These values are high in comparison to recommendations from the National Research Council's Diet and Health report.^{1/} The cholesterol content of the average meal offered in both schools compared favorably with NRC recommendations.

Frequency distributions of the fat, cholesterol and sodium content of the average meals offered in the individual schools are presented in Exhibit VII.14. Only two percent of elementary schools and five percent of middle/secondary schools offered meals whose fat content was within the range recommended by the Dietary Guidelines. In this sample, the average NSLP meal offered in 35 percent of the schools provided more than 40 percent of its calories from fat. This occurred most often in elementary schools, where 43 percent of the average NSLP meals had fat contents in this range.

None of the schools examined in this study offered lunches that, on average, provided 800 mg. of sodium or less.^{2/} Sodium content was highest in middle/secondary schools, where the average NSLP meal served in 85 percent of the schools contained more than 1200 mg. of sodium. In contrast, the average NSLP meal offered in 70 percent of the elementary schools contained less than 1200 (but more than 800) mg. of sodium.

Food Level Analysis

Three issues are of interest in examining the specific foods offered in NSLP meals:

- * How much choice is available to students, i.e., how often are they offered more than one choice within a major meal component category?

^{1/}The NRC guidelines are not endorsed by USDA. They are presented in this report solely as reference points to assist the reader in interpreting the data.

^{2/}800 mg. is equivalent to one-third of the NRC recommended daily maximum of 2400 mg. sodium.

Exhibit VII.14

Frequency Distribution of the Level of Fat, Cholesterol, and Sodium Provided in the Average NSLP Meal Offered In Elementary and Middle/Secondary Schools (SY 1989-90)

	Percent of Schools		
	Elementary (n=40)	Middle/ Secondary (n=20)	All Schools (n=60)
<u>Percent Calories from Fat</u>			
< 30 percent (D.G. Goal) ¹	2%	5%	3%
31-35 percent	25	20	23
36-38 percent	22	30	25
39-40 percent	8	25	13
> 40 percent	43	20	35
<u>Percent Calories from Saturated Fat</u>			
< 10 percent (D.G. Goal) ¹	0	0	0
11-13 percent	32	20	28
14-16 percent	45	60	50
> 17 percent	22	20	22
<u>Cholesterol (mg)²</u>			
< 75 mg	35	10	27
76-100 mg	43	55	47
101-150 mg	22	30	25
151-200 mg	0	5	2
<u>Sodium (mg)^{2,*}</u>			
< 800 mg	0	0	0
801-1,000 mg	30	5	22
1,001-1,200 mg	40	10	30
1,201-1,500 mg	27	65	40
> 1,500 mg	2	20	8

¹Level of intake recommended in the USDA/DHHS Dietary Guidelines for Americans.

²The Dietary Guidelines for Americans recommend choosing a diet low in cholesterol and use of salt and sodium only in moderation. The National Research Council (NRC) report Diet and Health recommends that adults and children limit salt intake to 6 grams per day (equal to 2400 mg. of sodium) and dietary cholesterol intake to less than 300 mg. per day.

*Chi-square test of differences between elementary and middle/secondary schools is statistically significant at the .01 level.

Data Source: On-Site Meal Observations.

- What specific foods are being offered to students in the NSLP?
- Are there differences between elementary and middle/secondary schools in the number, type or amount of foods offered?

Each of these issues is addressed, in turn, in the following sections.

Availability of Choices Within Meal Component Categories.

Exhibit VII.15 summarizes the number of options offered, within meal component category, in meals observed in the selected elementary and middle/secondary schools. As the exhibit illustrates, in SY 1989-90 middle/secondary schools offered a significantly greater number of choices for all meal component categories, except bread/bread alternates and desserts, than elementary schools. At both levels, students had the greatest number of options when it came to choosing milk. Only five percent of the meals offered in elementary schools and none of the meals offered in middle/secondary schools limited the availability of milk to one particular type. Most of the meals offered three or more kinds of milk (66 percent of meals in elementary schools and 81 percent of meals in middle/secondary schools).

Most schools also offered students a choice of fruits or juices. Fifty-four percent of the meals offered in elementary schools included two or more types of fruit or juice, as did 73 percent of the meals offered in middle/secondary schools. Over one-third of the meals offered in elementary schools and one-quarter of those offered in middle/secondary schools, however, included only one type of fruit or juice.^{1/}

Students tended to have fewer options in choosing vegetables. Forty-eight percent of the meals offered in elementary schools and 35 percent of middle/secondary school meals either offered vegetables only as part of a combination item, i.e., pasta with sauce, salad bars, chef salad, etc, or offered only one vegetable choice.

Of all the major meal components, students had the fewest options when it came to selecting a main entree. This is particularly true for elementary schools, where fifty percent of the meals offered included only one entree. In middle/secondary schools, on the other hand, only 29 percent of the meals were limited to one entree. Thirty-one percent of meals offered in these schools offered two entrees, 10 percent offered three entrees, and 29 percent included four or more entrees.

^{1/} Students in these schools may still have had some choice in selecting an NSLP meal, since a fully compliant meal can include two vegetables rather than a fruit and a vegetable.

Number of Options Available Within Meal Component Categories
In Lunches Offered in Elementary and Middle/Secondary Schools
(SY 1989-90)

Meal Component Category/ Number of Options	Percent of NSLP Meals Offered		
	Elementary (n=198)	Middle/ Secondary (n=99)	All Schools (n=297)
<u>Milk*</u>			
1 option only	5%	0%	3%
2 options	29	18	26
3 options	40	46	42
4 or more options	26	35	29
<u>Fruit*</u>			
None offered	7	6%	6
1 option only	39	20	33
2 options	25	17	23
3 options	15	23	18
4 or more options	14	33	20
<u>Vegetables*</u>			
1 option only	39	21	33
2 options	33	25	31
3 options	14	25	18
4 or more options	5	14	8
Combination items only ¹	9	14	11
<u>Entrees*</u>			
1 option only	50	29	42
2 options	36	31	35
3 options	10	10	10
4 options	1	11	4
5 or more options	3	18	8
<u>Bread/Bread Alternates</u>			
1 option only	43	49	45
2 or more options	6	12	8
Combination items only ²	51	38	47
<u>Desserts³</u>			
None offered	69	71	69
1 option only	27	23	26
2 or more options	4	6	5

¹No separate vegetable selections were offered. All vegetable options were part of a combination entree item such as chef salad, pasta with tomato sauce, tacos, etc.

²No separate breads/bread alternate selections were offered. All bread/bread alternate options were part of a combination entree item such as a sandwich or pizza.

³Includes only desserts that were considered part of a reimbursable NSLP meal. A la carte desserts are not included.

*Chi-square test of difference between elementary and middle/secondary schools is statistically significant at the .01 level.

Across all schools, almost one-half of the meals did not include a separate bread or bread alternate offering. This finding is not as surprising as it may seem, since the majority of entrees offered were combination items that included a bread/bread alternate component -- like hamburgers (the bun), sandwiches (the bread) and pizza (the crust) (See discussion below, and Exhibit VII.16.)

Finally, dessert items that do not contribute to meeting the meal pattern requirement were included in reimbursable meals only about 31 percent of the time. When dessert was offered, it was generally limited to one item.

Specific Food Items Offered. Exhibit VII.16 summarizes data on the specific food items offered in the 297 NSLP meals observed in SY 1989-90. Estimates for elementary and middle/secondary schools were compared, and significant differences between the two types of schools are identified.

The types of milk offered most frequently in both elementary and middle/secondary schools were, in descending order, low-fat (unflavored) milk, flavored milk, and whole milk. Skim milk was offered in only 32 percent of the elementary school meals and 39 percent of the middle/secondary school meals.

A wide variety of fruits were offered to students in both types of schools, with canned fruits offered more often than fresh fruits.^{1/} Dried fruits were offered infrequently. The specific types of fruit offered in elementary and middle/secondary schools were fairly comparable: fresh apples, fresh oranges, canned fruit cocktail and canned applesauce were among the most common choices. Canned pineapple, canned peaches and berries (other than strawberries) were offered more frequently in middle/secondary schools.

The types of vegetables offered were also fairly comparable in both schools. Raw vegetables, i.e., salads or sliced raw vegetables, were offered more frequently than any other type of vegetable, particularly in middle/secondary schools. A significantly larger proportion of meals in middle/secondary schools offered raw vegetables, and lettuce salads in particular, than elementary school meals. Potatoes, usually french fries and tater tots, were also offered frequently in both elementary and middle/secondary meals. The proportion of meals that offered these items, however, was significantly greater for middle/secondary schools (61 percent vs. 43 percent). Other types of cooked vegetables were offered in 45 percent of elementary school meals and 39 percent of middle/secondary school meals; corn and mixed vegetables were

^{1/}The timing of meal observations (in Mid-March) may have limited the number of SFAs offering fresh fruit.

Exhibit VII.16

Foods Offered in NSLP Meals in Elementary
and Middle/Secondary Schools
(SY 1989-90)

Meal Component/Food Item	Percent of Meals Offering Each Item	
	Elementary Schools (n=198)	Middle/Secondary Schools (n=99)
MILK	100%	100%
Whole Milk	71	83
Lowfat Milk	93	99
Skim Milk	32	39
Flavored Milk	90	96
FRUIT	93	94
FRESH FRUIT	44	49
Apple	23	24
Banana	7	9
Cantaloupe	1	1
Grapefruit	1	0
Grapes	4	1
Orange	21	32
Pear	3	8
Watermelon	1	2
Fruit Salad	1	3
CANNED FRUIT	58	70
Applesauce	18	23
Apricots	2	2
Fruit Cocktail	23	24
Peaches	12*	28
Pears	16	19
Pineapple	9*	23
Plums	1	2
Strawberries	1	0
Other Berries	1*	5
FRUIT JUICE	34	48
DRIED FRUIT	3	7
OTHER FRUIT CHOICES	19	20
Crisps, Cobblers	9	9
Gelatins (made with fruit juice or fruit) Juice Bars, Misc.	11	11

-continued-

Exhibit VII.16
(continued)

Meal Component/Food Item	Percent of Meals Offering Each Item	
	Elementary Schools (n=198)	Middle/Secondary Schools (n=99)
<u>VEGETABLES¹</u>	91%	86%
RAW VEGETABLES	49*	67
Lettuce, Salad	36*	58
Other Raw Vegetables	13	13
Cole Slaw, Miscellaneous Salads	5	8
COOKED VEGETABLES	45	39
Corn	17	13
Green Beans	10	8
Broccoli	6	7
Cabbage	1	2
Peas	5	2
Carrots	1	2
Mixed Vegetables	13	10
Onion Rings	1	2
Spinach, Greens	2	0
Miscellaneous Vegetables	3	3
POTATOES	43*	61
French Fries, Tater Tots, etc.	35*	54
Other Potatoes	9	15
BEANS, LEGUMES	12	6
SOUPS	1*	8
<u>BREADS/BREAD ALTERNATES²</u>	49	62
Bagels	1	0
Biscuits/Croissants	4	3
Bread, Toast	8	10
Cornbread	8	3
Crackers	4*	15
Rolls	18	29
Sweet Buns	2	3
Fruit Muffins/Breads	1	0
Tortillas, Taco Shells	1	0
Rice	7	7
Pasta, Noodles	1	2
Pancakes, Waffles	2	1

-continued-

Exhibit VII.16
(continued)

Meal Component/Food Item	Percent of Meals Offering Each Item	
	Elementary Schools (n=198)	Middle/Secondary Schools (n=99)
ENTREE	100%	100%
MEAT/POULTRY/FISH³	33	35
Beef - Roast, Ribs	1	2
Breaded Fried Steak	2	2
Broiled Steak	1	1
Meatloaf	1	1
Pork Chop	0	2
Baked, BBQ Chicken	5	6
Chicken Nuggets, Patty	6	6
Chicken or Turkey Croquettes	1	3
Roast Turkey	1	1
Fish Nuggets, Sticks	2	0
Fried Clams	0	1
Breaded Fish Portion	4	7
Bacon, Sausage	4	2
Chili (Mostly Meat)	6	5
Cold Meat, Cheese Plate	4	1
MEAT AND BREAD COMBINATIONS	74	78
BURGERS AND SANDWICHES	57	67
Hamburger, Cheeseburger	9*	39
Steak, Roast Beef Sandwich	3	5
Sloppy Joe, BBQ Beef	6	4
Hot Dogs, Corn Dogs	19	24
Fried Chicken Sandwich	10	14
Fried Fish Sandwich	4	6
Coldcut Sandwich, Submarine Sandwiches	7*	19
Ham & Cheese Sandwich	4*	18
Grilled Cheese Sandwich	4	5
Tuna Salad Sandwich	2	6
Egg Salad Sandwich	0	1
Peanut Butter & Jelly Sandwich	13	7
Turkey Sandwich	2	6
OTHER MEAT AND BREAD COMBINATIONS	33	39
Pizza	22	27
Burrito, Enchilada	4	10
Taco, Nacho (without vegetables)	6	8
Pot Pies	1	1
French Toast	1	1
Macaroni & Cheese	3	3
Beef & Noodles, Goulash, Miscellaneous	1	2

-continued-

Exhibit VII.16
(continued)

Meal Component/Food Item	Percent of Meals Offering Each Item	
	Elementary Schools (n=198)	Middle/Secondary Schools (n=99)
MEAT, GRAIN, VEGETABLE COMBINATIONS ⁴	15%	24%
Spaghetti with Meat Sauce	6	8
Lasagna, Ravioli, etc.	3	7
Taco, Taco Salad	7	3
Salad Bars ⁵	0*	6
MEAT, VEGETABLE COMBINATIONS	8	15
Chef Salad ⁶	6	10
Salad Bar ⁶	1	3
Potato Bar	1	1
Stir Fry, Miscellaneous Items	1	1
DESSERTS ⁷	31	29
Pies, Tarts	3	0
Cookies	14	12
Cakes, Brownies	7	11
Gelatins (without added fruit or juice)	1	5
Ice Cream, Puddings	9	5

¹Includes vegetables offered as a separate item, i.e., not included in combination items such as chef salad, tacos, taco salad, etc.

²Includes breads/bread alternates offered as a separate item, i.e., not included in combination items such as sandwiches, burgers, pizza, pasta dishes, etc.

³Meat, poultry and fish items offered separately, i.e., not in combination items.

⁴SFAs considered these items to meet part or all of the vegetable/fruit meal pattern requirement.

⁵These salads included a roll, crackers, pasta salad or other item that met a portion or all of the bread/bread alternate requirement.

⁶These salads did not include bread/bread alternate components.

⁷Includes foods served in reimbursable meals that were not creditable toward any component in the NSLP meal pattern.

*Difference between elementary and middle/secondary schools is statistically significant at the .01 level.

Data Source: On-Site Meal Observations.

the specific vegetables offered most often. Finally, a small percentage of middle/secondary school meals offered vegetable soups (8 percent); only 1 percent of the elementary school meals included soup.

As mentioned in the preceding section, a substantial number of the meals offered in both elementary and middle/secondary schools did not offer a bread or bread alternate as a separate choice (i.e., not included in an entree item). When a separate bread/bread alternate choice was offered, dinner rolls were most common. Fifteen percent of the middle/secondary school meals offered crackers, compared to only 4 percent of elementary school meals.

Entrees offered in NSLP meals most often included two or more meal component categories. Meat, poultry or fish were offered as separate entree items in only about a third of all meals, and few specific items (i.e., roast beef, baked chicken, etc.) were offered in more than 5 percent of all the meals observed. The most common type of entree offered was a meat/bread combination item. Approximately three-quarters of the meals offered in both types of schools included a meat/bread combination entree. These were most often burgers or sandwiches (57 percent of meals offered in elementary schools and 67 percent of middle/secondary school meals).

The specific meat/bread combination items offered most frequently in elementary schools were pizza (22 percent of all meals offered), hot dogs and corn dogs (19 percent), and peanut butter and jelly sandwiches (13 percent). In middle/secondary schools, hamburgers and cheeseburgers were the most common entree (39 percent of all meals), followed by pizza (27 percent), and hot dogs and corn dogs (24 percent). Hamburgers and cheeseburgers were offered in middle/secondary school meals about four times more often than elementary school meals (39 percent vs. nine percent). In addition, a significantly greater number of middle/secondary school meals offered cold cut sandwiches and ham and cheese sandwiches.

Combination entree items that contributed to meal pattern requirements for meat, bread/bread alternates and vegetables were also offered in meals observed in both elementary and middle/secondary schools. Such entree choices, particularly combination salad bars, were offered in a significantly larger proportion of middle/secondary school meals than elementary school meals. Meat and vegetable combination entrees (i.e., no bread/bread alternate component) were also encountered, but were much less common (8 percent of meals in elementary schools and 15 percent in middle/secondary schools).

Finally, as previously mentioned, desserts were infrequently included as part of the reimbursable meal. When offered, cookies were the most common type of dessert in both elementary and middle/secondary school meals.

Portion Sizes. NSLP meal pattern guidelines suggest, but do not require, that schools serve larger portions to children in grades 7 - 12, in recognition of their increased calorie and nutrient needs. Data from this study indicate that, for the most part, meals offered in middle/secondary schools do include larger portions than meals offered in elementary schools. Exhibit VII.17 summarizes average portions for each type of school for each meal component. The average serving in middle/secondary schools is significantly larger for milk (some middle/secondary schools offered 16 oz. containers of milk in addition to the traditional 8 oz. container), fruit, vegetables and meat/bread combination entrees.

NSLP MEALS SELECTED

This section discusses the food and nutrient composition of the average NSLP meal as selected by participating students in SY 1989-90. Nutrient content, percent contribution to RDAs, and INQ scores are examined, along with comparisons to Dietary Guidelines recommendations. Differences are examined at two levels:

- differences between the average meal offered and the average meal selected within each school type; and
- differences between elementary schools and middle/secondary schools in the nutritional characteristics of the average NSLP meal selected.^{1/}

The food-level analyses reported in this section describe the food selection patterns of students in elementary and middle/secondary schools, including the number of items selected, the NSLP meal components included, and the most common combinations of meal components. Detailed data on the percentage of students selecting various types of food offered in NSLP meals is also presented. Finally, the availability of a la carte items in the sampled elementary and middle/secondary schools is described.^{2/}

^{1/}As mentioned in the introduction to this chapter, the analysis does not assess potential nutritional differences between meals selected in schools with and without the OVS option. This is due to the fact that only twelve of the sampled elementary schools had not implemented the OVS option in SY 1989-90, providing too small a sample for meaningful comparative analyses.

^{2/}The calculated nutrient content of average NSLP meals as selected does not include calories or nutrients from a la carte foods. Data reflect nutritional characteristics of reimbursable NSLP foods only.

Exhibit VII.17

Average Portion Sizes of Foods Offered in NSLP Meals in
Elementary and Middle/Secondary Schools
(SY 1989-90)

Meal Component Category	Average Portion Size (in grams)		
	Elementary	Middle/Secondary	All Schools
Milk	240 gm.*	254 gm.	245 gm.
Fruit	96*	113	104
Vegetables	52*	69	59
Entrees			
- Meat, Poultry, Fish	95	109	100
- Meat/Bread Combination Entrees	114*	136	126
Breads/Bread Alternates	45	47	46
Desserts	58	63	60

*Difference between elementary and middle/secondary schools is statistically significant at the .01 level.

Note: Average serving sizes for meat-bread-vegetable combination entrees and meat-vegetable combination entrees could not be reliably calculated given the limited number of individual observations available and/or the dissimilarity of items included in these categories (e.g., lasagna and chef salad).

Data Source: On-Site Meal Observations.

Nutrient
Content

As Exhibit VII.18 illustrates, the nutrient content of the average NSLP meal selected in both elementary and middle/secondary schools did not differ significantly from the nutrient content of the average meal offered. This finding suggests that, overall, students are selecting meals that include all or most of the components contained in the pattern NSLP meal.^{1/}

As expected, the average meal selected in middle/secondary schools contained significantly greater amounts of calories and all nutrients, except carbohydrate and vitamin A, than the average meal selected in elementary schools. While this pattern is not surprising given the previously described differences in the meals offered in both schools, it is interesting to note that the average meal selected in middle/secondary schools contains significantly greater amounts of total fat, saturated fat, cholesterol, niacin and magnesium than the average meal selected in elementary schools, despite the fact that the average meals offered in the two schools did not differ from one another in these measures. This finding suggests differences in food selection patterns between students in elementary schools and students in middle/secondary schools. The food-level analyses discussed in a subsequent section of this chapter provides some potential explanations for these differences.

Percent
Contribution
to RDAs

Evaluating the percent RDA contribution of the average NSLP meal as selected by students is, for a number of reasons, not a straightforward exercise. First of all, the nutrient content of the average meal selected, as defined in this study, represents the nutrient content of the meal selected by the average student in each school. That is, this measure represents an aggregated estimate of nutrient content based on the meals selected by a random sample of students in each school. This sample included children of different ages and sexes, both of which are important factors in judging nutritional adequacy.^{2/}

^{1/}The instances where the nutrient content of the average meal selected is slightly greater than the average meal offered can be attributed to student selection patterns (i.e., more students selected the higher calorie options) and the fact that some students took multiple servings of some items.

^{2/}Due to both the pace and purposefully unobtrusive design of the data collection, information was not collected on the ages of the children observed. While childrens' sex was recorded, data are of limited usefulness in this analysis without accompanying information on age. FNS is pursuing further analysis of NSLP/SBP meals through the Special Nutrition Dietary Assessment Study which will collect sufficient information to make appropriate age and sex comparisons.

Exhibit VII.18

Mean Calorie and Nutrient Content of the Average NSLP Meal Offered and
Selected in Elementary and Middle/Secondary Schools
(SY 1989-90)

	Elementary Schools (n=40)			Middle/Secondary Schools (n=20)		
	Offered	Selected	Difference (%) (Sel vs. Off)	Offered	Selected	Difference (%) (Sel vs. Off)
Calories	721*	707*	-1.9%	808	836	+3.5%
Protein (gm)	30*	29*	-3.3	34	35	+2.9
Total Fat (gm)	31	28*	-9.7	34	36	+5.9
Saturated Fat (gm)	12	11*	-8.3	14	14	0.0
Cholesterol (mg)	84	79*	-6.0	99	94	-5.0
Total Carbohydrate (gm)	84	87	+3.6	94	96	+2.1
Vitamin A (mcg R.E.)	324	299	-7.7	369	328	-11.1
Vitamin C (mg)	25*	24*	-4.0	36	31	-13.9
Thiamin (mg)	.49*	.46*	-6.1	.56	.56	0.0
Riboflavin (mg)	.76*	.73*	-4.0	.86	.80	-7.0
Niacin (mg N.E.)	6.09	5.87*	-3.8	6.77	7.42	+9.6
Vitamin B ₆ (mg)	.47*	.46*	-2.1	.54	.55	+1.8
Calcium (mg)	476*	450*	-5.5	538	497	-7.6
Phosphorus (mg)	561*	544*	-3.0	627	625	-0.3
Magnesium (mg)	97	93*	-4.1	106	104	-1.9
Iron (mg)	4.14*	4.21*	+1.7	4.79	5.20	+10.6
Sodium (mg)	1,102*	1,120*	+1.6	1,341	1,422	+6.0

*Difference between elementary and middle/secondary schools is statistically significant at the .01 level.

Note: None of the differences between the nutrient content of the average meal offered and the average meal selected, within school type, are statistically significant.

Data Source: On-Site Meal Observations.

Thus, an important issue for this analysis is how to evaluate the nutritional adequacy of the average meal selected given the fact that the RDA standards are age- and sex-specific. After considerable discussion with FNS, it was decided to compare the nutrient content of the average meal selected to the RDA standards for each of the age groups that typically attend each school, as was done in the preceding analysis of meals offered. Interpretation of the results of these comparisons must be approached cautiously, however. The reader is advised to utilize the following logic when interpreting these data.

It is useful to begin by defining a target range for each nutrient for the selected meal. The target range is determined by the RDA values for age-sex groups included in the school population. For example, children 4-6 years old have an RDA of 1,800 calories, so the target calorie level for the NSLP lunch for this group is 600 calories. One-third of the RDA for male students 11-14 years old is 833 calories. Because these are the elementary school groups with the lowest and highest RDA values, respectively, then the target range for the average elementary meal can be defined as 600-833 calories.

The average meal selected in elementary schools provided 707 calories (see Exhibit VII.19), which is within the target range. This of course does not prove that every student selected a meal that contained one-third of the appropriate RDA for his or her age and sex. Indeed, if every student selected the same 707-calorie meal, those with higher RDAs would be falling short of one-third, while those with lower RDAs would be exceeding the target. Thus, the target range is only a rough approximation. A perfect pattern of meal selection, in which every student chooses a meal equal to one-third of the RDA, would produce an average that falls within the target range. But a number of imperfect patterns could also yield averages within the target range.

If the average meal selected falls outside the target range, the interpretation is more clear-cut. An average that lies below the low end of the target range indicates a significant deficiency. In the example above, an average of less than 600 calories would mean that most students are not selecting enough calories. An average exceeding the high end of the target range (above 833 calories, in the example) indicates that most students are selecting more than the target amount of the RDA.

Exhibit VII.19 presents comparisons of the nutrient content of the average NSLP meal as selected in elementary schools in SY 1989-90 with each of the appropriate RDA standards. Keeping in mind the interpretative guidelines outlined above, we can see that all nutrients fall within or above the target range. The average NSLP meal as selected was above the target range for protein, vitamin C, thiamin, riboflavin, niacin, calcium, phosphorus, and magnesium. The average meal selected was within the target range for calories, vitamin A, vitamin B6, and iron.

Exhibit VII.19

Percentage of Recommended Dietary Allowances Provided in
the Average NSLP Meal as Selected in Elementary Schools
(SY 1989-90)

	Nutrients In Meal Selected	Students 4-6 years		Students 7-10 years		Male Students 11-14 years		Female Students 11-14 years	
		One-Third Daily RDA	Percent Daily RDA	One-Third Daily RDA	Percent Daily RDA	One-Third Daily RDA	Percent Daily RDA	One-Third Daily RDA	Percent Daily RDA
Calories	707	600	39%	667	35%	833	28%	733	32%
Protein (gm)	29	8	121	9	104	15	64	15	63
Vitamin A (mcg R.E.)	299	167	60	233	43	333	30	267	37
Vitamin C (mg)	24	15	53	15	53	17	47	17	47
Thiamin (mg)	.46	.30	51	.33	46	.43	36	.37	42
Riboflavin (mg)	.73	.37	66	.40	61	.50	49	.43	56
Niacin (mg N.E.)	5.87	4.00	49	4.33	45	5.66	35	5.00	39
Vitamin B ₆ (mg)	.46	.37	42	.47	33	.57	27	.47	33
Calcium (mg)	450	267	56	267	56	400	37	400	37
Phosphorus (mg)	544	267	68	267	68	400	45	400	45
Magnesium (mg)	93	40	77	57	55	90	34	93	33
Iron (mg)	4.21	3.33	42	3.33	42	4.00	35	5.00	28

NOTE: NSLP goal is to provide approximately one-third of the RDA for all age groups. Percentages in this table are based on the nutrient content of the meal selected by the average student in each school. No age- or sex-specific data were collected.

Data Source: On-Site Meal Observations.

The exhibit shows several instances in which the average meal selected provided less than one-third of the RDA for a particular nutrient for a particular group. For example, the average meal as selected had only 28 percent of the RDA for calories for males aged 11-14. If males aged 11-14 actually selected "average" meals, these meals would not provide the targeted level of calories. But the available data do not indicate how the meals selected by any particular age-sex group differed from the average.

Exhibit VII.20 presents data on the percent RDA contribution of the average NSLP meal selected in middle/secondary schools in SY 1989-90. The average NSLP meal as selected was above or within the target range for calories and all nutrients. The nutrient content of the average NSLP meal selected exceeded the target for protein, vitamin C, thiamin, riboflavin, niacin, calcium, phosphorus and iron. It was within the target range for calories, vitamin A, vitamin B₆ and magnesium.

In a few cases, the average meal selected provided less than one-third of the RDA for a particular nutrient. If these students (15-18 year old males) indeed consumed the "average" meal, then they would not receive one-third of the RDA for these nutrients. In the absence of actual data on how particular age- and sex-groups selected NSLP meals, however, it is not possible to determine how the specific meals selected by these students might differ from the "average" NSLP meal.

Indices of
Nutritional
Quality (INQs)

INQ scores for the average NSLP meal selected in elementary and middle/secondary schools are presented in Exhibits VII.21 and VII. 22, respectively. Because these measures are based on RDA standards the aforementioned caveats about data interpretation still apply. That is, these data represent the nutrient density of meals selected by average students. Because data on students' age and sex were not available, we can not say with certainty that any particular age/sex group would, in fact, select meals comparable to the average meals considered in this analysis.

The nutrient density of the average meal as selected in both elementary and middle/secondary schools was very similar to the nutrient density of the average meals offered (see Exhibits VII.11 and VII.12). This suggests that meals selected by students varied little from those that were offered to them. INQs for vitamin B₆ and magnesium fell for some age/sex groups, but still closely approximated the optimal score of 1.0.

Iron density for female students remained the only appreciable problem in both schools. INQ scores for iron for the average meal as selected were consistently higher than for the average meal offered (0.88 vs. 0.85 for elementary schools and 0.92 vs. 0.86 for middle/secondary schools). This suggests that students who omitted one or more of the NSLP components tended to include

Exhibit VII.20

Percentage of Recommended Dietary Allowances Provided in
the Average NSLP Meal as Selected in Middle/Secondary Schools
(SY 1989-90)

	Nutrients In Meal Selected	Male Students 11-14 years		Female Students 11-14 years		Male Students 15-18 years		Female Students 15-18 years	
		One-Third Daily RDA	Percent Daily RDA	One-Third Daily RDA	Percent Daily RDA	One-Third Daily RDA	Percent Daily RDA	One-Third Daily RDA	Percent Daily RDA
Calories	836	833	33%	733	38%	1000	28%	733	38%
Protein (gm)	35	15	77	15	76	20	59	15	80
Vitamin A (mcg R.E.)	328	333	33	267	41	333	32	267	41
Vitamin C (mg)	31	17	63	17	63	20	52	20	52
Thiamin (mg)	.56	.43	43	.37	51	.50	37	.37	51
Riboflavin (mg)	.80	.50	54	.43	62	.60	45	.43	62
Niacin (mg N.E.)	7.42	5.66	44	5.00	49	6.67	37	5.00	49
Vitamin B ₆ (mg)	.55	.57	32	.47	39	.67	27	.50	37
Calcium (mg)	497	400	41	400	41	400	41	400	41
Phosphorus (mg)	625	400	52	400	52	400	52	400	52
Magnesium (mg)	104	90	39	93	37	133	26	100	35
Iron (mg)	5.20	4.00	43	5.00	35	4.00	43	5.00	35

NOTE: NSLP goal is to provide approximately one-third of the RDA for all age groups. Percentages in this table are based on the nutrient content of the meal selected by the average student in each school. No age- or sex-specific data were collected.

Data Source: On-Site Meal Observations.

Exhibit VII.21

Indices of Nutritional Quality (INQs) for
the Average NSLP Meal Selected in Elementary Schools
(SY 1989-90)

	INQs for Students 4-6 Years	INQs for Students 7-10 Years	INQs for Male Students 11-14 Years	INQs for Female Students 11-14 Years
Protein (gm)	3.10	2.97	2.29	1.97
Vitamin A (mcg R.E.)	1.54	1.23	1.07	1.16
Vitamin C (mg)	1.36	1.51	1.68	1.47
Thiamin (mg)	1.31	1.31	1.29	1.31
Riboflavin (mg)	1.70	1.74	1.75	1.75
Niacin (mg N.E.)	1.26	1.29	1.25	1.22
Vitamin B ₆ (mg)	1.10	0.94	0.96	1.03
Calcium (mg)	1.44	1.60	1.32	1.16
Phosphorus (mg)	1.74	1.94	1.61	1.41
Magnesium (mg)	1.97	1.57	1.21	1.03
Iron (mg)	1.08	1.20	1.25	0.88

NOTE: An INQ of 1.0 or more indicates that the meal is of high nutritional quality. INQs below 1.0 indicate that the meal will not provide 100% of the target level RDA (one-third) unless the target RDA for calories is exceeded.

Data Source: On-Site Meal Observations.

Exhibit VII.22

Indices of Nutritional Quality (INQs) for
the Average NSLP Meal Selected in Middle/Secondary Schools
(SY 1989-90)

	INQs for Male Students 11-14 Years	INQs for Female Students 11-14 Years	INQs for Male Students 15-18 Years	INQs for Female Students 15-18 Years
Protein (gm)	2.36	2.00	2.11	2.11
Vitamin A (mcg R.E.)	1.00	1.08	1.18	1.08
Vitamin C (mg)	1.91	1.66	1.86	1.37
Thiamin (mg)	1.30	1.34	1.32	1.34
Riboflavin (mg)	1.64	1.63	1.61	1.63
Niacin (mg N.E.)	1.33	1.29	1.32	1.29
Vitamin B ₆ (mg)	0.97	1.03	0.96	0.97
Calcium (mg)	1.24	1.08	1.46	1.08
Phosphorus (mg)	1.58	1.37	1.86	1.37
Magnesium (mg)	1.18	0.97	0.93	0.92
Iron (mg)	1.30	0.92	1.54	0.92

NOTE: An INQ of 1.0 or more indicates that the meal is of high nutritional quality. INQs below 1.0 indicate that the meal will not provide 100% of the target level RDA (one-third) unless the target RDA for calories is exceeded.

Data Source: On-Site Meal Observations.

iron-rich food(s) and exclude other foods. Because age- and sex-specific data are not available, however, it is impossible to determine the iron density of the meals actually selected by the students with the greatest iron requirements (females 11 years old or older).

Comparison to
Dietary
Guidelines
for Americans

In SY 1989-90, the average meal selected in both elementary and middle/secondary schools, like the average meal offered, exceeded the Dietary Guidelines recommendations for calories from total fat and saturated fat (Exhibit VII.23). The mean sodium content of the average meal selected in elementary schools was 1,120 mg., and the mean for middle/secondary schools was 1,422 mg. In comparison to the daily sodium intake recommended by the NRC, these values are elevated. Cholesterol levels in the average meal selected in both schools compared favorably with NRC recommendations.

In elementary schools the average meal selected was significantly lower in total fat calories and higher in carbohydrate calories than the average meal offered. The increased carbohydrate calories made the elementary school meal significantly different in relative carbohydrate content than the middle/secondary school meal. Although the average meal selected in elementary school was still high in fat and low in carbohydrate in comparison to the Dietary Guidelines recommendations, this change is certainly in a positive direction. It suggests that some children in elementary schools preferentially excluded foods high in total fat and may also have selected additional or larger servings of high carbohydrate foods, thereby contributing carbohydrate calories that diminish the overall contribution of calories from fat.

Exhibit VII.24 presents frequency distributions of the fat, saturated fat, cholesterol and sodium content of the average meal selected in elementary and middle/secondary schools. This exhibit further illustrates the fact that, while the average meals selected in both types of schools tended to be high in total fat and saturated fat, more elementary school meals met, or came close to meeting, the Dietary Guidelines recommendations.

Food-Level
Analysis

Several issues are examined in this section:

- In the presence of the offer-vs-serve (OVS) option, how many of the five items included in the NSLP meal pattern do students select? Which items are refused (not selected) most often?
- Of the specific foods available in each meal component category, which do students select most often?
- How many schools offer a la carte items in the same serving line as NSLP meals? What food items are typically available on an a la carte basis?

Exhibit VII.23

Macronutrient, Cholesterol and Sodium Content of
the Average NSLP Meal Offered and Selected
in Elementary and Middle/Secondary Schools
Compared to the Dietary Guidelines for Americans
(SY 1989-90)

	USDA/DHHS Dietary Guidelines for Americans	Elementary Schools (n=40)			Middle/Secondary Schools (n=20)		
		Offered	Selected	Difference (\$) (Sel vs. Off)	Offered	Selected	Difference (\$) (Sel vs. Off)
Percent of Calories from Fat	≤30.0	38.4	36.0	-2.4 [†]	38.0	38.4	+0.4
Percent of Calories from Saturated Fat	<10.0	14.8	14.2	-0.6	15.0	15.0	0.0
Percent Calories from Carbohydrate	55.0-65.0 ¹	46.4	49.2 [‡]	+2.8 [†]	46.4	46.0	-0.4
Percent Calories from Protein	5.0-15.0 ¹	16.8	16.5	-0.3	17.0	16.9	-0.1
Mean Cholesterol (mg)	n.q. ²	84	79 [‡]	-5.0	99	94	-5.0
Mean Sodium (mg)	n.q. ²	1,102 [‡]	1,120 [‡]	+1.6	1,341	1,422	+6.0

¹The USDA/DHHS Dietary Guidelines do not provide specific recommendations for the proportion of calories from carbohydrates and protein. RDAs for protein for school age children range from 5 to 8 percent of total calories. In general, the average protein intake considerably exceeds the RDA. The National Research Council (NRC) report Diet and Health recommends maintaining total protein levels lower than twice the RDA for all age groups and that the intake of carbohydrates be more than 55% of total calories. To achieve the recommended levels of calories from fat, carbohydrate and protein content would need to be in these ranges.

²Not quantified. There is no established Recommended Dietary Allowance or Estimated Safe and Adequate Intake for cholesterol or sodium. The Dietary Guidelines for Americans recommend choosing a diet low in cholesterol and use of salt and sodium only in moderation. The National Research Council (NRC) report Diet and Health recommends that adults and children limit salt intake to 6 grams per day, equal to 2400 mg of sodium, and dietary cholesterol intake to less than 300 mg per day.

[‡]Difference between elementary and middle/secondary schools is statistically significant at the .01 level.

[†]Difference between meal as offered and meal as selected, within school type, is statistically significant at the .01 level.

Data Source: On-Site Meal Observations.

Exhibit VII.24

Frequency Distribution of the Level of Fat, Cholesterol and
Sodium Provided in the Average NSLP Meal Selected
in Elementary and Middle/Secondary Schools
(SY 1989-90)

	Percent of Schools		
	Elementary (n=40)	Middle/ Secondary (n=20)	All Schools (n=60)
<u>Percent Calories from Fat</u>			
< 30 percent (D.G. Goal) ¹	10%	5%	8%
31-35 percent	27	5	20
36-38 percent	38	40	38
39-40 percent	15	30	20
> 40 percent	10	20	13
<u>Percent Calories from Saturated Fat</u>			
< 10 percent (D.G. Goal) ¹	0	0	0
11-13 percent	40	20	33
14-16 percent	48	60	52
> 16 percent	13	20	15
<u>Cholesterol (mg)²</u>			
< 75 mg	43	20	35
76-100 mg	45	45	45
101-150 mg	13	30	18
151-200 mg	0	5	2
<u>Sodium (mg)^{2,*}</u>			
< 800 mg	2	0	2
801-1,000 mg	18	5	13
1,001-1,200 mg	58	15	43
1,201-1,500 mg	20	50	30
> 1,500 mg	2	30	12

¹Level of intake recommended in the USDA/DHHS Dietary Guidelines for Americans.

²The Dietary Guidelines for Americans recommends choosing a diet low in cholesterol and use of salt and sodium only in moderation. The National Research Council (NRC) report Diet and Health recommends that adults and children limit salt intake to 6 grams per day (equal to 2400 mg. of sodium) and dietary cholesterol intake to less than 300 mg. per day.

*Chi-square test of differences between elementary and middle/secondary schools is significant at the .01 level.

Data Source: On-Site Meal Observations.

- What proportion of children select one or more a la carte items, in addition to their NSLP meal, when a la carte is available?

Differences between elementary and middle/secondary schools are explored for each question.

Food Selection Patterns Under OVS. Data on utilization of the OVS option in elementary schools was collected during a pre-visit interview with the SFA manager. Based on SFA managers' reports, only three SFAs (six elementary schools) had not implemented the OVS option in SY 1989-90. As detailed in Appendix B, however, field staff often noted discrepancies between the official SFA policy and the behaviors of local SFA staff. Most often the discrepancy resulted in OVS schools functioning like non-OVS schools, i.e., students were served or encouraged to take all five NSLP meal components. Unfortunately, data that would have described local SFA behavior in regard to the OVS option was not systematically collected during on-site observations since the variable was included in the SFA manager interview. Therefore, in preparing to address the food selection research questions centering on OVS, a decision had to be made about whether to use the SFA managers' reports or the patterns observed in the actual food selection data in classifying a particular school for analytical purposes.

The latter approach was selected. The original meal observation data books were reviewed for all elementary schools and an OVS status was assigned. All six of the schools that were originally reported to be non-OVS remained as such; no evidence of non-compliant meals was noted in the meals selected in these schools.^{1/} In addition, elementary schools in three additional SFAs were classified as non-OVS schools for the purposes of these analyses because no evidence of student refusals was found in the data (i.e., all observations included all the same foods). Thus, for these analyses, a total of 12 elementary schools were considered "non-OVS" and 28 were considered "OVS".

To evaluate food selection patterns under the OVS option, two separate analyses were carried out in the subsample of schools that was determined to have had the OVS option available.^{2/}

^{1/}It is impossible to tell whether non-compliant meals were never actually selected by participating students in these schools, or whether the data collection protocol and the reported SFA policy caused field staff to exclude non-compliant meals from their observations because they were non-reimbursable under USDA guidelines.

^{2/}This subsample actually represents a substantial portion of the full sample, since all middle/secondary schools (n = 20), and 28 of the 40 elementary schools are included.

First, meals selected by each of the students observed in these schools were examined to determine the number of meal components included; results are presented in Exhibit VII.25. The data indicate that, even under the OVS option, the majority of students in both types of schools selected meals that included all 5 of the NSLP meal components. Elementary school students were more likely to select meals of this size than middle/secondary school students. Relatively few students selected a reimbursable meal that contained only three of the five required components. Only six percent of elementary school students and ten percent of middle/secondary school students did so. These findings support the conclusions drawn in the previous discussion of nutrient content of meals selected.

To determine which of the five meal components students omitted when they did select a meal with fewer than five components, each individual student-level observation was inspected for presence or absence of the five NSLP meal components. This cross-check revealed that the meal component most frequently omitted is the second fruit and/or vegetable, particularly at the middle/secondary school level (Exhibit VII.26). Forty percent of middle/secondary school students included only one fruit or vegetable choice, as did 26 percent of the school students. Milk was the second most likely item to be omitted, however, it was omitted infrequently. Only five percent of the elementary school meals did not include milk, compared to 16 percent of middle/secondary school meals.

Specific Foods Included in NSLP Meals Selected by Students. Exhibit VII.27 presents data on the average percentage of student meals that included particular food items when they were offered.^{1/} Patterns for elementary and middle/secondary students were examined and the significance of observed differences were evaluated.

As Exhibit VII.27 shows, students in both types of schools most often selected flavored milk. As noted above, elementary school students were more likely to select milk than middle/secondary school students.

^{1/}This analysis included all observations of student meals, i.e., meals in both OVS and non-OVS schools. Evaluation of the data revealed that inclusion of non-OVS schools did not substantially alter the data (e.g., reported percentages), and did not affect the statistical significance of any findings. Thus, the term "selected" is used here in the broadest sense to reflect the foods that were actually on a student's tray. Students may or may not have had a true option to "select" or reject the food because 1) the OVS option may not have been available, and 2) there may have been no alternative choice, e.g., only one entree was offered.

Exhibit VII.25

Number of NSLP Meal Components¹ Included in Lunches
Selected in Elementary and Middle/Secondary Schools
with the OVS Option
(SY 1989-1990)

Number of Meal Components*	Percent of Lunches Selected		
	Elementary Schools ² (n=7,906)	Middle/Secondary Schools (n=5,127)	All Schools (n=13,033)
3 components	6%	10%	7%
4 components	26	35	29
5 or more components	67	55	63

¹Refers to specific foods, sometimes part of a combination item, considered to contribute to the NSLP meal pattern, rather than discrete food items. For example, a hamburger is considered as two meal components (meat and bread), spaghetti with meatballs and tomato sauce is considered to have three components (bread alternate, meat, vegetable).

²Includes only observations in subsample of elementary schools that had the OVS option available. (All middle/secondary schools have OVS.)

Note: Detail may not sum to 100 percent due to rounding.

*Chi-square test of differences between elementary and middle/secondary schools is statistically significant at the .01 level.

Data Source: On-Site Meal Observations.

Exhibit VII.26

Proportion of Lunches Selected in Elementary and Middle/Secondary
Schools with the OVS Option that Included
Various NSLP Meal Components

Meal Component Category	Percent of Lunches Including		
	Elementary Schools ¹ (n=7,906)	Middle/ Secondary Schools (n=5,127)	All Schools (n=13,033)
Milk*	95%	84%	91%
Fruit and Vegetables*			
-1 F or V as a separate item	24	33	28
-1 F or V in a combination item	2	6	4
-2 or more F or V, separately and/or in combination items	70	56	65
Bread/Bread Alternate ²	96	96	96
Meat/Meat Alternate	99	99	99

¹ Includes only observations in subsample of elementary schools that had the OVS option available. (All middle/secondary schools have OVS.)

² Includes both breads/bread alternates selected as a separate item and those found in combination entrees.

*Chi-square test of difference between elementary and middle/secondary schools is statistically significant at the .01 level.

Data Source: On-Site Meal Observations

Exhibit VII.27

Foods Included in Meals Selected by Students
in Elementary and Middle/Secondary Schools
(SY 1989-90)

Meal Component/Food Item	Elementary Schools		Middle/Secondary Schools	
	Percent of Meals Offering (n=198)	Percent of Meals Including ¹ (n=198)	Percent of Meals Offering (n=99)	Percent of Meals Including ¹
MILK	100%	95%	100%	84%
Whole Milk	71	11	83	12
Lowfat Milk	93	16	99	14
Skim Milk	32	11	39	5
Flavored Milk	90	76*	96	61
FRUIT	93	84*	94	54
FRESH FRUIT	44	56*	49	24
Apple	23	47*	24	18
Banana	7	38	9	8
Cantaloupe	1	13	1	14
Grapefruit	1	8	0	NA
Grapes	4	60	1	12
Orange	21	38*	32	16
Pear	3	28	8	2
Watermelon	1	42*	2	10
Fruit Salad	1	28	3	41
CANNED FRUIT	58	66*	70	31
Applesauce	18	58*	23	23
Apricots	2	11	2	1
Fruit Cocktail	23	46*	24	15
Peaches	12*	40	28	16
Pears	16	43	19	19
Pineapple	9*	40	23	17
Plums	1	100++	2	9
Strawberries	1	54	0	NA
Other Berries	1*	27	5	15
FRUIT JUICE	34	38	48	37
DRIED FRUIT	3	32*	7	13
OTHER FRUIT CHOICES	19	63*	20	27
Crisps, Cobblers	9	59*	9	20
Gelatins (made with fruit juice or fruit) Juice Bars, Misc.	11	67*	11	33

-continued-

Exhibit VII.27
(continued)

Meal Component/Food Item	Elementary Schools		Middle/Secondary Schools	
	Percent of Meals Offering (n=198)	Percent of Meals Including ¹	Percent of Meals Offering (n=99)	Percent of Meals Including ¹
<u>VEGETABLES²</u>	91%	80%	86%	79%
RAW VEGETABLES	49*	52*	67	37
Lettuce, Salad	36*	45	58	36
Other Raw Vegetables	13	54*	13	18
Cole Slaw, Miscellaneous Salads	5	64	8	24
COOKED VEGETABLES	45	56*	39	31
Corn	17	63	13	44
Green Beans	10	46	8	18
Broccoli	6	18	7	23
Cabbage	1	75	2	1
Peas	5	62	2	20
Carrots	1	8	2	13
Mixed Vegetables	13	40	10	10
Onion Rings	1	81	2	66
Spinach, Greens	2	11	0	NA
Miscellaneous Vegetables	3	4	3	17
POTATOES	43*	80	61	72
French Fries, Tater Tots, etc.	35*	80	54	72
Other Potatoes	9	63	15	34
BEANS, LEGUMES	12	50	6	33
SOUPS	1*	74*	8	19
<u>BREADS/BREAD ALTERNATES³</u>	49	70*	62	49
Bagels	1	83	0	NA
Bisquits/Croissants	4	69	3	47
Bread, Toast	8	71	10	53
Cornbread	8	68	3	71
Crackers	4*	53	15	18
Rolls	18	62	29	47
Sweet Buns	2	88*	3	16
Fruit Muffins/Breads	1	98	0	NA
Tortillas, Taco Shells	1	2	0	NA
Rice	7	67	7	70
Pasta, Noodles	1	20	2	57
Pancakes, Waffles	2	98	1	97

Exhibit VII.27
(continued)

Meal Component/Food Item	Elementary Schools		Middle/Secondary Schools	
	Percent of Meals Offering (n=198)	Percent of Meals Including ¹	Percent of Meals Offering (n=99)	Percent of Meals Including ¹
ENTREES	100%	99%	100%	99%
MEAT/POULTRY/FISH⁴	33	76*	35	50
Beef - Roast, Ribs	1	55	2	37
Breaded Fried Steak	2	91*	2	2
Broiled Steak	1	40	1	47
Meatloaf	1	99++	1	78
Pork Chop	0	NA	2	31
Baked, BBQ Chicken	5	81	6	61
Chicken Nuggets, Patty	6	89	6	69
Chicken or Turkey Croquettes	1	100++	3	9
Roast Turkey	1	85	1	51
Fish Nuggets, Sticks	2	46	0	NA
Fried Clams	0	NA	1	52
Breaded Fish Portion	4	78*	7	33
Bacon, Sausage	4	73	2	61
Chili (Mostly Meat)	6	70	5	40
Cold Meat, Cheese Plate	4	16	1	3
MEAT AND BREAD COMBINATIONS	74	85	78	82
BURGERS AND SANDWICHES	57	66	67	59
Hamburger, Cheeseburger	9**	51	39	36
Steak, Roast Beef Sandwich	3	39	5	53
Sloppy Joe, BBQ Beef	6	54	4	43
Hot Dogs, Corn Dogs	19	50*	24	26
Fried Chicken Sandwich	10	70*	14	35
Fried Fish Sandwich	4	84*	6	24
Coldcut Sandwich, Sub Sandwich	7*	37	19	23
Ham & Cheese Sandwich	4*	46*	18	8
Grilled Cheese Sandwich	4	65	5	49
Tuna Salad Sandwich	2	22*	6	3
Egg Salad Sandwich	0	NA	1	0
Peanut Butter & Jelly Sandwich	13	7*	7	2
Turkey Sandwich	2	55	6	6
OTHER MEAT AND BREAD COMBINATIONS	33	77	39	66
Pizza	22	76*	27	54
Burrito, Enchilada	4	67*	10	29
Taco, Nacho	6	57	8	53
Pot Pies	1	19	1	37
French Toast	1	100++	1	100
Macaroni & Cheese	3	29	3	37
Beef & Noodles, Goulash,				
Miscellaneous	1	100++	2	84

-continued-

Exhibit VII.27
(continued)

Meal Component/Food Item	Elementary Schools		Middle/Secondary Schools	
	Percent of Meals Offering (n=198)	Percent of Meals Including ¹	Percent of Meals Offering (n=99)	Percent of Meals Including ¹
MEAT, GRAIN, VEGETABLE COMBINATIONS⁵	15%	83%	24%	66%
Spaghetti with Meat Sauce	6	92	8	81
Lasagna, Ravioli, Miscellaneous	3	69	7	23
Taco, Taco Salad	7	82	3	63
Salad Bars ⁶	0*	NA	6	96
MEAT, VEGETABLE COMBINATIONS	8	30	15	40
Chef Salad ⁷	6	17	10	16
Salad Bar ⁷	1	70	3	80
Potato Bar	1	100++	1	100
Stir Fry, Miscellaneous	1	25	1	100
DESSERTS⁸	31	84*	29	64
Pies, Tarts	3	33	0	NA
Cookies	14	88*	12	64
Cakes, Brownies	7	78	11	50
Gelatin (without added fruit or juice)	1	37	5	13
Ice Cream, Puddings	9	60	5	59

¹Percentages reflect the proportion of student meals that included each item (or category) when the food was available. Sample size not reported because it varies for every item in the table.

²Includes vegetables offered as a separate item, i.e., not included in combination items such as chef salad, tacos, taco salad, etc.

³Includes breads/bread alternates offered as a separate item, i.e., not included in combination items such as sandwiches, burgers, pizza, pasta dishes, etc.

⁴Meat, poultry and fish items offered separately, i.e., not in combination items.

⁵SFAs considered these items to meet either part or all of the vegetable/fruit meal pattern requirements.

⁶These salads included a roll, crackers, pasta salad or other item that met some or all of the bread/bread alternate requirement.

⁷These salads did not include bread/bread alternate components.

⁸Includes foods served in reimbursable meals that were not creditable toward any component in the NSLP meal pattern.

*Difference between elementary and middle/secondary schools or students is statistically significant at the .01 level.

++Percentage of elementary school student meals is based on only one meal where the OVS option was not available.

NA: Selection data not available because none of the schools offered this item.

Data Source: On-Site Meal Observations.

Elementary school students were also more likely to select fruit, juice or another item that met a portion of the NSLP meal requirement for fruits and vegetables than middle/secondary school students (84 percent vs. 54 percent). The specific items included most often in meals selected by elementary school students were, in descending order, canned fruit, fresh fruit, fruit juices and other items that contained fruit and/or juice (e.g., crisps, cobblers, juice bars, gelatins made with juice or fruit, etc.).^{1/} The most common items in middle/secondary school meals were canned fruit, fruit juices, and other items made with fruit and/or juice (e.g., crisps, cobblers, juice bars, gelatin made with fruit or juice, etc.).

Potatoes were the most common vegetable selected by both elementary and middle/secondary school students, followed by raw vegetables and other cooked vegetables. Elementary school students were more likely to include raw vegetables or cooked vegetables when these items were available.

The type of entree most commonly included in student meals in both elementary and middle/secondary schools was a meat/bread combination item. In elementary school meals the most common entrees were, in descending order, pizza, hot dogs and corn dogs, fried chicken sandwiches and hamburgers and cheeseburgers. In middle/secondary school meals, the entrees were the same but the frequency of inclusion was slightly different: pizza was most common, followed closely by hamburgers and cheeseburgers and then, much less frequently, hot dogs and corn dogs and fried chicken sandwiches.

Finally, when desserts were offered, elementary school students were more likely to include them than middle/secondary school students (84 percent vs. 64 percent). This finding may be related to the fact that middle/secondary school students tend to have access to more a la carte dessert items than do elementary school students, as described later in this section.

To obtain a more complete picture of the characteristics of NSLP meals selected by participating students, a variable was created that reflected the specific types of food included in each student meal, using the major food taxonomy groupings. The results of this analysis are presented in Exhibit VII.28. More than 25 different meal component combinations were encountered, however, five specific combinations accounted for almost 60 percent of the meals overall. The most prevalent type of meal in elementary schools (31 percent of all meals) consisted of milk, two separate fruit and vegetable choices, and a meat/bread combination entree. Considering the foods most commonly offered

^{1/}Foods that were included most often were those that were offered most often and "selected" most often.

Exhibit VII.28

Most Common Meal Component Combinations in
NSLP Meals Selected in
Elementary and Middle/Secondary Schools
(SY 1989-90)

Meal Component Combinations*	Percent of Meals Including:		
	Elementary Schools (n=11,444)	Middle/ Secondary Schools (n=5,127)	All Schools (n=16,571)
Milk, 2 Fruit and Vegetable Choices, Meat and Bread Combination Entree	31%	21%	28%
Milk, 1 Fruit and Vegetable Choice, Meat and Bread Combination Entree	11	22	14
Milk, 2 Fruit and Vegetable Choices, Bread/Bread Alternate, Meat, Poultry or Fish	9	6	8
Milk, 1 Fruit and Vegetable Choice, Bread/Bread Alternate, and Meat, Vegetable, Bread Combination Entree	6	5	6
Milk, 1 Fruit or Vegetable Choice, Bread/Bread Alternate, Meat, Poultry or Fish	5	4	5
Other Combinations	37	42	39

*Chi-square analysis of the difference between elementary and middle/secondary schools was statistically significant at the .01 level.

Data Source: On-Site Meal Observations.

and selected in these schools, as described above, an example of an actual meal represented by this combination would be: flavored milk, canned fruit cocktail, french fries or potato puffs and a slice of pizza.

The most common type of meal in middle/secondary schools (22 percent of all meals) included milk, 1 fruit or vegetable choice, and a meat/bread combination entree. Given the foods most commonly offered and selected in these schools, this translates into flavored milk, french fries or potato puffs and either a slice of pizza or a hamburger or cheeseburger.

Availability of A La Carte Items. The final research issue addressed in this section is the availability of a la carte items. During on-site observations, field staff collected information on the types of a la carte items that were available in the same serving line as the reimbursable meals that were being observed. These data provide some insight into the prevalence of a la carte items in NSLP schools. The reader should bear in mind, however, that the data undoubtedly underestimate the full prevalence of a la carte items since a la carte items were frequently available elsewhere in the cafeteria or school.

As Exhibit VII.29 indicates, a la carte items were available in the same serving line as reimburseable meals in over half of the schools in the sample. A la carte items were especially prevalent in middle/secondary schools; 80 percent of middle/secondary schools had at least some a la carte items available, compared to 58 percent of elementary schools. (This difference was statistically significant.)

Most elementary schools offered either one or two types of a la carte items. Desserts were offered much more frequently than other items like chips, beverages and fruits and vegetables. None of the elementary schools offered entree items on an a la carte basis. (Exhibit ET-VII.2 provides a more detailed list of specific types of a la carte items that were available.)

Both the number and variety of a la carte items offered in middle/secondary schools was significantly greater than in elementary schools. Sixty-nine percent of middle/secondary schools offered three or more items; one-quarter had extensive a la carte service, offering beverages, chips and snacks, fruits and vegetables, entrees, desserts and other items. Dessert was, again, the category that was offered most frequently. A la carte entrees were available in 44 percent of middle/secondary schools that offered some a la carte service.

During meal observations, observers indicated whether the student selected for observation had taken any a la carte items.^{1/} Only 12 percent of the elementary school students and

^{1/}The type of a la carte item was not recorded.

Exhibit VII.29

Availability of A la Carte Items at Lunch in
Elementary and Middle/Secondary Schools
(SY 1989-90)

	Percent of Schools	
	Elementary Schools (n=40)	Middle/Secondary Schools (n=20)
Any A la carte available? ^a		
Yes	58%	80%
No	42	20
Number of A la carte categories available ^{1, *}		
1 category	39	19
2 categories	48	12
3 categories	9	12
4 categories	4	12
5 categories	0	19
6 categories	0	25
Categories of A la carte items available ^{1, *}		
Beverages	22	69
Fruits and Vegetables	9	62
Entrees	0	44
Desserts	96	75
Chips, Pretzels, Snacks	30	62
Other ²	22	62

¹Percentages reflect schools that have a la carte items available.

²Included yogurt, muffins, soups, candy, and a variety of other items, none of which were offered in more than three schools.

*Chi-square test of differences between elementary and middle/secondary schools is statistically significant at the .01 level.

Data Source: On-Site Meal Observations.

22 percent of the middle/secondary school students that had a la carte items available included an a la carte selection in the meal that was observed.

NSLP MEALS CONSUMED

This portion of the analysis discusses the food and nutrient composition of the average NSLP meal as actually consumed by participating students. The nutrient content and percentage contribution to RDAs are examined along with INQ scores and the levels of fat, cholesterol and sodium. Nutritional differences are again examined at two levels:

- differences between the average meal selected and the average meal consumed, within school type; and
- differences between elementary and middle/secondary schools in the nutritional characteristics of the average meal consumed.

The food-level analysis included in this section deals with the issue of plate waste in the NSLP, i.e., what proportion of the foods selected are actually consumed, and which specific types of food generate the greatest amount of waste?

Nutrient Content

The mean nutrient content of the average meal as offered, selected and consumed in elementary and middle/secondary schools in SY 1989-90 is summarized in Exhibit VII.30. As the exhibit shows, the nutrient content of the average meal consumed was consistently lower than the nutrient content of the average meal selected in both elementary and middle/secondary schools. This pattern indicates that, in general, students did not consume all of the foods they selected.

The magnitude of the differences between the average meal selected and the average meal consumed was consistently greater for elementary schools. In elementary schools, the average meal consumed contains significantly less calories and lower concentrations of every nutrient than the average meal selected. On average, elementary school students wasted about 23 percent of the nutrients that were available in the meals they had selected. In middle/secondary schools, on the other hand, the average meal consumed was only about 9 percent lower in nutrient content than the average meal selected, and none of the individual differences were statistically significant. Clearly, elementary school students wasted a larger portion of their meal than did middle/secondary school students.

A comparison of the nutrient content of the average meal consumed in each type of school adds further credence to this conclusion. The average meal consumed in elementary schools contained significantly less calories and all nutrients than the average meal consumed in middle/secondary schools. This finding

Exhibit VII.30

Mean Calorie and Nutrient Content of the Average
NSLP Meal Offered, Selected and Consumed
in Elementary and Middle/Secondary Schools
(SY 1989-90)

	Elementary Schools (n=40)				Middle/Secondary Schools (n=20)			
	Offered	Selected	Consumed	Difference (\$) (Con vs. Sel)	Offered	Selected	Consumed	Difference (\$) (Con vs. Sel)
Calories	721*	707*	544*	-23.0%+	808	836	755	-9.7%
Protein (gm)	30*	29*	22*	-24.1+	34	35	32	-8.6
Total Fat (gm)	31	28*	22*	-21.4+	34	36	32	-11.1
Saturated Fat (gm)	12	11*	9*	-18.2+	14	14	13	-7.1
Cholesterol (mg)	84	79*	61*	-22.8+	99	94	85	-9.6
Total Carbohydrate (gm)	84	87	66*	-24.1+	94	96	87	-9.4
Vitamin A (mcg R.E.)	324	299	215*	-28.1+	369	328	293	-10.7
Vitamin C (mg)	25*	24*	18*	-25.0+	36	31	30	-3.2
Thiamin (mg)	.49*	.46*	.35*	-23.9+	.56	.56	.51	-8.9
Riboflavin (mg)	.76*	.73*	.57*	-21.9+	.86	.80	.75	-6.2
Niacin (mg N.E.)	6.09	5.87*	4.50*	-23.3+	6.77	7.42	6.60	-11.0
Vitamin B ₆ (mg)	.47*	.46*	.35*	-23.9+	.54	.55	.49	-10.9
Calcium (mg)	476*	450*	353*	-21.5+	538	497	468	-5.8
Phosphorus (mg)	561	544*	423*	-22.2+	627	625	575	-8.0
Magnesium (mg)	97	93*	70*	-24.7+	106	104	94	-9.6
Iron (mg)	4.14*	4.21*	3.17*	-24.7+	4.79	5.20	4.66	-10.4
Sodium (mg)	1,102*	1,120*	859*	-23.3+	1,341	1,422	1,290	-9.3

*Difference between elementary and middle secondary schools is statistically significant at the .01 level.

+Difference between nutrient content of the average meal selected and the average meal consumed, within school type, is statistically significant at the .01 level.

Data Source: On-Site Meal Observations.

is expected given the results described previously in the meals offered and meals selected analyses. However, differences for the average meal consumed were consistently larger than the differences for either the average meal offered or the average meal selected. For example, the average meal selected in elementary schools contained 14 percent fewer calories than the average meal selected in middle/secondary schools. The average meal consumed in elementary schools, on the other hand, contained 39 percent fewer calories than the average meal consumed in middle/secondary schools.

Percent
Contribution
to RDAs

Exhibit VII.31 presents comparisons of the nutrient content of the average NSLP meal consumed in elementary schools with each of the age-appropriate RDA standards. The average lunch consumed by children in elementary schools exceeded the target nutrient ranges for protein, vitamin C, riboflavin and phosphorus, i.e., the average lunch consumed included levels of these nutrients that exceed approximately one-third of the daily needs of even the oldest elementary school students. The levels of vitamin A, thiamin, niacin, calcium and magnesium were within the target range. As the exhibit shows, older students would have to consume more than is included in the average NSLP meal in order to meet their needs for these nutrients. The available data do not indicate, however, how the meals consumed by any particular age/sex group may have differed from the average.

The average NSLP meal consumed in elementary schools was below the target range for calories, vitamin B₆ and iron. Thus, the average meal as consumed did not provide one-third of the RDA for calories and these nutrients for the majority of elementary school children. This finding is comparable to findings from other studies.

Exhibit VII.32 summarizes RDA comparisons for the average meal consumed in middle/secondary schools. The nutrient content of the average NSLP meal consumed in these schools exceeded the target range for protein, vitamin C, thiamin, riboflavin, niacin, calcium and phosphorus. It was within the target range for magnesium and iron, although the previous caveat about greater needs of older students applies here also.

The average NSLP meal consumed by middle/secondary students was below the target range for calories, vitamin A and vitamin B₆, and therefore did not meet the RDA goals for these nutrients for most middle/secondary school students. The findings for calories and vitamin B₆ are consistent with those noted for NSLP meals consumed in elementary schools and with other studies of NSLP meals. The apparent shortfall of vitamin A in NSLP meals as consumed has also been noted in previous studies.

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Exhibit VII.31

Percentage of Recommended Dietary Allowances Provided in
the Average NSLP Meal Consumed in Elementary Schools
(SY 1989-90)

	Nutrients In Meal Consumed	Students 4-6 years		Students 7-10 years		Male Students 11-14 years		Female Students 11-14 years	
		One-Third Daily RDA	Percent Daily RDA	One-Third Daily RDA	Percent Daily RDA	One-Third Daily RDA	Percent Daily RDA	One-Third Daily RDA	Percent Daily RDA
Calories	544	600	30%	667	27%	833	22%	733	25%
Protein (gm)	22	8	93	9	80	15	50	15	49
Vitamin A (mcg R.E.)	215	167	43	233	31	333	22	267	27
Vitamin C (mg)	18	15	39	15	39	17	35	17	35
Thiamin (mg)	.35	.30	39	.33	35	.43	27	.37	32
Riboflavin (mg)	.57	.37	52	.40	47	.50	38	.43	44
Niacin (mg N.E.)	4.50	4.00	37	4.33	35	5.67	26	5	30
Vitamin B ₆ (mg)	.35	.37	32	.47	25	.57	20	.47	25
Calcium (mg)	353	267	44	267	44	400	29	400	29
Phosphorus (mg)	423	267	53	267	53	400	35	400	35
Magnesium (mg)	70	40	58	57	41	90	26	93	25
Iron (mg)	3.17	3.33	32	3.33	32	4.00	26	5.00	21

NOTE: NSLP goal is to provide approximately one-third of the RDA for all age groups. Percentages in this table are based on the nutrient content of the meal consumed by the average student in each school. No age- or sex-specific data were collected.

Data Source: On-Site Meal Observations.

Exhibit VII.32

Percentage of Recommended Dietary Allowances Provided in
the Average NSLP Meal Consumed in Middle/Secondary Schools
(SY 1989-90)

	Nutrients In Meal Consumed	Male Students 11-14 years		Female Students 11-14 years		Male Students 15-18 years		Female Students 15-18 years	
		One-Third Daily RDA	Percent Daily RDA	One-Third Daily RDA	Percent Daily RDA	One-Third Daily RDA	Percent Daily RDA	One-Third Daily RDA	Percent Daily RDA
Calories	755	833	30%	733	34%	1000	25%	733	34%
Protein (gm)	32	15	71	15	69	20	54	15	72
Vitamin A (mcg R.E.)	293	333	29	267	37	333	29	267	37
Vitamin C (mg)	30	17	59	17	59	20	49	20	49
Thiamin (mg)	.51	.43	39	.37	46	.50	34	.37	46
Riboflavin (mg)	.75	.50	50	.43	58	.60	42	.43	58
Niacin (mg N.E.)	6.60	5.66	39	5.00	44	6.67	33	5.00	44
Vitamin B ₆ (mg)	.49	.57	29	.47	35	.67	25	.50	33
Calcium (mg)	468	400	39	400	39	400	39	400	39
Phosphorus (mg)	575	400	48	400	48	400	48	400	48
Magnesium (mg)	94	90	35	93	34	133	24	100	31
Iron (mg)	4.66	4.00	39	5.00	31	4.00	39	5.00	31

NOTE: NSLP goal is to provide approximately one-third of the RDA for all age groups. Percentages in this table are based on the nutrient content of the meal consumed by the average student in each school. No age- or sex-specific data were collected.

Data Source: On-Site Meal Observations.

When viewed in concert, the results of the three analyses (i.e., NSLP meals as offered, selected and consumed) indicate that meals planned in accordance with program guidelines and offered to students were very successful in meeting the program goal of one-third of the RDA. Further, the nutrient content of meals selected by students were, with few exceptions, within the target range for calories and all nutrients. Significant nutritional shortfalls were few and arose only in the meals actually consumed by students, particularly at the elementary school level. Thus, the key to ensuring that students receive approximately one-third of their daily nutritional needs from an NSLP meal is to increase the likelihood that students will actually consume the meals they select. It is also important to ensure that the oldest students in each school have the ability to receive larger or additional portions of food.

Indices of
Nutritional
Quality (INQs)

Exhibits VII.33 and VII.34 present INQ scores for the average meal consumed by students in elementary and middle/secondary schools, respectively. Results are comparable to those described previously for the average meal selected. While the average NSLP meals consumed by students may have been low in total calories, the mix of foods included was high in nutritional quality and well-balanced. Iron density for older female students was, again, the most notable potential shortfall.

Comparison
to Dietary
Guidelines
for Americans

Exhibit VII.35 summarizes the fat, cholesterol and sodium content of the average NSLP meal as offered, selected and consumed. In general, the conclusions drawn in previous analyses still hold: the average NSLP meal consumed in both elementary and middle/secondary schools exceeded the Dietary Guidelines recommendations for total fat and saturated fat. The average meal consumed in both types of schools was high in sodium, especially at the middle/secondary school level, and acceptable in cholesterol content, when compared to NRC Diet and Health guidelines. The average meal consumed in elementary schools came very close to meeting the NRC sodium goal, however, since this was due to food wastage, this finding is not entirely positive. Exhibit VII.36 presents frequency distributions for these nutrients.

Food Level
Analysis

To investigate the amount of plate waste in the NSLP program, food selection and plate waste data for the sample of students selected for plate waste observation were utilized to compute a measure of the average percent consumption for each food item included in the food group taxonomy. The following method was used to determine the percent consumption for each food item selected by sampled children:

$$\frac{[\text{food selected (gm)} - \text{plate waste (gm)}]}{\text{food selected (gm)}} \times 100$$

An aggregate measure was also computed, using the total weight of all foods included in a meal and the total weight of the foods that were not consumed.

Exhibit VII.33

Indices of Nutritional Quality (INQs) for
the Average NSLP Meal Consumed in Elementary Schools
(SY 1989-90)

	INQs for Students 4-6 Years	INQs for Students 7-10 Years	INQs for Male Students 11-14 Years	INQs for Female Students 11-14 Years
Protein (gm)	3.10	2.96	2.27	1.96
Vitamin A (mcg R.E.)	1.43	1.15	1.00	1.08
Vitamin C (mg)	1.30	1.44	1.59	1.40
Thiamin (mg)	1.30	1.30	1.23	1.28
Riboflavin (mg)	1.73	1.74	1.73	1.76
Niacin (mg N.E.)	1.23	1.30	1.18	1.20
Vitamin B ₆ (mg)	1.07	0.93	0.91	1.00
Calcium (mg)	1.47	1.63	1.32	1.16
Phosphorus (mg)	1.77	1.96	1.59	1.40
Magnesium (mg)	1.93	1.52	1.18	1.00
Iron (mg)	1.07	1.19	1.18	0.84

NOTE: An INQ of 1.0 or more indicates that the meal is of high nutritional quality. INQs below 1.0 indicate that the meal will not provide 100% of the target level RDA (one-third) unless the target RDA for calories is exceeded.

Data Source: On-Site Meal Observations.

Exhibit VII.34

Indices of Nutritional Quality (INQs) for
the Average NSLP Meal Consumed in Middle/Secondary Schools
(1989-90)

	INQs for Male Students 11-14 Years	INQs for Female Students 11-14 Years	INQs for Male Students 15-18 Years	INQs for Female Students 15-18 Years
Protein (gm)	2.37	2.03	2.16	2.12
Vitamin A (mcg R.E.)	0.97	1.09	1.16	1.09
Vitamin C (mg)	1.97	1.74	1.96	1.44
Thiamin (mg)	1.30	1.35	1.36	1.35
Riboflavin (mg)	1.67	1.71	1.68	1.71
Niacin (mg N.E.)	1.30	1.29	1.32	1.29
Vitamin B ₆ (mg)	0.97	1.03	1.00	0.97
Calcium (mg)	1.30	1.15	1.56	1.15
Phosphorus (mg)	1.60	1.41	1.92	1.41
Magnesium (mg)	1.17	1.00	0.96	0.91
Iron (mg)	1.30	0.91	1.56	0.91

NOTE: An INQ of 1.0 or more indicates that the meal is of high nutritional quality. INQs below 1.0 indicate that the meal will not provide 100% of the target level RDA (one-third) unless the target RDA for calories is exceeded.

Data Source: On-Site Meal Observations.

Exhibit VII.35

Macronutrient, Cholesterol and Sodium Content of the
Average NSLP Meal Offered, Selected and Consumed
In Elementary and Middle/Secondary Schools
Compared to the Dietary Guidelines for Americans
(SY 1989-90)

	USDA/DHHS Dietary Guidelines for Americans	Elementary Schools (n=40)				Middle/Secondary Schools (n=20)			
		Offered	Selected	Consumed	Difference (%) (Con vs. Sel)	Offered	Selected	Consumed	Difference (%) (Con vs. Sel)
Percent Calories from Total Fat	<30.0	38.4	36.0	36.1	+0.1%	38.0	38.4	38.1	-0.3
Percent Calories from Saturated Fat	<10.0	14.8	14.2	14.3	+0.1	15.0	15.0	15.1	+0.1
Percent Calories from Carbohydrate	55.0-65.0 ¹	46.4	49.2*	48.9*	-0.3	46.4	46.0	46.1	+0.1
Percent Calories from Protein	5.0-15.0 ¹	16.8	16.5	16.6	+0.1	17.0	16.9	17.0	+0.1
Mean Cholesterol (mg)	n.q. ²	84	79*	61*	-22.8+	99	94	85	-9.6
Mean Sodium (mg)	n.q. ²	1,102*	1,120*	859*	-23.3+	1,341	1,422	1,290	-9.3

¹The USDA/DHHS Dietary Guidelines do not provide specific recommendations for the proportion of calories from carbohydrates and protein. RDAs for protein for school age children range from 5 to 8 percent of total calories. In general, the average protein intake considerably exceeds the RDA. The National Research Council (NRC) report Diet and Health recommends maintaining total protein levels lower than twice the RDA for all age groups and that the intake of carbohydrates be more than 55% of total calories. To achieve the recommended levels of calories from fat, carbohydrate and protein content would need to be in these ranges.

²Not quantified. There is no established Recommended Dietary Allowance or Estimated Safe and Adequate Intake for cholesterol or sodium. The Dietary Guidelines for Americans recommend choosing a diet low in cholesterol and use of salt and sodium only in moderation. The National Research Council (NRC) report Diet and Health recommends that adults and children limit salt intake to 6 grams per day, equal to 2400 mg of sodium, and dietary cholesterol intake to less than 300 mg per day.

*Difference between elementary and middle/secondary schools is statistically significant at the .01 level.

+Difference between meal as selected and meal as consumed, within school type, is statistically significant at the .01 level.

Data Source: On-Site Meal Observations.

Exhibit VII.36

Frequency Distribution of the Level of Fat, Cholesterol and Sodium Provided in the Average NSLP Meal Consumed in Elementary and Middle/Secondary Schools (SY 1989-90)

	Percent of Schools		
	Elementary (n=40)	Middle/ Secondary (n=20)	All Schools (n=60)
<u>Percent Calories from Fat</u>			
< 30 percent (D.G. Goal) ¹	8	5	7
31-35 percent	27	5	20
36-38 percent	43	45	43
39-40 percent	13	30	18
> 40 percent	10	15	12
<u>Percent Calories from Saturated Fat</u>			
< 10 percent (D.G. Goal) ¹	0	0	0
11-13 percent	40	15	32
14-16 percent	45	60	50
>16 percent	15	25	18
<u>Cholesterol (mg)²</u>			
< 75 mg	85*	40	70
76-100 mg	15	50	27
101-150 mg	0	5	2
151-200 mg	0	5	2
<u>Sodium (mg)²</u>			
< 800 mg	32*	5	23
801-1,000 mg	55	0	37
1,001-1,200 mg	10	35	18
1,201-1,500 mg	2	50	18
> 1,500 mg	0	10	4

¹Level of intake recommended in the USDA/DHHS Dietary Guidelines for Americans.

²The Dietary Guidelines for Americans recommend choosing a diet low in cholesterol and use of salt and sodium only in moderation. The National Research Council (NRC) report Diet and Health recommends that adults and children limit salt intake to 6 grams per day (equal to 2400 mg. of sodium) and cholesterol intake to less than 300 mg. per day.

*Chi-square test of differences between elementary and middle/secondary schools is significant at the .01 level.

Data Source: On-Site Meal Observations.

Measures for individual food items were averaged by food group across all observations (within school group) to compute an overall average for each food group in each type of school. These data are presented in Exhibit VII.37. The column in this exhibit labeled "Average Percent Consumed" can be interpreted as the converse of plate waste, i.e., it represents the proportion of available food that, on average, was consumed by children in each school.

Overall, elementary school students consume about three-quarters of the lunch foods they select, and middle/secondary school students consume almost ninety percent of the foods they select. As the preceding nutritional analyses suggested, elementary school students waste significantly more of the food they select than do middle/secondary students. The particular foods that elementary school students appear to waste more often than middle/secondary school students are, in descending order, cooked vegetables, salads and other raw vegetables, rolls and milk.

Exemplary
SFAs vs.
Typical SFAs

NSLP meals in SFAs selected as "exemplary" turned out to be no different than meals in "typical" SFAs, as Exhibits ET-VII.3 through ET-VII.8 demonstrate. Differences between the quantities of nutrients provided in NSLP meals by exemplary and typical SFAs were examined via t-tests for meals as offered, selected and consumed. The mean proportions of calories supplied by fat (total, saturated and unsaturated), protein and carbohydrate were also evaluated. Only one statistically significant difference emerged from this line of analysis--the vitamin C content of meals offered in elementary schools in exemplary SFAs was greater than that of elementary schools in typical SFAs.^{1/}

There are a number of possible explanations for the lack of discernible differences between these two groups of SFAs. First, although each exemplary SFA, by definition, was thought by FNS Regional Office or State-level staff to have initiated some effort toward improving the nutritional quality of NSLP meals, there was considerable diversity within the group in terms of the goals of these interventions as well as the specific actions taken. Interviews conducted with food service managers in these SFAs revealed that a minority had extensive efforts underway, including computerized nutritional analysis, numerical goals for fat, saturated fat, sodium, and sometimes sugar, for use in meal planning, and training for cooks and other food service staff.

^{1/}Frequency distributions were also examined for all nutrients in all three levels of meal analysis; no significant differences were noted. In addition, the two types of typical SFAs, i.e., those participating in menu modification grants and those that were not (see Chapter I), were compared. Only one difference--the level of vitamin C in the average meal offered in elementary schools--was detected.

Exhibit VII.37

Average Consumption of Food Portions Selected by
or Served to Students in NSLP Meals Consumed in Elementary
and Middle/Secondary Schools
(SY 1989-90)

Meal Component/Food Item	Elementary Schools		Middle/Secondary Schools	
	Percent of Meals Offering (n=198)	Average Percent Consumed ¹	Percent of Meals Offering (n=99)	Average Percent Consumed ¹
<u>ALL ITEMS</u>	--	76%*	--	87%
<u>MILK</u>	100%	78*	100%	93
Whole Milk	71	74*	83	90
Lowfat Milk	93	73*	99	91
Skim Milk	32	72*	39	92
Flavored Milk	90	80*	96	94
<u>FRUIT</u>	93	74	94	85
<u>FRESH FRUIT</u>	44	68	49	80
Apple	23	62	24	77
Banana	7	71	9	74
Cantaloupe	1	48	1	100
Grapefruit	1	75	0	NA
Grapes	4	91	1	100
Orange	21	67*	32	90
Pear	3	75	8	++
Watermelon	1	84	2	94
Fruit Salad	1	75	3	56
<u>CANNED FRUIT</u>	58	74	70	82
Applesauce	18	75	23	77
Apricots	2	50	2	++
Fruit Cocktail	23	72	24	84
Peaches	12*	82	28	85
Pears	16	74	19	86
Pineapple	9*	78	23	81
Plums	1	17	2	100
Strawberries	1	83	0	NA
Other Berries	1*	92	5	83
<u>FRUIT JUICE</u>	34	87*	48	94
<u>DRIED FRUIT</u>	3	60	7	78
<u>OTHER FRUIT CHOICES</u>	19	74	20	80
Crisps, Cobblers	9	68	9	77
Gelatin (made with fruit juice or fruit) Juice Bars, Misc.	11	79	11	81

Exhibit VII.37

(continued)

Meal Component/Food Item	Elementary Schools		Middle/Secondary Schools	
	Percent of Meals Offering (n=198)	Average Percent Consumed ¹	Percent of Meals Offering (n=99)	Average Percent Consumed ¹
VEGETABLES²	91%	62%*	86%	82%
RAW VEGETABLES	49*	58*	67	83
Lettuce, Salad	36*	60*	58	83
Other Raw Vegetables	13	58*	13	83
Cole Slaw, Miscellaneous Salads	5	44*	8	83
COOKED VEGETABLES	45	52*	39	78
Corn	17	67*	13	85
Green Beans	10	59	8	56
Broccoli	6	67	7	84
Cabbage	1	16	2	++
Peas	5	29	2	60
Carrots	1	56	2	++
Mixed Vegetables	13	25	10	50
Onion Rings	1	90	2	100
Spinach, Greens	2	58	0	NA
Miscellaneous Vegetables	3	0	3	100
POTATOES	43*	77	61	85
French Fries, Tater Tots, etc.	35*	79	54	85
Other Potatoes	9	65	15	85
BEANS, LEGUMES	12	46	6	59
SOUPS	1*	45	8	48
BREADS/BREAD ALTERNATES³	49	66*	62	82
Bagels	1	64	0	NA
Biscuits/Croissants	4	62	3	80
Bread, Toast	8	69	10	79
Cornbread	8	60	3	79
Crackers	4*	70*	15	94
Rolls	18	62*	29	81
Sweet Buns	2	76	3	88
Fruit Muffins/Breads	1	60	0	NA
Tortillas, Taco Shells	1	++	0	NA
Rice	7	66	7	81
Pasta, Noodles	1	100	2	64
Pancakes, Waffles	2	88	1	199

Exhibit VII.37

(continued)

Meal Component/Food Item	Elementary Schools		Middle/Secondary Schools	
	Percent of Meals Offering (n=198)	Average Percent Consumed ¹	Percent of Meals Offering (n=99)	Average Percent Consumed ¹
ENTREE	100%	77%	100%	91%
MEAT/POULTRY/FISH⁴	33	78	35	92
Beef - Roast, Ribs	1	88	2	100
Breaded Fried Steak	2	77	2	++
Broiled Steak	1	73	1	95
Meatloaf	1	76	1	83
Pork Chop	0	NA	2	88
Baked, BBQ Chicken	5	69	6	86
Chicken Nuggets, Patty	6	93	6	94
Chicken or Turkey Croquettes	1	31	3	88
Roast Turkey	1	66	1	95
Fish Nuggets, Sticks	2	75	0	NA
Fried Clams	0	NA	1	96
Breaded Fish Portion	4	74	7	92
Bacon, Sausage	4	92	2	100
Chili (Mostly Meat)	6	76	5	96
Cold Meat, Cheese Plate	4	64	1	50
MEAT AND GRAIN COMBINATIONS	74	80	78	92
BURGERS AND SANDWICHES	57	79	67	92
Hamburger, Cheeseburger	9*	90	39	92
Steak, Roast Beef Sandwich	3	58	5	88
Sloppy Joe, BBQ Beef	6	84	4	88
Hot Dogs, Corn Dogs	19	81*	24	96
Fried Chicken Sandwich	10	78*	14	95
Fried Fish Sandwich	4	79	6	84
Coldcut Sandwich, Sub Sandwich	7*	85	19	91
Ham & Cheese Sandwich	4*	63*	18	95
Grilled Cheese Sandwich	4	72	5	96
Tuna Salad Sandwich	2	73	6	50
Egg Salad Sandwich	0	NA	1	++
Peanut Butter & Jelly Sandwich	13	74	7	72
Turkey Sandwich	2	58*	6	100
OTHER MEAT AND BREAD COMBINATIONS	33	82	39	72
Pizza	22	85	27	91
Burrito, Enchilada	4	76	10	96
Taco, Nacho	6	84	8	96
Pot Pies	1	75	1	85
French Toast	1	84	1	83
Macaroni & Cheese	3	63	3	94
Beef & Noodles, Goulash,				
Miscellaneous	1	69	2	83

-continued-

Exhibit VII.37
(continued)

Meal Component/Food Item	Elementary Schools		Middle/Secondary Schools	
	Percent of Meals Offering (n=198)	Average Percent Consumed ¹	Percent of Meals Offering (n=99)	Average Percent Consumed ¹
MEAT, GRAIN, VEGETABLE COMBINATIONS ⁵	15%	71%	24%	84%
Spaghetti with Meat Sauce	6	70	8	85
Lasagna, Ravioli, etc.	3	76	7	83
Taco, Taco Salad	7	76	3	88
Salad Bars ⁶	0*	NA	6	87
MEAT, VEGETABLE COMBINATIONS	8	86	15	88
Chef Salad ⁷	6	45	10	68
Salad Bar ⁷	1	85	3	90
Potato Bar	1	88	1	92
Stir Fry, Miscellaneous	1	79	1	79
DESSERTS ⁸	31	83	29	85
Pies, Tarts	3	67	0	NA
Cookies	14	83	12	92
Cakes, Brownies	7	83	11	80
Gelatins (without added fruit or juice)	1	100	5	71
Ice Cream, Puddings	9	84	5	77

¹Percentages reflect the proportion of student meals that included each item (or category) when the food was available. Sample size not reported because it varies for every item in the table.

²Includes vegetables offered as a separate item, i.e., not included in combination items such as chef salad, tacos, taco salad, etc.

³Includes breads/bread alternates offered as a separate item, i.e., not included in combination items such as sandwiches, burgers, pizza, pasta dishes, etc.

⁴Meat, poultry and fish items offered separately.

⁵SFAs considered these items to meet part or all of the vegetable/fruit meal pattern requirements.

⁶These salads included a roll, crackers, pasta salad or other item that met some or all of the bread/bread alternate requirement.

⁷These salads did not include bread/bread alternate components.

⁸Includes foods served in reimbursable meals that were not creditable toward any component in the NSLP meal pattern.

* Difference between elementary and middle/secondary students is significant at the .01 level.

++Consumption data not available because none of the students included in the plate waste observations selected this item.

NA: Consumption data not available because none of the schools offered this item.

Data Source: On-Site Meal Observations

Most of the exemplary SFAs had menu modification efforts that were less comprehensive and less well-defined. Many reported implementing simple steps such as deleting added fats from cooked vegetables, baking processed food items rather than frying, and purchasing low-calorie dressings. Few of these managers cited specific numerical goals for fat or sodium in school meals, or direct assessment of the impact or effectiveness of the menu modification efforts cited. The manager in one exemplary SFA did not mention any efforts directed at lowering fat, cholesterol or sodium in school meals.

Second, as Exhibit VII.38 indicates, many of the typical SFAs reported involvement in similar, and in some cases more extensive, activities aimed at decreasing fat, cholesterol and/or sodium in NSLP meals. Over half of the typical SFAs had initiated menu modification steps to decrease the level of fat in NSLP meals. The specific strategies mentioned by managers in these SFAs were not as detailed as those of the most elaborate programs in exemplary SFAs, but they were very similar to the more limited general steps identified by the majority of exemplary SFAs.

Thus, while it was indeed true that exemplary SFAs had initiated efforts to improve the nutritional quality of NSLP meals, the variability within the group in terms of the specific actions taken, coupled with the fact that many typical SFAs were employing the same intervention strategies as exemplary SFAs, means that, on average, NSLP meals were essentially the same in both groups of SFAs.

Exhibit VII.38

Menu Modification Efforts of Exemplary
and Typical SFAs
(SY 1989-90)

Menu Modification Effort	Percent of SFAs		
	Exemplary SFAs (n=10)	Typical SFAs (n=10)	All SFAs (n=20)
Decrease Fat	90%	60%	75%
Decrease Sodium	80	20	50
Decrease Sugar	50	40	45
Increase Fiber	30	10	20
Increase Complex Carbohydrates	10	10	10
None: Using USDA Menu Planning Guidelines Only	10	40	25

Data Source: SFA Manager Interview.

VIII. FOOD AND NUTRIENT COMPOSITION OF SBP MEALS

This chapter presents results of the analysis of data gathered in the on-site meal observations. The analysis examines the food and nutrient composition of the average SBP meal at three levels: (1) as offered by participating schools, (2) as selected by participating students, and (3) as actually consumed by participating students. At each level, the overall nutritional adequacy of the average SBP meal is compared to the Recommended Dietary Allowances for essential nutrients. The nutrient density of average NSLP meals is examined along with the fat, cholesterol and sodium content. Finally, food-level analyses are presented which provide information on the types of food offered to students in the SBP, the foods students typically select from those available, and the foods students tend to waste.

BACKGROUND

The School Breakfast Program was authorized in 1966, and was targeted toward "nutritionally needy" children in low-income school districts.^{1/} The 1975 Amendments to the Child Nutrition Act extended the SBP to all schools who wished to participate. Today, approximately 41 percent of all elementary and secondary school students have the program available to them and, on an average day, almost 4 million breakfasts are served.^{2/}

Like the NSLP, meals served in the SBP must comply with meal pattern requirements set forth in program regulations in order to be eligible for Federal reimbursement. The requirements specify both the components (types of food to be included in an SBP meal), and quantities (minimum portions of food to be served.) The current SBP meal pattern requirements, summarized in Exhibit VIII.1, were issued in March 1989. The meal pattern calls for one more food item than had been required prior to 1989, i.e., a pattern SBP meal now includes four components instead of three. Expansion of the SBP meal pattern requirements was undertaken as a result of P.L. 99-591 which

^{1/}The Child Nutrition Act of 1966, P.L. 89-642.

^{2/}Annual Historical Review of FNS Programs: Fiscal Year 1989. USDA, Food and Nutrition Service, 1990.

Exhibit VIII.1

SBP Meal Pattern Requirements

Food Components/Items	Minimum Required Quantities Grades K-12
<u>MINIMUM REQUIREMENTS</u>	
4 components must be offered:	
• One serving of fluid milk • One serving of fruit or vegetable or both • Two servings of bread/bread alternate or meat/meat alternate, or one serving of each	
<u>MILK (Fluid):</u>	
(As a beverage, on cereal, or both)	1/2 pint
<u>JUICE/FRUIT/VEGETABLE:¹</u>	
Fruit and/or vegetable; or full-strength fruit juice or vegetable juice	1/2 cup
<u>BREAD/BREAD ALTERNATES:</u>	
Bread (whole-grain or enriched)	1 slice
Biscuit, roll, muffin, or equal serving of cornbread, etc. (whole-grain or enriched meal or flour)	1 serving
Cereal (whole-grain, enriched or fortified)	1/4 cup or 1 ounce
<u>MEAT/MEAT ALTERNATES:</u>	
Meat/poultry, or fish	1 oz.
Cheese	1 ounce
Egg (large)	1/2
Peanut Butter or other nut or seed butters	1 1/2 tbsp.
Cooked dry beans and peas	4 tbsp.
Nuts and/or Seeds	1 ounce

¹ It is recommended that a citrus juice or fruit or a fruit or vegetable or juice that is a good source of vitamin C be offered daily.

directed USDA to revise the breakfast meal pattern in order to improve the nutritional quality of SBP meals.^{1/}

P.L. 99-591 also instructed the Agency to extend the offer-versus-serve option (OVS) to the SBP, in order to increase local flexibility in implementing the Program and thereby increase the number of schools electing to offer the Program. Under the OVS option, students must be offered all four breakfast components (milk, fruit or juice, and either 2 bread/bread alternate choices, 2 meat/meat alternate choices or 1 bread choice and 1 meat/meat alternate) but may refuse one of the four food items and still have the breakfast qualify as a reimbursable meal.^{2/}

While previous studies have evaluated the nutritional benefits of the SBP, such analyses have not been undertaken since the revised meal pattern requirements went into effect. FNS therefore needs more current information on the nutritional value of meals offered in the SBP and the types of food schools offer in SBP meals. In addition, the Recommended Dietary Allowances (RDAs), the standards traditionally used in evaluating nutritional adequacy, have recently been updated and the current standards for several nutrients are different than the 1980 standards.^{3/} Most significantly, the RDAs for vitamin B₆, iron and magnesium have decreased for several age groups. Standards for other key nutrients have also changed (increased or decreased) for some groups of children. The analyses presented here evaluate the nutritional quality of SBP meals in light of the most recent recommendations for nutrient intake.

KEY RESEARCH ISSUES

In view of the information needs identified above, the primary objective of this portion of the study is to describe the food and nutrient composition of SBP meals at three levels:

- as offered, i.e., meals planned in accordance with program guidelines and made available to participating students;
- as selected, i.e., the combination of foods actually selected by students from all the options available to them; and

^{1/}The 1980 National Evaluation of School Nutrition Programs (NESNP-I) revealed that while SBP breakfasts were superior to other types of breakfasts in calcium and magnesium content, they were inferior in vitamin A, vitamin B₆ and iron content.

^{2/}7 CFR 245, Part 220.

^{3/}National Research Council, Committee on Dietary Allowances. Recommended Dietary Allowances, tenth edition. Washington, D.C.: National Academy Press, 1989.

- as consumed, i.e., the portions of food actually consumed by students.

A secondary objective is to examine potential nutritional differences between exemplary and typical SFAs and between elementary and middle/secondary schools.^{1/}

The following research questions were addressed for each level of analysis--meals as offered, selected and consumed:

- What is the nutrient content of the average SBP meal?
- How does the nutrient content of the average SBP meal compare to the Recommended Dietary Allowances (RDAs)?
- What is the nutrient density or quality of the average SBP meal?
- What is the fat, saturated fat, cholesterol and sodium content of the average SBP meal?

Research questions were also posed to assess nutritional differences among SBP meals as offered, selected and consumed:^{2/}

- Is the nutrient content of the average SBP meal as selected significantly different from the nutrient content of the average meal offered?
- Is the nutrient content of the average SBP meal consumed significantly different from the nutrient content of the average SBP meal selected?

A number of additional research questions related to food availability, food selection and food consumption are also addressed within the appropriate analysis:

^{1/}Exemplary SFAs were reported to have initiated some efforts to decrease the amount of fat and/or sodium in school meals. The 10 exemplary SFAs were selected from a pool of 70 SFAs that were nominated by FNS Regional Office staff, the American School Food Service Association and directors of State Child Nutrition Programs (see Chapter I).

^{2/}The original plans for this study also included research questions designed to assess the nutritional impact of the OVS option by comparing the nutrient content of meals offered, selected and consumed in schools with and without the OVS option. The final sample of schools that did not practice OVS was too small, however, (n = 9) to support meaningful analysis.

Meals offered

- How much choice is available to students, i.e., how often are students offered choices within a major meal component category?
- What specific foods are being offered to students in SBP meals?
- Are there differences between elementary and middle/secondary schools in terms of the specific types and amounts of food offered to students?

Meals selected

- In the presence of the offer-vs-serve (OVS) option, how many of the five items included in the SBP meal pattern do students select? Which items are refused (not selected) most often?
- Of the specific foods available in each meal component category, which do students select most often?
- Are there differences between elementary and middle/secondary schools in terms of the number or types of food items selected by students?
- How many schools offer a la carte items in the same serving line as SBP meals? What food items are typically available on an a la carte basis?
- Does the availability of a la carte items vary by school type?
- What proportion of children select one or more a la carte items, in addition to their SBP meal, when a la carte items are available?

Meals consumed

- How much of the food that students select in SBP meals is actually consumed, in total, and by food type?
- Are there differences in food consumption between elementary and middle/secondary school students?

DATA AND VARIABLES

Data were gathered in mid-March, 1990. On-site observations were conducted in 44 schools within 20 SFAs. In each school, observations were conducted during breakfast for four consecutive days.^{1/} Two separate analyses (nutrient content and food composition) were undertaken at three different levels (meals offered, selected and consumed.) A thorough description of the procedures used to aggregate meal observation data for the various analyses is provided in Chapter VII. The reader is referred to this chapter for a complete description of how the analyses were conducted. Key points are summarized below.

Nutrient Content Analysis

Unit of Analysis. The unit of analysis for evaluation of the nutrient content of SBP meals is the average meal offered, selected or consumed in each of the sampled schools. The nutrient content of the average meal is determined by averaging across the four days of observation.

Comparing Nutrient Content to Recommended Standards. Once the nutrient content of the average SBP meal was determined at all three levels (offered, selected and consumed), three different measures were computed to assess overall nutritional adequacy and quality. These included: percent contribution to Recommended Dietary Allowances (RDAs), indices of nutritional quality (INQs), and comparison to the Dietary Guidelines for Americans. Each is described briefly in the following paragraphs.

Recommended Dietary Allowances (RDAs). The RDAs are the accepted standard for determining the relative adequacy of mean nutrient intakes of population groups. SBP regulations, unlike NSLP regulations, do not include a specific RDA target goal for nutrient content. For these analyses, 25 percent of the RDA was used as a target level against which to compare nutrient content of SBP meals. This level was chosen rather than the 33 percent target used for NSLP meals because most children eat more often than 3 times each day. Snacks play an important role in childrens' diets, accounting for up to one-third of total calories.^{2/} Thus, it is not necessary for the breakfast meal to supply the same level of calories and nutrients as the other two "main" meals.

^{1/}Basic data collection procedures and available sample sizes are described in Chapter I; a more detailed description of the meal observation methodology is included in Appendix B.

^{2/}Farris, R.P., et. al., "Macronutrient intakes of 10-year old children, 1973 to 1982." Journal of the American Dietetic Association. 86: 765, 1986.

The most recent (1989) Recommended Dietary Allowances (see Appendix F) were used as reference standards. The proportion of the RDA provided in SBP meals was evaluated for those nutrients that have established RDAs. The nutrient content of the average SBP meal was examined separately for elementary and middle/secondary schools. Because the RDAs are defined on the basis of age and sex, the average SBP meal in each type of school was compared to the appropriate age- and sex-group RDA values.^{1/}

As was the case for NSLP meals (see Chapter VII), the RDA comparisons presented in this chapter are based on the meals selected or consumed by "average" students in each school. No age- or sex-specific data were collected for the students who were observed. It is not possible, therefore, to identify with certainty specific groups of students who may be selecting or consuming meals that provide less than one-third of the RDA for a given nutrient.^{2/} This issue is discussed in detail in Chapter VII.

Indices of Nutritional Quality (INQs). The INQ was used to measure the nutrient density or nutritional quality of the average SBP meal. The INQ measures the nutrient contribution of a meal relative to its caloric content.^{3/} An INQ was computed for each nutrient within each RDA age/sex group. An INQ score of 1.0 or greater indicates that the meal is high in nutritional quality, i.e., calories and nutrients are optimally balanced.^{4/}

Dietary Guidelines for Americans. Several important aspects of nutritional quality are not addressed in the RDA standards. Specifically, the RDAs do not address fat (both quantity and type), cholesterol and sodium content. The Dietary Guidelines for Americans (hereafter referred to as the Dietary Guidelines) issued jointly by USDA and the U.S. Department of Health and Human Services (DHHS) recommends moderate intake of these dietary constituents.^{5/} Currently, Child Nutrition Programs are

1/The RDAs define separate, and frequently different, nutrient needs for 4-6 year olds, 7-10 year olds, 11-14 year old males, 11-14 year old females, 15-18 year old males and 15-18 year old females.

2/FNS is collecting these data through the ongoing Special Nutritional Dietary Assessment Study.

3/Sorenson, W., Wyse, B., Wittwer, A., and Hansen, R.G. (1976). "An Index of Nutritional Quality for a Balanced Diet." Journal of the American Dietetic Association, 68:236-242.

4/The equation used in computing INQs is provided in Chapter VII.

5/Specific recommendations in The Dietary Guidelines for Americans are summarized in Chapter VII.

not required to address the Dietary Guidelines in planning menus for the SBP. However, USDA has encouraged School Nutrition Programs to consider them. The Menu Planning Guide for School Food Service highlights the Dietary Guidelines recommendations and encourages menu planners to keep fat, sugar and salt at a "moderate level."^{1/} The Department has recently identified incorporation of the Dietary Guidelines principles as a goal that school districts should be striving to meet by the year 2000.

In this report, the Dietary Guidelines are used as reference standards for evaluating the percent of calories from total fat and saturated fat in SBP meals. The Dietary Guidelines do not include specific recommendations for sodium or cholesterol intake. The National Research Council (NRC) recommends that adults and children limit salt intake to 6 grams per day (equivalent to 2400 mg. of sodium), and dietary cholesterol intake to less than 300 mg. per day.^{2/} The NRC guidelines for sodium and cholesterol intake are not endorsed by USDA, but are presented in this report as reference points to assist the reader in interpreting the data.

Food-Level Analysis

Unit of Analysis. The primary objective of the food-level analysis is to provide FNS with up-to-date information on the types of food offered to, selected by and consumed by children participating in the SBP. In order to obtain this information it is necessary to focus not on the 4-day "average" SBP meal used in the nutrient content analysis, but on each of the specific meals offered, and in the case of data on food selection and consumption, on the individual student-level observations.

Thus, for research questions related to foods included in SBP meals as offered, the unit of analysis is the SBP meal offered in each school on each day of observation (n=176). ^{3/} For research issues related to food selection decisions and food consumption patterns, the unit of analysis is the SBP meal as selected or consumed by each of the students observed. ^{4/}

^{1/}Menu Planning Guide for School Food Service. U.S. Department of Agriculture, Food and Nutrition Service, 1983.

^{2/}National Research Council, Food and Nutrition Board, Committee on Diet and Health. Diet and Health. Washington, D.C.: National Academy Press, 1989.

^{3/}Breakfast was observed for 4 consecutive days in 44 schools, for a total of 176 meals offered.

^{4/}On each day of observation, food selection was observed for approximately 60 children (or in some cases as many children as ate breakfast), and plate waste (food consumption) was observed for approximately 12 children. A total of 10,560 student meals were available for analyses focusing on meals selected, and 2,024 student meals were available for analyses dealing with meals consumed.

General
Analytic
Approach

Analysis of both the nutrient content and food-level data employs simple descriptive statistics, such as means, proportions, and frequency distributions. Statistics are calculated and presented separately for each of the three types of SBP meals--offered, selected and consumed. Data are also stratified by school type (elementary and middle/secondary) and, in some cases, by SFA type (exemplary and typical).

T-tests or chi-square tests have been performed to test the statistical significance of selected differences between SFAs (exemplary and typical) and schools (elementary and middle/secondary). T-tests have also been used to evaluate the significance of differences in nutrient content between meals offered and meals selected, and between meals selected and meals consumed. Because of the large number of t-tests calculated in this analysis, discussions are limited to variables that exhibit a difference that is statistically significant at the .01 level rather than the more liberal .05 level. This approach compensates for the possibility of finding large numbers of comparisons significant by chance alone. (See Chapter VII for a more detailed discussion of this issue.)

SBP MEALS OFFERED

This section presents data on the food and nutrient composition of the average SBP meal offered in elementary and middle/secondary schools.^{1/} First, the nutrient contribution of the average SBP meal offered in each type of school is evaluated in light of age- and sex-appropriate RDA standards and the target level of 25 percent used in these analyses. Second, INQ scores are examined. Third, the nutrient content of the average SBP meal offered is compared to the Dietary Guidelines recommendations. Finally, food-level analyses are presented and findings related to the types of food offered in SBP meals are discussed.

Nutrient
Content

Exhibit VIII.2 presents mean levels of calories and nutrients for the average breakfast offered in elementary and middle/secondary schools in SY 1989-90. The exhibit illustrates a tendency for breakfasts offered in middle/secondary schools to be slightly higher in calories and most nutrients, however these differences were not statistically significant. This finding is not surprising in view of the fact that SBP guidelines specify one meal pattern (i.e., types and amounts of food) for all students in grades K-12 (Exhibit VIII.1), although program guidance material encourages SFAs to serve larger portions to older students when possible.

^{1/}For reasons that will be explained later in this chapter, data for exemplary and typical SFAs have been pooled for all analyses.

Exhibit VIII.2

Mean Calorie and Nutrient Content of the Average SBP Meal Offered in Elementary and Middle/Secondary Schools (SY 1989-90)

	<u>Elementary</u> (n=31)	<u>Middle/Secondary</u> (n=13)	<u>All Schools</u> (n=44)
Calories	469	522	484
Protein (gm)	16	17	17
Total Fat (gm)	16	17	17
Saturated Fat (gm)	7	8	7
Unsaturated Fat (gm)	8	8	8
Cholesterol (mg)	56	58	56
Total Carbohydrate (gm)	66	77	69
Vitamin A (mcg R.E.)	353	344	350
Vitamin C (mg)	30	35	32
Thiamin (mg)	.48	.53	.49
Riboflavin (mg)	.77	.81	.78
Niacin (mg N.E.)	4.76	4.77	4.76
Vitamin B ₆ (mg)	.47	.47	.47
Calcium (mg)	380	406	387
Phosphorus (mg)	388	425	398
Magnesium (mg)	70	72	70
Iron (mg)	4.23	5.11	4.49
Sodium (mg)	621	645	628

Note: None of the differences between elementary and middle/secondary schools is statistically significant at the .01 level.

Data Source: On-Site Meal Observations.

Percent
Contribution
to RDAs

When compared to the RDAs for the groups of children that typically attend each type of school, the average SBP meal offered in both elementary and middle/secondary schools provided approximately 25 percent or more of students' daily nutritional needs in all but a few cases.^{1/}

The average breakfast offered in elementary schools supplied one-fourth or more of the RDA for all nutrients for 4-6 year olds, 7-10 year olds and 11-14 year olds (Exhibit VIII.3). It supplied 25 percent of daily calorie needs for 4-6 year old students, but fell short of this level for 7-10 year olds (23 percent), 11-14 year old females (21 percent) and 11-14 year old males (19 percent). The average breakfast offered in middle/secondary schools also provided approximately one-fourth of students' calorie and nutrient needs, with three exceptions: calories (21 percent) for 11-14 year old males and calories (17 percent) and magnesium (18 percent) for 15-18 year old males (Exhibit VIII.4).

With the exception of magnesium for 15-18 year old males, the only apparent nutritional shortcoming of the average SBP meal as offered was its inability to provide approximately 25 percent of students' daily calorie needs. The significance of this finding is open to question, however. As previously mentioned, children typically obtain a substantial proportion of their daily calories from between-meal snacks--in some cases 30 percent or more--and therefore may not need to acquire a full 25 percent of their daily calorie requirements from an SBP meal.^{2/}

Indices of
Nutritional
Quality (INQs)

INQ scores for the average meals offered in both elementary and middle/secondary schools met or exceeded 1.0 for all nutrients examined (Exhibits VIII.5 and VIII.6). This indicates that SBP meals planned in accordance with program meal component guidelines were high in nutritional quality and balanced across a number of key nutrients. While the overall caloric value of the average SBP meal may have been somewhat low, the meals were very high in nutrient density supplying in excess of 30 percent of the RDA for most nutrients examined.

^{1/}Program regulations do not specify a target RDA level for SBP meals. Twenty-five percent of the RDA was used as a target in these analyses. Any nutrient supplied at 24 percent or more of the RDA was judged to meet the target goal of approximately 25 percent of the RDA.

^{2/}Farris, R.P., et al., "Macronutrient intakes of 10-year old children, 1973 to 1982." Journal of the American Dietetic Association. 86: 765, 1986.

Exhibit VIII.3

Percentage of Recommended Dietary Allowances Provided in
the Average SBP Meal Offered in Elementary Schools
(SY 1989-90)

	Nutrients in Meal Offered	Students 4-6 years		Students 7-10 years		Male Students 11-14 years		Female Students 11-14 years	
		One-Fourth Daily RDA	Percent Daily RDA	One-Fourth Daily RDA	Percent Daily RDA	One-Fourth Daily RDA	Percent Daily RDA	One-Fourth Daily RDA	Percent Daily RDA
Calories	469	450	26%	500	23%	625	19%	550	21%
Protein (gm)	16	6	67	7	58	11	36	12	35
Vitamin A (mcg R.E.)	353	125	71	175	50	250	35	200	44
Vitamin C (mg)	30	11	67	11	67	12	60	12	60
Thiamin (mg)	.48	.22	53	.25	48	.32	37	.28	43
Riboflavin (mg)	.77	.28	70	.30	64	.38	51	.32	59
Niacin (mg N.E.)	4.76	3.00	40	3.25	37	4.25	28	3.75	32
Vitamin B ₆ (mg)	.47	.28	43	.35	34	.42	28	.35	34
Calcium (mg)	380	200	47	200	47	300	32	300	32
Phosphorus (mg)	388	200	48	200	48	300	32	300	32
Magnesium (mg)	70	30	58	42	41	68	26	70	25
Iron (mg)	4.23	2.50	42	2.50	42	3.00	35	3.75	28

NOTE: Target goal used in these analyses in one-fourth of the RDA for all age groups.

Data Source: On-Site Meal Observations.

Exhibit VIII.4

Percentage of Recommended Dietary Allowances Provided in
the Average SBP Meal Offered in Middle/Secondary Schools
(SY 1989-90)

	Nutrients In Meal Offered	Male Students 11-14 years		Female Students 11-14 years		Male Students 15-18 years		Female Students 15-18 years	
		One-Fourth Daily RDA	Percent Daily RDA	One-Fourth Daily RDA	Percent Daily RDA	One-Fourth Daily RDA	Percent Daily RDA	One-Fourth Daily RDA	Percent Daily RDA
Calories	522	625	21%	550	24%	750	17%	550	24%
Protein (gm)	17	11	38	12	38	15	29	11	39
Vitamin A (mcg R.E.)	344	250	34	200	43	250	34	200	43
Vitamin C (mg)	35	12	71	12	71	15	59	15	59
Thiamin (mg)	.53	.32	41	.28	48	.38	35	.28	48
Riboflavin (mg)	.81	.38	54	.32	63	.45	45	.32	63
Niacin (mg N.E.)	4.77	4.25	28	3.75	32	5.00	24	3.75	32
Vitamin B ₆ (mg)	.47	.42	28	.35	34	.50	24	.38	31
Calcium (mg)	406	300	34	300	34	300	34	300	34
Phosphorus (mg)	425	300	35	300	35	300	35	300	35
Magnesium (mg)	72	68	27	70	26	100	18	75	24
Iron (mg)	5.11	3.00	43	3.75	34	3.00	43	3.75	34

NOTE: Target goal used in these analyses is one-fourth of the RDA for all age groups.

Data Source: On-Site Meal Observations.

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Exhibit VIII.5

Indices of Nutritional Quality (INQs) for
the Average SBP Meal Offered in Elementary Schools
(SY 1989-90)

	INQs for Students 4-6 Years	INQs for Students 7-10 Years	INQs for Male Students 11-14 Years	INQs for Female Students 11-14 Years
Protein (gm)	2.58	2.52	1.89	1.67
Vitamin A (mcg R.E.)	2.73	2.17	1.84	2.10
Vitamin C (mg)	2.58	2.91	3.16	2.86
Thiamin (mg)	2.04	2.09	1.95	2.05
Riboflavin (mg)	2.69	2.78	2.68	2.81
Niacin (mg N.E.)	1.54	1.61	1.47	1.52
Vitamin B ₆ (mg)	1.65	1.48	1.47	1.62
Calcium (mg)	1.81	2.04	1.68	1.52
Phosphorus (mg)	1.85	2.09	1.68	1.52
Magnesium (mg)	2.23	1.78	1.37	1.19
Iron (mg)	1.62	1.83	1.84	1.33

NOTE: An INQ of 1.0 or more indicates that the meal is of high nutritional quality. INQs below 1.0 indicate that the meal will not provide 100% of the target level RDA (one-third) unless the target RDA for calories is exceeded.

Data Source: On-Site Meal Observations.

Exhibit VIII.6

Indices of Nutritional Quality (INQs) for
the Average SBP Meal Offered in Middle/Secondary Schools
(SY 1989-90)

	INQs for Male Students 11-14 Years	INQs for Female Students 11-14 Years	INQs for Male Students 15-18 Years	INQs for Female Students 15-18 Years
Protein (gm)	1.81	1.58	1.71	1.63
Vitamin A (mcg R.E.)	1.62	1.79	2.00	1.79
Vitamin C (mg)	3.38	2.96	3.47	2.46
Thiamin (mg)	1.95	2.00	2.06	2.00
Riboflavin (mg)	2.57	2.63	2.65	2.63
Niacin (mg N.E.)	1.33	1.33	1.41	1.33
Vitamin B ₆ (mg)	1.33	1.42	1.41	1.29
Calcium (mg)	1.62	1.42	2.00	1.42
Phosphorus (mg)	1.67	1.46	2.06	1.46
Magnesium (mg)	1.29	1.08	1.06	1.00
Iron (mg)	2.05	1.42	2.53	1.42

NOTE: An INQ of 1.0 or more indicates that the meal is of high nutritional quality. INQs below 1.0 indicate that the meal will not provide 100% of the target level RDA (one-third) unless the target RDA for calories is exceeded.

Data Source: On-Site Meal Observations.

Comparison
to Dietary
Guidelines
for Americans

Exhibit VIII.7 summarizes the mean proportion of calories provided by the three macronutrients--fat (both total fat and saturated fat), carbohydrate and protein--as well as the mean cholesterol and sodium content of average SBP meals offered in elementary and middle/secondary schools in SY 1989-90. The average breakfast offered in both schools provided approximately 30 percent of total calories from fat, which is the level recommended by the Dietary Guidelines for Americans. The level of saturated fat, however, exceeded the Dietary Guidelines recommendation of 10 percent of calories in both elementary (14 percent) and middle/secondary (13 percent) schools. The levels of cholesterol and sodium in average SBP meals were within acceptable ranges.

Frequency distributions of fat, saturated fat, cholesterol and sodium content of the average breakfasts offered in each of the individual schools are presented in Exhibit VIII.8. The exhibit illustrates that while the overall mean for calories from fat met the Dietary Guidelines recommendations, more than half of the individual schools in the sample offered breakfasts that, on average, provided more than 30 percent of calories from fat. This was particularly true of elementary school breakfasts, where the average SBP meal in 61 percent of schools exceeded this standard. Only 7 percent of the schools in the study sample offered breakfasts that, on average, supplied less than 10 percent of calories from saturated fat.

Food-Level
Analysis

Three issues are of interest in examining the specific foods offered in SBP meals:

- How much choice is available to students, i.e., how often are they offered more than one item within a major meal component category?
- What specific foods are being offered to students in the SBP?
- Are there differences between elementary and middle/secondary schools in the number, type or amount of foods offered?

Each of these issues is addressed, in turn, in the following sections.

Availability of Choices within Meal Component Categories.

Exhibit VIII.9 summarizes the number of options offered, within meal component category, in breakfasts observed in the selected elementary and middle/secondary schools. As the exhibit illustrates, in SY 1989-90 students had relatively few options when choosing an SBP meal.

In both elementary and middle/secondary schools, students had the greatest number of options when it came to choosing milk. Overall, only 16 percent of the breakfasts offered limited the availability of milk to one particular type. Middle/secondary schools tended to offer more choices than elementary schools, however.

Exhibit VIII.7

Macronutrient, Cholesterol and Sodium Content of the Average
SBP Meal Offered in Elementary and Middle/Secondary Schools
Compared to the Dietary Guidelines for Americans
(SY 1989-90)

	USDA/DHHS Dietary Guidelines for Americans	Elementary (n=31)	Middle/ Secondary (n=13)	All Schools (n=44)
Percent Calories from Fat	≤ 30.0	31.4	29.5	30.8
Percent Calories from Saturated Fat	< 10.0	14.0	13.1	13.7
Percent Calories from Carbohydrate	55.0-65.0 ¹	56.5	58.6	57.1
Percent*Calories from Protein	5.0-15.0 ¹	14.0	13.4	13.8
Mean Cholesterol (mg)	n.q. ²	56	58	56
Mean Sodium (mg)	n.q. ²	621	645	628

¹The USDA/DHHS Dietary Guidelines do not provide specific recommendations for the proportion of calories from carbohydrates and protein. RDAs for protein for school age children range from 5 to 8 percent of total calories. In general, the average protein intake considerably exceeds the RDA. The National Research Council (NRC) report Diet and Health recommends maintaining total protein at levels lower than twice the RDA for all age groups and that the intake of carbohydrates be more than 55% of total calories. To achieve the recommended levels of calories from fat, carbohydrate and protein content would need to be in these ranges.

²Not quantified. There is no established Recommended Dietary Allowance or Estimated Safe and Adequate Intake for cholesterol or sodium. The Dietary Guidelines for Americans recommend choosing a diet low in cholesterol and use of salt and sodium only in moderation. The National Research Council (NRC) report Diet and Health recommends that adults and children limit salt intake to 6 grams per day, equal to 2400 mg. of sodium, and dietary cholesterol intake to less than 300 mg. per day.

Note: None of the differences between elementary and middle/secondary schools are statistically significant.

Data Source: On-Site Meal Observations.

Exhibit VIII.8

Frequency Distribution of the Level of Fat, Cholesterol, and Sodium Provided in the Average SBP Meal Offered in Elementary and Middle/Secondary Schools (SY 1989-90)

	Elementary (n=31)	Middle/ Secondary (n=13)	All Schools (n=44)
<u>Percent Calories from Fat</u>			
< 30 percent (D.G. Goal) ¹	39%	69%	48%
31-35 percent	39	31	36
36-38 percent	19	0	14
39-40 percent	3	0	2
<u>Percent Calories from Saturated Fat</u>			
< 10 percent (D.G. Goal) ¹	6	8	7
11-13 percent	39	38	39
14-16 percent	39	54	43
>17 percent	16	0	11
<u>Cholesterol (mg)²</u>			
< 75 mg	84	85	84
76-100 mg	13	0	9
> 100 mg	3	15	7
<u>Sodium (mg)²</u>			
< 600 mg	39	39	38
601-800 mg	48	46	48
801-1,000 mg	13	15	14
1,000 mg	0	0	0

¹Level of intake recommended in the USDA/DHHS Dietary Guidelines for Americans.

²The Dietary Guidelines for Americans recommend choosing a diet low in cholesterol and use of salt and sodium only in moderation. The National Research Council (NRC) report Diet and Health recommends that adults and children limit salt intake to 6 grams per day (equal to 2,400 mg. of sodium) and dietary cholesterol intake to less than 300 mg. per day.

Note: None of the differences between elementary and middle/secondary schools is statistically significant.

Data Source: On-Site Meal Observations.

Exhibit VIII.9

Number of Options Available Within Meal Component Categories in Breakfasts Offered in Elementary and Middle/Secondary Schools (SY 1989-90)

Meal Component Category/ Number of Options	Percent of SBP Meals Offered		
	Elementary (n=124)	Middle/Secondary (n=52)	All Schools (n=176)
<u>Milk*</u>			
1 option only	22%	2%	16%
2 options	35	37	36
3 options	24	40	29
4 or more options	19	21	19
<u>Fruit/Fruit Juice</u>			
1 option only	73	71	72
2 options	20	13	18
3 options	6	13	8
4 or more options	2	2	2
<u>Vegetables/Vegetable Juice</u>			
None offered	97	90	95
1 option only	3	10	5
<u>Bread/Bread Alternate</u>			
1 option only	45	31	41
2 options	35	40	36
3 options	18	17	18
4 or more options	2	12	5
<u>Meat/Meat Alternate*</u>			
None offered	54	44	51
1 option only	42	38	41
2 options	4	2	3
3 options	0	4	1
4 options	0	8	2
5 options	0	4	1

*Chi-square test of difference between elementary and middle/secondary schools is statistically significant at the .01 level.

Data Source: On-Site Meal Observations.

Schools generally offered students few options to meet the fruit/juice/vegetable requirement. Almost three-quarters of all breakfast meals offered only one type of fruit or fruit juice. Few schools offered vegetables or vegetable juice.

The number of options available for bread/bread alternates was also limited. Thirty-five percent of the breakfasts offered in elementary schools and 40 percent of the breakfasts offered in middle/secondary schools offered only two bread/bread alternates. In many cases, however, students had to take both of these items in order to select a breakfast that fully complied with meal pattern regulations.^{1/}

Forty-five percent of elementary schools and 31 percent of middle/secondary schools offered only one bread/bread alternate. In some cases, this was complemented by a meat/meat alternate offering. In many other cases, however, this one offering was counted as two servings of a bread/bread alternate following program guidelines. This occurred most frequently for muffins and doughnuts. Program guidance defines a serving of bread as 25 gm. Many doughnuts and muffins weigh twice as much as this, and are therefore considered to be equivalent to 2 bread/bread alternate servings.

Meat and meat alternates were offered in only about half of the breakfasts examined. Middle/secondary schools offered meat selections more frequently than elementary schools. When a meat/meat alternate was included in the breakfast meal, there is generally only one item available. A small percentage of middle/secondary schools included a more substantial number of options in this category. The breakfasts offered in these schools actually looked more like lunches, in that full cafeteria service was available and, as Exhibit VIII.10 illustrates, included everything from cheeseburgers to lasagna to pizza.^{2/}

Specific Food Items Offered. Exhibit VIII.10 summarizes data on the specific food items offered in the 176 SBP meals that were observed in SY 1989-90. Estimates for elementary and middle/secondary schools were compared, and significant differences between the two types of schools are identified.

^{1/}Schools can offer 2 meat/meat alternates or 1 bread and 1 meat instead of 2 bread/bread alternates, however, as the exhibit shows, only about half of all schools offered meats or meat alternates.

^{2/}Several kitchen managers indicated that full-service menus were available at breakfast because some students were so fully scheduled during the day that they did not have time to eat lunch.

Exhibit VIII.10

Foods Offered in SBP Meals in Elementary
and Middle/Secondary Schools
(SY 1989-90)

Meal Component/Food Item	Percent of Meals Offering Each Item	
	Elementary Schools (n=124)	Middle/Secondary Schools (n=52)
<u>MILK</u>	100%	100%
Whole Milk	66	77
Lowfat Milk	88	98
Skim Milk	28	29
Flavored Milk	57*	75
<u>FRUIT</u>	99	100
FRESH FRUIT	24*	8
Apple	7	2
Banana	6	4
Grapefruit	1	0
Grapes	1	0
Orange	11	2
CANNED FRUIT	35	38
Applesauce	10	17
Apricots	2	2
Fruit Cocktail	10	13
Peaches	7	8
Pears	4	2
Pineapple	4	6
Plums	0	4
Strawberries/Other Berries	2	2
FRUIT JUICE	66*	85
DRIED FRUIT	3	0
<u>VEGETABLES</u>	3	10
POTATOES		
Fried Potatoes	3	2
Other Potatoes	0	2
SOUPS	0	6

-continued-

Exhibit VIII.10
(continued)

Meal Component/Food Item	Percent of Meals Offering Each Item	
	Elementary Schools (n=124)	Middle/Secondary Schools (n=52)
BREADS/BREAD ALTERNATES¹	87%	92%
Bagels	6	0
Biscuits/Croissants	8	8
Bread, Toast	48	44
Cereal, Cold	52	56
Cereal, Hot	7	6
Crackers	2	0
Doughnuts	10*	37
Rolls	2	10
Sweet Buns	6*	21
Fruit Muffins/Breads	14	10
Tortillas, Taco Shells	3	0
Rice	2	0
Pancakes, Waffles	5	15
MEAT/MEAT ALTERNATES	46	56
EGGS/MEATS/CHEESE, ETC.	30	31
Eggs	13	17
Bacon, Sausage	17	19
Peanut Butter, Nuts	19	8
Cheese	7	0
Baked, BBQ Chicken	0	2
Chicken Nuggets, Patty	0	2
MEAT AND GRAIN COMBINATIONS	20*	38
Egg and/or Sausage Sandwich	5	15
French Toast	3	6
Grilled Cheese Sandwich	5	10
Peanut Butter & Jelly Sandwich	2	0
Tuna Salad Sandwich	0	2
Pizza	4	4
Hamburger, Cheeseburger	0	8
Hot Dogs, Corn Dogs	0	8
Ham & Cheese Sandwich	0	10
MISCELLANEOUS MEAT ITEMS	0	2
Lasagna, Ravioli, etc.	0	2
Stuffed Cabbage	0	2

¹Includes breads/bread alternates offered as a separate item, i.e., not included in combination items such as french toast, egg sandwiches, etc.

*Difference between elementary and middle/secondary schools is statistically significant at the .01 level.

Data Source: On-Site Meal Observations.

The types of milk offered most frequently in both elementary and middle/secondary schools were, in descending order, low-fat (unflavored) milk, whole milk and flavored milk. Skim milk was offered in fewer than 30 percent of breakfast meals.

As noted above, approximately three-quarters of all breakfasts offered only one option for the fruit/juice/vegetable requirement. As Exhibit VIII.10, fruit juice is the item most commonly offered in both elementary and middle/secondary schools. Details about the specific types of juice offered were not retained when the data were aggregated. However, a review of the original data set indicates that orange juice is by far the most common type of juice offered. Fruit was offered relatively infrequently in the SBP meals observed in this study. Fresh fruits were particularly uncommon, especially in middle/secondary school breakfasts. Only about one-quarter of the elementary school breakfasts and eight percent of middle/secondary school breakfasts included fresh fruit.^{1/}

In both elementary and middle/secondary schools, cold cereal and toast were the most common bread/bread alternate offerings. In middle/secondary schools, the next most common bread alternates were doughnuts (37 percent of the observed breakfasts) and sweet buns/rolls (21 percent of breakfasts). In contrast, doughnuts and sweet buns/rolls were offered in only 10 percent and six percent of elementary school breakfasts, respectively. (These differences were statistically significant.)

Finally, the types of meat and meat alternates offered in elementary and middle/secondary schools were comparable with eggs, bacon and sausage being the most common. In elementary schools, peanut butter and/or nuts were offered slightly more often than either bacon, sausage or eggs. Combination items like egg and bacon or sausage sandwiches, were more common in middle/secondary schools than elementary schools.

Portion Sizes. The SBP meal pattern specifies a uniform set of minimum portion sizes for students in grades K-12. Program guidance materials, however, encourage schools to be flexible in serving the needs of their students and, whenever possible, to offer more food to older children. Data from this study indicate that, for the most part, breakfasts offered in middle/secondary schools do include larger portions for each meal component category (Exhibit VIII.11). The average serving in middle/secondary schools is significantly larger for milk (some middle/secondary schools offer 16 oz. containers of milk in addition to the traditional 8 oz. container), fruit, breads/bread alternates and meat/meat alternates.

^{1/}The timing of meal observations (in mid-March) may have affected the prevalence with which SFAs were observed to offer fresh fruit.

Exhibit VIII.11

Average Portion Sizes of Foods Offered in SBP Meals
in Elementary and Middle/Secondary Schools
(SY 1989-90)

Meal Component Category	Average Portion Size (in grams)		
	Elementary (n=124)	Middle/Secondary (n=52)	All Schools (n=176)
Milk	239 gm*	252 gm	243 gm
Fruit	104*	121	109
Breads/Bread Alternates	43*	54	47
Meat/Meat Alternates	32*	56	41
Meat and Bread Combination Entrees	74	96	87

*Difference between elementary and middle/secondary schools is statistically significant at the .01 level.

Data Source: On-Site Meal Observations.

SBP MEALS SELECTED

This section discusses the food and nutrient composition of the average SBP meal as selected by participating students in SY 1989-90. Nutrient content, percent contribution to RDAs and INQ scores are examined, along with comparisons to Dietary Guidelines recommendations. Differences are examined at two levels:

- differences between the average meal offered and the average meal selected, within each school type; and
- differences between elementary schools and middle/secondary schools in the nutritional characteristics of the average SBP meal selected.

The food-level analyses reported in this section describe the food selection patterns of students in elementary and middle/secondary schools, including the number of items selected, the SBP meal components included, and the most common combinations of meal components. Detailed data on the percentage of students selecting various types of food offered in SBP meals is also presented. Finally, the availability of a la carte items in the sampled elementary and middle/secondary schools is described.^{1/}

Nutrient Content

As Exhibit VIII.12 illustrates, differences between the average breakfast offered and the average breakfast selected are generally quite small, and none reached statistical significance. This finding suggests that, overall, students are selecting meals that include all or most of the components contained in the pattern SBP meal.^{2/}

Comparison of the nutrient content of the average breakfast selected in elementary schools with the average breakfast selected in middle/secondary schools revealed only one significant difference. The average breakfast selected in middle/secondary schools contains more calories than the average breakfast selected in elementary schools. This difference is at least partially due to the larger portion sizes offered in

^{1/}The calculated nutrient content of average SBP meals as selected does not include calories or nutrients from a la carte foods. Data reflect nutritional characteristics of reimbursable SBP foods only.

^{2/}The few instances where the nutrient content of the average meal selected is slightly greater than the average meal offered can be attributed to student selection patterns or the fact that some students took more than one serving of a given item, e.g., multiple strips of bacon or sausage, extra toast, etc.

Exhibit VIII.12

Mean Calorie and Nutrient Content
of the Average SBP Meal Offered and Selected
in Elementary and Middle/Secondary Schools
(SY 1989-90)

	Elementary Schools (n=40)			Middle/Secondary Schools (n=20)		
	Offered	Selected	Difference (%) (Sel vs. Off)	Offered	Selected	Difference (%) (Sel vs. Off)
Calories	469	445*	-5.1%	522	519	-0.6%
Protein (gm)	16	15	-6.2	17	17	0.0
Total Fat (gm)	16	15	-6.2	17	18	+5.9
Saturated Fat (gm)	7	7	0.0	8	8	0.0
Cholesterol (mg)	56	50	-10.7	58	66	+13.8
Total Carbohydrate (gm)	66	66	0.0	77	74	-3.9
Vitamin A (mcg R.E.)	353	319	-9.6	344	293	-14.8
Vitamin C (mg)	30	30	0.0	35	36	-2.9
Thiamin (mg)	.48	.44	-8.3	.53	.47	-11.3
Riboflavin (mg)	.77	.72	-6.5	.81	.74	-8.6
Niacin (mg N.E.)	4.76	4.12	-13.4	4.77	3.86	-19.1
Vitamin B ₆ (mg)	.47	.42	-10.6	.47	.38	-19.1
Calcium (mg)	380	365	-4.0	406	388	-4.4
Phosphorus (mg)	388	365	-5.9	425	415	-3.5
Magnesium (mg)	70	64	-8.6	72	65	-9.7
Iron (mg)	4.23	3.84	-9.2	5.11	4.05	-20.7
Sodium (mg)	621	579	-6.8	645	645	0.0

*Difference between elementary and middle/secondary schools is statistically significant at the .01 level.

NOTE: None of the differences between the nutrient content of the average meal offered and the average meal selected, within school type, is statistically significant.

Date Source: On-Site Meal Observations.

middle/secondary schools, but may also be related to differences in the types of food selected by middle/secondary students.

Percent
Contribution
to RDAs

Evaluating the percent RDA contribution of the average SBP meal as selected by students is not a straightforward exercise. As explained in Chapter VII, the nutrient content of the average meal selected represents the nutrient content of the meal selected by the average student in each school.^{1/} Therefore, it is inappropriate to compare the mean nutrient content of the average breakfast selected to the various RDA standards and draw conclusions about nutrient shortfalls for particular groups of children.

It is more appropriate to utilize the age-appropriate RDA standards to define a target range of nutrient content for each school type. The target range for each nutrient is defined by the lowest and highest RDA values for each school, based on a goal for breakfast of 25 percent of the RDA. If the average meal selected provides a level of calories or nutrients between these two extremes then we can conclude it is within the target range.^{2/} If it falls outside the lower limit of the target range, then a significant nutritional deficiency is evident; conversely, a value that exceeds the high end of the target range indicates that the average meal selected is likely to provide more than the goal RDA level for most students.

Exhibit VIII.13 presents comparisons of the nutrient content of the average SBP meal as selected in elementary schools with each of the appropriate RDA standards. The exhibit shows that the average breakfast selected in elementary schools met or exceeded the target range for all nutrients except calories. Students aged 4-6 selecting the average elementary school breakfast would receive 25 percent of the RDA for calories. All other elementary school age groups, however, would not. The proportion of calories provided ranged from 18 percent of the RDA for 11-14 year old males to 22 percent of the RDA for 7-10 year olds. The available data do not indicate, however, how the meals selected by these students may have differed from the average. Given USDA's policy of encouraging schools to serve larger portions or additional foods to older students, it is possible that these students did in fact select meals that provided more calories than the average SBP meal, and thereby satisfied their increased caloric needs. It is also important to bear in mind the previously-mentioned caveat about whether it is necessary for an SBP meal to supply 25 percent of daily calorie needs.

^{1/}The reader is referred to Chapter VII for a more thorough discussion of this issue and its analytic implications.

^{2/}A value within the target range does not prove that every student in the sample selected a meal that contained 25 percent of the appropriate RDA.

Exhibit VIII.13

Percentage of Recommended Dietary Allowances Provided in
the Average SBP Meal Selected in Elementary Schools
(SY 1989-90)

	Nutrients in Meal as Selected	Students 4-6 years		Students 7-10 years		Male Students 11-14 years		Female Students 11-14 years	
		One-Fourth Daily RDA	Percent Daily RDA	One-Fourth Daily RDA	Percent Daily RDA	One-Fourth Daily RDA	Percent Daily RDA	One-Fourth Daily RDA	Percent Daily RDA
Calories	445	450	25%	500	22%	625	18%	550	20%
Protein (gm)	15	6	62	7	53	11	33	12	33
Vitamin A (mcg R.E.)	319	125	64	175	46	250	32	200	40
Vitamin C (mg)	30	11	66	11	66	12	60	12	60
Thiamin (mg)	.44	.22	49	.25	44	.32	34	.28	40
Riboflavin (mg)	.72	.28	65	.30	60	.38	48	.32	55
Niacin (mg N.E.)	4.12	3.00	34	3.25	32	4.25	24	3.75	27
Vitamin B ₆ (mg)	.42	.28	38	.35	30	.42	25	.35	30
Calcium (mg)	365	200	46	200	46	300	30	300	30
Phosphorus (mg)	365	200	46	200	46	300	30	300	30
Magnesium (mg)	64	30	54	42	38	68	24	70	23
Iron (mg)	3.84	2.50	38	2.50	38	3.00	32	3.75	26

NOTE: Target goal used in these analyses is one-fourth of the RDA for all age groups. Percentages in this table are based on the nutrient content of the meal selected by the average student in each school. No age- or sex-specific data were collected.

Data Source: On-Site Meal Observations.

The average SBP meal selected in middle/secondary schools exceeded the target range for all nutrients except niacin, vitamin B₆, calories and magnesium (Exhibit VIII.14). The amount of niacin and vitamin B₆ supplied in the average SBP meal was within the target range, but fell very near the lowest end. Female middle/secondary school students consuming the average SBP meal would receive approximately 25 percent of their needs for niacin and vitamin B₆; male students consuming the same meal, however, would not. The amount of calories and magnesium supplied in the average middle/secondary school breakfast fell below the target range, indicating that the average SBP meal as selected is unlikely to meet 25 percent of middle/secondary students' daily needs for calories and magnesium.

Indices of
Nutritional
Quality (INQs)

INQ scores for the average SBP meal selected in elementary and middle/secondary schools are presented in Exhibits VIII.15 and VIII.16, respectively. Because these measures are based on RDA standards the caveats about data interpretation outlined above (and in detail in Chapter VII) still apply. That is, these data represent the nutrient density of meals selected by average students. Because sufficient data on students' age and sex were not available, we can not say with certainty that any particular age/sex group would, in fact, select meals comparable to the average meals considered in this analysis.

The INQ scores in Exhibits VIII.15 and VIII.16 indicate that the average SBP meals selected by both groups of students were well-balanced in terms of total calories and relative nutrient density. Values for the average meals selected differed only slightly from the average meals offered (see Exhibits VIII.5 and VIII.6). INQ scores for magnesium fell slightly below the optimal score of 1.0 for some middle/secondary school students.

Comparison
to Dietary
Guidelines
for Americans

In SY 1989-90, the average SBP meal selected in both elementary and middle/secondary schools, like the average meal offered, complied with the Dietary Guidelines recommendations for calories from total fat (Exhibit VIII.17). Likewise, the average meal selected in both types of school exceeded Dietary Guidelines recommendations for saturated fat. Sodium and cholesterol content compared favorably with NRC Diet and Health recommendations. Exhibit VIII.18 presents frequency distributions for these variables for the average SBP meal selected in both elementary and middle/secondary schools.

Food-Level
Analysis

This section examines several issues related to the types of foods included in SBP meals as selected by students:

- * In the presence of the offer-vs-serve (OVS) option, how many of the four components included in the SBP meal pattern do students select? Which items are refused (not selected) most often?

Exhibit VIII.14

Percentage of Recommended Dietary Allowances Provided in
the Average SBP Meal Selected in Middle/Secondary Schools
(SY 1989-90)

	Nutrients In Meal As Selected	Male Students 11-14 years		Female Students 15-18 years		Male Students 15-18 years		Female Students 15-18 years	
		One-Fourth Daily RDA	Percent Daily RDA	One-Fourth Daily RDA	Percent Daily RDA	One-Fourth Daily RDA	Percent Daily RDA	One-Fourth Daily RDA	Percent Daily RDA
Calories	519	625	21%	550	24%	750	17%	550	24%
Protein (gm)	17	11	38	12	37	15	29	11	38
Vitamin A (mcg R.E.)	293	250	29	200	37	250	29	200	37
Vitamin C (mg)	36	12	71	12	71	15	60	15	60
Thiamin (mg)	.47	.32	36	.28	43	.38	31	.28	43
Riboflavin (mg)	.74	.38	49	.32	57	.45	41	.32	57
Niacin (mg N.E.)	3.86	4.25	23	3.75	26	5.00	19	3.75	26
Vitamin B ₆ (mg)	.38	.42	22	.35	27	.50	19	.38	25
Calcium (mg)	388	300	32	300	32	300	32	300	32
Phosphorus (mg)	410	300	34	300	34	300	34	300	34
Magnesium (mg)	65	68	24	70	23	100	16	75	22
Iron (mg)	4.05	3.00	34	3.75	27	3.00	34	3.75	27

NOTE: Target goal used in these analyses is one-fourth of the RDA for all age groups. Percentages in this table are based on the nutrient content of the meal selected by the average student in each school. No age- or sex-specific data were collected.

Data Source: On-Site Meal Observations.

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Exhibit VIII.15

Indices of Nutritional Quality (INQs) for
the Average SBP Meal Selected in Elementary Schools
(SY 1989-90)

	INQs for Students 4-6 Years	INQs for Students 7-10 Years	INQs for Male Students 11-14 Years	INQs for Female Students 11-14 Years
Protein (gm)	2.48	2.41	1.83	1.65
Vitamin A (mcg R.E.)	2.56	2.09	1.78	2.00
Vitamin C (mg)	2.64	3.00	3.33	3.00
Thiamin (mg)	1.96	2.00	1.89	2.00
Riboflavin (mg)	2.60	2.73	2.67	2.75
Niacin (mg N.E.)	1.36	1.45	1.33	1.35
Vitamin B ₆ (mg)	1.52	1.36	1.39	1.50
Calcium (mg)	1.84	2.09	1.67	1.50
Phosphorus (mg)	1.84	2.09	1.67	1.50
Magnesium (mg)	2.16	1.73	1.33	1.15
Iron (mg)	1.52	1.73	1.78	1.30

NOTE: An INQ of 1.0 or more indicates that the meal is of high nutritional quality. INQs below 1.0 indicate that the meal will not provide 100% of the target level RDA (one-third) unless the target RDA for calories is exceeded.

Data Source: On-Site Meal Observations.

Exhibit VIII.16

Indices of Nutritional Quality (INQs) for
the Average SBP Meal Selected in Middle/Secondary Schools
(SY 1989-90)

	INQs for Male Students 11-14 Years	INQs for Female Students 11-14 Years	INQs for Male Students 15-18 Years	INQs for Female Students 15-18 Years
Protein (gm)	1.81	1.54	1.71	1.58
Vitamin A (mcg R.E.)	1.38	1.54	1.71	1.54
Vitamin C (mg)	3.38	2.96	3.53	2.50
Thiamin (mg)	1.71	1.79	1.82	1.79
Riboflavin (mg)	2.33	2.38	2.41	2.38
Niacin (mg N.E.)	1.10	1.08	1.12	1.08
Vitamin B ₆ (mg)	1.05	1.13	1.12	1.04
Calcium (mg)	1.52	1.33	1.88	1.33
Phosphorus (mg)	1.62	1.42	2.00	1.42
Magnesium (mg)	1.14	0.96	0.94	0.92
Iron (mg)	1.62	1.13	2.00	1.12

NOTE: An INQ of 1.0 or more indicates that the meal is of high nutritional quality. INQs below 1.0 indicate that the meal will not provide 100% of the target level RDA (one-third) unless the target RDA for calories is exceeded.

Data Source: On-Site Meal Observations.

Exhibit VIII.17

Macronutrient, Cholesterol and Sodium Content of the
Average SBP Meal Offered and Selected in Elementary
and Middle/Secondary Schools Compared to
the Dietary Guidelines for Americans
← (SY 1989-90)

	USDA/DHHS Dietary Guidelines for Americans	Elementary Schools (n=40)			Middle/Secondary Schools (n=20)		
		Offered	Selected	Difference (%) (Sel vs. Off)	Offered	Selected	Difference (%) (Sel vs. Off)
Percent of Calories from Fat	≤30.0	31.4	29.4	-2.0%	29.5	30.9	+1.4
Percent of Calories from Saturated Fat	<10.0	14.0	13.5	-0.5	13.1	13.8	+0.7
Percent Calories from Carbohydrate	55.0-65.0 ¹	56.5	58.9	+2.4	58.6	57.4	-1.2
Percent Calories from Protein	5.0-15.0 ¹	14.0	13.5	-0.5	13.4	13.1	-0.3
Mean Cholesterol (mg)	n.q. ²	56	50	-10.7	58	66	+13.8
Mean Sodium (mg)	n.q. ²	621	579	-6.8	645	645	0.0

¹The USDA/DHHS Dietary Guidelines do not provide specific recommendations for the proportion of calories from carbohydrates and protein. RDAs for protein for school age children range from 5 to 8 percent of total calories. In general, the average protein intake considerably exceeds the RDA. The National Research Council (NRC) report Diet and Health recommends maintaining total protein levels lower than twice the RDA for all age groups and that the intake of carbohydrates be more than 55% of total calories. To achieve the recommended levels of calories from fat, carbohydrate and protein content would need to be in these ranges.

²Not quantified. There is no established Recommended Dietary Allowance or Estimated Safe and Adequate Intake for cholesterol or sodium. The Dietary Guidelines for Americans recommend choosing a diet low in cholesterol and use of salt and sodium only in moderation. The National Research Council (NRC) report Diet and Health recommends that adults and children limit salt intake to 6 grams per day, equal to 2400 mg of sodium, and dietary cholesterol intake to less than 300 mg per day.

NOTE: None of the differences between elementary and middle/secondary schools or between the nutrient content of breakfasts offered and selected, within school type, is statistically significant.

Data Source: On-Site Meal Observations.

Exhibit VIII.18

Frequency Distribution of the Level of Fat, Cholesterol and Sodium Provided in the Average SBP Meal Selected in Elementary and Middle/Secondary Schools (SY 1989-90)

	Percent of Schools		
	Elementary (n=31)	Middle/ Secondary (n=13)	All Schools (n=44)
<u>Percent Calories from Fat</u>			
< 30 percent (D.G. Goal) ¹	55%	54%	55%
31-35 percent	32	23	30
36-38 percent	10	15	11
39-40 percent	0	0	0
> 40 percent	3	8	5
<u>Percent Calories from Saturated Fat</u>			
< 10 percent (D.G. Goal) ¹	10	8	9
11-13 percent	39	38	39
14-16 percent	39	46	41
> 16 percent	13	8	11
<u>Cholesterol (mg)²</u>			
< 75 mg	90	77	85
76-100 mg	6	8	7
> 100 mg	4	15	7
<u>Sodium (mg)²</u>			
< 600 mg	56	54	57
601-800 mg	35	23	32
801-1000 mg	6	15	9
> 1000 mg	0	8	2

¹Level of intake recommended in the USDA/DHHS Dietary Guidelines for Americans.

²The Dietary Guidelines for Americans recommend choosing a diet low in cholesterol and use salt and sodium only in moderation. The National Research Council (NRC) report Diet and Health recommends that adults and children limit salt intake to 6 grams per day (equal to 2,400 mg. of sodium) and dietary cholesterol intake to less than 300 mg. per day.

Note: None of the differences between elementary and middle/secondary schools are statistically significant.

Data Source: On-Site Meal Observations.

- Of the specific foods available in each meal component category, which do students select most often?
- How many schools offer a la carte items in the same serving line as SBP meals? What food items are typically available on an a la carte basis?
- What proportion of children select one or more a la carte items, in addition to their SBP meal, when a la carte is available?

Food Selection Patterns Under OVS. To address FNS' interest in food selection patterns under the OVS option, two separate analyses were carried out on meals selected in the subsample of schools that had the OVS option available. (This subsample actually represents a substantial portion of the full sample, since all of the middle/secondary schools, and 22 of the 31 elementary schools had implemented the OVS option in SY 1989-90.^{1/}) First, meals selected by each of the students observed in these schools were examined to determine the number of meal components included; results are presented in Exhibit VIII.19. The data indicate that approximately two-thirds of students in school with the OVS option selected a breakfast that included all four of the SBP meal pattern components.

To determine which of the four meal components students omitted when they did select a breakfast containing fewer than four components, each individual student-level observation was inspected for presence or absence of the four SBP meal components. This cross-check revealed that the component most frequently omitted is the second bread/bread alternate or meat/meat alternate serving, particularly at the elementary school level (Exhibit VIII.20). Few students omitted milk or the fruit/juice component, but middle/secondary students were more likely to do so than elementary school students.

^{1/}Because of the problem with discrepancies between SFA reports about OVS implementation and actual behavior in the individual schools (see Chapter VII and Appendix B), all data books were examined to confirm the presence or absence of OVS-like behavior (i.e., evidence that some students refused one of the four available components). In all cases, the patterns in the data matched the SFA managers' reports.

Exhibit VIII.19

Number of SBP Meal Components Included in Breakfasts Selected in Elementary and Middle/Secondary Schools with the OVS Option (SY 1989-90)

Number of Components ^{1*}	Percent of Breakfasts Selected		
	Elementary Schools ² (n=4,603)	Middle/ Secondary Schools (n=2,011)	All Schools (n=6,614)
3 components	34%	33%	34%
4 or more components	66	67	66

¹Refers to specific foods, sometimes part of a combination item, considered to contribute to the SBP meal pattern, rather than discrete food items. For example, a breakfast sandwich of egg and English muffin is considered to satisfy two of the four meal component requirements (meat/meat alternate and bread.) Since program regulations permit SFAs to define a serving for the bread/bread alternate component by weight, discrete bread/bread alternates that were heavy enough to count as two servings (50 grams or more) have been counted as representing two components.

²Includes only observations in subsample of elementary schools that had the OVS option available. (All middle/secondary schools had OVS.)

Exhibit VIII.20

Proportion of Breakfasts Selected in
Elementary and Middle/Secondary Schools with the OVS Option
that Included Various SBP Meal Components
(SY 1989-90)

Meal Component Category	Percent of Breakfast Selected		
	Elementary Schools ¹ (n=4,603)	Middle/ Secondary Schools (n=2,011)	All Schools (n=6,614)
Milk*	95%	90%	93%
Fruit/Juice*	91	79	87
Bread/Bread Alternate*			
- 1 serving only	35	34	35
- 2 servings ²	62	64	63
Meat/Meat Alternate*	29	42	33

¹Includes only observations in subsample of elementary schools that had the OVS option available.

²Includes cases where two separate food items are selected as well as individual foods that were large (heavy) enough to count as two servings.

*Chi-square test of difference between elementary and middle/secondary schools is statistically significant at the .01 level.

Data Source: On-Site Meal Observations.

Specific Foods Included in SBP Meals Selected by Students. Exhibit VIII.21 presents data on the average percentage of student meals that included particular food items when they were offered.^{1/} Patterns for elementary and middle/secondary students were examined and the significance of observed differences were evaluated.

As the exhibit demonstrates, the foods included in breakfasts in both types of schools were fairly comparable. Elementary school students were more likely to include milk and a fruit/juice selection, as mentioned above, than middle/secondary school students.

Flavored milk was selected most often by students in both elementary and middle/secondary schools, followed by low-fat (unflavored) milk and whole milk. Skim milk was selected infrequently, particularly in middle/secondary schools. Fruit juice (almost always orange juice) was most often selected to satisfy the fruit/juice/vegetable component, largely because alternatives were rarely available.

For the bread/bread alternate requirement, elementary school students selected toast and cold cereal most frequently. Bagels, biscuits and croissants, doughnuts, and pancakes and waffles were also selected frequently when available, however these items were offered in 10 percent or less of the breakfasts observed. Middle/secondary school students selected cold cereal, doughnuts and toast most often.

To obtain a more complete picture of the characteristics of SBP meals selected by participating students, a variable was created that reflected the specific types of food included in each student meal, using the major food taxonomy groupings. The results of this analysis are presented in Exhibit VIII.22. While 15 different meal component combinations were encountered, five combinations accounted for all but ten percent of all breakfasts. The most common breakfast in both school types, representing over half of all SBP meals, consisted of milk, fruit or juice, and a bread/bread alternate. Considering the most common foods offered and selected, as discussed above, an

^{1/}This analysis included all observations of student meals, i.e., meals in both OVS and non-OVS schools. Evaluation of the data revealed that inclusion of non-OVS schools did not substantially alter the data (e.g., reported percentages), and did not affect the statistical significance of any findings. Thus, the term "selected" is used here in the broadest sense to reflect the foods that were actually on a student's tray. Students may or may not have had a true option to "select" or reject the food because 1) the OVS option may not have been available, or 2) there may have been no alternative choice, e.g., only one choice was offered for a given meal component.

Exhibit VIII.21

Foods Included in SBP Meals Selected by Students
in Elementary and Middle/Secondary Schools
(SY 1989-90)

Meal Component/Food Item	Elementary Schools		Middle/Secondary Schools	
	Percent of Meals Offering (n=124)	Percent of Meals Including ¹	Percent of Meals Offering (n=52)	Percent of Meals Including ¹
<u>MILK</u>	100%	96%*	100%	92%
Whole Milk	66	30	77	25
Lowfat Milk	88	47	98	34
Skim Milk	28	15	29	6
Flavored Milk	57*	53	75	50
<u>FRUIT</u>	99	92*	100	82
FRESH FRUIT	24	62	8	40
Apple	7	66	2	7
Banana	6	61	4	43
Grapefruit	1	100++	0	NA
Grapes	1	12	0	NA
Orange	11	47	2	67
CANNED FRUIT	35	55	38	38
Applesauce	10	58	17	31
Apricots	2	28	2	17
Fruit Cocktail	10	47	13	11
Peaches	7	63	8	54
Pears	4	39	2	10
Pineapple	4	32	6	50
Plums	0	NA	4	7
Strawberries/Other Berries	2	15	2	8
FRUIT JUICE	66*	87	85	81
DRIED FRUIT	3	57	0	NA
<u>VEGETABLES</u>	3	76*	10	17
POTATOES	3	76	2	30
Fried Potatoes	3	76	2	53
Other Potatoes	0	NA	2	8
SOUPS	0	NA	6	83

-continued-

(continued)

Meal Component/Food Item	Elementary Schools		Middle/Secondary Schools	
	Percent of Meals Offering	Percent of Meals Including ¹	Percent of Meals Offering	Percent of Meals Including ¹
BREADS/BREAD ALTERNATES²	87%	95%*	92%	83%
Bagels	6	91	0	NA
Bisquits/Croissants	8	80	8	93
Bread, Toast	48	75	44	54
Cereal, Cold	52	67*	56	48
Cereal, Hot	7	62	6	70
Crackers	2	51	0	NA
Doughnuts	10*	73	37	70
Rolls	2	36	0	27
Sweet Buns	6*	70	21	36
Fruit Muffins/Breads	14	66*	10	11
Tortillas, Taco Shells	3	19	0	NA
Rice	2	26	0	NA
Pancakes, Waffles	5	89*	15	34
MEAT/MEAT ALTERNATES	46	65	56	65
EGGS/MEATS/CHEESE, ETC.	30	57	31	46
Eggs	13	42	17	35
Bacon, Sausage	17	47*	19	87
Peanut Butter, Nuts	19	21	8	17
Cheese	7	50	0	NA
Baked, BBQ Chicken	0	NA	2	15
Chicken Nuggets, Patty	0	NA	2	7
MEAT AND GRAIN COMBINATIONS	20*	75	38	62
Egg and/or Sausage Sandwich	5	57	15	74
French Toast	3	92	6	37
Grilled Cheese Sandwich	5	87	10	21
Peanut Butter & Jelly Sandwich	2	23	0	NA
Tuna Salad Sandwich	0	NA	2	2
Pizza	4	82	4	85
Hamburger, Cheeseburger	0	NA	8	5
Hot Dogs, Corn Dogs	0	NA	8	1
Ham & Cheese Sandwich	0	NA	10	36
MISCELLANEOUS MEAT ITEMS	0	NA	2	2
Lasagna, Ravioli, etc.	0	NA	2	2
Stuffed Cabbage	0	NA	2	2

¹Percentages reflect the proportion of student meals that included each item (or category) when the food was available. Sample size not reported because it varies for every item in the table.

²Includes breads/bread alternates offered as a separate item, i.e., not in combination items such as french toast, egg sandwiches, etc.

*Difference between elementary and middle/secondary schools is statistically significant at the .01 level.

++Percentage of elementary school student meals is based on only one meal, when the OVS option was not available.

NA: Selection data not available because none of the schools offered this item.

Data Source: On-Site Meal Observations.

Exhibit VIII.22

Most Common Meal Component Combinations in
SBP Meals Selected in
Elementary and Middle/Secondary Schools¹
(SY 1989-90)

Meal Component Combinations*	Percent of Students Selecting		
	Elementary Schools (n=6,528)	Middle/ Secondary Schools (n=2,011)	All Schools (n=8,539)
Milk, Fruit/Juice, Bread/Bread Alternate	55%	43%	52%
Milk, Fruit/Juice, Meat and Bread Combination Item ¹	14	15	15
Milk, Fruit/Juice, Bread/Bread Alternate, Meat/Meat Alternate	15	8	13
Milk, Bread/Bread Alternate	6	9	7
Milk, Meat and Bread Combination Item ¹	1	10	3
Other Combinations	9	15	10

¹Examples: Egg and/or sausage sandwich.

*Chi-square analysis of the difference between elementary and middle/secondary schools was statistically significant at the .01 level.

Data Source: On-Site Meal Observations.

example of the actual meal represented by this combination would be: for elementary schools, flavored milk, orange juice, toast and/or cold cereal. In middle/secondary schools, the meal would be similar--flavored milk and orange juice, with either cold cereal and/or toast, a doughnut or sweet bun/roll.

Availability of A La Carte Items. The final research issue addressed in this section is the availability of a la carte items. During on-site observations, field staff collected information on the types of a la carte items that were available in the same serving line as the reimbursable meals that were being observed. These data provide some insight into the prevalence of a la carte items in SBP schools. The reader should bear in mind, however, that the data undoubtedly underestimate the full prevalence of a la carte items in schools, since a la carte items were frequently available elsewhere in the cafeteria.

As Exhibit VIII.23 demonstrates, a la carte items were generally not offered at breakfast in the schools in this sample. None of the elementary schools offered a la carte breakfast items, and only about a third of the middle/secondary schools did so.

During meal observations, observers indicated whether the student selected for observation had taken any a la carte items.^{1/} Only 9 percent of the students that had a la carte items available (all in middle/secondary schools) included an a la carte selection in the meal that was observed.

SBP MEALS CONSUMED

This portion of the analysis discusses the food and nutrient composition of the average SBP meal as actually consumed by participating students. Nutrient content and percentage contribution to RDAs are examined, along with INQ scores and the levels of fat cholesterol and sodium. Nutritional differences are again examined at two levels:

- differences between the average meal selected and the average meal consumed within school type; and
- differences between elementary and middle/secondary schools in the nutritional characteristics of the average meal consumed.

The food-level analysis included in this section deals with the issue of food consumption in the SBP, i.e., what proportion of the foods selected are actually consumed, and which specific types of food generate the greatest amount of waste?

^{1/}The type of a la carte item was not recorded.

Exhibit VIII.23

Availability of A la Carte Items at Breakfast in
Elementary and Middle/Secondary Schools
(SY 1989-90)

	Percent of Schools	
	Elementary Schools (n=31)	Middle/Secondary Schools (n=13)
Any A la carte available?		
No	100%	62%
Yes	0	38
Categories of A la carte items available ¹		
1 category	0	40
3 categories	0	20
4 categories	0	20
6 categories	0	20
Categories of A la carte items available ¹		
Beverages	0	40
Fruits and Vegetables	0	40
Entrees	0	40
Desserts	0	80
Chips, Pretzels, Snacks	0	40
Other	0	60

¹Percentages reflect schools that had a la carte items available.

Data Source: On-Site Meal Observations.

Nutrient
Content

The mean nutrient content of the average breakfast as offered, selected and consumed in elementary and middle/secondary schools is summarized in Exhibit VIII.24. As the exhibit shows, the nutrient content of the average meal consumed was consistently lower than the nutrient content of the average meal selected in both elementary and middle/secondary schools. This indicates that, in general, students did not consume all of the foods they selected.

The magnitude of the differences between the average meal selected and the average meal consumed was consistently greater for elementary schools. In elementary schools, the average meal consumed contains significantly less calories and lower concentrations of all nutrients except vitamin A, vitamin C, niacin, vitamin B₆ and iron than the average meal selected. On average, elementary school students wasted about 24 percent of the nutrients that were available in the meals they had selected. In middle/secondary schools, on the other hand, the average meal consumed was only about 9 percent lower in nutritional content than the average meal selected, and none of the individual differences were statistically significant. As was seen in the preceding analysis of NSLP meals (Chapter VII), elementary school students waste a larger portion of their meals than do middle/secondary school students.

Percent
Contribution
to RDAs

The nutrient content of the average breakfast consumed in elementary schools is evaluated in light of the target RDA ranges (defined as 25 percent of the RDA), in Exhibit VIII.25. Despite the nutrient losses associated with student plate waste, the average breakfast as consumed in elementary schools exceeded the target nutrient range for vitamin C, thiamin and riboflavin (i.e., it provided more than 25 percent of the RDA for these nutrients for all age-sex groups). It was within the target range for protein, vitamin A, niacin, vitamin B₆, calcium, phosphorus, magnesium and iron. Results indicate, however, that the students with the greatest nutrient needs, 11-14 year old males and females, would need to consume a meal containing greater amounts of these nutrients than the "average" meal in order to satisfy one-fourth of their daily nutrient needs. The average SBP meal in elementary schools as consumed failed to provide 25 percent of daily caloric needs for even the youngest students (4-6 year olds).

The average breakfast consumed in middle/secondary schools (Exhibit VIII.26) exceeded the target range for protein, vitamin A, vitamin C, thiamin, riboflavin, calcium, phosphorus and iron. It fell below the target range for calories and magnesium and just reached the lowest end of the target range for niacin and vitamin B₆.

When viewed in concert, the results of the three analyses (i.e., SBP meals as offered, selected and consumed) indicate that meals planned in accordance with program guidelines and offered to students were very successful in meeting the goal used in this

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Mean Calorie and Nutrient Content
of the Average SBP Meal Offered, Selected
and Consumed in Elementary and Middle/Secondary Schools
(SY 1989-90)

	Elementary Schools (n=31)				Middle/Secondary Schools (n=13)			
	Offered	Selected	Consumed	Difference (%) (Con vs. Sel)	Offered	Selected	Consumed	Difference (%) (Con vs. Sel)
Calories	469	445*	342*	-23.1%+	522	519	467	-10.0
Protein (gm)	16	15	11*	-26.7+	17	17	15	-11.8
Total Fat (gm)	16	15	11*	-26.7+	17	18	16	-11.1
Saturated Fat (gm)	7	7	5*	-28.6+	8	8	7	-12.5
Cholesterol (mg)	56	50	38	-24.0+	58	66	59	-10.6
Total Carbohydrate (gm)	66	66	51*	-22.7+	77	74	67	-9.5
Vitamin A (mcg R.E.)	353	319	247	-22.6	344	293	267	-12.3
Vitamin C (mg)	30	30	26	-13.3	35	36	34	-5.5
Thiamin (mg)	.48	.44	.35	-20.4+	.53	.47	.44	-6.4
Riboflavin (mg)	.77	.72	.53	-26.4+	.81	.74	.66	-10.8
Niacin (mg N.E.)	4.76	4.12	3.34	-18.9	4.77	3.86	3.68	-4.7
Vitamin B ₆ (mg)	.47	.42	.33	-21.4	.47	.38	.35	-7.9
Calcium (mg)	380	365	256*	-29.9+	406	388	341	-12.1
Phosphorus (mg)	388	365	262*	-28.2+	425	410	365	-11.0
Magnesium (mg)	70	64	47*	-26.6+	72	65	58	-10.8
Iron (mg)	4.23	3.84	2.96	-22.9	5.11	4.05	3.84	-5.2
Sodium (mg)	621	579	454*	-21.6+	645	645	594	-7.9

*Difference between elementary and middle/secondary schools is statistically significant at the .01 level.

+Difference between nutrient content of the average meal consumed and the average meal selected, within school type, is statistically significant at the .01 level.

Data Source: On-site Meal Observations.

Exhibit VIII.25

Percentage of Recommended Dietary Allowances Provided in
the Average SBP Meal Consumed in Elementary Schools
(SY 1989-90)

	Nutrients in Meal As Consumed	Students 4-6 years		Students 7-10 years		Male Students 11-14 years		Female Students 11-14 years	
		One-Fourth Daily RDA	Percent Daily RDA	One-Fourth Daily RDA	Percent Daily RDA	One-Fourth Daily RDA	Percent Daily RDA	One-Fourth Daily RDA	Percent Daily RDA
Calories	342	450	19%	500	17%	625	14%	550	16%
Protein (gm)	11	6	46	7	39	11	24	12	24
Vitamin A (mcg R.E.)	247	125	49	175	35	250	25	200	31
Vitamin C (mg)	26	11	58	11	58	12	52	12	52
Thiamin (mg)	.35	.22	39	.25	35	.32	27	.28	32
Riboflavin (mg)	.53	.28	48	.30	44	.38	35	.32	41
Niacin (mg N.E.)	3.34	3.00	28	3.25	26	4.25	20	3.75	22
Vitamin B ₆ (mg)	.33	.28	30	.35	24	.42	20	.35	24
Calcium (mg)	256	200	32	200	32	300	21	300	21
Phosphorus (mg)	262	200	33	200	33	300	22	300	22
Magnesium (mg)	47	30	39	42	28	68	17	70	17
Iron (mg)	2.96	2.50	30	2.50	30	3.00	25	3.75	20

NOTE: Target goal used in these analyses is one-fourth of the RDA for all age groups. Percentages in this table are based on the nutrient content of the meal consumed by the average student in each school. No age- or sex-specific data were collected.

Data Source: On-Site Meal Observations.

Exhibit VIII.26

Percentage of Recommended Dietary Allowances Provided in
the Average SBP Meal Consumed in Middle/Secondary Schools
(SY 1989-90)

	Nutrients in Meal Selected	Male Students 11-14 years		Female Students 11-14 years		Male Students 15-18 years		Female Students 15-18 years	
		One-Fourth Daily RDA	Percent Daily RDA	One-Fourth Daily RDA	Percent Daily RDA	One-Fourth Daily RDA	Percent Daily RDA	One-Fourth Daily RDA	Percent Daily RDA
Calories	467	625	19%	550	21%	750	16%	550	21%
Protein (gm)	15	11	34	12	33	15	26	11	35
Vitamin A (mcg R.E.)	267	250	27	200	33	250	27	200	33
Vitamin C (mg)	34	12	68	12	68	15	57	15	57
Thiamin (mg)	.44	.32	33	.28	40	.38	29	.28	40
Riboflavin (mg)	.66	.38	44	.32	51	.45	37	.32	51
Niacin (mg N.E.)	3.68	4.25	22	3.75	25	5.00	18	3.75	25
Vitamin B ₆ (mg)	.35	.42	21	.35	25	.50	17	.38	23
Calcium (mg)	341	300	28	300	28	300	28	300	28
Phosphorus (mg)	365	300	30	300	30	300	30	300	30
Magnesium (mg)	58	68	21	70	21	100	14	75	19
Iron (mg)	3.84	3.00	32	3.75	26	3.00	32	3.75	26

NOTE: Target goal used in these analyses is one-fourth of the RDA for all age groups. Percentages in this table are based on the nutrient content of the meal consumed by the average student in each school. No age- or sex-specific data were collected.

Data Source: On-Site Meal Observations.

analysis--25 percent of the RDA. Further, the nutrient content of meals selected by students were, with few exceptions, within the target range for all nutrients. Significant nutrient shortfalls arose only in the meals actually consumed by students, particularly at the elementary school level. Thus, the key to ensuring that students receive approximately one-fourth of their daily nutritional needs from an SBP meal, is to increase the likelihood that students will actually consume the meals they select. It is also important to ensure that the oldest students in each school have the ability to receive larger or additional portions of food.

The average SBP meal in both elementary and middle/secondary schools did not consistently meet 25 percent of students' daily energy needs. As has been mentioned throughout this chapter, however, the need for an average SBP meal to supply this proportion of daily energy needs is open to debate.

Indices of
Nutritional
Quality (INQs)

SBP meals consumed by students in both elementary and middle/secondary schools were high in nutrient density, as evidenced by the INQ scores shown in Exhibits VIII.27 and VIII.28. This demonstrates that, while the total calorie level of the meals may have been somewhat low, students received concentrated amounts of key nutrients in every calorie they consumed.

Comparison
to Dietary
Guidelines
for Americans

Exhibit VIII.29 summarizes the fat, cholesterol and sodium content of the average SBP meal as offered, selected and consumed. As the exhibit illustrates, student plate waste had little impact on these measures. In general, the conclusions drawn in previous analyses still hold: the average SBP meal, at all levels and in both school types, contained appropriate amounts of total fat, cholesterol and sodium, but exceeded Dietary Guidelines recommendations for saturated fat. As Exhibit VIII.30 indicates, the average breakfast as consumed met the Dietary Guidelines recommendations for saturated fat in only 11 percent of schools.

Food-Level
Analysis

To investigate the amount of plate waste in the SBP program, food selection and plate waste data for the sample of students included in plate waste observations were utilized to measure the average percent consumption for each food item included in the food group taxonomy. The following method was used to determine the percent consumption for each food item:

percent consumption =

$$\frac{[\text{food selected (gm)} - \text{plate waste (gm)}] \times 100}{\text{food selected (gm)}}$$

An aggregate consumption measure was also computed using the total weight of all foods included in a meal and the total weight of the foods that were not consumed.

Exhibit VIII.27

Indices of Nutritional Quality (INQs) for
the Average SBP Meal Consumed in Elementary Schools
(SY 1989-90)

	INQs for Students 4-6 Years	INQs for Students 7-10 Years	INQs for Male Students 11-14 Years	INQs for Female Students 11-14 Years
Protein (gm)	2.42	2.29	1.71	1.50
Vitamin A (mcg R.E.)	2.58	2.06	1.79	1.94
Vitamin C (mg)	3.05	3.41	3.71	3.25
Thiamin (mg)	2.05	2.06	1.93	2.00
Riboflavin (mg)	2.53	2.59	2.50	2.56
Niacin (mg N.E.)	1.47	1.53	1.43	1.38
Vitamin B ₆ (mg)	1.58	1.41	1.43	1.50
Calcium (mg)	1.68	1.88	1.50	1.31
Phosphorus (mg)	1.74	1.94	1.57	1.38
Magnesium (mg)	2.05	1.65	1.21	1.06
Iron (mg)	1.58	1.76	1.79	1.25

NOTE: An INQ of 1.0 or more indicates that the meal is of high nutritional quality. INQs below 1.0 indicate that the meal will not provide 100% of the target level RDA (one-third) unless the target RDA for calories is exceeded.

Data Source: On-Site Meal Observations.

Exhibit VIII.28

Indices of Nutritional Quality (INQs) for
the Average SBP Meal Consumed in Middle/Secondary Schools
(SY 1989-90)

	INQs for Male Students 11-14 Years	INQs for Female Students 11-14 Years	INQs for Male Students 15-18 Years	INQs for Female Students 15-18 Years
Protein (gm)	1.79	1.57	1.63	1.67
Vitamin A (mcg R.E.)	1.42	1.57	1.69	1.57
Vitamin C (mg)	3.58	3.24	3.56	2.71
Thiamin (mg)	1.74	1.90	1.81	1.90
Riboflavin (mg)	2.32	2.43	2.31	2.43
Niacin (mg N.E.)	1.16	1.19	1.13	1.19
Vitamin B ₆ (mg)	1.11	1.19	1.06	1.10
Calcium (mg)	1.47	1.33	1.75	1.33
Phosphorus (mg)	1.58	1.43	1.88	1.43
Magnesium (mg)	1.11	1.00	0.88	0.90
Iron (mg)	1.68	1.24	2.00	1.24

NOTE: An INQ of 1.0 or more indicates that the meal is of high nutritional quality. INQs below 1.0 indicate that the meal will not provide 100% of the target level RDA (one-third) unless the target RDA for calories is exceeded.

Data Source: On-Site Meal Observations.

Exhibit VIII.29

Macronutrient, Cholesterol and Sodium Content of
the Average SBP Meal Offered, Selected and Consumed
in Elementary and Middle/Secondary Schools
Compared to the Dietary Guidelines for Americans
(SY 1989-90)

	USDA/DHHS Dietary Guidelines for Americans	Elementary Schools (n=31)				Middle/Secondary Schools (n=13)			
		Offered	Selected	Consumed	Difference (%) (Con vs. Sel)	Offered	Selected	Consumed	Difference (%) (Con vs. Sel)
Percent Calories from Total Fat	<30.0	31.4	29.4	28.9	-0.5%	29.5	30.9	30.1	-0.8%
Percent Calories from Saturated Fat	<10.0	14.0	13.5	13.0	-0.5	13.1	13.8	13.4	-0.4
Percent Calories from Carbohydrate	55.0-65.0 ¹	56.5	58.9	60.1	+0.2	58.6	57.4	58.1	+0.7
Percent Calories from Protein	5.0-15.0 ¹	14.0	13.5	12.8	-0.7	13.4	13.1	13.1	0.0
Mean Cholesterol (mg)	n.q. ²	56	50	38	-24.0	58	66	59	-10.6
Mean Sodium (mg)	n.q. ²	621	579	455	-21.6	645	645	594	-7.9

¹The USDA/DHHS Dietary Guidelines do not provide specific recommendations for the proportion of calories from carbohydrates and protein. RDAs for protein for school age children range from 5 to 8 percent of total calories. In general, the average protein intake considerably exceeds the RDA. The National Research Council (NRC) report Diet and Health recommends maintaining total protein levels lower than twice the RDA for all age groups and that the intake of carbohydrates be more than 55% of total calories. To achieve the recommended levels of calories from fat, carbohydrate and protein content would need to be in these ranges.

²Not quantified. There is no established Recommended Dietary Allowance or Estimated Safe and Adequate Intake for cholesterol or sodium. The Dietary Guidelines for Americans recommend choosing a diet low in cholesterol and use of salt and sodium only in moderation. The National Research Council (NRC) report Diet and Health recommends that adults and children limit salt intake to 6 grams per day, equal to 2400 mg of sodium, and dietary cholesterol intake to less than 300 mg per day.

Note: None of the differences between school types or between meals selected and consumed, within school type, is statistically significant.

Data Source: On-Site Meal Observations.

Exhibit VIII.30

Frequency Distribution of the Level of Fat, Cholesterol and
Sodium Provided in the Average SBP Meal Consumed in
Elementary and Middle/Secondary Schools
(SY 1989-90)

	Percent of Schools		
	Elementary (n=31)	Middle/ Secondary (n=13)	All Schools (n=44)
<u>Percent Calories from Fat</u>			
< 30 percent (D.G. Goal) ¹	55%	62%	57%
31-35 percent	35	23	32
36-38 percent	6	8	7
39-40 percent	0	0	0
< 40 percent	3	8	5
<u>Percent Calories from Saturated Fat</u>			
< 10 percent (D.G. Goal) ¹	10	15	11
11-13 percent	42	46	43
14-16 percent	42	23	36
>16 percent	6	15	9
<u>Cholesterol (mg)²</u>			
< 75 mg	96	77	91
76-100 mg	3	15	7
> 100 mg	0	8	2
<u>Sodium (mg)²</u>			
< 600 mg	90	69	84
601-800 mg	6	15	9
801-1000	4	8	5
> 1000 mg	0	8	2

¹Level of intake recommended in the USDA/DHHS Dietary Guidelines for Americans.

²The Dietary Guidelines for Americans recommend choosing a diet low in cholesterol and use of salt and sodium only in moderation. The National Research Council (NRC) report Diet and Health recommends that adults and children limit salt intake to 6 grams per day (equal to 2400 mg. of sodium) and cholesterol intake to less than 300 mg. per day.

Note: None of the differences between elementary and middle/secondary schools is statistically significant.

Data Source: On-Site Meal Observations.

Measures for individual food items were averaged by food group across all observations to compute an overall average for each food group in each type of school. These data are presented in Exhibit VIII.31. The percent consumption column in this exhibit can be interpreted as the converse of plate waste, i.e., it represents the proportion of available food that, on average, was consumed by children in each school.

Overall, elementary school students consumed about two-thirds of the foods they selected, and middle/secondary school students consumed over 80 percent the foods they selected. The food group with the highest level of consumption (i.e., least amount of plate waste) was meat/meat alternates; elementary school children consumed an average of 84 percent of these foods and middle/secondary school children consumed an average of 92 percent. The next best-consumed food group was bread/bread alternates (77 percent consumed by elementary school children and 85 percent consumed by middle/secondary school children). Results for milk and fruit/juice selections differ for the two types of students. Elementary school students on average tended to consume more of the fruit or juice they selected than the milk. Middle/secondary school students, on the other hand, consumed more of the milk and less of the fruit/juice.

As the preceding nutritional analyses suggested, elementary students wasted significantly more of the food they selected than did middle/secondary students. This result is in keeping with research on plate waste in the National School Lunch Program.^{1/2/} Data from this study indicate that elementary school students consumed less of their meal, overall, and specifically consumed less milk (except for flavored milk) and fruit juice than middle/secondary school students.

Exemplary
SFAs vs.
Typical SFAs

As in the preceding analysis of NSLP meals (Chapter VII), a comparison of SBP meals offered, selected and consumed in exemplary and typical SFAs revealed no significant differences. As Exhibits ET-VIII.1 through ET-VIII.6 demonstrate, this included comparisons of the means of exemplary and typical SFAs for all nutrients, stratified by school type, for SBP meals as offered,

^{1/}Jansen, G.R. and Harper, J.M., "Consumption and Plate Waste of Menu Items in the National School Lunch Program," Journal of the American Dietetic Association 73: 395, 1978; and Lilly, H.D., et al., "Findings of the report on food consumption and nutritional evaluation in the National School Lunch Program," School Food Service Research Review 4: 7, 1980.

^{2/}No plate waste studies specific to the SBP Program could be located in the literature.

Exhibit VIII.31

Average Consumption of Food Portions Selected By
or Served to Students in SBP Meals in
Elementary and Middle/Secondary Schools
(SY 1989-90)

Meal Component/Food Item	Elementary Schools		Middle/Secondary Schools	
	Percent of Meals Offering (n=124)	Average Percent Consumed ¹	Percent of Meals Offering (n=52)	Average Percent Consumed ¹
<u>ALL ITEMS</u>	--	69%*	--	81%
<u>MILK</u>	100%	66	100%	82
Whole Milk	66	58*	77	81
Lowfat Milk	88	64*	95	81
Skim Milk	28	61	29	81
Flavored Milk	57*	74*	77	84
<u>FRUIT</u>	99	79	100	91
<u>FRESH FRUIT</u>	24*	70	8	87
Apple	7	63	2	100
Banana	6	70	4	75
Grapefruit	1	36	0	NA
Grapes	1	100	0	NA
Orange	11	81	2	100
<u>CANNED FRUIT</u>	35	71	38	81
Applesauce	10	76	17	86
Apricots	2	63	2	50
Fruit Cocktail	10	70	13	91
Peaches	7	69	8	72
Pears	4	48	2	100
Pineapple	4	88	6	88
Plums	0	NA	4	50
Strawberries/Other Berries	2	100	2	++
<u>FRUIT JUICE</u>	66*	84*	85	93
<u>DRIED FRUIT</u>	3	90	0	NA
<u>VEGETABLES</u>	3	76	10	92
<u>POTATOES</u>	3	76	2	95
Fried Potatoes	3	76	2	100
Other Potatoes	0	NA	2	63
<u>SOUPS</u>	0	NA	6	83

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Meal Component/Food Item	Elementary Schools		Middle/Secondary Schools	
	Percent of Meals Offering (n=124)	Average Percent Consumed ¹	Percent of Meals Offering (n=52)	Average Percent Consumed ¹
BREADS/BREAD ALTERNATES²	87%	80%	92%	89%
Bagels	6	66	0	NA
Biscuits/Croissants	8	77	8	84
Bread, Toast	48	77*	44	88
Cereal, Cold	52	86	56	91
Cereal, Hot	7	71	6	59
Crackers	2	81	0	NA
Doughnuts	10*	91	37	98
Rolls	2	53	0	67
Sweet Buns	6*	81	21	81
Fruit Muffins/Breads	14	72	10	100
Tortillas, Taco Shells	3	95	0	NA
Rice	2	68	0	NA
Pancakes, Waffles	5	88	15	96
MEAT/MEAT ALTERNATES	46	74	56	95
EGGS/MEATS/CHEESE/ETC.	30	86	31	89
Eggs	13	75	17	81
Bacon, Sausage	17	90	19	95
Peanut Butter, Nuts	19		8	
Cheese	7		0	NA
Baked, BBQ Chicken	0	NA	2	83
Chicken Nuggets, Patty	0	NA	2	100
MEAT AND GRAIN COMBINATIONS	20*	83	38	98
Egg and/or Sausage Sandwich	5	73*	15	96
French Toast	3	84	6	100
Grilled Cheese Sandwich	5	87	10	99
Peanut Butter & Jelly Sandwich	2	90	0	NA
Tuna Salad Sandwich	0	NA	2	
Pizza	4	89	4	99
Hamburger, Cheeseburger	0	NA	8	100
Hot Dogs, Corn Dogs	0	NA	8	
Ham & Cheese Sandwich	0	NA	10	100
MISCELLANEOUS MEAT ITEMS	0	NA	2	100
Lasagna, Ravioli, etc.	0	NA	2	100
Stuffed Cabbage	0	NA	2	100

¹The average percentage of each selected food item (or category) that was actually consumed. Sample size not reported because it varies for every item in the table.

²Includes breads/bread alternates offered as a separate item, i.e., not included in combination items such as french toast, egg sandwiches, etc.

*Difference between elementary and middle/secondary schools is statistically significant at the .01 level.

++Consumption data not available because none of the students included in the plate waste observations selected this item.

NA: Consumption data not available because none of the schools offered this item.

Data Source: On-Site Meal Observations.

selected and consumed, and the mean proportions of calories supplied by fat, saturated and unsaturated fat.^{1/} Possible explanations for the lack of discernible differences between these two groups of SFAs are discussed in Chapter VII. In light of the comparability of the nutritional characteristics of breakfasts offered, selected and consumed in the two groups of SFAs, data were pooled for all analyses presented in this report.

^{1/}The frequency distributions were also examined for all nutrients in all three levels of meal analysis; no significant differences were noted. In addition, the two types of "typical" SFAs--those participating in USDA menu modification grants and those that were not (see Chapter I)--were compared. No significant differences were detected.

PART 4: EXTENDED TABLES

Food and Nutrient Composition of NSLP Meals

- Exhibits ET-VII.1 - ET-VIII.8

Food and Nutrient Composition of SBP Meals

- Exhibits ET-VIII.1 - ET-VIII.6

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Exhibit ET-VII.1

Food Group Taxonomy Used in Food Level Analysis

<u>Major Categories</u>	<u>Subgroups</u>	<u>Food Items</u>
<u>MILK</u>	None	Whole Milk Lowfat Milk Skim Milk Flavored Milk
<u>FRUIT</u>	Fresh Fruit	Apple Banana Cantalope Grapefruit Grapes Orange Pear Watermelon Fruit Salads
	Canned Fruit	Applesauce Apricots Fruit Cocktail Peaches Pears Pineapple Plums Strawberries Other Berries
	Fruit Juice	(all juices)
	Dried Fruit	(all dried fruits)
	Other Fruit Items	Crisps, Cobblers, Gelatins (with fruit or juices) Juice Bars, Misc.
<u>VEGETABLES¹</u>	Raw Vegetables	Lettuce, Salad Other Raw Vegetables Cole Slaw, Miscellaneous Salads
	Cooked Vegetables	Corn Green Beans Broccoli Cabbage Peas Carrots Mixed Vegetables Onion Rings Spinach, Greens Miscellaneous Vegetables

-continued-

<u>Major Categories</u>	<u>Subgroups</u>	<u>Food Items</u>
<u>VEGETABLES</u> (con't.)	Potatoes	French Fries, Tater Tots, etc. Other Potatoes
	Beans, Legumes	(all types)
	Soups	(all vegetable soups; contained little or no meat or poultry)
<u>BREADS/BREAD</u> <u>ALTERNATES</u> ²	None	Bagels Bisquits, Croissants Bread, Toast Cornbread Crackers Rolls Sweet Buns Fruit Muffins, Breads Tortillas, Taco Shells Rice Pasta, Noodles Pancakes, Waffles Hot Cereals (Breakfast Only) Cold Cereals (Breakfast Only) Doughnuts (Breakfast Only)
<u>ENTREES</u>	Meat, Poultry or Fish ³	Beef-Roast, Ribs Breaded Fried Steak Broiled Steak Meatloaf Pork Chop Baked, BBQ Chicken Chicken Nuggets, Patty Chicken or Turkey Croquettes Roast Turkey Fish Nuggets, Sticks Fried Clams Breaded Fish Portion Bacon, Sausage Chili (Mostly Meat) Cold Meat, Cheese Plate Eggs (Breakfast Only)

-continued-

<u>Major Categories</u>	<u>Subgroups</u>	<u>Food Items</u>
<u>ENTREES</u> (cont'd.)	Meat/Bread Combinations	
	-Burgers/Sandwiches	Hamburger, Cheeseburger Steak, Roast Beef Sandwich Sloppy Joe, BBQ Beef Hot Dogs, Corn Dogs Fried Chicken Sandwich Fried Fish Sandwich Coldcut Sandwich, Submarine Sandwich Ham & Cheese Sandwich Grilled Cheese Sandwich Tuna Salad Sandwich Egg Salad Sandwich Peanut Butter & Jelly Sandwich Turkey Sandwich
	-Other Meat/Bread Combination Items	Pizza Burrito, Enchilada Taco, Nacho (without vegetables) Pot Pies French Toast Macaroni & Cheese Beef & Noodles, Goulash, Miscellaneous Pancakes & Sausage (Breakfast only) Egg/Sausage Sandwich (Breakfast only)
	Meat, Bread, Vegetable Combinations ⁴	Spaghetti with Meat Sauce Lasagna, Ravioli, etc. Taco, Taco Salad Salad Bar ⁵
	Meat, Vegetable Combinations ⁴	Chef Salad ⁶ Salad Bar ⁶ Potato Bar Stir Fry, Miscellaneous Items

-continued-

<u>Major Categories</u>	<u>Subgroups</u>	<u>Food Items</u>
<u>DESSERT</u>	None	Pies, Tarts Cookies Cakes, Brownies Gelatins Ice Cream, Puddings

¹ Includes vegetables offered as a separate item, i.e., not included in combination items such as chef salad, tacos, taco salad, etc.

² Includes breads/bread alternates offered as a separate item, i.e., not included in combination items such as sandwiches, burgers, pasta dishes, etc.

³ Meat, poultry and fish items offered separately, i.e., not in combination items.

⁴ SFAs considered these items to meet part or all of the vegetable/fruit meal pattern requirement.

⁵ These salads included a roll, crackers, pasta salad or other item that met a portion or all of the bread/bread alternate requirement.

⁶ These salads did not include bread/bread alternate components.

Exhibit ET-VII.2

A la Carte Items Available at Lunch in Elementary
and Middle/Secondary Schools
(SY 1989-90)

A la Carte Item	Percent of Schools ¹	
	Elementary Schools (n=23)	Middle/Secondary Schools (n=16)
<u>Beverages</u>	22%	69%
- Carbonated soft drinks	0	12
- Non-carbonated soft drinks	4	62
- Juice (100%)	17	38
- Tea, coffee, iced tea	0	19
- Milkshakes, malts	0	25
<u>Fruits and Vegetables</u>	9	62
- Fresh fruits	4	25
- Canned fruits	4	12
- French fries	0	31
- Salad Bar	0	44
- Side salads/raw vegetables	0	6
<u>Entrees</u>		
- Pizza	0	44
- Tacos, Nachos, burritos	0	38
- Hamburgers, cheeseburgers	0	25
- Hot dogs	0	12
- Sandwiches	0	12
<u>Desserts</u>	96	75
- Cakes, cupcakes	22	38
- Cookies, brownies	65	44
- Pies, turnovers, crisps	4	44
- Donuts, sweetrolls	0	38
- Ice cream, sherbet	44	50
- Frozen Ices, Popsicles	9	0
- Puddings	13	0
- Fruit roll-ups	17	0
- Other	13	12
<u>Chips, Pretzels, Snacks</u>	30	62
- potato chips, cornchips	4	31
- pretzels, corn nuts	4	12

-continued-

Exhibit ET-VII.2
(continued)

A la Carte Item	Percent of Schools ¹	
	Elementary Schools (n=23)	Middle/Secondary Schools (n=16)
<u>Chips, Pretzels, Snacks</u> (cont'd.)		
- cheese puffs	4	12
- popcorn	26	12
- other salty snacks	13	31
<u>Other</u>	22	62
- yogurt	9	19
- muffins	0	6
- soups	0	6
- bagel/cream cheese	0	19
- candy	9	12
- granola bars	4	6
<u>Candy</u>	9	12

¹Ns and percentages reflect schools that had some a la carte food service available.

Data Source: On-Site Meal Observations.

Exhibit ET-VII.3

Mean Calorie and Nutrient Content of the Average NSLP
Lunch Offered in Elementary and Middle/Secondary Schools
in Exemplary and Typical SFAs
(SY 1989-90)

	Elementary Schools		Middle Secondary Schools		All Schools	
	Exemplary (n=20)	Typical (n=20)	Exemplary (n=10)	Typical (n=10)	Exemplary (n=30)	Typical (n=30)
Calories	723	719	801	814	749	751
Protein (gm)	31	30	35	33	32	31
Total Fat (gm)	31	31	34	35	32	32
Saturated Fat (gm)	12	12	13	14	12	13
Cholesterol (mg)	87	82	88	110	87	91
Total Carbohydrate (gm)	83	84	92	95	86	88
Vitamin A (mcg R.E.)	348	300	354	383	350	327
Vitamin C (mg)	29*	21	35	37	31	26
Thiamin (mg)	.49	.48	.57	.56	.51	.51
Riboflavin (mg)	.76	.76	.88	.85	.80	.79
Niacin (mg N.E.)	6.22	5.97	7.08	6.46	6.50	6.14
Vitamin B ₆ (mg)	.49	.46	.56	.52	.51	.48
Calcium (mg)	478	475	548	528	501	493
Phosphorus (mg)	569	554	632	622	590	576
Magnesium (mg)	102	93	106	105	103	97
Iron (mg)	4.20	4.08	4.83	4.76	4.41	4.30
Sodium (mg)	1,112	1,092	1,316	1,366	1,180	1,183

*Difference between exemplary and typical SFAs is statistically significant at the .01 level.

Data Source: On-Site Meal Observations.

Exhibit ET-VII.4

Mean Proportion of Calories Provided
by Fat, Carbohydrate and Protein in the Average NSLP Lunch
as Offered in Elementary and Middle/Secondary Schools
in Exemplary and Typical SFAs
(SY 1989-90)

	<u>Elementary Schools</u>		<u>Middle Secondary Schools</u>		<u>All Schools</u>	
	Exemplary (n=20)	Typical (n=20)	Exemplary (n=10)	Typical (n=10)	Exemplary (n=30)	Typical (n=30)
Percent Calories from Fat	38.4	38.3	37.9	38.1	38.2	38.2
Percent Calories from Saturated Fat	14.4	15.2	14.9	15.2	14.6	15.2
Percent Calories from Carbohydrate	46.1	46.0	46.7	46.7	46.1	46.7
Percent Calories from Protein	17.1	16.6	17.6	16.5	17.2	16.6

Note: None of the differences between exemplary and typical SFAs is statistically significant.

Data Source: On-Site Meal Observations.

Exhibit ET-VII.5

Mean Calorie and Nutrient Content of the Average NSLP
Lunch Selected in Elementary and Middle/Secondary Schools
in Exemplary and Typical SFAs
(SY 1989-90)

	Elementary Schools		Middle Secondary Schools		All Schools	
	Exemplary (n=20)	Typical (n=20)	Exemplary (n=10)	Typical (n=10)	Exemplary (n=30)	Typical (n=30)
Calories	696	717	819	842	737	758
Protein (gm)	29	29	35	35	31	31
Total Fat (gm)	28	29	34	36	30	31
Saturated Fat (gm)	11	12	14	14	12	13
Cholesterol (mg)	80	77	83	102	81	85
Total Carbohydrate (gm)	85	88	96	96	89	91
Vitamin A (mcg R.E.)	299	300	334	317	311	306
Vitamin C (mg)	26	21	31	31	28	24
Thiamin (mg)	.45	.48	.57	.55	.49	.50
Riboflavin (mg)	.73	.73	.79	.80	.75	.75
Niacin (mg N.E.)	5.84	5.88	7.51	7.24	6.39	6.33
Vitamin B ₆ (mg)	.46	.46	.56	.54	.49	.48
Calcium (mg)	450	449	489	499	463	466
Phosphorus (mg)	544	541	623	624	570	569
Magnesium (mg)	94	90	103	104	97	95
Iron (mg)	4.16	4.26	5.14	5.13	4.49	4.55
Sodium (mg)	1,098	1,136	1,346	1,455	1,180	1,242

Note: None of the differences between exemplary and typical SFAs is statistically significant.

Data Source: On-Site Meal Observations.

Exhibit ET-VII.6

Mean Proportion of Calories Provided
by Fat, Carbohydrate and Protein in the Average NSLP Lunch
as Selected in Elementary and Middle/Secondary Schools
in Exemplary and Typical SFAs
(SY 1989-90)

	<u>Elementary Schools</u>		<u>Middle Secondary Schools</u>		<u>All Schools</u>	
	Exemplary (n=20)	Typical (n=20)	Exemplary (n=10)	Typical (n=10)	Exemplary (n=30)	Typical (n=30)
Percent Calories from Fat	35.7	36.1	37.3	38.9	36.2	37.1
Percent Calories from Saturated Fat	13.8	14.5	14.9	15.2	14.2	14.7
Percent Calories from Carbohydrate	49.0	49.4	47.2	45.3	48.4	48.0
Percent Calories from Protein	16.9	16.2	16.9	16.8	16.9	16.4

Note: None of the differences between exemplary and typical SFAs is statistically significant.

Data Source: On-Site Meal Observations.

Exhibit ET-VII.7

Mean Calorie and Nutrient Content of the Average NSLP
Lunch Consumed in Elementary and Middle/Secondary Schools
in Exemplary and Typical SFAs
(SY 1989-90)

	Elementary Schools		Middle Secondary Schools		All Schools	
	Exemplary (n=20)	Typical (n=20)	Exemplary (n=10)	Typical (n=10)	Exemplary (n=30)	Typical (n=30)
Calories	524	565	730	784	593	638
Protein (gm)	22	23	31	32	25	26
Total Fat (gm)	21	23	31	34	24	27
Saturated Fat (gm)	8	9	12	13	10	11
Cholesterol (mg)	61	61	78	94	66	72
Total Carbohydrate (gm)	64	69	84	90	71	76
Vitamin A (mcg R.E.)	209	222	293	296	237	247
Vitamin C (mg)	19	16	27	32	22	21
Thiamin (mg)	.33	.38	.51	.51	.39	.42
Riboflavin (mg)	.55	.58	.74	.76	.61	.64
Niacin (mg N.E.)	4.29	4.69	6.60	6.68	5.06	5.35
Vitamin B ₆ (mg)	.34	.36	.49	.50	.39	.40
Calcium (mg)	346	361	456	481	383	401
Phosphorus (mg)	414	431	566	586	465	483
Magnesium (mg)	69	71	91	98	76	80
Iron (mg)	3.06	3.29	4.61	4.75	3.58	3.77
Sodium (mg)	828	895	1,245	1,344	967	1,044

Note: None of the differences between exemplary and typical SFAs is statistically significant.

Data Source: On-Site Meal Observations.

Exhibit ET-VII.8

Mean Proportion of Calories Provided
by Fat, Saturated Fat, Unsaturated Fat,
Carbohydrate and Protein in the Average NSLP Lunch
Consumed in Elementary and Middle/Secondary Schools
in Exemplary and Typical SFAs
(SY 1989-90)

	<u>Elementary Schools</u>		<u>Middle Secondary Schools</u>		<u>All Schools</u>	
	Exemplary (n=20)	Typical (n=20)	Exemplary (n=10)	Typical (n=10)	Exemplary (n=30)	Typical (n=30)
Percent Calories from Fat	35.8	36.4	37.6	38.5	36.4	37.1
Percent Calories from Saturated Fat	14.0	14.7	15.1	15.0	14.4	14.8
Percent Calories from Unsaturated Fat	19.2	19.2	19.8	20.8	19.4	19.7
Percent Calories from Carbohydrate	49.0	48.8	46.4	45.8	48.1	47.8
Percent Calories from Protein	16.8	16.3	17.3	16.7	17.0	16.5

Note: None of the differences between exemplary and typical SFAs are statistically significant.

Data Source: On-Site Meal Observations.

Exhibit ET-VIII.1

Mean Calorie and Nutrient Content of the Average SBP
Breakfast Offered in Elementary and Middle/Secondary
Schools in Exemplary and Typical SFAs
(SY 1989-90)

	Elementary Schools		M/S Schools		All Schools	
	Exemplary	Typical	Exemplary	Typical	Exemplary	Typical
	(n=15)	(n=16)	(n=6)	(n=7)	(n=21)	(n=23)
Calories	450	486	504	537	466	502
Protein (gm)	16	16	18	16	17	16
Total Fat (gm)	15	18	17	17	16	17
Saturated Fat (gm)	7	8	8	7	7	8
Cholesterol (mg)	55	56	73	45	60	53
Total Carbohydrate (gm)	65	67	69	83	66	72
Vitamin A (mcg R.E.)	369	339	219	450	326	373
Vitamin C (mg)	31	30	25	45	29	34
Thiamin (mg)	.48	.47	.44	.60	.47	.51
Riboflavin (mg)	.77	.77	.72	.89	.75	.81
Niacin (mg N.E.)	4.84	4.69	3.36	5.98	4.41	5.08
Vitamin B ₆ (mg)	.48	.46	.32	.60	.44	.50
Calcium (mg)	378	381	430	386	393	382
Phosphorus (mg)	399	377	443	409	412	387
Magnesium (mg)	71	69	67	76	70	71
Iron (mg)	4.60	3.89	3.39	6.58	4.26	4.71
Sodium (mg)	627	614	665	627	638	618

Note: None of the differences between exemplary SFAs and typical SFAs is statistically significant.

Data Source: On-Site Meal Observations

Exhibit ET-VIII.2

Mean Proportion of Calories Provided
by Fat, Carbohydrate and Protein in the Average SBP Breakfast
Offered in Elementary and Middle/Secondary
Schools in Exemplary and Typical SFAs
(SY 1989-90)

	<u>Elementary Schools</u>		<u>M/S Schools</u>		<u>All Schools</u>	
	Exemplary (n=15)	Typical (n=16)	Exemplary (n=6)	Typical (n=7)	Exemplary (n=21)	Typical (n=23)
Percent Calories from Fat	29.8	32.8	31.0	28.2	30.1	31.4
Percent Calories from Saturated Fat	13.2	14.7	13.9	12.5	13.4	14.1
Percent Calories from Carbohydrate	57.8	55.3	55.3	61.4	57.1	57.2
Percent Calories from Protein	14.5	13.5	14.7	12.3	14.5	13.1

Note: None of the differences between exemplary SFAs and typical SFAs is statistically significant.

Data Source: On-Site Meal Observations

Exhibit ET-VIII.3

Mean Calorie and Nutrient Content of the Average SBP
Breakfast as Selected in Elementary and Middle/Secondary
Schools in Exemplary and Typical SFAs
(SY 1989-90)

	Elementary Schools		M/S Schools		All Schools	
	Exemplary	Typical	Exemplary	Typical	Exemplary	Typical
	(n=15)	(n=16)	(n=6)	(n=7)	(n=21)	(n=23)
Calories	426	464	514	523	451	482
Protein (gm)	15	15	18	16	16	15
Total Fat (gm)	13	16	21	15	15	16
Saturated Fat (gm)	.6	7	9	7	7	7
Cholesterol (mg)	46	53	92	44	59	51
Total Carbohydrate (gm)	64	67	64	83	64	72
Vitamin A (mcg R.E.)	325	314	200	372	289	331
Vitamin C (mg)	31	29	24	46	29	34
Thiamin (mg)	.44	.44	.40	.53	.43	.47
Riboflavin (mg)	.70	.73	.67	.80	.69	.75
Niacin (mg N.E.)	4.15	4.08	2.70	4.85	3.74	4.32
Vitamin B ₆ (mg)	.43	.41	.24	.49	.38	.44
Calcium (mg)	353	377	408	370	369	375
Phosphorus (mg)	369	361	435	389	388	370
Magnesium (mg)	65	64	59	70	64	66
Iron (mg)	3.98	3.71	2.56	5.32	3.57	4.20
Sodium (mg)	568	590	691	606	603	595

Note: None of the differences between exemplary SFAs and typical SFAs is statistically significant.

Data Source: On-Site Meal Observations.

Exhibit ET-VIII.4

Mean Proportion of Calories Provided
by Fat, Carbohydrate and Protein in the Average SBP Breakfast
as Selected in Elementary and Middle/Secondary Schools in
Exemplary and Typical SFAs
(SY 1989-90)

	Elementary Schools		M/S Schools		All Schools	
	Exemplary (n=20)	Typical (n=20)	Exemplary (n=10)	Typical (n=10)	Exemplary (n=30)	Typical (n=30)
Percent Calories from Fat	28.2	30.6	36.2	26.3	30.5	29.3
Percent Calories from Saturated Fat	12.8	14.1	16.1	11.9	13.7	13.5
Percent Calories from Carbohydrate	59.9	58.0	50.4	63.4	57.2	59.6
Percent Calories from Protein	13.9	13.1	14.0	12.3	14.0	12.9

Note: None of the differences between exemplary SFAs and typical SFAs is statistically significant.

Data Source: On-Site Meal Observations

Exhibit ET-VIII.5

Mean Calorie and Nutrient Content of the Average
Breakfast as Consumed in Elementary and Middle/Secondary
Schools in Exemplary and Typical SFAs
(SY 1989-90)

	Elementary Schools		M/S Schools		All Schools	
	Exemplary	Typical	Exemplary	Typical	Exemplary	Typical
	(n=15)	(n=16)	(n=6)	(n=7)	(n=21)	(n=23)
Calories	319	365	490	440	368	388
Protein (gm)	10	11	18	13	13	12
Total Fat (gm)	10	12	19	13	12	13
Saturated Fat (gm)	4	6	9	6	6	6
Cholesterol (mg)	34	42	86	35	49	40
Total Carbohydrate (gm)	49	53	62	70	53	58
Vitamin A (mcg R.E.)	247	246	196	321	232	269
Vitamin C (mg)	27	25	25	42	26	30
Thiamin (mg)	.35	.35	.39	.47	.36	.39
Riboflavin (mg)	.51	.55	.65	.66	.55	.59
Niacin (mg N.E.)	3.34	3.34	2.72	4.41	3.16	3.67
Vitamin B ₆ (mg)	.34	.33	.25	.43	.31	.36
Calcium (mg)	236	275	394	293	281	280
Phosphorus (mg)	256	269	423	310	203	282
Magnesium (mg)	47	48	57	57	50	50
Iron (mg)	3.10	3.03	2.64	4.77	2.97	3.56
Sodium (mg)	434	474	675	517	502	487

Note: None of the differences between exemplary SFAs and typical SFAs is statistically significant.

Data Source: On-Site Meal Observations.

Exhibit ET-VIII.6

Mean Proportion of Calories Provided
by Fat, Carbohydrate and Protein in the Average SBP Breakfast
as Consumed in Elementary and Middle Schools in
Exemplary and Typical SFAs
(SY 1989-90)

	<u>Elementary Schools</u>		<u>M/S Schools</u>		<u>All Schools</u>	
	Exemplary (n=20)	Typical (n=20)	Exemplary (n=10)	Typical (n=10)	Exemplary (n=30)	Typical (n=30)
Percent Calories from Fat	27.4	30.4	34.7	26.3	29.5	29.1
Percent Calories from Saturated Fat	12.2	13.9	15.5	11.6	13.1	13.2
Percent Calories from Carbohydrate	61.4	58.8	51.8	63.6	58.6	60.3
Percent Calories from Protein	13.2	12.5	14.3	12.1	13.5	12.4

Note: None of the differences between exemplary and typical SFAs is statistically significant.

Data Source: On-Site Meal Observations

PART 5: APPENDICES

Appendix A:	Year Two SFA Manager Survey
Appendix B:	Meal Observation Methodology
Appendix C:	Meal Observation Instruments
Appendix D:	Non-Response Analysis for Year Two SFA Manager Survey
Appendix E:	Sample Weighting Methodology
Appendix F:	1989 Recommended Dietary Allowances
Appendix G:	SFA Manager Interview

APPENDIX A
YEAR TWO SFA MANAGER SURVEY

1990 SCHOOL LUNCH SURVEY

INTRODUCTION

Hello, this is _____. I am calling from Abt Associates in Cambridge, Massachusetts. We are doing a study of the National School Lunch Program and other Child Nutrition Programs for the U.S. Department of Agriculture. You may remember that we called you for this study last spring and I hope that you will be willing to help with the study this year.

- X1. Recently, we sent you a letter and brochure describing the study and the types of information we need. The same letter was sent to over 1,700 school districts across the country. Do you remember the letter?

YES (SKIP TO Q.X3).....	1	14/
NO.....	2	

Let me briefly describe what the study is about. The study is funded by the U.S. Department of Agriculture. It calls for an annual national survey of more than 1,700 school districts so that the Department can learn about several important issues related to the Child Nutrition Programs. This year, some of the issues to be covered in the survey include: CN Labeling, commodity distribution, meal prices, school lunch participation, and technical assistance.

- X3. Is this a good time to do the interview?

YES (SKIP TO Q.X5).....	1	15/
NO.....	2	

- X4. SCHEDULE CALL BACK. INDICATE ON FACE SHEET WHETHER REMAIL IS NEEDED. IF REMAIL, VERIFY RESPONDENT'S NAME AND ADDRESS.

- X5. Since the interview covers many different topics, I may need to talk to more than one person. If, for any topic, you feel that you are not the best person to talk to, just tell me the name and telephone number of the person I will need to talk to.

SECONDARY RESPONDENT: _____

TITLE: _____

TELEPHONE #: _____

NUMBER OF SCHOOLS

1. I would like to ask you some questions about the number of schools in your school district and the number of schools that are participating in the National School Lunch Program or the School Breakfast Program for this, the 1989 to 1990, school year.

Can you answer these questions first for all your elementary schools and then for a combination of your middle and secondary schools?

YES (SKIP TO Q.1B).....	1	16/
NO (CONTINUE).....	2	

1A. ALL SCHOOLS

- | | | | |
|------|---|-------|--------|
| 1a1. | In total, how many schools are there in your school district? | _____ | 17-19/ |
| 1a2. | How many of them participate in the National School Lunch Program? | _____ | 20-22/ |
| 1a3. | How many participate in the School Breakfast Program? | _____ | 23-25/ |
| 1a4. | How many participate in the Breakfast Program as severe need schools? | _____ | 26-28/ |

| SKIP TO QUESTION 2 |

1B. ELEMENTARY SCHOOLS

- | | | | |
|------|--|-------|--------|
| 1b1. | First, for your elementary schools, how many elementary schools are there in your school district? | _____ | 29-31/ |
| 1b2. | How many of them participate in the National School Lunch Program? | _____ | 32-34/ |
| 1b3. | How many participate in the School Breakfast Program? | _____ | 35-37/ |
| 1b4. | How many participate in the Breakfast Program as severe need schools? | _____ | 38-40/ |

1C. MIDDLE/SECONDARY SCHOOLS

Now, for middle and secondary schools:

- | | | | |
|------|--|-------|--------|
| 1c1. | How many middle and secondary schools are there in your school district? | _____ | 41-43/ |
| 1c2. | How many of them participate in the Lunch Program? | _____ | 44-46/ |
| 1c3. | How many participate in the Breakfast Program? | _____ | 47-49/ |
| 1c4. | How many participate in the Breakfast Program as severe need schools? | _____ | 50-52/ |

SECONDARY RESPONDENT: _____
 TITLE: _____
 TELEPHONE #: _____

2. ENROLLMENT AND ATTENDANCE

The next questions are about the number of children enrolled in your school district this year. Can you answer these questions separately for elementary and then for middle and secondary schools?

YES (SKIP TO Q.2B)..... 1 53/
 NO (CONTINUE)..... 2

2A. ALL SCHOOLS

2a1. In total, how many children were enrolled in your school district as of October 1st? _____ 54-59/

2a2. How many of these children had the opportunity to participate in the School Lunch Program? That is, exclude any child who is ordinarily in school for a half-day and is not offered lunch, such as half-day kindergarteners. _____ 60-65/

2a3. How many had the opportunity to participate in the Breakfast Program? _____ 66-71/

2a4. Has the racial mix of children in your school district changed substantially from last year?
 YES..... 1 72/
 NO (SKIP TO Q.2a6)..... 2
 DON'T KNOW (SKIP TO Q.2a6)..... 8

Card 2
 12-13/02

2a5. How many children in your district are Black or Hispanic? _____ 14-19/

2a6. ASK ONLY IF INDICATED ON FACE SHEET
 How many are female? _____ 20-25/

SKIP TO QUESTION 3

2B. ELEMENTARY SCHOOLS

2b1. How many children were enrolled in elementary schools in your school district as of October 1? _____ 26-31

- 2b2. How many of these children had the opportunity to participate in the School Lunch Program? That is, exclude any child who is ordinarily in school for a half-day and is not offered lunch, such as half-day kindergarteners. _____ 32-37/
- 2b3. How many had the opportunity to participate in the Breakfast Program? _____ 38-43/
- 2b4. Has the racial mix of children in your schools changed substantially from last year?
- | | | |
|---------------------------------|---|-----|
| YES..... | 1 | 44/ |
| NO (SKIP TO Q.2b6)..... | 2 | |
| DON'T KNOW (SKIP TO Q.2b6)..... | 8 | |
- 2b5. How many children in your elementary schools are Black or Hispanic? _____ 45-50/
- 2b6. ASK ONLY IF INDICATED ON FACE SHEET
- How many children in your elementary schools are female? _____ 51-56/
- 2C. MIDDLE/SECONDARY SCHOOLS
- 2c1. How many children were enrolled in middle and secondary schools in your school district as of October 1? _____ 57-62/
- 2c2. How many of these children had the opportunity to participate in the School Lunch Program? _____ 63-68/
- 2c3. How many had the opportunity to participate in the Breakfast Program? _____ 69-74/
- 2c4. Has the racial mix of children in your schools changed substantially from last year?
- | | | |
|---------------------------------|---|--|
| YES..... | 1 | |
| NO (SKIP TO Q.2c5)..... | 2 | |
| DON'T KNOW (SKIP TO Q.2c5)..... | 8 | |
- Card 3
 12-13/03
 14/
- 2c41. How many children in your middle/secondary schools are Black or Hispanic? _____ 15-20/
- 2c5. ASK ONLY IF INDICATED ON FACE SHEET
- How many children in your middle/secondary schools are female? _____ 21-26/

SECONDARY RESPONDENT: _____

TITLE: _____

TELEPHONE # _____

3. AVERAGE DAILY ATTENDANCE

The next questions are about average daily attendance in your school district for the month of October of this school year.

3A. ELEMENTARY SCHOOLS

3a1. What was the average daily attendance for elementary school children in your school district for the month of October of this school year? _____ 27-32/

DON'T KNOW (SKIP TO Q.3C)..... 1 33/

3B. MIDDLE AND SECONDARY SCHOOLS

3b1. What was the average daily attendance for middle and secondary school children in your school district for the month of October of this school year? _____ 34-39/

ASK "ALL SCHOOLS" QUESTIONS ONLY IF RESPONDENT COULD NOT ANSWER FOR ELEMENTARY AND MIDDLE/SECONDARY SCHOOLS

3C. ALL SCHOOLS

3c1. What was the average daily attendance for all children in your school district for the month of October of this school year? _____ 40-45/

SECONDARY RESPONDENT: _____
 TITLE: _____
 TELEPHONE #: _____

4. CHILDREN APPROVED

The next questions have to do with the number of children approved for free and reduced-price meals as of October 31 of this school year.

4A. ELEMENTARY SCHOOLS

4a1. For elementary schools, how many children were approved for free meals by October 31st of this school year? _____ 46-51/
 DON'T KNOW (SKIP TO Q.4C)..... 999998

4a2. For elementary schools, how many children were approved for reduced-price meals by October 31st of this school year? _____ 52-57/

4a3. For elementary schools, how many children applied but were denied free or reduced-price meals this school year? _____ 58-63/

4B. MIDDLE AND SECONDARY SCHOOLS

4b1. For middle and secondary schools, how many children were approved for free meals by October 31st of this school year? _____ 64-69/

4b2. For middle and secondary schools, how many children were approved for reduced-price meals by October 31st of this school year? _____ 70-75/

4b3. For middle and secondary schools, how many children applied but were denied free or reduced-price meals this school year? _____ 14-19/

Card 4
12-13/04

ASK "ALL SCHOOLS" QUESTIONS ONLY IF RESPONDENT COULD NOT ANSWER FOR ELEMENTARY AND MIDDLE/SECONDARY SCHOOLS

4C. ALL SCHOOLS

4c1. For all schools, how many children were approved for free meals by October 31st of this school year? _____ 20-25/

4c2. For all schools, how many children were approved for reduced-price meals by October 31st of this school year? _____ 26-31/

4c3. For all schools, how many children applied but were denied free or reduced-price meals this school year? _____ 32-37/

SECONDARY RESPONDENT: _____
 TITLE: _____
 TELEPHONE # _____

5. LUNCH PRICES

Now I have questions about your lunch prices for this school year. First I will ask you about lunch prices in your elementary schools, then about prices in your middle schools, and then in your secondary schools. If you have more than one standard reimbursable lunch, please give me the price for the one that is purchased most frequently.

5A. ELEMENTARY SCHOOLS

5a1. For elementary schools, what price did you charge at the start of this school year for a standard reimbursable school lunch for children who pay full price? \$____.____ 38-40/

5a2. What price did you charge at the start of this school year for children who pay reduced-price? \$____.____ 41-43/

5a3. What price did you charge at the start of this school year for meals served to adults in elementary schools? \$____.____ 44-46/

5a4. Did the prices charged for your elementary school lunches change since the beginning of this school year?

YES.....	1	47/
NO (SKIP TO Q.5a5).....	2	
DON'T KNOW (SKIP TO Q.5a5).....	8	

5a41. What did the price change to for (READ LIST). IF NO CHANGE, RECORD CURRENT PRICE)

Full Price	\$____.____	48-50/
Reduced Price	\$____.____	51-53/
Adult Price	\$____.____	54-56/

5a5. Does the price of a standard reimbursable lunch differ between your middle and secondary schools?

YES.....	1	57/
NO (SKIP TO Q.5C).....	2	
DON'T KNOW (SKIP TO Q.5c).....	8	

5B. MIDDLE SCHOOLS

- 5b1. For middle schools, what price did you charge at the start of this school year for a standard reimbursable school lunch for children who pay full price? \$____.____ 58-60/
- 5b2. What price did you charge at the start of this school year for children who pay reduced-price? \$____.____ 61-63/
- 5b3. What price did you charge at the start of this school year for meals served adults in middle schools? \$____.____ 64-66/
- 5b4. Did the prices charged for your middle school lunches change since the beginning of this school year?
- YES..... 1 67/
 NO (SKIP TO Q.5c)..... 2
 DON'T KNOW (SKIP TO Q.5c)..... 8

5B41. What did the price change to for (READ LIST. IF NO CHANGE, RECORD CURRENT PRICE)

Full Price \$____.____ 68-70/
 Reduced Price \$____.____ 71-73/
 Adult Price \$____.____ 74-76/

Card 5 12-13/05

5C. SECONDARY SCHOOLS

- 5c1. For secondary schools, what price did you charge at the start of this school year for a standard reimbursable school lunch for children who pay full price? \$____.____ 14-16/
- 5c2. What price did you charge at the start of this school year for children who pay reduced-price? \$____.____ 17-19/
- 5c3. What price did you charge at the start of this school year for meals served to adults in secondary schools? \$____.____ 20-22/
- 5c4. Did the price charged for your secondary school lunches change since the beginning of this school year?
- YES..... 1 23/
 NO (SKIP TO Q.6)..... 2
 DON'T KNOW (SKIP TO Q.6)..... 8

5c41. What did the price change to for (READ LIST. IF NO CHANGE, RECORD CURRENT PRICE)

Full Price \$____.____ 24-26/
 Reduced Price \$____.____ 27-29/
 Adult Price \$____.____ 30-32/

6. BREAKFAST PRICES SKIP TO Q.7 IF NO SCHOOLS SERVE BREAKFAST

The next questions are about your breakfast prices for this school year. First I will ask you about breakfast prices in your elementary schools, then about prices in your middle schools, and then in your secondary schools. If you have more than one standard reimbursable breakfast, please give me the price for the one that is purchased most frequently.

6A. ELEMENTARY SCHOOLS

6a1. For elementary schools, what price did you charge at the start of this school year for a standard reimbursable school breakfast for children who pay full price? \$____.____ 33-35/

6a2. What price did you charge at the start of this school year for children who pay reduced-price? \$____.____ 36-38/

6a3. What price did you charge at the start of this school year for meals served to adults in elementary schools? \$____.____ 39-41/

6a4. Did the prices charged for your elementary school breakfasts change since the beginning of this school year?

YES..... 1 42/
NO (SKIP TO Q.6a5)..... 2
DON'T KNOW (SKIP TO Q.6a5)..... 8

6a41. What did the price change to for (READ LIST. IF NO CHANGE, RECORD CURRENT PRICE)

Full Price \$____.____ 43-45/

Reduced Price \$____.____ 46-48/

Adult Price \$____.____ 49-51/

6a5. Does the price of a standard reimbursable breakfast differ between your middle and secondary schools?

YES..... 1 52/
NO (SKIP TO Q.6C)..... 2
DON'T KNOW (SKIP TO Q.6C)..... 8

6B. MIDDLE SCHOOLS

6b1. For middle schools, what price did you charge at the start of this school year for a standard reimbursable school breakfast for children who pay full price? \$____.____ 53-55/

6b2. What price did you charge at the start of this school year for children who pay reduced-price? \$____.____ 56-58/

6b3. What price did you charge at the start of this school year for meals served to adults in middle schools? \$____.____ 59-61/

6b4. Did the prices charged for your middle school breakfasts change since the beginning of this school year?

YES..... 1 62/
 NO (SKIP TO Q.6C)..... 2
 DON'T KNOW (SKIP TO Q.6c)..... 8

6b41. What did the price change to for (READ LIST. IF NO CHANGE, RECORD CURRENT PRICE)

Full Price \$____.____ 63-65/

Reduced Price \$____.____ 66-68/

Adult Price \$____.____ 69-71/

6C. SECONDARY SCHOOLS

6c1. For secondary schools, what price did you charge at the start of this school year for a standard reimbursable school breakfast for children who pay full price?

\$____.____ 72-74/

6c2. What price did you charge at the start of this school year for children who pay reduced-price?

\$____.____ 75-77/

6c3. What price did you charge at the start of this school year for meals served to adults in secondary schools?

\$____.____ 14-16/

Card 6
12-13/06

6cd. Did the price charged for your secondary school breakfasts change since the beginning of this school year?

YES..... 1 17/
 NO (SKIP TO Q.7)..... 2
 DON'T KNOW (SKIP TO Q.7)..... 8

6c41. What did the price change to for (READ LIST. IF NO CHANGE, RECORD CURRENT PRICE)

Full Price \$____.____ 18-20/

Reduced Price \$____.____ 21-23/

Adult Price \$____.____ 24-26/

SECONDARY RESPONDENT: _____

TITLE: _____

TELEPHONE # _____

7. CN LABELING

7A. Do you know what CN labeling is?

YES.....	1	27/
NO (SKIP TO Q.8).....	2	

7B. Do you require CN labeling for any of the foods that you purchased this year?

YES.....	1	28/
NO (SKIP TO Q.7C).....	2	
DON'T KNOW (SKIP TO Q.7C).....	8	

7b1. Do you require CN labels for..READ LIST. RECORD
A RESPONSE FOR EACH ITEM

	YES	NO	
7b11. Meat or poultry.....	1	2	29/
7b12. Seafood.....	1	2	30/
7b13. Non-meat products such as cheese, eggs, nut or seed butter, dry beans or dry peas....	1	2	31/
7b14. Juice drinks.....	1	2	32/

7C. Do you prepare bid specifications for any products that could have CN labels?

YES.....	1	33/
NO (SKIP TO Q.7D).....	2	
DON'T KNOW (SKIP TO Q.7D).....	8	

7c1. When you prepare bid specifications for products that could have CN labels, do you include CN labeling as part of those bid specifications for all bids, most bids, a few bids, or none of your bids?

All.....	1	34/
Most.....	2	
A Few.....	3	
None.....	4	

- 7D. What percentage of your commercially-purchased entree items are CN labeled this year? _____ % 35-37/
- 7E. Please give me your opinion--for your school district, are the following statements true or false?
- | | TRUE | FALSE | DK | |
|--|------|-------|----|--------|
| 7e1. CN labeling ensures standard portions..... | 1 | 2 | 8 | 38/ |
| 7e2. CN labeling ensures higher quality..... | 1 | 2 | 8 | 39/ |
| 7e3. CN labeling allows me to buy foods at lower prices..... | 1 | 2 | 8 | 40/ |
| 7e4. CN labeling ensures that products meet the meal pattern requirements..... | 1 | 2 | 8 | 41/ |
| 7e5. CN labeling allows many vendors to bid for my business..... | 1 | 2 | 8 | 42/ |
| 7e6. CN labeled products are nutritionally better than other products..... | 1 | 2 | 8 | 43/ |
| 7e7. What most influenced your overall opinion about CN labeling? Was it. READ LIST. CIRCLE ONE RESPONSE. | | | | |
| Your direct experience..... | 1 | | | 44/ |
| Comments by other school personnel..... | 2 | | | |
| Comments by the State Child Nutrition Director..... | 3 | | | |
| Comments by manufacturers or distributors, or..... | 4 | | | |
| Comments by others? SPECIFY _____..... | 5 | | | 45-46/ |
| 7f. Aside from any possible advantages listed above, are there any other advantages to using CN labeled foods? | | | | |
| YES..... | 1 | | | 47/ |
| NO (SKIP TO Q.7g)..... | 2 | | | |
| DON'T KNOW (SKIP TO Q.7g)..... | 8 | | | |
| 7f1. What are the advantages? | | | | |
| _____ | | | | 48-49/ |
| _____ | | | | 50-51/ |
| _____ | | | | 52-53/ |
| 7g. Are there any disadvantages to using CN labeled foods? | | | | |
| YES..... | 1 | | | 54/ |
| NO (SKIP TO Q.7h)..... | 2 | | | |
| DON'T KNOW (SKIP TO Q.7h)..... | 8 | | | |

7gl. What are the disadvantages?

55-56/

57-58/

59-60/

7h. How important is CN labeling to your school district? Is it...
 READ LIST AND CIRCLE ONE

Very important.....	1
Important.....	2
Somewhat important.....	3
Not important at all.....	4

61/

SECONDARY RESPONDENT: _____
 TITLE: _____
 TELEPHONE #: _____

8. FOOD DONATION PROGRAM

8A. BUY AMERICA

8a1. The Commodity Distribution Reform Act of 1987 requires that, whenever possible, school districts purchase food products that are produced or manufactured in the United States. Do you know about this "Buy American" provision?

YES.....	1	62/
NO (SKIP TO Q.8B).....	2	

8a2. What, if anything, is your school district doing to implement this requirement?

_____	63-64/
_____	65-66/
_____	67-68/

8B. COMMODITY INVENTORY AND REDONATION

8b1. Did you have more than a 6-month supply of any USDA commodity in inventory over the past summer?

YES.....	1	69/
NO (SKIP TO Q.8b12).....	2	
DON'T KNOW (SKIP TO Q.8b12).....	8	

- 8b11. For which commodities did you have more than a 6-month supply in inventory and why did this excess inventory exist? Was it an unpopular item, was it delivered late in the year, did you voluntarily store State inventory, or was there some other reason for the excess inventory?

<u>Commodity</u>	<u>Reason for Excess</u>			
	Unpopular item	Delivered Late in Year	Voluntary	Other
_____ 70-71/	1 72/.....2	73/.....3	74/	_____ 75-76/ Card 7 12-13/07
_____ 14-15/	1 16/.....2	17/.....3	18/	_____ 19-20/
_____ 21-22/	1 23/.....2	24/.....3	25/	_____ 26-27/
_____ 28-29/	1..30/.....2	31/.....3	32/	_____ 33-34/

- 8b12. Did your school district "transfer out" any commodities that you had in inventory last year to any other agency? We are not interested in transfers between schools in your school district, or transfers from one school district to another.

YES.....	1	35/
NO (SKIP TO Q.8b13).....	2	
DON'T KNOW (SKIP TO Q.8b13).....	8	

- 8b121. What commodities were "transferred out" last year, what was the value of these transferred foods, and who received the food?

<u>Food Product</u>	<u>Amount</u>	<u>Recipient</u>
_____ 36-37/	\$_____ .00	_____ 44-45/
_____ 46-47/	\$_____ .00	_____ 54-55/

- 8b13. Were any commodities "transferred in" to your district last year from other agencies? We are not interested in transfers from school to school inside your school district or transfers from other school districts.

YES.....	1	56/
NO (SKIP TO Q.8C).....	2	
DON'T KNOW (SKIP TO Q.8C).....	8	

- 8b131. What commodities were transferred in last year, what was the value of these transferred foods, and from whom was the food received?

<u>Food Product</u>	<u>Amount</u>	<u>From</u>
_____ 57-58/	\$_____ .00	_____ 65-66/
_____ 67-68/	\$_____ .00	_____ 75-76/

SECONDARY RESPONDENT: _____
TITLE: _____
TELEPHONE # _____

8C. PROCESSING

8c1. Are you purchasing any processed end-products made with USDA commodities through a commercial distributor this year?

YES.....	1	14/
NO (SKIP TO Q.8D).....	2	
DON'T KNOW (SKP TO Q.8D).....	3	

8c11. When you buy processed end-products containing USDA commodities, how often do your vendors show the value of the commodities contained in those end-products on the invoice? Do they show the value...

All of the time (SKIP TO Q.8D).....	1	15/
Most of the time.....	2	
Some of the time.....	3	
Never.....	4	

8c12. How did you know the value of the discount included in the price or the value of the rebate due you?

_____	16-17/
_____	18-19/
_____	20-21/

SECONDARY RESPONDENT: _____

TITLE: _____

TELEPHONE #: _____

8D. DELIVERY SYSTEMS

8d1. I'm going to read a list of several methods that are used to deliver USDA commodities to school districts. For each one that you use, please tell me how frequently you usually receive commodities by this method.

Do you use (READ LIST RECORD RESPONSE ON GRID BELOW).

IF YES, ASK:

How often do you receive commodities by this method, that is, about how many weeks is it between deliveries?

RECORD ON GRID

	USED			IF YES:	
	YES	NO	DK	# Weeks	
(a) Commercial distribution where USDA commodities are delivered by a commercial distributor to school districts directly as part of a delivery of commercially purchased foods.	1	2	8	22/	23-24/
(b) Commercial distribution where USDA commodities are delivered by a commercial distributor to school districts but are <u>not</u> combined with the delivery of commercially purchased foods.	1	2	8	25/	26-27/
(c) Commercial carrier arranged by the State where USDA commodities processed and products are delivered by a commercial trucking firm to school districts.	1	2	8	28/	29-30/
(d) State-operated distribution where USDA commodities are delivered by a State-operated vehicle to school districts.	1	2	8	31/	32-33/
(e) Direct delivery of USDA commodities to school districts from USDA suppliers arranged for by the State Distributing Agency.	1	2	8	34/	35-36/
(f) Recipient Agency pick-up of USDA commodities from a State-owned or contracted central warehouse or regional distribution point.	1	2	8	37/	38-39/
(g) Other type of distribution system.	1	2	8	40/	41-42/

8d2. Where are USDA commodities delivered within the school district? Are they delivered to a . . .

Central warehouse.....	1	43/
Individual preparation sites.....	2	
Both, or.....	3	
Other (Specify)	4	44-45/
DON'T KNOW.....	8	

8d3. To what extent do you know when commodities are scheduled to be delivered or available for pick-up? Do you know about delivery and pick-up schedules . . .

Always.....	1	46/
Most of the time.....	2	
Some of the time, or.....	3	
Never.....	4	
DON'T KNOW.....	8	

8d4. To what extent do you know the types and quantities of commodities you will receive or pick up? Do you know about the type and quantities of commodities expected . . .

Always.....	1	47/
Most of the time.....	2	
Some of the time, or.....	3	
Never.....	4	
DON'T KNOW.....	8	

8d5. To what extent do you know in advance when delivery and distribution schedules change? Do you have advance notice . . .

Always.....	1	48/
Most of the time.....	2	
Some of the time, or.....	3	
Never.....	4	
DON'T KNOW.....	8	

8d6. How would you rate the overall communications between you and your State Distributing Agent? Would you say that communications are . . .

Excellent.....	1	49/
Very good.....	2	
Satisfactory.....	3	
Fair, or.....	4	
Poor.....	5	
DON'T KNOW.....	8	

8d7. To what extent have communications between you and your State Distributing Agent changed in the past few years? Are communications . . .

Much better.....	1	50/
Better.....	2	
About the same.....	3	
Worse, or.....	4	
Much worse.....	5	
DON'T KNOW.....	8	

8d8. How often does your receipt, bill of lading, or invoice correctly reflect the commodities that you receive? Is it correct . . .

All of the time.....	1	51/
Most of the time.....	2	
Some of the time, or.....	3	
Never.....	4	
DON'T KNOW.....	8	

8d9. How would you rate the overall performance of the commodity distribution system this year? This rating should reflect the effectiveness of the distribution system and not the availability of specific donated commodities. Would you rate it . . .

Excellent.....	1	52/
Very good.....	2	
Good.....	3	
Satisfactory, or.....	4	
Poor.....	5	
DON'T KNOW.....	8	

8d10. How would you rate the performance of your commodity distribution system this year as compared with previous years? Again, this rating should not reflect differences in the availability of specific donated commodities. Would you rate it . . .

Much better.....	1	53/
Better.....	2	
About the same.....	3	
Worse, or.....	4	
Much worse.....	5	
DON'T KNOW.....	8	

SECONDARY RESPONDENT: _____
 TITLE: _____
 TELEPHONE #: _____

9. TECHNICAL ASSISTANCE:

This set of questions deals with technical assistance offered to school districts this year.

- 9A. USDA recently began mailing a quarterly newsletter entitled "Commodity Foods" to all school districts in the country to keep them apprised of developments in the commodity donation program.

Has anyone in your school district been receiving this newsletter?

YES.....	1	54/
NO (SKIP TO Q.9B).....	2	
DON'T KNOW (SKIP TO Q.9B).....	8	

- 9a1. Do you have any suggestions for improving the newsletter?

YES.....	1	55/
NO (SKIP TO Q.9B).....	2	

- 9a11. What are your suggestions?

_____	56-57/
_____	58-59/
_____	60-61/

- 9B. USDA is interested in your opinion about some other materials that have been sent to school districts.

Facts about USDA Commodities, FNS-251, contains information on storage, handling, preparation, and cooking for each of 70 commodities purchased by USDA.

Did anyone in your school district receive these?

YES.....	1	62/
NO (SKIP TO Q.9C).....	2	
DON'T KNOW (SKIP TO Q.9C).....	8	

- 9b1. Did you find them . . .

Very useful.....	1	63/
Somewhat useful, or.....	2	
Not at all useful.....	3	

- 9C. Nutritive Values of USDA-Donated Commodities, FNS-255, provides calorie and nutrient information for typical serving sizes of USDA-donated commodities.

Did anyone in your school district receive this publication?

YES.....	1	64/
NO (SKIP TO Q.9D).....	2	
DON'T KNOW (SKIP TO Q.9D).....	8	

- 9cl. Did you find it . . .

Very useful.....	1	65/
Somewhat useful, or.....	2	
Not at all useful.....	3	

- 9D. The new Quantity Recipes for School Food Service, PA-1371, provides step-by-step directions detailing amounts of ingredients for each recipe for both 50 and 100 servings.

Did anyone in your school district receive these recipes?

YES.....	1	66/
NO (SKIP TO Q.10).....	2	
DON'T KNOW (SKIP TO Q.10).....	8	

- 9dl. Did you find them . . .

Very useful.....	1	67/
Somewhat useful, or.....	2	
Not at all useful.....	3	

SECONDARY RESPONDENT: _____
 TITLE: _____
 TELEPHONE #: _____

10. OPERATING DAYS

The next set of questions is about the total number of operating days for the School Lunch and School Breakfast Programs during last school year, that is, during school year 1988-89.

10A. ELEMENTARY SCHOOLS

10a1. For elementary schools, how many operating days were there in the School Lunch Program last school year? _____ 68-70/

10a2. For elementary schools, how many operating days were there in the School Breakfast Program last school year? _____ 71-73/

10B. MIDDLE/SECONDARY SCHOOLS

10b1. For middle and secondary schools, how many operating days were there in the School Lunch Program last school year? _____ 74-76/

10b2. For middle and secondary schools, how many operating days were there in the School Breakfast Program last school year? _____ 14-16/

Card 9
12-13/09

ASK "ALL SCHOOLS" QUESTIONS ONLY IF RESPONDENT COULD NOT ANSWER FOR ELEMENTARY AND MIDDLE AND SECONDARY SCHOOLS

10C. ALL SCHOOLS

10c1. For all schools, how many operating days were there in the School Lunch Program last school year? _____ 17-19/

10c2. For all schools, how many operating days were there in the School Breakfast Program last school year? _____ 20-22/

SECONDARY RESPONDENT: _____

TITLE: _____

TELEPHONE # _____

11. REIMBURSABLE LUNCHES

Now I have some questions about the number of reimbursable lunches served and claimed last school year, that is, during school year 1988-89.

Can you answer these questions first for all your elementary schools, and then for a combination of your middle and secondary schools?

YES (SKIP TO Q.11B).....	1	23/
NO (CONTINUE).....	2	

11A. ALL SCHOOLS

- | | | |
|--|-------|--------|
| 11a1. For all schools, how many free lunches were served to children and claimed for reimbursement in the School Lunch Program last year? | _____ | 24-32/ |
| 11a2. For all schools, how many reduced-price lunches were served to children and claimed for reimbursement in the School Lunch Program last year? | _____ | 33-41/ |
| 11a3. For all schools, how many full-price lunches were served to children and claimed for reimbursement in the School Lunch Program last year? | _____ | 42-50/ |

| SKIP TO QUESTION 12 |

11B. ELEMENTARY SCHOOLS

- | | | |
|---|-------|--------|
| 11b1. For elementary schools, how many free lunches were served to children and claimed for reimbursement in the School Lunch Program last year? | _____ | 51-59/ |
| 11b2. For elementary schools, how many reduced-price lunches were served to children and claimed for reimbursement in the School Lunch Program last year? | _____ | 60-68/ |
| 11b3. For elementary schools, how many full-price lunches were served to children and claimed for reimbursement in the School Lunch Program last year? | _____ | 69-77/ |

11C. MIDDLE/SECONDARY SCHOOLS

- 11c1. For middle and secondary schools, how many free lunches were served to children and claimed for reimbursement in the School Lunch Program last year? _____ 14-22/
- 11c2. For middle and secondary schools, how many reduced-price lunches were served to children and claimed for reimbursement in the School Lunch Program last year? _____ 23-31/
- 11c3. For middle and secondary schools, how many full-price lunches were served to children and claimed for reimbursement in the School Lunch Program last year? _____ 32-40/

12. REIMBURSABLE BREAKFASTS

Now I have some questions about the number of reimbursable breakfasts served and claimed last school year, that is, during school year 1988-89.

Can you answer these questions first for all your elementary schools, and then for a combination of your middle and secondary schools?

YES (SKIP TO Q.12B).....	1	41/
NO (CONTINUE).....	2	

12A. ALL SCHOOLS

- | | | |
|---|-------|--------|
| 12a1. For all schools, how many free breakfasts were served to children and claimed for reimbursement in the School Breakfast Program last year? | _____ | 42-50/ |
| 12a2. For all schools, how many reduced-price breakfasts were served to children and claimed for reimbursement in the School Breakfast Program last year? | _____ | 51-59/ |
| 12a3. For all schools, how many full-price breakfasts were served to children and claimed for reimbursement in the School Breakfast Program last year? | _____ | 60-68/ |

| SKIP TO QUESTION 13 |

12B. ELEMENTARY SCHOOLS

- | | | |
|--|-------|---|
| 12b1. For elementary schools, how many free breakfasts were served to children and claimed for reimbursement in the School Breakfast Program last year? | _____ | 69-77/ |
| | | <div style="border: 1px solid black; padding: 2px; display: inline-block;">Card 11
12-13/11</div> |
| 12b2. For elementary schools, how many reduced-price breakfasts were served to children and claimed for reimbursement in the School Breakfast Program last year? | _____ | 14-22/ |
| 12b3. For elementary schools, how many full-price breakfasts were served to children and claimed for reimbursement in the School Breakfast Program last year? | _____ | 23-31/ |

12C. MIDDLE/SECONDARY SCHOOLS

- | | | |
|--|-------|--------|
| 12c1. For middle/secondary schools, how many free breakfasts were served to children and claimed for reimbursement in the School Breakfast Program last year? | _____ | 32-40/ |
| 12c2. For middle/secondary schools, how many reduced-price breakfasts were served to children and claimed for reimbursement in the School Breakfast Program last year? | _____ | 41-49/ |
| 12c3. For middle/secondary schools, how many full-price breakfasts were served to children and claimed for reimbursement in the School Breakfast Program last year? | _____ | 50-58/ |

SECONDARY RESPONDENT: _____
 TITLE: _____
 TELEPHONE #: _____

13. ANNUAL REVENUES

Now I have some questions about the income that was received by your school district's food service program last school year, that is, the 1988-89 school year.

13A. INCOME FROM SCHOOL DISTRICT SOURCES

- 13a1. What was your cash income from reimbursable meals served to students enrolled in your school district? \$_____.00 59-67/
- 13a2. What was your income from all other cafeteria sales including a la carte and adult meals, as well as sales to other institutions, child care programs, elderly feeding programs, or child care after school feeding programs? \$_____.00 68-76/
- 13a3. Did you have any income from the school district, such as a per-meal subsidy from the district or an end-of-year subsidy? If so, how much? IF NONE, ENTER 0 Card 12
12-13/12 \$_____.00 14-22/
- 13a4. Did you have any income from the community, such as donations? If so, how much? IF NONE, ENTER 0 \$_____.00 23-31/
- 13a5. Did you have any other local income?
- | | | |
|----------|---|-----|
| YES..... | 1 | 32/ |
| NO..... | 2 | |

13B. INCOME FROM FEDERAL AND STATE SOURCES

- 13b1. What was your total income from federal and state meal reimbursements? \$_____.00 33-41/
- 13b2. Did you receive an adjustment, either an overclaim or underclaim, from a comprehensive review or audit from the previous year? If so, how much? IF NONE, ENTER 0 \$_____.00 42-50/
- 13b3. Did you have any other federal or state income? If so, how much? IF NONE, ENTER 0 \$_____.00 51-59/

13C. OTHER INCOME

13c1. Did you have any other income from any other source?
If so, how much?

YES.....	1	60/
NO (SKIP TO Q.14).....	2	
DON'T KNOW (SKIP TO Q.14).....	8	

SOURCE	AMOUNT	
_____	\$ _____ .00	61-69/
_____	\$ _____ .00	70-78/
_____	\$ _____ .00	

Card 13
12-13/13
14-22/

SECONDARY RESPONDENT: _____
 TITLE: _____
 TELEPHONE #: _____

14. ANNUAL EXPENDITURES

Now I have some questions about the expenditures made by your school food service last school year, that is, the 1988-89 school year. These are direct expenditures out of the school food service account.

14A. How much did you spend on labor? Can you give me salary and fringe benefits separately?

14a1.	Total labor	\$ _____ .00	23-31/
14a2.	Salary	\$ _____ .00	32-40/
14a3.	Fringes	\$ _____ .00	41-49/
14b.	How much did you spend on food?	\$ _____ .00	50-58/
14c.	How much did you spend on capital expenditures?	\$ _____ .00	59-67/
14d.	How much did you spend on supplies such as spoons, forks, plates, and all other supplies?	\$ _____ .00	68-76/
14e.	How much did you spend on storage and transportation?	\$ _____ .00	Card 14 12-13/14 14-22/
14f.	How much did you spend for contracted services such as ADP or professional services?	\$ _____ .00	23-31/
14g.	How much did you spend on overhead and indirect costs?	\$ _____ .00	32-40/
14h.	Did you have any other expenses?		

YES.....	1	41/
NO (SKIP TO CLOSING).....	2	
DON'T KNOW (SKIP TO CLOSING).....	8	

14i. What are they?

SOURCE	AMOUNT	
_____	\$ _____ .00	42-50/
_____	\$ _____ .00	51-59/
_____	\$ _____ .00	60-68/

CLOSING: That's all the questions. We thank you very much for your time.

APPENDIX B
MEAL OBSERVATION METHODOLOGY

MEAL OBSERVATION METHODOLOGY

This appendix summarizes the methodology used in the on-site meal observations. It also includes a summary of the variations in cafeteria environment that complicated or affected data collection. The strategies employed in this study in dealing with these situations are outlined and recommendations for future studies are provided.

OBSERVATION METHODOLOGY

The on-site meal observations were designed to capture data on a full week's worth of school meals in each of 60 selected schools. In schools that participated in only the NSLP, five lunches were observed. In schools that offered both breakfast and lunch, breakfast was observed for four days and lunch was observed for five days. Because of the preparatory work involved in the meal observation protocol, it was not possible to observe breakfast on the first day.

For each of the five days on site, data were collected on reimbursable meals offered to students, meals selected by participating students (i.e., what children actually took/purchased from the available foods), and meals consumed (what the children actually ate.) Data collection strategies and the instruments utilized in collecting these data are described below:

Meals Offered

For each meal, detailed information was collected on the foods actually offered to students. This was based on actual observation rather than reliance on a written menu. In practice, what is planned (i.e., on the menu) is often not what is served. When several options were available, i.e., different fruit, vegetable or entree choices, data were collected for all possible choices. This information included the name of each specific food item as well as a complete description of the food, including brand name and preparation method when appropriate. For foods prepared from scratch, detailed recipes were collected, including ingredients, preparation methods and yields. Observers were trained to carefully probe for details that could effect the fat, sugar or sodium content of foods, since these characteristics were of particular interest to FNS.

Average portion sizes for each food were determined by actually weighing, or measuring in the case of beverages, five portions of each food item served each day, and then computing the average. For self-serve items, observers established a

reference portion size for use in visual estimation following the protocols established and tested by Comstock and Symington.^{1/}

The data collection instruments used in collecting these data are the Menu Record, the Recipe Form and the Serving Size Computation Forms. Samples of all forms are provided in Appendix C.

Meals Selected

To obtain data on which foods children select for inclusion in an NSLP meal, field staff observed approximately 60 children at each meal and recorded the foods and beverages included in their NSLP or SBP meals. Observations were limited to reimbursable meals. The operational definition of a reimbursable meal depended on whether or not the school utilized the offer-vs-serve (OVS) option.^{2/}

Observers positioned themselves at the cash register, or another strategic location, and utilized the Food Selection and Plate Waste Record (see Appendix C) to record the foods actually taken by each child. All menu items eligible for inclusion in a reimbursable meal were recorded on these forms. Observers then recorded the number of servings, or fraction thereof, for each of the food items a child selected.

The following guidelines were utilized in collecting these data:

- observers were instructed to spread the 60 observations across all lunch periods, so that a random sample of children would be observed. Prior to each site visit, the project coordinator at AAI phoned each school and obtained information on the number of lunch periods and age groups (grades) included in each session. The observer could then plan ahead of time on how to space observations.
- in schools where several different food lines were available, i.e., hot lunch, salad bar, or sandwich line, observers were asked to focus on a different line each day. For logistical reasons, it was not possible for one

^{1/}Comstock, E. M., and Symington, L. E.: "Distribution of serving sizes and plate waste in school lunches." Journal of the American Dietetic Association 81:413, 1982.

^{2/}The offer-vs-serve (OVS) option stipulates that schools must offer meals planned in accordance with USDA meal pattern requirements, but that students may decline up to two of the five NSLP meal components or one of the four SBP meal components. OVS has been mandatory for the NSLP at the secondary school level since 1975. In 1981, the OVS option was extended to elementary schools, at the discretion of the local school district. OVS was extended to the SBP in 1989.

observer to observe more than one line per meal (see discussion in Chapter VII).

- observers indicated whether or not the child being observed had taken any a la carte items along with their reimbursable meal. The specific type of a la carte item was not recorded.

Meals Consumed

During each meal observation period, observers tagged the tray of every fifth child they observed, for a total of 12 trays, in order to observe plate waste. Children whose trays were tagged were instructed to deposit their trays (including trash) in a designated area after they finished eating.

Upon completion of all meal observations, data collectors retrieved the tagged trays and visually estimated the amount of plate waste following the procedures described and validated by Comstock and Symington, and others.^{1/} These data were recorded in the appropriate columns on the Food Selection and Plate Waste Record (Appendix C). Waste was recorded as fractions of an average serving, i.e., 3/4 serving, 1/2 serving or 1/4 serving. If no trace of food that was selected remained on the plate, a zero was recorded; if the full portion of food remained, a 1 was recorded to indicate that a full average serving was wasted (not consumed). The one exception to the visual estimation rule was beverages. Leftover (wasted) beverages were actually measured, since the opaque nature of the typical serving containers made visual estimations impossible. A la carte items were not included in plate waste observations.

When food items appeared on a plate waste tray that had not been recorded as a food selected, the observation was adjusted to indicate that the student had taken the food if it had actually been offered. Other items (e.g., foods from home, vending or a la carte) were ignored.

CAFETERIA ENVIRONMENT FACTORS

The basic strategy employed for meal observation involved (1) developing a list of the foods offered, based on conversations with the cafeteria manager and on observation of the foods actually available in the serving line; (2) copying the list onto a series of forms which were divided into numbered columns for the observations; and (3) standing at the foot of the food-selection line (usually by the cashier) and checking off the

^{1/}Comstock, E. M., and Symington, L. E.: "Distribution of serving sizes and plate waste in school lunches." Journal of the American Dietetic Association 81:413, 1982 and Stallings, S. F. and McKibben, G. D., "Validation of plate waste visual assessment techniques in selected elementary schools." School Food Service Research Review 6:9, 1982.

foods observed on each tray by recording the number of servings taken.

A variety of cafeteria characteristics were found to influence the feasibility of collecting certain types and amounts of data. Although a pre-visit scheduling questionnaire provided some details that were useful for planning data collection, each school, and every cafeteria, is unique.

All of the situations and contingencies described below have been observed by staff of the Child Nutrition Program Operations Study. Although anecdotal, they serve to illustrate the variety of situations that exist in school cafeterias and that must be considered in planning data collection for future studies. The issues are divided into the following categories: (1) menu characteristics, (2) cafeteria layout, (3) type of service, (4) money, (5) schedules, and (6) other factors.

Menu Characteristics

Real Menus. Most schools plan and announce their menus weeks ahead of time. Because of contingencies of food supplies, equipment, and staffing, the meals as actually offered usually differed from the "official" menu. The most common aberrations were: (1) addition of leftover items, (2) substitution for items not available (e.g., the offered vegetable would be different from that on the official menu); (3) supplements for foods used up (e.g., offering frozen pizza if the day's official entry sold out); and (4) standard items that are always offered, so they are not listed on the menu (hamburgers, French fries, peanut butter and jelly sandwiches). Thus, the official menu is just a starting point for developing the "real" menu for the day.

Unexpected Items. After the "real" menu had been developed and transferred into observation forms, observers found that additional foods appeared without warning during the course of their observations, or that foods they were told would be available did not appear on any students' trays.

In the former case, observers noted the additional food and incorporated it into their observations. They later checked with the cafeteria manager to obtain the necessary descriptive information, portion size, etc. for the "unplanned" food item. On occasion, these unexpected foods turned out to be special items provided to a very few students (for example, juice provided to one or two students who cannot tolerate milk). When this was the case, the affected observations were deleted.

In the case of foods that were listed on the "real" (observation) menu but did not turn up in any observations, observers must ascertain (either through direct observation or through discussions with the manager) whether the food was indeed offered. It is possible to offer a food that no student takes, especially unpopular commodity items (prunes offered as one of several canned fruits) or alternates to a popular entree (peanut butter sandwiches as an alternate to pizza).

A la Carte Items. If a la carte items are offered, the observer must know whether to record information about the a la carte foods (e.g., ingredients and recipes; whether taken; whether to record plate waste of a la carte items, etc.). Frequently, a la carte items are arrays of prepackaged snacks that are similar in size, price, and nutritional content. If the observer is going to include a la carte items, it may help to be able to aggregate similar items (e.g., all bags of chips, or all cakes).

For the Child Nutrition Program Operations Study, the focus of meal observations was the reimbursable meal. Thus, a la carte items were not recorded or considered when determining nutrient content of meals offered, selected or consumed. Basic descriptive information on the number and type of a la carte items was collected, along with a simple check-off to indicate when students had included an a la carte item (of any type).

A final comment about a la carte foods is in order, for considerations for future studies. A la carte items can be available in a number of locations in the cafeteria. Thus, to accurately record a la carte food selection via student observations, one observer may need to "track" one student through the lunch period.

Depleted Menus. This occurs when an entire food group runs out while students are still selecting their meals. For example, meat and meat alternate foods are popular at salad bars, and may disappear before all students have assembled their salads. Since a reimbursable meal (under OVS) can still be assembled without this component, eligible meals can still be taken. Nevertheless, the observer must deal with the fact that the full pattern meal is not available. In this study, observers were instructed to continue recording observations of reimbursable meals.

Cafeteria Layout

Multiple Serving Lines. If foods are served in more than one location, the observer must know whether to observe foods served in all lines. This is possible if students from all lines go to one cashier. If students may go to any one of a group of cashiers, there may be some bias regarding which lines serve which cashiers, so a random distribution of foods among all cashiers cannot be assumed. If the lines are served by different cashiers, the number of students that can be observed may be reduced. In this study, observers were instructed to distribute observations evenly across lines throughout the lunch period in order to achieve a random distribution of foods.

Specialized Lines. Cafeterias with more than one serving line often serve different menus at different lines (for example, hot lunches in one line, sandwiches in another, and salad bar in a third). Such arrangements often yield a list of available items of unwieldy length. Furthermore, if each line has its own cashier the observer will be able to observe only one group of

foods at a time. If all lines feed into the same cashier (or group of cashiers), the observer may elect to observe the full menu. For logistical reasons, observers in this study were instructed to focus on one specialized line each day when multiple serving lines, that did not funnel down to one cashier area, were present. This approach, when used over a five-day period, still allowed for a random sampling of the various types of meals available.

Apparently Unspecialized Lines. Cafeterias with more than one line may assert that the same items are available through two or more lines, but our experience indicates that no two serving lines are ever quite identical. Leftovers and other limited items often appear in only one line. The lines may offer different soup or sandwiches. Portion sizes may differ among servers. Or the students using one line may differ systematically from the those in the other. We have seen lines habitually frequented by students of a single sex (for no discernable reason), resulting in smaller meals (often too small to be reimbursable, even with OVS) taken in the line frequented by girls. In one school, students were assigned to lines alphabetically, with the result that a significant minority group with atypical food choices was much more prevalently assigned to one line. In summary, all food serving lines must be treated as unique, despite any apparent lack of differences in the items officially offered or in the students using the lines. For this reason, observers in the Child Nutrition Program Operations Study were instructed to distribute observations across all serving lines, even those purported to be identical.

No Lines. Some schools have adopted a "scramble" or "scatter" system of serving that apparently works well from their perspective but wreaks havoc for observers. Typically, students may approach any of several food stations serving various menus, and proceed to any of several cashiers. Self-serve items are frequently offered, and it becomes very difficult to observe a significant number of students. For this study, self-serve lines required that observers track individual students throughout the selection process in order to obtain complete data. In such cases, observers were able to observe only 50-75 percent of the targeted number of students.

Multiple Passes. In most cafeterias, students may return to the line for more food (or to buy a la carte desserts). Thus, it is impossible to observe all foods purchased by an individual student unless (a) there is only one cashier, and (b) students are not allowed to return to the line a second time; or (c) individual students are tracked throughout their lunch period. Since the unit of observation for this study was the reimbursable meal as taken, observers did not observe individual students continuously over the lunch period.

Type of
Service

Prepayment. Sometimes, students will pay for a meal before being served all of its components. Most often, condiments such as catsup and salt are available at a station in the cafeteria. But occasionally, major portions of a meal, such as an entire salad bar, are picked up after a student has paid for the meal. To complicate matters more, this system of paying may be combined with a "scramble" system of serving, making the observer's task extremely challenging. Observers may have to resort to the system used for salad bars, of following individual students (selected at random or at predefined intervals) through the entire food selection process.

No Cafeteria. In some schools, due to crowding or temporary building conditions, some or all students may eat lunch in their classrooms. This may influence the way in which lunches are served (for example, pre-plated meals may be brought to students, eliminating opportunities for food choices and OVS) and access to trays for plate waste studies.

Offer-vs.-Serve. If observers are charged with observing only reimbursable meals, OVS can complicate and slow down their observations by increasing the number of trays for which observers must pause to determine eligibility. Generally, at schools lacking OVS, cafeteria personnel enforce the meal pattern requirements and all observed meals are clearly pattern meals.

Reality of OVS. An additional concern is the high prevalence of discrepancies between SFA managers' statements about the presence of OVS in district schools and whether it is actually being practiced. In some elementary schools described by their SFA managers as having OVS, cafeteria managers not only insist that students take the full pattern meal, but they cannot even describe the OVS concept. Alternatively, in some schools that officially do not have OVS, staff interested in averting plate waste will not compel children to take items they certainly will not eat. For this study, data on OVS implementation was originally based on SFA managers' reports. Given the reports received from data collectors, however, it was decided to use a reconstructed OVS variable based on observed behavior rather than reported policy. This approach is recommended for future studies.

Self-Serve. If students are allowed to serve themselves (that is, to determine the portion size, not just to select from among several choices), then observers must be specially trained to visually estimate portion size. If students are serving themselves single items (for example, if they serve themselves from among a selection of hot vegetables), the observers may simply note the portion size as they would otherwise note the number of standard portions served. However, if the self-serve items may be aggregated, such as in a salad bar or "potato bar," then observers at the end of the line cannot determine portion sizes (or even types of foods) for the first foods taken, that

is, the ones at the bottom of the salad, and they must instead observe each salad as it is constructed by selecting students and following them through the line. Such observations take several times longer per student than observations of standardized meals, and severely limit the number of observations that an individual can complete during a single lunch session. (See Chapter VII for a discussion of how this was handled in the CNOPS study).

Intermediate types of service also exist. For example, a "sandwich bar" can consist of bread, meat, and cheese selected by the student but assembled by food service staff, with condiments (including salad vegetables) self-served (salad bar style, after the sandwich is received. In such a case, the observer must still determine the contents of each sandwich, but may be able to determine the bread, meat, and cheese components as each sandwich is handed to each student, leaving the labor-intensive salad bar observations for only the second half of the observation, thus minimizing the amount of time and labor required.

Officially Varying Portion Sizes. Menus usually include a single portion size for each food, but variations exist for several reasons. "Super sizes," officially equal to one and one-half times the standard portion, are offered at some secondary schools to accommodate the greater appetites of some students. These may (or may not) be offered at a premium price.

The USDA meal pattern specifies one set of portion sizes for children in grades K through 3, and larger portions of many foods for grades 4 through 6. Schools may offer different sized portions, especially if students from different grades are served during different lunch sessions, as is often the case.

In both of the above situations, we have found that the portions as actually served (and as our observers weighed several samples of each) do not match the reported portion size or the portion size as specified in the USDA Meal Pattern guidelines. In at least one case, the portion served to older elementary school children was smaller than that served to the younger children. This underscores the importance of weighing and measuring actual portions of food served to students rather than relying on "reported" portion sizes.

Unofficially Varying Portion Sizes. Portion sizes may vary from those stated by both the official menu and the USDA meal pattern. Poor portion control may lead to portions that differ systematically from the planned size. For example, heaping ladles that should be level ladles lead to over-size portions. For this reason, our sample portions for weighing were obtained in the same manner as the students' (e.g., from among the same pre-portioned dishes or during the serving of the meal, for bulk items dished out as students requested them).

Accommodating individual students' preferences often happens when staff serve students individually, rather than pre-portioning foods. Students may request and receive portions smaller or larger than the standard. Our notes on our observations indicate that these variations probably balance each other out, but there is no practical way to determine this.

Money

Price of Meal. If the price of the reimbursable lunch is an even dollar, the line will move much more quickly than if it is an amount that will involve change. Thus, an observer is less likely to be able to observe consecutive trays.

A la Carte. If a la carte items are available in the same line as reimbursable foods, or if many students are buying reimbursable items on an a la carte basis (milk, for example), the rate at which students pass by the cashier will be reduced, thereby facilitating observations.

Free and Reduced-Price Meals. Despite firm discouragement, many school districts persist in using readily discernible methods for identifying students entitled to free and reduced-price meals. Depending on the system used, processing such students may take more or less time than processing full-price students, and the speed of the line will be affected accordingly, the degree depending on the proportion of free and reduced-price meals served. Especially in small schools where the free-meal students are known to the cashier, they may hardly pause at the checkout, jeopardizing opportunities for observing meals taken. In such cases, it is essential to recruit the cashiers' cooperation in encouraging students to pause at the checkout.

Computerization. Some schools have adopted computers with various capacities for tracking foods purchased, prices to be charged different students, and other bookkeeping tasks. Depending on the tasks and the success with which they are conducted, this aspect may speed or slow down the line.

Schedules

Grades. Students of different ages have different food preferences and appetites. Therefore, especially in elementary schools and in secondary schools serving a broad range of ages, observers must determine whether students of different ages are served lunch at different times. Typically, the youngest children are served first, so any sample of students must be selected during different lunch periods to be representative.

Times. Both the duration of the lunch period and the time between the beginning of one period and the beginning of the next are significant. Short lunch periods (20 to 25 minutes) lead to rushed students and staff, a disorganized atmosphere, and less opportunity to observe all meals served. They may also lead to departures from the official OVS policy. One SFA director told us that he has dropped OVS (in practice) at some secondary schools (although not in the one we observed) because offering choices slows down the lines.

Intervals between lunch periods may vary from 20 minutes to virtually nothing. Longer intervals allow staff to restock foods (thus keeping offerings consistent with the "official" menu) and keep a perspective, enhancing observations in circumstances where time constraints might otherwise occur and in circumstances where the cooperation of the cashier is helpful.

Continuous Serving. To keep lines moving, some schools have instituted serving schedules that call for classes to arrive at the cafeteria at five-minute intervals throughout the lunch period. Such scheduling usually enhances opportunities for observations, because students and cafeteria staff are less rushed. (Students know they will get their full lunch period, unlike the last students served during a typical schedule). On the other hand, cafeteria staff have less "down time" to accommodate observers, restock foods, and catch their own breath.

**Other Factors
and Relation-
ships Between
Factors**

Number of Meals Served. Even in schools with active lunch programs, there may be very few breakfasts available for data collection. In schools offering different menus (e.g., a hot lunch and a salad bar), one may be far more popular among all students, leaving few possibilities for observing the less-popular alternative.

Observation Opportunities. The maximum number of students one observer could potentially record depends on how many students pass by the selected observation point during the entire lunch session, which in turn depends on the number of meals served and the number of points where students may purchase lunches. In addition, the number of observations one observer can make can depend on how long a single observation takes. Observation time can be increased by long food lists, OVS, a la carte items, and physically awkward observation situations (e.g., peering over the cashier's shoulder if there's nowhere else to stand). Obviously, they will not be able to observe consecutive meals if the time required for each observation is greater than the amount of time required for each transaction with the cashier. Time per transaction is influenced by the price of lunch, the presence of a la carte foods, the use of computerized checkouts, and the nature of the system for tracking free and reduced-price meals.

When observers clearly will not be able to observe every transaction, they are instructed to observe meals at specified intervals (every second, third, or fifth tray) if this does not jeopardize their chances of attaining the target number of observations.

Staffing. Understaffed programs will be more difficult to observe because procedures will be rushed or not carried out correctly. For example, salad bars will not be restocked

frequently, and may not offer pattern meals. Overtaxed kitchen managers will be less able to provide needed information on foods offered, recipes, and ingredients. They are more likely to resent the presence of observers and be unmotivated to cooperate. Overtaxed staff will be less likely to offer support in vital areas such as supplying sample foods for weighing, and arranging vantage points for meal observers.

Although kitchen managers will almost certainly speak English, many cafeteria staff do not, and eliciting their cooperation may depend on interpreters or on hiring observation staff who speak a second language.

Contingencies. Crises and contingencies are endemic to studies conducted in schools. Teachers strike. Buildings are flooded, or lose heat. Cafeterias are commandeered for other uses, from administering standardized tests to filming television programs. Food preparation equipment breaks down. Schools conduct emergency evacuation drills in the middle of lunch. Key respondents call in sick, or resign. The principal decides to help out by coming to the cafeteria and "making sure that every student gets a good, hot lunch."

On-site observers must be prepared to deal with unusual situations by receiving thorough training in the principles underlying the data collection system, and they must have continuous access to the project staff responsible for making key data collection decisions.

APPENDIX C
MEAL OBSERVATION INSTRUMENTS

**Child Nutrition Program Operations Study
On-Site Data Collection:
Record of Lunch Sent for Chemical Analysis**

Day: M Tu W Th F Date: _____, 1990

Site: _____

Collected by: _____

Food Code	Menu Items Sent	Weight (grams) or Fluid Ounces
	Meat:	
	Grain:	
	Fruit/Veg:	
	Fruit/Veg:	
	Other:	

Child Nutrition Program Operations Study
On-Site Data Collection:
A La Carte Items

Breakfast: ____ Lunch: ____

Day: M Tu W Th F

Site: _____

Date: _____, 1990

Collected by: _____

List all "a la carte" items (i.e., all items not eligible as part of the school meal) that were available in the breakfast or lunch line(s) you observed.

Beverages:

Fruits/vegetables:

Entrees:

Desserts:

Chips, pretzels

Other:

3/14/90

**Child Nutrition Program Operations Study
On-Site Data Collection:
Serving Size Computations for Self-Serve Foods**

Breakfast: _____ Lunch: _____
Day: M Tu W Th F Site: _____
Date: _____, 1990 Collected by: _____

Menu item: _____

Menu item: _____

**Weight of reference sample
of full portion:**

_____ grams

Divide by 4=

1/4 portion _____ grams

Multiply by 2=

1/2 portion _____ grams

Multiply by 1.5=

3/4 portion _____ grams

Re-enter

1 portion _____ grams

Multiply by 1.25=

1- 1/4 portion _____ grams

Multiply by 1.2=

1-1/2 portion _____ grams

Multiply by 1.17=

1-3/4 portion _____ grams

Multiply by 1.14=

2 portions _____ grams

Divide by 2= _____ grams

Now, double-check your math.

*This figure should match
your original portion size!*

**Weight of reference sample
of full portion:**

_____ grams

Divide by 4=

1/4 portion _____ grams

Multiply by 2=

1/2 portion _____ grams

Multiply by 1.5=

3/4 portion _____ grams

Re-enter

1 portion _____ grams

Multiply by 1.25=

1- 1/4 portion _____ grams

Multiply by 1.2=

1-1/2 portion _____ grams

Multiply by 1.17=

1-3/4 portion _____ grams

Multiply by 1.14=

2 portions _____ grams

Divide by 2= _____ grams

Now, double-check your math.

*This figure should match
your original portion size!*

APPENDIX D

YEAR TWO NONRESPONSE ANALYSIS FOR SFA MANAGER SURVEY

SFA MANAGER SURVEY NON-RESPONSE ANALYSIS (YEAR TWO)

An analysis of possible non-response bias was conducted to determine the extent to which SFAs which responded to the Year Two SFA Manager Survey were systematically different from non-responding SFAs. Analyses were conducted for two sets of SFAs: (1) the 1,222 SFAs contained in the longitudinal data set, and (2) the 1,109 SFAs in the cross-sectional data set. Both groups were compared to the subset of SFAs that did not respond to the survey on three background characteristics: (1) SFA enrollment, (2) percent of enrolled children approved for free or reduced-price meals, and (3) participation in the SBP. A discussion of the results is presented below. Data for the analysis were obtained from State records for the 1986-87 school year (i.e., the data used to construct the sampling frame).

Longitudinal Data Set

Enrollment. Because the distributions of enrollment for responding and non-responding SFAs were skewed (many more small, rather than large SFAs), a simple test of the difference of the two mean values was inappropriate. As a result, enrollment was transformed using a logarithmic function, thus generating symmetric, near-normal distributions. A t-test, comparing the means of the transformed version of enrollment indicated that there is a statistically significant difference between the two distributions ($t=-11.93$). On average, the non-responding SFAs are smaller than the responding SFAs.

To examine this difference in more detail, Exhibit D.1 classifies SFA enrollment into five levels. Overall, the response rate to the telephone survey was 71 percent. However, for small SFAs--enrollment less than 1,000--the response rate was only 53 percent. A chi-square test on this contingency table indicated a statistically significant relationship between enrollment and response to the telephone survey ($X^2 = 139.1$).

Participation in SBP. An analysis comparing participation in the SBP for non-responding and responding SFAs (see Exhibit D.2) revealed that there is no statistically significant differences between the groups ($X^2=.80$).

Percent Free or Reduced-Price. The percent of free or reduced-price children is defined as the proportion of students within an SFA who are approved to receive either free or reduced-price lunches. As with enrollment, a simple t-test of means is inappropriate because the two distributions are skewed. A t-test of the logarithmically transformed version indicated that there is a statistically significant difference such that SFAs with a high percentage of children approved for free or reduced-price meals are less likely to respond (see Exhibit D.3).

Exhibit D.1

Number and Percentage of Responders and Non-Responders by SFA Enrollment: Year Two SFA Manager Survey, Longitudinal Data Set

Enrollment (Number of Students)	Non-Responder		Responder		Total	
	#	%	#	%	#	%
1-999	254	47%	283	53%	537	100%
1000-4999	167	24	526	76	693	100
5000-9999	42	17	211	83	253	100
10000-24999	24	15	134	85	158	100
25000 or more	10	13	68	87	78	100
Total N	497	29	1,222	71	1,719	100

Data Source: Year Two SFA Manager Survey and Sampling Frame for the Study

Exhibit D.2

Number and Percentage of Responders and Non-Responders, by SBP Participation: Year Two SFA Manager Survey, Longitudinal Data Set

SBP Participation	Non-Responder		Responder		Total	
	#	%	#	%	#	%
NSLP only	287	28%	736	72%	1,023	100%
NSLP + SBP	210	30	486	70	696	100
Total N	497	29	1,222	71	1,719	100

Data Source: Year Two SFA Manager Survey and Sampling Frame for the Study

Exhibit D.3

Number and Percentage of Responders and Non-Responders, by Percent Free or Reduced Price: Year Two SFA Manager Survey, Longitudinal Data Set

Percent Free or Reduced-Price	Non-Responder		Responder		Total	
	#	%	#	%	#	%
0-9.9%	103	26%	286	74%	389	100%
10-24.9%	124	22	449	78	573	100
25-49.9%	108	25	317	75	425	100
50%-74.9%	78	41	114	59	192	100
75% or more	84	60	56	40	140	100
Total N	497	29	1,222	71	1,719	

Data Source: Year Two SFA Manager Survey and Sampling Frame for the Study

Summary. The analyses presented here examined three characteristics of SFAs that did and did not respond to the longitudinal data items on the Year Two SFA Manager Survey. The findings are:

- Enrollment - small SFAs had lower response rates than large SFAs.
- SBP participation - no statistically significant differences between the two groups.
- Percent free or reduced-price - SFAs with a high percentage of children approved for free or reduced-price meals had lower response rates than SFAs with lower percentages of free or reduced-price children.

In summary, there does appear to be a response bias problem with SFAs that are included in the Year Two longitudinal data set. The sample weighting adjustments described in Appendix E work to counteract and compensate for this bias.

Cross-Sectional
Data Set

Enrollment. Exhibit D.4 presents information on survey responses for different sizes of SFAs. Overall, the response rate for the mail survey was 64%. However, the exhibit shows that small SFAs had a lower response rate (53%) than any other subgroup.

Participation in SBP. Exhibit D.5 presents the response rates for SFAs that participate only in the NSLP and for those SFAs that offer both the NSLP and SBP. For both groups, the response rate is not substantially different from the overall response rate of 64%. For SFAs that offer lunch only, the response rate was 65%, and for SFAs that offer breakfast as well as lunch, the response rate was 63%.

Percent Free and Reduced-Price. Exhibit D.6 presents response rates for SFAs that have varying percentages of children approved for free or reduced-price meals. It can be seen that SFAs with a high percentage of free or reduced-price children were less likely to respond to the cross-sectional survey than other SFAs.

Summary. In summary, an examination of the relationship between response rates and SFA enrollment, percent of free or reduced-price children, and SBP participation, supports the conclusion that there is a response bias problem with the cross-sectional survey. The sample weighting adjustments described in Appendix E work to counteract and compensate for this bias.

Exhibit D.4

Number and Percentage of Responders and Non-Responders,
by SFA Enrollment:
Year Two SFA Manager Survey,
Cross-Sectional Data Set

SFA Size (Number of Students)	Non-Responder		Responder		Total	
	#	%	#	%	#	%
1-999	253	47%	284	53%	537	100%
1000-4999	216	31	477	69	693	100
5000-9999	74	29	179	71	253	100
10000-24999	39	25	119	75	158	100
25000 or more	29	37	49	63	78	100
Total N	611	36	1,108	64	1,719	100

Data Source: Year Two SFA Manager Survey and Sampling Frame for the Study

Exhibit D.5

Number and Percentage of Responders and Non-Responders,
by SBP Participation:
Year Two SFA Manager Survey,
Cross-Sectional Data Set

SBP Participation	Non-Responder		Responder		Total	
	#	%	#	%	#	%
NSLP only	354	35%	691	65%	1,023	100%
NSLP + SBP	257	37	426	63	696	100
Total N	611	36	1,108	64	1,719	100

Data Source: Year Two SFA Manager Survey and Sampling Frame for the Study

Exhibit D.6

Number and Percentage of Responders
and Non-Responders, by Percent Free or Reduced Price:
Year Two SFA Manager Survey,
Cross-Sectional Data Set

Percent Free or Reduced-Price	Non-Responder		Responder		Total	
	#	%	#	%	#	%
0-9.9%	125	32%	264	68%	389	100%
10-24.9%	179	31	394	69	573	100
25-49.9%	144	34	281	66	425	100
50%-74.9%	84	44	108	56	192	100
75% or more	79	56	61	44	140	100
Total N	611	36	1,108	64	1,719	100

Data Source: Year Two SFA Manager Survey and Sampling Frame for the Study

APPENDIX E
WEIGHTING METHODOLOGY

WEIGHTING METHODOLOGY

This appendix describes the procedures used to calculate the sampling weights that are used to extrapolate sample data to the population of all SFAs in the Nation. The calculation of sampling weights is a multi-stage process involving the following steps which are done separately for the longitudinal component and the cross-sectional component:

Public SFAs

- Assign each public SFA an initial sampling weight equal to the reciprocal of its two-stage selection probability.
- Ratio-adjust the weights of public SFAs for nonresponse based on counts of total approved applicants, separately for self-representing (large) and non-self-representing (smaller) SFAs.
- Ratio-adjust the weights of public SFAs to match the count of all public SFAs in the Nation.
- Truncate the weights of outlying SFAs to reduce their contribution to the total.

Private SFAs

- Follow the same steps as for public SFAs.

All SFAs

- Ratio-adjust the weights of all SFAs so that the weighted count of total lunches served matches FNS' universe count in total and separately for high-poverty and low-poverty SFAs.

These weighting procedures not only allow extrapolation from the sample SFAs to the Nation as a whole, but to the extent possible, they also correct for nonresponse bias in the surveys. As was seen in Appendix D, there is a nonresponse bias in both the longitudinal and cross-sectional survey components such that non-responding SFAs tend to be smaller than responding SFAs. The longitudinal and cross-sectional surveys have a further bias in that nonresponding SFAs have a higher percentage of children approved for free or reduced-price meals (higher poverty level) than responding SFAs.

The weighting procedures specifically correct for the nonresponse bias due to SFA size and for poverty level in that separate weight adjustments are done for self-representing vs.

non-self-representing SFAs and for SFAs that serve 60 percent or more free or reduced-price lunches vs. SFAs that serve 59 percent or fewer free or reduced-price lunches. Self-representing SFAs were included in the sample with certainty (selection probability = 1.0) and are large SFAs. Non-self-representing SFAs are all other (non-large) SFAs.

LONGITUDINAL SAMPLE WEIGHTS

Each sample SFA was assigned an initial sampling weight equal to the reciprocal of its two-stage selection probability. The basic sampling weight was then adjusted for survey non-response.

Non-response Adjustment: Public SFAs. Public SFAs were first divided into two weighting classes--self-representing public SFAs (selection probability of PSU=1.0 and selection probability of SFA within PSU=1.0), and non-self-representing public SFAs. The basic SFA weights of the 243 responding self-representing public SFAs were multiplied by 1.1654, the ratio of the weighted count of total approved applicants for all 308 sample self-representing SFAs to the weighted count for the 243 responding SFAs. The total approved applicant variable referred to here is the SY 1986-87 data reported by the States to FNS for SFAs in the selected sample of 80 PSUs.

The basic SFA weights of the responding non-self-representing public SFAs were also ratio-adjusted in a similar manner. For this class of SFAs, the ratio equalled 1.1343.

After this initial adjustment for non-response, the weighted count of public SFAs equalled 9,273 and the weighted count of total approved applicants equalled 10,727,915. This weighted total of SFAs is lower than the figure of 15,715 public school districts cited in the Digest of Educational Statistics. Therefore, the weights of the non-self-representing public SFAs were further ratio-adjusted by the factor 1.7166 to bring the weighted count of public SFAs up to 15,715. This yielded a weighted total of approved NSLP applicants of 14,402,912.

The next step in the weighting process involved examining the distributions of the sampling weights and of the weighted counts of approved NSLP applicants. The latter distribution indicated that a few public SFAs were contributing disproportionately to the weighted count of 16,402,912 total approved applicants due to their high SFA weight value. The SFA weight of these SFAs was, therefore, truncated to the weight value representing the 95th percentile to the SFA weight distribution, in order to reduce the contribution of these SFAs to the overall total. After truncation, the weighted count of public SFAs declined to 15,050, while the weighted count of total approved applicants declined to 15,581,297.

Non-response Adjustment: Private SFAs. The weighting methodology for private SFAs responding to the longitudinal questions followed the same steps that were used for public SFAs. The only difference is that the weights were initially adjusted so that the weighted count of private SFAs equalled 4,274, the FNS estimate of the number of private SFAs in the U.S. At that point, the weighted count of total approved applicants in private SFAs equalled 220,950.

After examining the distributions of the SFA sampling weights and of the total approved applicants, private SFAs with a high values had their SFA weight truncated to the 90th percentile of the SFA weight distribution. The 90th percentile was selected as the truncation point because the smaller sample size of private SFAs was subject to more weight variability in terms of total approved applicants. This yielded a weighted count of 4,184 private SFAs, and a weighted count of 219,776 approved applicants.

Meal Count Post-Stratification. An important analytical component of the study is the estimation of total meal counts for key domains of the SFA universe. The weighted count of free lunches, reduced-price lunches and paid lunches as reported on the SFA longitudinal survey were all found to be higher than universe counts available from FNS secondary data sources. The magnitude of the difference varied by meal type: +23 percent for free lunches, +39 percent for reduced lunches, and +54 percent for paid lunches. It was important to have the weighted lunch count agree with the FNS universe count.

Although the total weighted lunch count was higher than the FNS count by 41 percent, the difference varied significantly by SFA poverty status. For SFAs that serve 59 percent or fewer free or reduced-price lunches, the difference was +63 percent. On the other hand, for SFAs that serve 60 percent or more free or reduced-price lunches, the difference was -4 percent. The under-representation of lunches in this latter group was caused by a lower response rate among this class of SFAs. Fortunately, FNS secondary data reports total lunches for both of these subgroups of SFAs:

	<u>Total Lunches</u>
59% or less F&R	2,648,127,048
60% or more F&R	<u>1,322,078,422</u>
Total	3,970,205,470

The longitudinal sample SFA weights for both subgroups of SFAs were separately ratio-adjusted to equal the FNS universe counts. After this adjustment the weighted count of free, reduced-price and paid lunches were all within 2 percent of the FNS universe counts. This final weight adjustment lowered the weighted count of total SFAs to 12,834. Weighted counts for key domains are shown in Exhibit E.1.

Exhibit E.1

Weighted Counts for Key Population Domains
in Longitudinal Data Set for Year Two
SFA Manager Survey

SFA Subgroups	Estimated Number of SFAs		Estimated Total Approved Applicants as Reported in the Survey	
	Number	Percent	Number	Percent
<u>Type of SFA</u>				
Public	10,161	79.2	8,156,778	98.8
Private	2,673	20.8	99,307	1.2
<u>Poverty Level of SFA</u>				
60% or more F&R	2,472	19.3	4,403,882	53.3
0-59% F&R	10,362	80.7	3,852,203	46.7
<u>Participation in SBP</u>				
NSLP and SBP	4,274	33.3	6,672,557	80.8
NSLP Only	8,559	66.7	1,583,528	19.2
Total Sample	12,834	100.0	8,256,085	100.0

In addition to lunch counts, the FNS secondary data also provides the universe count of total breakfasts. For those analyses that include only SFAs that offer the SBP, it was desirable to have the weighted count of breakfasts in agreement with the FNS count. The SFA weights for all SFAs that offer the SBP were therefore ratio-adjusted to equal the FNS count of 623,341,613 breakfasts. This separate set of weights was used only for those analyses involving SFAs that offer the SBP.

CROSS-SECTIONAL SAMPLE WEIGHTS

The cross-sectional sample consists of those SFAs that answered the questions included for the first time in the Year Two survey. The steps in the weighting methodology were exactly the same as for the longitudinal sample; however, no meal count post-stratification was carried out. Rather, the weighted count of total approved applicants in the cross-sectional sample was ratio-adjusted to agree with the weighted count of total approved applicants in the longitudinal sample. Because the ratio-adjustment used total approved applicants, the weighted number of SFAs in the cross-sectional sample does not agree exactly with the weighted count of SFAs in the cross-sectional sample.

APPENDIX F
RECOMMENDED DIETARY ALLOWANCES

Appendix F

Food and Nutrition Board, National Academy of Sciences--National Research Council
Recommended Dietary Allowances, Revised 1989¹

Category/ Age (years)	Protein (gm)	Vitamins						Minerals			
		Vitamin A (mcg RE)	Vitamin C (mg)	Thiamin (mg)	Riboflavin (mg)	Niacin (mg)	Vitamin B ₆ (mg)	Calcium (mg)	Phosphorus (mg)	Magnesium (mg)	Iron (mg)
<u>Males</u>											
4-6	24	500	45	0.9	1.1	12	1.1	800	800	120	10
7-10	28	700	45	1.0	1.2	13	1.4	800	800	170	10
11-14	45	1,000	50	1.3	1.5	17	1.7	1,200	1,200	270	12
15-18	59	1,000	60	1.5	1.8	20	2.0	1,200	1,200	400	12
<u>Females</u>											
11-14	46	800	50	1.1	1.3	15	1.4	1,200	1,200	280	15
15-18	44	800	60	1.1	1.3	15	1.5	1,200	1,200	300	15

¹This table includes RDAs only for nutrients and age groups examined in the Child Nutrition Program Operations Study.

APPENDIX G

SFA MANAGER INTERVIEW

- **Overview**
- **Tabulated Responses**

SFA MANAGER INTERVIEW

Overview

In an effort to determine characteristics which might differentiate "Exemplary" districts from "Typical" districts, a brief interview was completed with the manager in each of the SFAs included in the meal observation study. The interview included questions related to general decision-making responsibilities; nutrition-related policies; nutrition education and student involvement; and steps taken to reduce plate waste. Respondents were also asked to comment on current USDA commodities.

Interviews were completed by the study's senior nutritionist. Five were administered in person during Spring, 1990; the remaining fifteen interviews were conducted via telephone during Summer, 1990. In most cases, the SFA manager was the sole respondent, but occasionally, questions were referred to other staff. Tabulated responses are presented in this Appendix (Exhibits G.1 - G.5). Additional information is presented and discussed in Chapter VII (Part 3) of this report.

Exhibit G.1

Individual(s) with Primary Responsibility for
Food-Service-Related Decisions in Exemplary and Typical SFAs
(SY 1989-90)

Decision/ Responsible Parties	Number and Percent of SFAs				All SFAs (n=20)	
	Exemplary		Typical			
	SFAs (n=10)		SFAs (n=10)			
	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>
Type of Food Service:						
SFA Manager	8	80%	7	70%	15	75%
School Board	2	20	3	30	5	25
Food Purchasing:						
SFA Manager	7	70	8	80	15	75
Food Service Supervisor ¹	4	40	2	20	6	30
Recipes and Menus:						
SFA Manager	5	50	6	60	11	55
Food Service Supervisor ¹	4	40	4	40	8	40
Dietician ¹	1	10	0	0	1	1
Participation in SBP:						
SFA Manager	3	30	3	30	6	30
State mandate	2	20	3	30	5	25
School Principals	3	30	1	10	4	20
Superintendent	2	20	1	10	3	15
School Board	1	10	2	20	3	15
School manager	1	10	0	10	2	10
Nutrition education activities:						
SFA Manager	1	10	1	10	2	10
Food Service Supervisor ¹	2	20	4	40	6	30
Teachers	4	40	3	30	7	35
Curriculum committee	3	30	3	30	6	30

¹ In large districts, these tasks were sometimes delegated by the SFA Manager

Data Source: SFA Manager Interview

Exhibit G.2

Credentials of Menu Planners
in Exemplary and Typical SFAs
(SY 1989-90)

Credentials	Number/Percent of SFAs					
	Exemplary SFAs		Typical SFAs		All SFAs	
	(n=10)		(n=10)		(n=20)	
	n	%	n	%	n	%
Registered Dietician (R.D.)	4	40	4	40	8	40
MS, not R.D.	2	20	1	10	3	15
BS, not R.D.	3	30	2	20	5	25
Some college	0	0	1	10	1	5
High School graduate	1	10	2	20	3	15

Data Source: SFA Manager Interview

Exhibit G.3

Availability of Salt in Exemplary
and Typical SFAs
(SY 1989-90)

Availability	Number/Percent of SFAs					
	Exemplary SFAs		Typical SFAs		All SFAs	
	(n=10)		(n=10)		(n=20)	
	n	%	n	%	n	%
On-line	2	20	5	50	7	35
At tables	0	0	0	0	0	0
On request	3	30	1	10	4	20
With selected foods ¹	1	10	0	0	1	5
Not available	4	40	4	40	8	40

¹Salt is available for french fries.

Data Source: SFA Manager Interview

Exhibit G.4

Nutrition Education Activities
in Exemplary and Typical SFAs
(SY 1989-90)

Net Participation/Activity	Number/Percent of SFAs					
	Exemplary SFAs		Typical SFAs		All SFAs	
	(n=10)		(n=10)		(n=20)	
	n	%	n	%	n	%
Any current NET activity	4	40	0	0	4	20
Regular training for food service Staff ¹	6	60	2	20	8	40
Recent external funding for NET activities	1	10	1	10	2	20
Nutrition education for students						
None	0	0	4	40	4	20
Classroom curriculum	6	60	1	10	7	35
Separate activities	5	50	5	50	10	50
Kitchen tours only	1	10	0	0	1	5
Student involvement in Food Service						
None	0	0	2	20	2	10
YACs ²	3	30	4	40	7	35
Menu planning	1	10	1	10	2	10
Product testing	8	80	7	70	15	75
Facility tours	1	10	1	10	2	10
Informal surveys	0	0	1	10	1	5

¹Excludes answers that described training for new employees or optional, educational sessions at annual meetings, etc. Includes only SFAs that offer regular training programs (>4 hours per year) for staff.

²Youth Advisory Councils; frequency established only in senior high schools.

Data Source: SFA Manager Interview

Exhibit G.5

Recent Actions Taken to Reduce Plate Waste in Exemplary and Typical SFAs (SY 1989-90)

<u>Action Taken</u>	<u>Exemplary SFAs</u> (n=10)		<u>Typical SFAs</u> (n=10)		<u>All SFAs</u> (n=10)	
	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>
None	0	0	1	10	1	5
Introduce OVS in elementary schools	3	30	5	50	8	40
Provide more choices	3	30	6	60	9	45
Respond to student preferences	3	30	1	10	4	20
Student education	1	10	1	10	2	10
Self-serve fruits/vegetables	0	0	1	10	1	5
Have recess before lunch	0	0	1	10	1	5
Improve food quality	1	10	1	10	2	10

Percentages total more than 100 percent because respondents could report multiple actions.

Data source: SFA Manager Interview.

Exhibit G.6

SFA Managers' Suggestions for Changes in Current USDA Commodities
(SY 1989-90)

Suggestions	Exemplary SFAs (n=10)		Typical SFAs (n=10)		All SFAs (n=10)	
	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>
No suggestions or changes	0	0	1	10	1	5
Dietary Guidelines-related:						
Less fat in and on meats	4	40	2	20	6	30
Lower-fat cheeses	4	40	2	20	6	30
Lower sodium content in general	1	10	1	10	2	10
More whole grains, fiber	1	10	0	0	1	5
Less sugar	2	20	1	10	3	15
Less butter	1	10	2	20	3	15
Offer fewer foods that students don't like/won't eat:						
Dried fruits	3	30	3	30	6	30
Frozen fruits, berries	3	30	1	10	4	20
Grapefruit juice	2	20	0	0	2	10
Other	1	10	2	20	3	15
Offer more staples and fewer surplus and "exotic" items ¹	2	20	3	30	5	25
Shorter, more precise and more effective wording of specifications	2		2		4	20
Clear, more complete processing standards	1	10	4	40	5	25
Smaller containers/sacks	0	0	2	20	2	10
Smaller portions of meat	1	10	1	10	2	10

¹ Items described as exotic included salmon and blackberries.

Exhibit G.7

Commodities Refused by SFA Managers and Reasons for Refusal
(SY 1989-90)

Commodity/Reason	Exemplary SFAs (n=10)		Typical SFAs (n=10)		All SFAs (n=10)	
	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>
None refused	2	20	1	10	3	15
Student preferences ¹ :						
Dried fruits	5	50	6	60	11	55
Salmon	1	10	2	20	3	15
Sweet potatoes	1	10	2	20	3	15
Canned vegetables	3	30	0	0	3	15
Others	2	20	5	50	7	35
Poor quality:						
Pasta ²	2	20	1	10	3	15
Hamburgers	0	0	1	10	1	5
Canned vegetables	0	0	2	20	2	10
Honey	1	10	0	0	1	5
Excessive quantity:						
Flour, corn meal	3	30	3	30	6	30
Butter	1	10	3	30	4	20
Nuts	1	10	1	10	2	10
Rice	1	10	1	10	2	10
Other	0	0	3	30	3	15
Form:						
Whole poultry	2	20	0	0	2	10
Dried beans	1	10	1	10	2	10
honey	1	10	0	0	1	5
Other	2	20	0	0	2	10

¹SFA Managers reported that these foods are "difficult to market" to students.

²Pasta was reported to have inferior cooking and holding properties, and to frequently discolor.