Financial Management Benchmarks for School Nutrition Programs

National Food Service Management Institute
The University of Mississippi

Building the Future Through Child Nutrition

The National Food Service Management Institute (NFSMI) was authorized by Congress in 1989 and established in 1990 at The University of Mississippi in Oxford. The Institute operates under a grant agreement with the United States Department of Agriculture, Food and Nutrition Service.

PURPOSE
The purpose of NFSMI is to improve the operation of Child Nutrition Programs through research, education and training, and information dissemination. The Administrative Offices and Divisions of Technology Transfer and Education and Training are located in Oxford. The Division of Applied Research is located at The University of Southern Mississippi in Hattiesburg.

MISSION
The mission of the NFSMI is to provide information and services that promote the continuous improvement of Child Nutrition Programs.

VISION
The vision of the NFSMI is to be the leader in providing education, research, and resources to promote excellence in Child Nutrition Programs.

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EXECUTIVE SUMMARY

School Nutrition Programs (SNP) serve millions of children a nutritious lunch, breakfast, and snack daily. Managing the financial resources of these programs is critical to the success of maintaining quality standards and accountability. The ability to interpret the financial outcomes of operational decisions and benchmark best practices is necessary to long term planning and effective management of the school district's SNPs. The purpose of this study was to determine the feasibility of developing a national database that can be used to collect and analyze demographic and financial data to assist SNP administrators in decision making and establishing benchmarks both internally and externally. FUNDamentals, the software developed by the National Food Service Management Institute (NFSMI), provided the financial data used in the study.

The research proceeded in three phases. In the first two phases, the research design used a case study methodology that included direct observation, systematic interviewing, and a review of SNP records. In Phase I and II, a total of 12 school districts were used for the review of records and documentation. On-site observation and data collection occurred in two of the 12 school districts. In Phase III, simple linear regression and descriptive statistics (means and standard deviation) were used to analyze financial characteristics in a stratified random sample of records from 60 school districts.

School districts in Mississippi, Florida, and Texas that utilize the NFSMI FUNDamentals software were selected as the basis for analyzing SNP operations. Documents and records reviewed were from the 2003-2004 school year beginning July 1, 2003 and ending July 30, 2004. On-site visits occurred in 2005.

Financial reports and data most often mentioned during Phase I of the study as important to analysis of the SNP included the following:

- Cost Analysis Report,

- Statement of Revenue and Expenditures,

- Participation Comparatives,

- Meal Equivalent Reports, and

- Operating Ratios.

School districts in the case study phase ranged from 2,112 to 32,194 in student enrollment. The percent of students qualifying for meal benefits ranged from 36% to 90% of student enrollment and lunch participation ranged from 44% to 78%. Breakfast participation was lower, ranging from 11% to 46% of enrollment.

The average percent of revenue spent on food in the 12 school districts was approximately 35% and an average of approximately 44% was spent on labor. Total labor costs as a percent of total revenue was higher in 11 of the 12 districts than food costs. The difference between labor and food as a percent of revenue ranged from approximately 1% to 30%. Ten of the 12 school districts had an annual revenue gain for the year, while two of the smallest districts ended the year with a loss.

Although all SNPs in the study tracked the amount of indirect cost generated, only three actually paid indirect costs to the school district. None of the schools paid the entire amount

generated. This information indicates that payment of indirect costs by the SNP is most likely a decision made at the district level in the three states included in this study.

The majority (11) of the 12 school districts in Phase II of the study received the largest percent of their revenue from federal dollars. One district received 47% of its revenue from local dollars and 46% from federal dollars. The value of donated commodities accounted for about 5% of revenue in most districts (10) in the study.

In Phase III, statistical analysis was conducted for the purpose of testing the process using data from the NFSMI FUNDamentals database. Means and standard deviations were used to describe variability in meal costs categories. Simple linear regression analysis was used to determine whether a relationship existed between the number of students qualifying for meal benefits and the number of students participating in the school meals programs.

Meal costs ranged from $1.66 to $3.55 with an average cost of $2.24 per meal in the 60 school districts included in Phase III. Most of the cost could be attributed to food, salaries/wages, and employee benefits. The average cost for food was $0.81, the average cost for salaries/wages was approximately $0.75, and the average cost for benefits was just under $0.27 per meal served. When salaries/wages and benefits were added together, the cost of total labor averaged near $1.02 for each meal.

A Pearson correlation coefficient showed a significant statistical correlation between the daily average participation of students enrolled in the 60 sample districts and the number of students qualifying for meal benefits (r=.82). Simple regression analysis revealed that the percentage of students in a school district qualifying for meal benefits was a significant positive predictor of participation in relation to school enrollment (R^2=.675, P,.01).

Data collected in the research project indicated that the standardized financial reports generated by the NFSMI FUNDamentals software were viable and could be useful in studying trends and establishing national benchmarks. The software allows users to define parameters so that similar schools can be selected anonymously and used for comparing financial data.

INTRODUCTION

School Nutrition Programs (SNP) supply millions of children with nutritious meals each school day. The National School Lunch Program serves over 30 million children lunch daily and approximately 11 million students participate in the School Breakfast Program and after-school snack service. These programs represent a cost to the federal government of over 13 billion dollars annually (CT030807, 2007).

Managing the financial resources of nutrition programs in the school setting is critical to the success of maintaining quality standards and ensuring nutritious meals are served to children. According to a U.S. General Accounting Office (GAO) report (2003), the costs of serving student meals at school are increasing faster than the generation of revenues in many school districts, leaving SNP administrators with difficult decisions about long-term goals for their operations. At the same time, demands are increasing for more accountability in all nutrition programs, both financially and nutritionally.

The ability to interpret the financial outcomes of operational decisions is critical to the effective management of SNPs. Good financial management decisions are based on inquiry and analysis. With rapidly changing federal regulations, increasing program costs, and decreasing financial support from local districts, the need for a standardized financial management information system to assist in evaluating the effectiveness of SNP operations is critical in today's school environment.

In 1995 a National Research Agenda Task Force convened by the National Food Service Management Institute (NFSMI) identified the need to establish industry standards for financial quality indicators of SNP performance (Cater, Cross, & Conklin, 2001). In response to the task force concerns, NFSMI immediately initiated a project to develop a financial management model

that could be used by school foodservice professionals throughout the United States for better decision-making. The first step in the development process was determining the various factors that characterize financial effectiveness in SNPs. NFSMI created a national taskforce represented by the major players in the school nutrition professions. Task force members worked together to outline the content, format, and scope of a financial management model that could eventually be computerized. The group explored the best ways to allocate revenues and costs, determine categories of revenues and costs, and identify data items to include in each category. Task force participants identified six quality performance indicators essential to the financial management of SNP operations. These performance indicators served as the basis for NFSMI's development of the analysis and evaluation component of a Financial Management Information System (FMIS) model (Cross, Cater, & Conklin, 2000). The six quality performance measurements identified to include in the model were:

- A measure of program profitability (statement of revenues and expenditures, net gain/loss, and fund balance),

- A standard unit of measurement for meal equivalents,

- Per meal costs, including total costs and costs by category (food, labor, supply),

- Expenditure costs by category (food, labor) as a percentage of total revenue,

- Participation rates by program and eligibility category, and

- Measure of productivity (meals per labor hour, percentage of labor to revenue).

The first draft of the model was developed by the NFSMI staff, then evaluated and revised by the national task force. The revised draft of the model was mailed to a national review panel of experts in the field of nutrition. Based on comments from the national review panel, further revisions were made to improve content accuracy, comprehensiveness, clarity,

conciseness, and usefulness to the SNP professionals (Cater, 2002). A draft model was published

in 2001 (Cater, Cross, & Conklin) to provide users with an opportunity to make comments and

suggestions for improvement before final publication of the model in 2005 (NFSMI).

The NFSMI FMIS model represents a uniform reporting and analysis tool that provides

school officials with the means to evaluate the financial status of the school district and to

compare position and operations performance of the district's SNP to other similar school meal

programs. It provides information that helps SNP administrators compare financial data from

year to year, establish a budget plan, and forecast revenue and expenditures more accurately.

(Cross, Cater, & Conklin, April, 2000).

During the development period of the FMIS model, NFSMI began the initial process of

planning a critical path for eventual development of a computerized version of the model. It was

the consensus of both national task force members and school district administrators

participating in the field testing phase of the FMIS model development that few SNP directors

and administrators would utilize the model without a computerized application. A computerized

format for the model would yield a more consistent data analysis and the results could be used

for benchmarking with other school districts using the FMIS format. NFSMI made a

commitment to support the development of a computerized version of the FMIS model and

began the process of selecting a software developer.

After reviewing three proposals, the Applied Research Division (ARD) of NFSMI

contracted with Visual Solutions located in Dothan, Alabama to develop a software application

based on the FMIS model. The software, FUNDamentals, was released for general use in 2001.

The FUNDamentals software is available for free download to any school district in the nation

through the NFSMI Web site. Though exact numbers are not available, phone call logs and

registrations lists indicate that at the beginning of 2004-2005, more than 1,650 individual school districts throughout the United States were using FUNDamentals to analyze the effectiveness of their SNPs. This included approximately 1,280 schools in Mississippi, Florida, and Texas. Mississippi and Florida state agencies adopted the software structure as a basis for the design of a Web based application that is used for state analysis. Recently, the Texas School Nutrition Association agreed to fund a statewide financial management project that would utilize the NFSMI FUNDamentals as the basis for a Web application to provide districts with the ability to analyze their data and compare the results with other districts in the state.

While analysis of financial data within a school district is important to effective management of the SNP, it is important to be able to benchmark with other districts. Without benchmarks, there are no industry trends. Benchmarks must be research based on using consistent data if they are to help school districts identify best practices (Cater, Mann, & Conklin, 1999). Currently there is very little available data to establish benchmarks in School Nutrition Programs. One reason may that states prepare and report financial information differently. In a study to provide benchmarking data on general financial performance for school foodservice operations in large districts, Hwang & Sneed (2004) found that school districts were not consistent in their system of accounts. If school districts are going to have the ability to benchmark best practices and establish financial trends to provide guidelines for performance improvement in financial management of the school meals programs, then it is important to have consistent and timely national financial data available to local, state, and federal agencies responsible for feeding school children nutritious meals. Computerization in school meal programs can save time in implementation of functions and improve efficiency through standardized reporting procedures (Boehrer, 1993).

The focus of this research project was to determine the feasibility of developing a national database that can be used to collect and analyze demographic and financial data from school district nutrition programs. The study further sought to explore avenues to develop a process for doing statistical research using the NFSMI FUNDamentals software elements as the basis for a database. The research objectives that guided this study include the following:

- Identify and define data definitions necessary for financial analysis of SNPs.

- Determine the types of variables relevant to a quality SNP.

- Determine demographic criteria necessary for effective program analysis.

- Review audited state agency level SNP data generated by the FUNDamentals software.

- Identify differences in types of data collected from SNPs at both the local and state levels.

- Analyze financial data using analytical and descriptive statistics.

- Recommend a method for utilizing research based information to assist SNPs in setting goals for improving efficiency.

METHOD

Research Design

This research project proceeded in three phases. The first two phases utilized case study methodology to collect and analyze data from school districts in Mississippi, Florida, and Texas. These states were selected for the study because their state agencies used the NFSMI FUNDamentals software as the basis for analyzing SNP operations. In Phase I, direct observation and structured interviews were conducted during site visits to two school districts located in Mississippi and Florida. During Phase II, the researcher reviewed school district archival records from all three states. To provide the necessary information for analysis, records from an additional ten schools were selected and added to the two school districts that served as observation sites. Data tables were developed to summarize financial information. In Phase III, district financial records were analyzed using simple linear regression and descriptive statistics (means and standard deviation). A stratified random sample of 60 school districts was used in the statistical analysis.

The site visits to the observation districts occurred in 2005. All documents and records used in the study were from the 2003-2004 school year beginning July 1, 2003 and ending July 30, 2004. These records were chosen because they were complete and had been audited for accuracy.

Informed Consent

The Human Subjects Protection Review Committee of The University of Southern Mississippi approved the protocol for the research project. Only publicly available information was used in the study.

Phase I: Direct Observation and Structured Interview

Sampling and Data Collection

The first phase of the research study consisted of a one-day visit to each of two sites selected in Mississippi and Florida. The purpose of the site visits was to 1) identify data necessary for financial analysis of school meal programs, 2) assess the extent to which financial data reported to state agencies in Mississippi and Florida were being utilized to analyze SNPs, and 3) determine the feasibility of importing financial data related to school nutrition programs into a national database for research that could lead to setting reliable benchmarks. The site visits included observation of routines and procedures for entering data into the FUNDamentals software at the district level, an interview with staff members responsible for implementation and use of FUNDamentals, and examination of reports generated by FUNDamentals that met requirement for state level reporting.

Criteria for selection of the school districts for site visits included 1) verification by the researcher that the school district utilized the FUNDamentals software for program analysis, 2) the software had been used by the district for longer than one year, and 3) the school district's willingness to participate. Once the observation sites were selected, the NFSMI researcher contacted the SNP administrator by telephone to discuss the purpose of the study and seek permission of the appropriate school district officials to conduct a site visit. A date was established for the visit and follow-up letters were mailed to SNP administrators and superintendents confirming the purpose of the study (Appendix A). The letters contained a brief discussion of the types of data important for the review process and a list of what would be involved in the examination of financial records. In addition, the letter mailed served as a

reminder to SNP directors and school superintendents that participation was voluntary and school district data would be treated as anonymous.

Structured interview questions were developed (Appendix B) to guide the researcher during discussions with district personnel responsible for software set-up and data entry. The interview questions were not made available prior to the site visit to encourage more spontaneity in answers.

Data Analysis

Once the site visits were completed, the researcher examined the financial data generated by the NFSMI FUNDamentals to determine the different types of data collected and analyzed using FUNDamentals and how the data could best be used to set benchmarks. Interview responses and notes from the NSFMI researcher's observations were organized and categorized.

Phase II: Review and Analysis of Documents and Financial Records

Sampling and Data Collection

The purpose of Phase II was to determine the types of variables relevant to a quality SNP and to examine demographic criteria necessary for effective program analysis. A total of 12 school districts were used in this phase of the study. The two school districts used as observation sites along with an additional convenience sample of ten districts were selected for review of documentation. The additional school district information was important to test the consistency and uniformity of the types of data collected by SNPs for financial analysis.

The researcher used a two-step process for selection in order to ensure school districts chosen were evenly distributed across Florida, Mississippi, and Texas. In the first step, school districts were categorized by school enrollment sizes. Four enrollment categories were identified

to provide a cross section of school districts ranging from the larger districts in the FUNDamentals database to the smaller districts. Categories selected included school districts with enrollments of approximately 32,000, 5,500, 6,800, and 2,100. In step two of the selection process, the researcher used the FUNDamentals 'selection criteria' function to group districts in the four established enrollment categories from which ten additional school districts were selected to round out the sample of 12. All financial reports from each district were examined to ensure that only complete and consistent records were used in the study. Two of the school districts initially selected had reports with missing data. The reports were replaced with school district records selected from the remaining appropriate enrollment categories.

Once the schools were selected, the researcher utilized financial reports from the FUNDamentals database to compare data across districts. Meal participation rates, revenue generation, program costs, operating ratios, and profitability were among the performance indicators examined.

Data Analysis

Financial records and documents from the 12 school districts were reviewed to determine demographics needed for effective analysis, identify the differences in types of data collected for the database, and to evaluate the financial data generated by the NFSMI FUNDamentals software. Data tables were constructed to allow for the systematic organization and tabulation of financial information. Financial data were then compared and cross-checked to determine if commonalities and differences in SNP finances were provided by the software.

Phase III: Statistical Analysis of Data

Sampling and Data Collection

Sixty school districts were selected from the 1,284 districts in the NFSMI FUNDamentals database for statistical analysis. Twelve of the 60 districts were used in the case study portion of this project and a stratified random sampling was used to select 48 additional reports (16 from each state) from Mississippi, Florida, and Texas. The FUNDamentals cost analysis report (Appendix C) from each school district provided the source of financial data used for statistical analysis.

The cost analysis report is generated for each school district by the FUNDamentals software and is based on annual school district data transferred into the database at the end of the school year. The report used in Phase III included a cumulative participation report, meals cost analysis, revenue and expenditure report, cost allocations analysis, eligibility of students for meal benefits, and student participation in the school lunch, breakfast, and snack programs. Participation rates and meal eligibility percentages were reported as actual numbers as well as percentages of enrollment. Actual dollar amounts were reported for revenue and expenditures based on revenue source and operating categories respectively.

Data Analysis

Once it was determined that the 60 school district records met the selection criteria, selected data from the cost analysis report were entered into SPSS for Windows (Version 13.0, Chicago, Il.) for statistical analysis. Descriptive statistics (means and standard deviations) were computed for the school district's financial performance indicators including program costs, operational ratios, and meal participation rates to determine the level of similarities and

commonalities among school districts. Sample linear regression was used to examine participation factors. A significance level of 0.01 was used.

The reader is reminded that the statistical analysis in Phase III was to test the feasibility of using the records in the FUNDamentals database for research that could assist in identifying trends in the nation's SNPs. Although the results were interesting and indicated specific trends, the purpose in reporting the findings here is to show the benefits of having a database with financial information and not to draw statistical conclusions for the purposes of developing benchmarks.

RESULTS AND DISCUSSION

Phase I: Direct Observation and Structured Interview

The two school sites selected for site observation were located in Mississippi and Florida and had approximately 32,000 students enrolled in each district. Both districts reported data to state agencies using the NFSMI FUNDamentals and assigned only one primary staff member to enter data into the FUNDamentals software. When and how often data were entered into the software varied between districts. Certain types of financial information such as meal counts, money collection, and eligibility for meals was collected on a daily or weekly basis through a variety of SNP software applications and entered into FUNDamentals as time permitted. Other data were collected from the accounting office and either entered manually or transferred by file to FUNDamentals from the district accounting software. Both methods appeared to be efficient based on the limited observation of the researcher. Data entry personnel indicated that the method and system used for data input was mostly determined by the structure of the accounting system used in the school district central office.

During the focused interview, the researcher gathered information regarding the advantages and disadvantages of the software application with the SNP administrator and other district supervisory personnel associated with the school meals programs. Both school districts' supervisory personnel reported satisfaction with the NFSMI FUNDamentals financial reports. They specifically noted the value of the breakdown on the cost analysis report (Appendix C) of meal costs for the various categories of expenditures and the calculation of revenue generated per category for each meal served. The financial reports and data most often mentioned as important to analysis of the SNP included:

- Cost Analysis Report,

- Statement of Revenue and Expenditures,

- Participation Comparatives,

- Meal Equivalents Report, and

- Operating Ratios.

There were no comments expressing dissatisfaction with the FUNDamentals software. However staff members from both districts mentioned the time involved in the initial set-up process for the software, the time required for data entry and analysis, and the need for more training in techniques that could be used to customize reports to meet school board requirements at the local level.

Phase II: Review and Analysis of Documents and Financial Records

In the second phase of the research project, an extensive review of the financial reports available to the NFSMI FUNDamentals users was conducted. Financial reports available to users include participation reports, revenue and expenditure statements, meals per labor hour, gain/loss calculations, per meal costs, indirect costs generated, average daily non-reimbursable food sales per lunch equivalent, and current fund balance. Other reports and charts were available based on the criteria set by the user.

Demographics

Table 1 demonstrates the type of demographic information available in the FUNDamentals database and how it can be used to compare districts. Among the 12 districts used in Phase II of the study, the largest district (A) had an enrollment of 32,194 students and the smallest school district (L) had an enrollment of 2,112. Average school district participation rates, defined as total number of breakfasts or lunches divided by total enrollment, ranged from a

low of approximately 44% to a high of 78% for lunch. It is interesting to note that in this sample size of 12, both the highest and lowest average daily lunch participation occurred in school districts with the highest enrollment. Though the sample is too small to draw conclusions, this demonstrates the type of information that could be useful if a larger population were sampled.

The average breakfast participation ranged from a high of 46% to a low of 11%. However, district D did not offer breakfast in all schools, thus contributing to a low percentage of participation when calculated based on total district enrollment. It is important that users remember this variability when setting the criteria for selecting school districts to compare with their operation. If wrong comparisons are made, the results may be skewed and useless to districts attempting to benchmark best practices.

The percent of students qualifying for meal benefits ranged from 90% in district A to 36% of students in both districts D and E. All three districts were grouped in the two highest enrollment categories. If this factor remained consistent in a larger sample, it might provide insight into whether the number of students qualifying for meal benefits influences financial outcomes in the school district's SNP.

Table 1

Demographics (n=12)

School Districts	Student Enrollment	Total % F/R	# School Days	ADP Lunch	Par %	ADP Breakfast	Par %
Approximately 32,000 Enrollment							
A	32,194	90%	180	14,207	44%	3,994	12%
B	31,967	85%	180	24,934	78%	10,820	34%
C	31,867	61%	180	18,707	59%	6,183	19%
Approximately 15,500 Enrollment							
D	15,999	36%	180	10,841	68%	1,718	11%[a]
E	15,510	36%	180	7,935	51%	1,935	13%
F	15,459	50%	180	9,608	62%	5,043	33%
Approximately 6,800 Enrollment							
G	6,904	77%	180	4,909	71%	2,243	33%
H	6,870	56%	180	4,101	60%	1,248	18%
I	6,857	55%	180	4,660	68%	2,241	33%
Approximately 2,100 Enrollment							
J	2,169	72%	180	1,442	67%	665	31%
K	2,116	56%	180	1,528	72%	830	39%
L	2,112	64%	180	1,606	76%	974	46%

[a]Breakfast was not served in all schools in the district; therefore the smaller participation of enrollment is not necessarily reflective of participation at the individual school site.

Meal Cost Analysis

One area that requires constant review and monitoring in any district is the relationship between the cost to produce a meal and how much revenue is earned per meal. Meal costs and meal pricing can seriously affect the financial status of the district SNP (March & Gould, 2001). For this reason, the review of documents in Phase II included comparing the revenue earned per meal with the costs to prepare a meal, and comparing the net loss/gain per meal among districts. Meals costs were also examined statistically in Phase III.

The FUNDamentals software calculated the 2003-2004 annual meal costs by dividing the total expenditures for the year by the total meal equivalents served. The costs to produce a meal

in the 12 sample districts ranged from approximately $1.84 (district F) to $2.67 (district J) and may be seen in Table 2. Generation of revenue earned per meal/meal equivalent ranged from approximately $1.88 (district F) to $2.64 (district J). While district J generated the most revenue per meal served, it also had the highest costs per meal served resulting in a loss to the district. Interestingly, the two school districts (J and L) reporting net losses for the year were among the three smaller districts selected for the case study. This is consistent with findings by March and Gould (2001) in a study of self-sufficiency in Kansas school meal programs. They reported that an enrollment of at least 400 at the school level site was necessary to break-even and that as enrollment increased, the percentage of schools able to achieve financial success increased.

A larger sampling would provide additional financial data about the size of a school district as it relates to profitability. As SNP administrators face increasing pressure to operate a financially sound program, it is important to have access to financial information that can be used to benchmark best practices with other similar districts and assist school administrators in financial management decisions making.

Table 2

Revenue and Expenditures per Meal Served

School Districts	Total Revenue	Total Expenditure	Total MEQ	Revenue Per Meal	Total Cost Per Meal	Net Gain /Loss Per Meal
Approximately 32,000 Enrollment						
A	8,711,597	8,467,574	3,577,213	2.4353	2.3671	0.682
B	14,962,767	14,278,263	6,440,458	2.3232	2.2170	0.1063
C	11,036,862	10,263,865	5,338,769	2.0673	1.9225	0.1448
Approximately 15,500 Enrollment						
D	5,561,661	5,216,724	2,426,659	2.3290	2.1498	0.1792
E	4,506,680	4,312,219	1,880,835	2.3961	2.2927	0.1034
F	5,944,113	5,819,249	3,165,497	1.8779	1.8383	0.0394
Approximately 6,800 Enrollment						
G	13,111,611	2,997,045	1,282,185	2.4268	2.3375	0.0894
H	2,510,404	2,486,783	1,214,842	2.0664	2.0470	0.0194
I	2,899,045	2,798,969	1,227,288	2.3622	2.2806	0.0815
Approximately 2,100 Enrollment						
J	1,005,426	1,016,525	381,056	2.6385	2.6677	0.0291
K	952,871	920,357	418,752	2.2755	2.1979	0.0776
L	1,090,049	1,100,455	552,465	1.9731	1.9919	0.0188

Percent of Expenditures to Total Revenue

Expenditures in the SNP are costs such as food, labor, supplies, equipment, and service that can be specifically identified with the operation of the SNP. There are 13 separate categories available in the FUNDamentals software that can be used to classify expenditures (Appendix D). However, not all categories are required and school districts may customize expenditure reports to individual district requirements.

One of the most useful calculations provided by the NFSMI FUNDamentals is the percentage of costs in each operating category to total revenue. These operating ratios allow school districts to compare their financial effectiveness and set benchmarks by relating expenses to revenues. Operating ratios are useful to management because they allow comparison both

internally and externally (NFSMI, 2005). For example, if a district wanted to know how they compared with other similar districts in food and labor categories, they could compare the percent of total revenue spent in each category.

The 12 sample school districts were relatively consistent in the categories they used to report expenditures. Categories selected to compare cost data for purposes of this study included salaries/wages, employee benefits, purchased food, donated commodities, supplies, equipment, and other which included miscellaneous and overhead.

Although salaries/wages and employee benefits are separate categories in FUNDamentals to allow for more thorough review of labor issues at the district level, the researcher combined the two when calculating operating ratios. This allowed a snapshot view of the average percent of revenue spent for all labor.

As shown in Table 3, the average percent of revenue spent on food was 34.86% and an average of 43.9% was spent on labor. Total labor costs as a percent of total revenue was higher in 11 of the 12 school districts than food cost. Only one district had higher food costs. The difference between labor as a percent of revenue and food as a percent of revenue ranged from approximately 1% to almost 30%. This finding indicates a critical need for further study in an expanded sample. Although the number of school districts in the study is extremely small, increasing labor costs as a percentage of total revenue appeared as a possible trend. One possible question for school districts to address is whether or not this trend will impact food quality.

Ten of the 12 districts had an annual gain in revenue for the year, while two districts showed an annual loss. The average gain for the 12 districts as a group for 2003-2004 was 3.16%.

Table 3

Operating Ratios for Expenditures to Total Revenue[a]

School District	Labor	Purchased Food	Com-modities	Supplies	Equip	Indirect Cost	Other	Total	Gain/ Loss
Approximately 32,000 Enrollment									
A	42.39%	33.64%	5.37%	6.13%	0.22%	1.72%	7.73%	97.20%	2.80%
B	44.18%	39.32%	4.89%	3.82%	0.59%	0.0%	2.63%	95.43%	4.57%
C	42.26%	34.52%	7.09%	4.03%	0.61%	0.0%	4.49%	93.00%	7.00%
Approximately 15,500 Enrollment									
D	46.35%	31.59%	5.20%	5.10%	0.31%	0.0%	3.75%	92.30%	7.70%
E	42.86%	31.80%	4.82%	4.62%	2.61%	1.58%	7.40%	95.69%	4.31%
F	41.18%	38.44%	5.28%	7.68%	0.0%	0.0%	5.32%	97.90%	2.10%
Approximately 6,800 Enrollment									
G	45.73%	32.35%	5.30%	5.48%	1.99%	2.73%	2.74%	96.32%	3.68%
H	37.29%	36.14%	4.87%	6.88%	0.0%	0.0%	13.88%	99.06%	0.94%
I	44.27%	33.85%	5.41%	3.82%	2.43%	0.0%	6.77%	96.55%	3.45%
Approximately 2,100 Enrollment									
J	56.22%	27.73%	8.93%	4.09%	.01%	0.0%	4.12%	101.10%	(1.10%)
K	43.73%	37.62%	5.61%	5.20%	2.84%	0.0%	1.59%	96.59%	3.41%
L	40.86%	41.31%	4.65%	7.71%	2.64%	0.0%	3.78%	100.95%	(0.95%)
Average Operating Ratios for all Districts									
Average	43.94%	34.86%	5.62%	5.38%	1.19%	.50%	5.35%	96.84%	3.16%

[a]All calculations in the following table are expressed as percentages

Specialized Costs Analysis

One advantage of a computerized analysis is the amount of information available to the user. This is important to school districts that want to examine a specific category of expense to determine patterns that might suggest an avenue for improvement. For example, the FUNDamentals software provides the user with information about actual dollars spent on labor (salaries/wages and benefits), the percent of labor costs to total revenue, and the per meal cost for labor. This breakdown provides financial data that can be used for both internal and external comparisons. From the financial reports supplied by the 12 sample districts in the case study, one can easily determine that the average percentage cost for total labor was approximately 44% for

all districts, ranging from a low of 37.29% to a high of 56.22%, as seen in Table 4. This type of information can be valuable to school districts looking for guidelines or benchmarks to improve financial performance.

There can be a significant difference among school districts within specific cost categories. For example, financial records available from the FUNDamentals software indicated that the per meal costs for employee benefits ranged from less than 0.02 cents to over 0.04 cents in the three smallest school districts in this phase of the study. This type of information can be used to track industry trends across several years and provide important financial information for SNP directors.

Table 4

Analysis of Labor (n=12)

School Districts	Total Cost of Salaries and Wages	Percent of Revenue	Per Meal Cost	Total Cost of Benefits	Percent of Revenue	Per Meal Cost
Approximately 32,000 Enrollment						
A	$2,741,961	31.47%	0.7665	$951,373	10.92%	0.2660
B	$4,541,138	30.35%	0.7051	$2,069,785	13.83%	0.3214
C	$3,591,277	32.54%	0.6727	$1,073,334	9.72%	0.2010
Average	**$3,624,792**	**31.45%**	**0.7148**	**$1,364,831**	**11.49%**	**0.2628**
Approximately 15,500 Enrollment						
D	$1,846,081	32.66%	0.7608	$773,510	13.69%	0.3188
E	$1,546,362	34.31%	0.8222	$385,485	8.55%	0.2050
F	$1,935,945	32.57%	0.6116	$512,005	8.61%	0.1617
Average	**$1,776,129**	**33.18%**	**0.7315**	**$557,000**	**10.28%**	**0.2285**
Approximately 6,800 Enrollment						
G	$1,024,667	32.93%	0.7992	$398,245	12.80%	0.3106
H	$695,421	27.70%	0.5724	$240,809	9.59%	0.1982
I	$948,002	32.70%	0.7724	$335,534	11.57%	0.2734
Average	**$889,363**	**31.11%**	**0.7147**	**$324,863**	**11.32%**	**0.2607**

(table continues)

Table 4 *(continued)*

Analysis of Labor (n=12)

School Districts	Total Cost of Salaries and Wages	Percent of Revenue	Per Meal Cost	Total Cost of Benefits	Percent of Revenue	Per Meal Cost
Approximately 2,100 Enrollment						
J	$404,569	40.24%	1.0617	$160,621	15.98%	0.4215
K	$298,868	31.37%	0.7137	$117,775	12.36%	0.2813
L	$341,237	31.30%	0.6177	104,192	9.56	0.1886
Average	**$348,225**	**34.30%**	**0.7977**	**$127,529**	**12.63%**	**0.2971**
Average Labor Cost for all Districts Combined						
Averages		**32.51%**			**11.43%**	

Indirect Costs Analysis

Another expenditure area of interest to NFSMI FUNDamentals users who are evaluating their programs is the indirect cost generated versus indirect cost paid. Table 5 shows how the amount of indirect costs generated varies from district to district and the amount actually paid in three of the 12 districts. Only three SNPs in the study sample used in Phase II paid indirect cost to the school district. The highest percentage of indirect cost paid from indirect cost generated was district E. None of the school districts were charged the entire amount of indirect cost generated.

This information indicates that payment of indirect costs by SNPs is inconsistent among districts and most likely a decision made at the district level. Clearly, whether or not the SNP pays indirect cost may influence the bottom line. The information provided by the software offers several possibilities for statistical analysis that could lead to a better understanding of how indirect cost impacts the financial status of the SNP.

Table 5

Indirect Cost Analysis

School Districts in Study	Indirect Cost Percentage 2003-2004	Actual Indirect Cost Generated	Indirect Cost Per Meal	Actual Indirect Cost Paid	Paid Versus Generated
Approximately 32,000 Enrollment					
A	0.594	291,093	0.0814	150,000.00	0.0.52
B	0.1862	1,367,131	0.2123	0.00	0.00
C	0.1290	673,792	0.1262	0.00	0.00
Approximately 15,500 Enrollment					
D	0.1332	383,317	0.1580	0.00	0.00
E	0.043	99,671	0.0530	71,342.00	0.72
F	0.1346	430,585.27	0.1360	0.00	0.00
Approximately 6,800 Enrollment					
G	0.1410	221,941	0.1731	85,000.00	0.38
H	0.1351	191,331	0.1575	0.00	0.00
I	0.0497	79,029	0.0644	0.00	0.00
Approximately 2,100 Enrollment					
J	0.0424	27,470	0.0721	0.00	0.00
K	0.1763	78,155	0.1866	0.00	0.00
L	0.1436	76,267	0.1380	0.00	0.00

Revenue Generation Analysis

In this study, inconsistencies were more prevalent in how districts reported revenue than how they reported expenditures. For example, in Texas some school districts reported student meal sales, adult meal sales, and à la carte sales as one total under 'Local Sales.' Mississippi and Florida school districts used subcategories to record revenue so that the source could be identified. These factors could impact comparisons of revenue among school districts in the database. Table 6 provides the total revenue received from federal, state, local, and miscellaneous sources in the 2003-2004 school year. The value of donated commodities is presented separately although it is actually federal dollars. Local dollars includes student meal sales, adult meal sales, à la carte sales, and all other non reimbursable food sales. Federal dollars

were the largest source of revenue for all districts with the exception of district D. That district

received 47% of its revenue from local dollars and 46% from federal dollars. The value of

donated commodities accounted for 5% of revenue in all but districts J and K. In those districts,

donated commodities accounted for 9% and 6% of the revenue received.

Table 6

Revenue by Source

School District	Total Revenue Dollars	% Federal Dollars	% State Dollars	% Local Dollars	% Misc. Dollars	% Commodity Dollars
Approximately 32,000 Enrollment						
A	$8,711,597	52%	2%	39%	2%	5%
B	$14,962,767	78%	0.5%	16%	0.5%	5%
C	$11,036,862	66%	0.9%	26%	0.1%	5%
Approximately 15,500 Enrollment						
D	$5,651,661	46%	1%	47%	1%	5%
E	$4,506,680	53%	2%	39%	1%	5%
F	$5,944,113	59%	3%	32%	1%	5%
Approximately 6,800 Enrollment						
G	$3,111,611	77%	0.5%	17%	0.5%	5%
H	$2,510,404	58%	1%	30%	6%	5%
I	$2,899,045	62%	2%	30%	1%	5%
Approximately 2,100 Enrollment						
J	$1,005,426	66%	2%	22%	1%	9%
K	$952,871	60%	1%	32%	1%	6%
L	$1,090,049	63%	0.5%	31%	0.5%	5%

Phase III: Statistical Analysis of Data

The reader should keep in mind that the statistical analysis in Phase III is from a sample

of 60 school districts. The statistical analysis conducted was for the purpose of testing the

process; therefore, analysis is limited to selected data from the FUNDamentals database. Means

and standard deviations were used to describe variability in meal costs categories. Simple linear

regression analysis was used to determine whether a relationship existed between the number of

students qualifying for meal benefits and the number of students participating in the school meals program.

The researcher chose the categories of food, labor, benefits, supplies, indirect costs, overhead, and major equipment to provide sample financial data from the NFSMI FUNDamentals software for statistical analysis. It is important to remember that indirect costs were not paid to districts by all SNPs, therefore a mean average may not have the same value in this category as in other categories.

The average mean cost for preparing a meal was calculated for the SNPs (n=60) selected for this phase of the study. As Table 7 summarizes, meal cost averaged $2.24 with a standard deviation of .3328 and a cost range of $1.66 to $3.55 per meal. Most of the meal cost could be attributed to food, salaries/wages, and employee benefits. The average cost for food was $0.81, the average cost for salaries/wages was near $0.75 and the average cost for benefits was just under $0.27 per plate. However, when salaries/wages and benefits were added together, the total cost of labor averaged very near $1.02 per plate for the 60 school districts in this study.

This type analysis allows SNP administrators to compare operational costs in their district with the average costs on other districts similar in size and other variables selected. It provides information that helps SNP administrators answer questions about how their district is doing when compared to other districts.

Table 7

Average Meal Costs for School Districts in Three States (n=60)

| Category	Mean	SD	Range
Food Cost	.8097	.1269	.65-1.39
Salaries/Wages	.7478	.1427	.49-1.26
Employee Benefits	.2689	.0768	.11-.45
Commodities Used	.1232	.0393	.04-.28
Supplies	.1167	.0418	.01-.26
Overhead	.1112	.0648	.01-.29
Indirect Costs	0222	.0378	.00-.15
Major Equipment	.0420	.0509	.00-.28
Total Meal Cost	2.2413	.3378	1.66-3.55

Simple linear regression was used to determine the strength of the relationship between meal participation and eligibility for meal benefits and whether meal benefits can be used to predict student participation. In simple regression analysis, a dependent variable is examined in relation to an independent variable which is considered to be an explanatory variable.

Before attempting to fit the linear model to the data, the researcher first produced a simple scatter plot to determine if there was a linear relationship between the two variables student meal participation and student eligibility for meal benefits, and to screen for outliers. An outlier is defined as a data point that lies an abnormal distance from other values in the study sample. It can be identified and eliminated or the researcher can choose to leave the outlier in the sample. The participation rate for lunch was used as the dependent variable. The percent of students qualifying for meal benefits was used as the independent variable.

The scatter plot of the two variables showed a strong positive linear relationship between the participation rate and percent of students qualifying for meal benefits. In Figure 1, visual examination of the scatter plot reveals that as the percentage of students in a district qualifying

for meal benefits increased, the average daily participation in the school lunch and breakfast program increased. One outlier (lower left hand corner) was detected in the scatter plot. In this case the district represented was identified and left in the analysis.

Figure 1
Scatter Plot to Determine Linear Relationship between Participation Rates and Students Qualifying for Meal Benefits
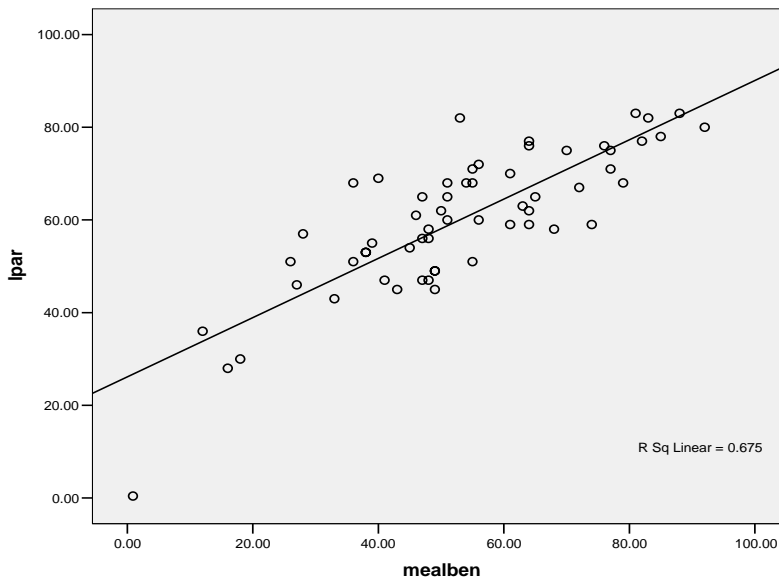
Next, the researcher conducted a Pearson product-moment correlation procedure to test the strength of the relationship between participation rates and the number of students qualifying for meal benefits.

The Pearson correlation coefficient showed a significant statistical correlation between the daily average participation of students enrolled in the sample districts and the number of students qualifying for meal benefits (r=.82). Simple regression analysis revealed that the percentages of students in a school district qualifying for meal benefits was a significant positive predictor of participation in relation to school enrollment. Close to 68% of the variability

observed in school lunch participation in the 60 school districts in the study is explained by the number of students receiving free or reduced meals ($R^2 = .675$, $P<.01$)

Once the relationship between meal benefits and participation rates was established, a least-square regression analysis was conducted to determine how participation rates could be predicted based on meal benefits. Using the slope and intercept values from the least-squares regression, the researcher determined the regression equation. The slope of the line was .640 and the intercept 26.13, thus the equation of the least-square regression line used to predict participation was:

Y (participation rate) = 0.64 x benefit rate + 26.13.

This means that if a school district similar to the study population had a meal benefit rate of 65% of total enrollment, they could predict a participation rate in the school lunch program by using the equation y = 0.64 x 65 + 26.13 = 67.73, or a participation rate of approximately 68%. Since the correlation coefficient was .82, one can be fairly sure that this prediction is accurate.

A simple regression analysis was also conducted to examine the relationship between students receiving meal benefits and breakfast participation. Results indicated there is less strength in the relationship between breakfast participation and meal benefits (r=.75) than between lunch participation and meal benefits. However, there is also considerable strength between students eating breakfast and the number qualifying for meal benefits. The difference in strength may be because of low participation in the breakfast program in general.

CONCLUSIONS AND APPLICATIONS

The NFSMI FUNDamentals software provides a uniform reporting system and an analysis method that allows school administrators the capability of comparing financial position and operational performance of the district's SNP to other similar programs. It provides information that helps SNP administrators compare financial data from year to year, project revenues and estimate expenditures, monitor and evaluate program operations, and identify needed changes in a timely manner.

The school districts in this study used the financial data from reports generated by FUNDamentals to make decisions crucial to financial success and to benchmark within their operations. In some instances they were able to compare operational performance with other districts within their respective states. Having current audited financial information available on a monthly basis provided SNP administrators with the resources to conduct a continuous benchmarking process.

Data collected in this research project indicates that the standardized financial reports generated by the NFSMI FUNDamentals software could be used to study trends and establish national benchmarks. The software allows users to define parameters so that similar schools can be selected anonymously and used for comparing financial data. This includes elimination of school districts with a deviation from the parameters set by the user. The districts selected for comparison are identified only as sequential numbers (i. e. 1, 2, 3, etc.).

As schools struggle with the need for more accountability in all operational aspects, measurement of financial performance for purposes of benchmarking is becoming more important to school officials at all levels. One way to achieve this comparison is through publication of the district's SNP data to a national database that uses a consistent method for

reporting financial performance. Without uniformity and consistency to compare financial position and operational performance of similar districts, valid benchmarks are not possible.

It is important for more state agencies to "buy-in" to the establishment of a national financial database that aids in the collection of comparable financial information from school districts. Acceptance and use of the NFSMI FUNDamentals database over a period of time can generate local, state, regional, and national statistics that will assist in identifying trends and collecting valid benchmarks from SNPs that are comparable in size, location, number of meals served, and meal eligibility rates.

Due to the small size of the sample school districts used in the study, the statistical results are limited in scope and meaning. Further research using a larger number of school districts is necessary to establish trends and provide basic benchmarks. Currently the data is limited to three states which may affect the reliability of some variables. A larger cross section of states from across the nation would improve credibility and reliability of statistical findings.

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Appendix A

Sample Cover Letter

Date

Dear

We are pleased that you have expressed an interest in participating in a research study to help us identify financial data necessary for analysis of school nutrition programs and to determine the feasibility of importing the financial data necessary for analysis into a national database. The research findings from this study can be used to develop standards for collecting comparable financial performance data and establish financial performance measures.

During our one-day visit to your school district, we would like to review the following documents and reports relevant to analysis of school nutrition effectiveness. We are limiting our request to documents that are publicly available. The documents/records are:

- Student Participation in School Meals
- Percentage of Free/Reduced Price Meal Eligibility
- Revenue and Expenditure Statements
- Budget Variances
- Cost Analysis
- Productivity Rates
- Meal Equivalents for Non Reimbursable Food Sales
- Site Demographics
- Operating Ratios
- Others (any pertinent reports provided by school officials on a voluntary basis)

Your support of this study is important and we want to assure you that your school information will be kept in strictest confidence. Information will be recorded in such a manner that sites cannot be identified directly or through identities linked to sites. Participation in this project is completely voluntary and participants may withdraw from the study at any time.

This project has been reviewed by the Human Subjects Protection Review Committee, which ensures that research projects involving human subjects follow federal regulations. Any questions or concerns about rights for a research subject should be directed to the chair of the Institutional Review Board, The University of Southern Mississippi, Box 5147, Hattiesburg, MS 39406, (601) 266-6820.

Thank you for your help.

Sincerely,

Jerry B. Cater, PhD
Research Scientist
(601) 266-5773
Jerry.Cater@usm.edu

Appendix B

Structured Interview

Development of a National Database for
Collecting School Nutrition Program Data

1. Tell me about your experience with setting up the NFSMI FUNDamentals software application for your school district.

2. Are you generally more satisfied or dissatisfied with the software as an analysis tool? Why?

3. Which reports do you consider the most helpful in financial management decision-making?

4. Are there reports that you seldom use or do not consider helpful?

5. What changes would you recommend to the financial reports generated by FUNDamentals to make them better?

6. How often do you enter data in FUNDamentals?

7. Is the data entered manually or by file transfer from central office accounting?

8. How often do you generate reports using FUNDamentals?

9. In your opinion, would a national database using the FUNDamentals financial structure be helpful for benchmarking?

10. Is there anything else you would like to tell me about the software and your experiences as a user?

Appendix C

Cost Analysis 2003-2004 as Printed from FUNDamentals

Cost Analysis - 2003-2004

Meal Equivalent Ratios		
1.50	Breakfasts	= 1 Lunch
3.00	Snacks	
Meal Equivalent Factor	2.3475	

Participation

Program Enrollment	Meal Status	Approved Applications Count	Applications / Enrollment	Meals Served	Average Daily Served	% Part. ADP/ Enrollment	% Part. ADP/ Applications
Lunch	Free	2,931	0.85	444,144	2,467	71.46	84.19
	Reduced	163	0.05	23,678	132	3.81	80.70
3,453	Paid	359	0.10	55,773	310	8.97	86.31
	Totals	**3,453**		**523,595**	**2,909**	**84.24**	
Breakfast	Free	0	0.00	241,537	1,342	38.86	0.00
	Reduced	0	0.00	6,792	38	1.09	0.00
3,453	Paid	3,453	1.00	8,331	46	1.34	0.00
	Totals	**3,453**		**256,660**	**1,426**	**41.29**	
Snacks	Free	600	1.00	27,254	345	57.50	57.50
	Reduced	0	0.00	0	0	0.00	0.00
600	Paid	0	0.00	0	0	0.00	0.00
	Totals	**600**		**27,254**	**345**	**57.50**	

Revenues

Account	$ Amount	$/Meal
Adult Meal Sales	44,791.54	0.0579
Contract Meal Sales	16,390.10	0.0212
Donated Commodities	105,209.39	0.1360
Federal Source	1,445,581.20	1.8680
Fund Transfer-In	0.00	0.0000
Interest	13,130.90	0.0170
Miscellaneous	16,300.14	0.0211
Other Food Sales	89,867.41	0.1161
Other Local Source	0.00	0.0000
State Source	8,851.54	0.0114
Student Meals Sales	0.00	0.0000
Total Revenues	**1,740,122.22**	**2.2486**

Expenses

Account	$ Amount	$/Meal	Operating Ratio
Administrative Overhead	0.00	0.0000	0.00%
Capital Equipment	1,767.75	0.0023	0.10%
Donated Commodities	105,209.39	0.1360	6.05%
Employee Benefits	184,662.72	0.2386	10.61%
Food Production Supplies	82,644.48	0.1068	4.75%
Fund Transfer-Out	0.00	0.0000	0.00%
Gen. Operating Supplies	8,556.25	0.0111	0.49%
Indirect Costs	86,140.00	0.1113	4.95%
Miscellaneous	214.00	0.0003	0.01%
Property Maint., & Energy	20,091.71	0.0260	1.15%
Purchased Food	614,691.12	0.7943	35.32%
Purchased Tech Services	26,710.08	0.0345	1.53%
Salary & Wages	498,478.31	0.6441	28.65%
Total Expenditures	**1,629,165.81**	**2.1053**	**93.62%**

	Profit/Loss	Per Meal $
Revenues	$ 1,740,122.22	$ 2.2486
Expenditures	$ 1,629,165.81	$ 2.1053
	$ 110,956.41	$ 0.1434

Meals Per Labor Hour		
Total Meal Equivalents	773,856	= 15.6908
Total Labor Hours	49,319.00	

Indirect Cost Percentage:		0.1532%
Actual Indirect Expenses Paid	$	86,140.00
Generated Indirect Expenses	$	113,170.84
Overpay	$	0.00
Actual / Generated		76.12%
Indirect Generated CPME	$	0.1462

Beginning Fund Balance	$	428,318.08
Prior Year Adjustment	$	0.00
Total Revenues	$	1,740,122.22
Total Expenses	$	1,629,165.81
Current Fund Balance	$	539,274.49
Current Balance / 3 Month Average		99.30%

Commodity Value Per Lunch: $ 0.2009
Average Daily Other Food Sales per Lunch Enrollment: $ 0.0616
Ratio Other Food Sales / Total Meal Equivalents: 4.95%

Appendix D

Expenditure Categories for NFSMI FUNDamentals

Expenditure Categories
NFSMI FUNDamentals

CONTENTS

National Food Service Management Institute
The University of Mississippi
P. O. Drawer 188
University, MS 38677-0188
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Item number R-112-07 (GY 05)