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Food Stamp Participants' Access to Food Retailers

Final Report

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EXECUTIVE SUMMARY

The Food Stamp Program (FSP), administered by the Food and Nutrition Service (FNS) of the U.S. Department of Agriculture (USDA), provides financially needy households with benefits that are used for the purchase of food from authorized retailers. To receive food stamps, households must meet eligibility requirements (primarily related to income and assets). In 1996, the program provided more than $22 billion in benefits to an average monthly caseload of about 22 million individuals in 9 million households.

One objective of the National Food Stamp Program Survey (NFSPS), conducted between June 1996 and January 1997 by Mathematica Policy Research, Inc. (MPR), was to gain a perspective on the food shopping opportunities of FSP participants and other low-income households by obtaining and analyzing survey information from program participants and eligible nonparticipants. In this report, data from the NFSPS are used to address several important questions concerning food store access of low-income households, including: (1) At what kinds of stores do low-income households shop? (2) What distances do low-income households travel to reach those stores? (3) What transportation methods do they use to reach their food stores? (4) Do low-income households engage in careful shopping behaviors that can allow them to get the most out of the money and food stamp benefits they spend on food? and (5) In general, how satisfied are low-income Americans with their shopping opportunities?

PRINCIPAL FINDINGS

Previous research conducted as part of the FNS Authorized Retailer Characteristics Study (Mantovani and Welsh 1996) had found that "a large majority of low-income households are in close proximity to a full-line grocery store or supermarket" but that distances to food stores were sometimes much larger for the minority of households living in rural areas. Similar conclusions were reached in the FNS Evaluation of the Expanded EBT Demonstration in Maryland (Cole 1997). Past research has also suggested that most Americans tend to rate the stores they use relatively highly on consumer satisfaction scales (Food Marketing Institute 1998).

As summarized below, the current research indicates that these earlier findings apply in general to FSP participants and eligible and near-eligible nonparticipants. In addition, it extends these findings by reporting attitudinal data relating to the reasons for the observed shopping patterns of this population.

Most low-income households use supermarkets as their main type of food store. Nearly 90 percent of survey respondents indicated that they relied principally on supermarkets for their food purchases. In addition, however, many also reported making use of several other types of stores, including smaller neighborhood grocery stores, convenience stores, warehouse or discount stores, and specialty food stores. Forty-two percent used convenience stores, 36 percent used bakeries, and 33 percent shopped at produce stands.

Approximately one-third of low-income households usually shop for food within a mile of where they live. Another third shop at stores between one and four miles away. However, many food stamp recipients do not shop at the store nearest them. The average round trip takes about 24 minutes.

For households who do not usually shop in their neighborhoods, the most common reasons for going to other areas to shop were high prices in their neighborhood (47 percent) and lack of stores (51 percent). Being embarrassed to use food stamps locally and crime rates were only infrequently mentioned (two percent and one percent of households, respectively).

Most low-income households use the automobile as their form of transportation for food shopping, but fewer than half use their own car. Approximately 45 percent of food stamp recipients drove themselves to food shopping, while another 31 usually got rides with friends or relatives. The next most commonly reported method of transportation to the food store was walking (14 percent overall and 17 percent for the elderly). Approximately 20 percent of food stamp participants had out-of-pocket costs for transportation to purchase food, with about 17 percent having out-of-pocket costs of $4.00 per trip.

Substantial majorities of the respondent households reported that they either usually or fairly often engaged in "careful shopping" activities designed to stretch their food-buying resources. Among the most commonly reported activities were comparing prices across supermarkets, looking for grocery "specials," and stocking up on bargains.

Depending on the specific criterion used, between 80 and 90 percent of the low-income households in the sample indicated that they regarded the store they go to as either "good" or "excellent." For instance, 88 percent gave their stores one of these ratings for cleanliness, 82 percent gave these ratings for the quality of the meat, and 86 percent gave these ratings for courtesy of the store employees. While quite high, these satisfaction level responses are lower than those given by the general U.S. population for similar questions. (The differences tend to be about five percentage points and are not statistically significant).

Among respondents who shopped within their neighborhoods, more than 85 percent characterized themselves as either very satisfied or somewhat satisfied with the neighborhood shopping opportunities. About seven percent were very dissatisfied. Not surprisingly, satisfaction levels were lower among households who did not regularly shop in their neighborhoods. However, even among this group, between 41 percent (for participants) and 63 percent (for near-eligible nonparticipants) indicated that they were very satisfied or somewhat satisfied with the food shopping available to them where they lived.

When asked about the types of improvements they would like to see in the shopping situations of their neighborhoods, respondents commonly mentioned the introduction of more supermarket shopping opportunities. In addition, many respondents cited lower prices and better selection of foods.

The nutrient efficiency of food purchases in terms of cost per nutrient obtained varies by nutrient and by type of store. Convenience stores have the highest nutrient efficiency for calcium and vitamin A, presumably reflecting the fact that many people rely on convenience stores for much of their milk. Interestingly, specialty stores, which include bakeries, meat markets, health food stores, and other food stores whose range of merchandise is limited, rank high in the distributions of food energy, vitamin A, and iron. Supermarkets are not at the top of any of the rankings, which probably reflects the fact that they sell a full range of products and, correspondingly, do not specialize in any particular area. Discount stores seem in general to have high efficiency ratios, perhaps reflecting their low prices.

DATA AND METHODS

The household surveys were based on samples obtained from two frames: (1) a list frame consisting of administrative lists of FSP participants, which yielded a sample of FSP participants, and (2) a random-digit-dialing (RDD) frame, which yielded samples of FSP-eligible and near-eligible nonparticipants, as well as some FSP participants. Overall, MPR completed surveys of 2,454 FSP participants, 450 FSP-eligible nonparticipants, and 405 near-eligible nonparticipants. The data have been weighted to make them nationally representative of these populations.

Since most of the research questions addressed in this report are descriptive, most findings are based on tabular and cross-tabular analysis.

The data assembled for the study represent a solid basis for examining the research questions on store access. As with all survey data, however, they have limitations that should be noted in interpreting the analysis. The four most important of these are:

1. ***Lags between participant sampling and data collection*** meant that considerable numbers of participants had dropped off food stamps by the time they were contacted. Since many of the research questions involved active participants, these dropouts were not interviewed. As a result, the sample tends to have too many long-term food stamp participants and too few short-term participants. However, no reason seems to exist for believing that shopping patterns would be different for long-term versus short-term participants.

2. ***The lack of nonparticipants without telephones*** meant that the sampling methodology effectively limited the nonparticipant sample to households with telephones. Although the sample has been post-stratified in an attempt to correct for this, the correction is probably not complete. To the extent that nonparticipants without phones are different from those with phones, the non-telephone households are not reflected in the analysis.

3. ***The accuracy of nonparticipant eligibility determination is only approximate,*** since nonparticipant eligibility was determined with a short screening instrument that could not fully replicate all the complex eligibility criteria the FSP uses in assessing applicant eligibility. Furthermore, even for the full interviews, in which more-detailed data on

income, household expenses, and living arrangements were obtained, the data were not sufficient to fully replicate the information obtained during an FSP application. As a result, the determinations of "FSP-eligible" and "FSP-near-eligible" used in the analysis must be taken as approximations; some households were undoubtedly misclassified.

4. ***There are a substantial number of missing observations in the geocoding data used, in part, to estimate distances to stores.*** Approximately 40 percent of the cases attempted could not be coded.

I. INTRODUCTION

The Food Stamp Program (FSP), the largest of the 15 nutrition assistance programs administered by the Food and Nutrition Service (FNS) of the U.S. Department of Agriculture (USDA), is the cornerstone of America's strategy for ensuring that all Americans have enough to eat. Households participating in the FSP receive benefits that are used to purchase food from authorized retailers. Households must meet eligibility requirements--primarily related to income and assets--in order to receive food stamps. In 1996, the program provided more than $22 billion in benefits to an average monthly caseload of 22 million individuals in 9 million households.

Because the FSP is such an important part of the nation's policy for providing assistance to low-income households, it is essential that the program be assessed periodically to see how well it is achieving its objectives. The National Food Stamp Program Survey (NFSPS), conducted in 1996 by MPR, was designed to obtain and analyze survey information from program participants and eligible nonparticipants to assess key aspects of how well the program is meeting the needs of low-income households requiring food assistance. Three areas of the FSP structure and operations are of particular interest in the current study:

1. Customer service
2. Access to authorized food retailers
3. Food security and benefit adequacy

This report summarizes the findings on access to food retailers. The rest of this introductory chapter provides a context for the report. Section A provides a brief overview of the FSP. Section

B discusses current issues regarding access to food retailers. The research questions are discussed in Section C, and the organization of the rest of the report is described in Section D.

A. AN OVERVIEW OF THE FOOD STAMP PROGRAM

The objective of the FSP, as stated in its authorizing legislation, is to "permit low-income households to obtain a more nutritious diet through normal channels of trade by increasing food purchasing power for all eligible households who apply for participation" (see Food Stamp Act of 1977, as amended Section 2). To accomplish this, the USDA administers a multibillion-dollar program that provides services throughout the United States.

Eligibility standards and benefit levels for the program are set by Congress. Broad policy guidance in implementing these standards is provided by FNS, through its headquarters in Alexandria, Virginia, and through regional offices in various parts of the country. FSP benefits are federally funded. Program administrative costs are shared by federal, state, and local governments. Direct administration of the program on a day-to-day basis is carried out by the states (or, in some areas, by counties, under state supervision).

1. Eligibility Criteria

Households must meet eligibility requirements to receive food stamps. Households may have no more than $2,000 in countable resources, such as a bank account ($3,000 if the household contains at least one person age 60 or older). Certain resources (such as a home and lot) are not counted. Households have to meet at least one, and usually two, income tests unless all members are receiving Temporary Assistance for Needy Families (TANF), Supplemental Security Income (SSI), or, in some places, General Assistance (GA). The gross income test assesses whether the household's gross income exceeds 130 percent of the poverty level for its household size. The net

income test is based on gross income minus certain deductions for expenses and other factors. To be eligible, a household must have net income below the poverty level. Most households must meet both the gross and net income tests, but a household with an elderly person or a person who is receiving certain types of disability payments has to meet only the net income test. Except for those exceptions noted, households with income over the limits for their size are not eligible to receive food stamps.

The welfare reform act of 1996 and other recent legislation have ended eligibility for many immigrants and placed time limits on benefits for able-bodied, childless adults. For noncitizens, eligibility depends on a complex set of factors, including age, date of entry into the country, veterans status, and refugee status. If citizenship is in doubt, proof is required. Alien status must be verified. With some exceptions, able-bodied adults between age 16 and 60 must register for work, accept suitable employment, and take part in an employment and training program to which they are referred by the food stamp office. Failure to comply with these requirements can result in disqualification from the program. In addition, able-bodied adults between age 18 and 50 who do not have any dependent children can get food stamps for only 3 months in a 36-month period if they do not work or participate in a workfare or employment and training program other than job search. However, this requirement can be waived in some locations.

2. Benefits

Applicant households that meet the legislated income and asset standards are certified as eligible for the program. Once certified, households receive monthly benefits, with the amount based on their income (net of certain deductions) and household size. Benefit levels are determined through formulas derived from the "Thrifty Food Plan," a set of estimated expenditure levels needed to maintain adequate diets.

Households have traditionally received benefits in the form of food coupons. Depending on local procedures and household circumstances, these coupons are issued in one of several ways. They may be sent to clients through the mail, issued directly over the counter at welfare offices, or provided through intermediaries (such as banks or check-cashing establishments) when participants show an Authorization-to-Participate (ATP) card.

Except in a few relatively uncommon circumstances, food coupons can be exchanged only for eligible food items at authorized food retailers, of which there are more than 180,000 throughout the country. The federal government has responsibility for accepting applications from retailers who wish to participate in the program and for formally authorizing retailer participation. The federal role also includes monitoring retailers in the program and sanctioning them if they are found to engage in activities that are not in compliance with program rules, such as giving customers cash or nonfood merchandise in exchange for food stamps.

The majority of food stamp households now receive their benefits through electronic benefit transfer (EBT) systems, debit-card type mechanisms that debit food stamp accounts electronically after food is purchased at participating retailers. All states are required by law to set up EBT systems by the year 2002. It is anticipated that this will have several effects, including making it harder for food stamp trafficking to occur (selling food stamps for cash), streamlining check-out operations, and reducing the stigma felt by some participants when using food stamp coupons. Fifty-one percent of households, receiving 52 percent of total benefits, were using EBT issuances as of October 1998. Approximately nine percent of the participant sample in the NFSPS received food stamp benefits through EBT.

B. ISSUES REGARDING ACCESS TO FOOD RETAILERS

This current report is part of an ongoing effort by FNS to examine food stamp recipient access to retailers. An earlier analysis, the FNS Authorized Retailer Characteristics Study, examined issues related to store access using Census data about the demographics of the populations in areas where authorized Food Stamp Program stores are located. However, unlike the current study, it did not include collecting data on access issues directly from program participants. Below, the issues that have been of concern in both of these studies are discussed.

It is often suggested that low-income households, especially households in low-income urban areas and sparsely populated rural areas, have limited access to food retailers and that this poses a significant obstacle for FSP participants in using program benefits efficiently and effectively to improve their diets. Low-income households may not have access to cars and may be limited to using stores that they can reach on foot or by public transportation. This in itself is a significant limitation on access, when compared with shopping opportunities for middle-income households. The situation may be compounded by possible limitations in shopping opportunities in areas with a high concentration of low-income households. Many observers believe that major retailers, concerned about business, security, limited consumer purchasing power, and other factors, shun low-income areas, charge higher prices, and provide lower-quality merchandise.

These issues are of concern in the context of the FSP, because they directly relate to the effectiveness with which its policies can be carried out through the "normal channels of trade," as specified in the program's authorizing legislation. They also interact with food stamp policy issues, since FSP participant access to stores is dependent upon what stores are authorized to accept food stamps. More generally, analyzing the degree to which low-income households have access to

stores, and the shopping choices they make in the context of those choices, sheds light on the constraints they face in securing nutritious diets.

From a conceptual perspective, ensuring access to food retailers by low-income households involves factors related both to the existence of food stores at reasonable distances from the households and to the ability of low-income households to get to those stores. Further, assessing the availability of stores in a meaningful way depends both on examining where they are located and on assessing the quality of the shopping opportunities they offer, in terms of prices, quality of merchandise, variety of merchandise, and other factors. Similarly, the ability of households to reach stores readily depends not only on the stores' locations but also on whether the household has access to a car and on what other means of transportation is available.

The FNS Authorized Retailer Characteristics Study provided extensive insight into the store side of this "access equation."[1] That study examined the availability of various types of food stores in both urban and rural areas throughout the country. For a sample of the stores, it also obtained data on the prices charged for a standard set of food items, as well as on other characteristics.

The key findings of the study suggest greater degrees of access to stores by low-income households than many observers had expected. The study found that, nationally, "90 percent of the total population and 90 percent of the populations under the poverty line live in zip codes with at least one supermarket or large grocery present."[2] Proximity to stores was less common in rural areas but did not vary by the poverty level of the population. Apparently, scarcity of food stores in rural areas is mostly a result of retailers' efforts to gain economies of scale.

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[1]Mantovani, Richard E., Lynn Daft, Theodore F. Macaluso, and Katherine Hoffman. "Food Retailers in the Food Stamp Program: Characteristics and Service to Program Participants." USDA, February 1997.

[2]See page iii of Montovani, Daft, Macaluso, and Hoffman.

The study also concluded that, among supermarkets, there did not appear to be major cost differences in areas with different poverty concentrations: "The price of our market basket was either about the same or lower among supermarkets and large groceries in high-poverty areas as among those in lower-poverty areas" (two-page "Summary" of project report).

The FNS Authorized Retailer Characteristics Study greatly increases our understanding of store access by low-income households, based on Census data linked to store location information. The current survey has obtained complementary information by asking respondents about their food shopping experiences, their transportation to food stores, their food shopping patterns, and their perceptions of the adequacy of their food shopping opportunities.

C. RESEARCH QUESTIONS RELATED TO STORE ACCESS

The NFSPS provides an important opportunity to explore issues related to store access from the standpoint of participants and other low-income households.

The key research questions addressed in this report are:

1. How far, on average, do FSP participants and other low-income households travel to buy their food?
2. To what degree do they shop at the store nearest them?
3. How many of them usually shop at supermarkets?
4. For those who don't usually shop at supermarkets, is the reason principally lack of access or some other factor?
5. To what degree do FSP participants and other low-income households organize their shopping to obtain maximum value for their money and food stamp benefits?
6. What is the nutritional efficiency of these households' shopping (in terms of nutrients obtained per dollar) at different types of stores?

7. Overall, how satisfied are FSP participants and other low-income households with their shopping opportunities?

D. THE REMAINDER OF THE REPORT

The rest of this report is organized into four chapters. Chapter II describes the NFSPS and describes the characteristics of the participant and nonparticipant samples. Chapter III presents findings on the shopping patterns of FSP participants and other low-income households. Chapter IV presents findings on the levels of access to stores experienced by these households. Chapter V summarizes conclusions from the analysis.

II. DATA AND METHODS

This chapter provides an overview of the data collection methodology underlying the NFSPS and the characteristics of the participant and nonparticipant samples analyzed in this report. In addition, it describes analysis methods, including the weights that were constructed to make the participant and nonparticipant data nationally representative. Limitations of the data and analyses, as well as how they may affect the findings, are also discussed.

A. SAMPLING AND DATA COLLECTION METHODS

Addressing the research objectives highlighted in Chapter I, as well as those of the other reports based on the NFSPS, required obtaining nationally representative data from three different sets of households:

1. A sample of FSP participants, who could provide information about their experiences with the program, their access to stores, their food security, and their food use

2. A sample of FSP-eligible nonparticipants, who could provide information about their reasons for nonparticipation, their levels of food security and need for food stamp assistance, and their access to food stores

3. A sample of "near-eligible" nonparticipants with which to examine the characteristics of households who were just above the established eligibility limits, as well as about their access to foodstores

Efficiently obtaining data from all three of these groups required a multifaceted data collection design as described below. (See Appendix A for a detailed discussion of the methods used to select the sample, conduct the survey, and process the data.)

1. The Household Surveys

The household surveys, conducted between June 1996 and January 1997, were organized and directed from MPR's main survey facilities near Princeton, New Jersey, and were based on samples obtained from two sample frames: (1) a list frame consisting of administrative lists of FSP participants, and (2) a random-digit-dialing (RDD) frame.

a. Nonparticipant Household Surveys

For identification of eligible and near-eligible nonparticipants for the data collection, randomly drawn U.S. telephone numbers were called and given a short screening interview to determine (1) whether the phone number was for a household rather than a business, and (2) whether the household appeared to meet (eligible) or almost meet (near-eligible) criteria for food stamps. Households who passed this screen, were not FSP participants, and were willing to participate in the survey were then given a full nonparticipant household interview. The number of completions from the RDD frame was 450 eligible nonparticipants and 405 near-eligible nonparticipants.

In implementing this approach for the RDD sample, RDD respondents were first asked whether they were receiving food stamps and what their household size was. They were then asked whether the household's monthly income was greater than or less than "X," where "X" was set at 150 percent of the poverty level for a household of that size. Households that passed this initial screen and were not receiving food stamps were then tracked into the full nonparticipant interview, which obtained detailed income, asset, and shelter information. Using these detailed data, gross and net income and deductions, as defined by the FSP, were calculated, as well as countable household assets. Households whose reported income and assets were under the applicable program limits were then

placed in the "eligible nonparticipant" sample. Households that were not under these limits but that had assets less than $15,000 were placed in the "near-eligible nonparticipant" sample.[1]

b. Participant Household Surveys

MPR completed 2,454 interviews with FSP participants. Of these, 2,150 were sampled from the participant list frame (lists of FSP households provided by states or local food stamp offices). Essentially, this participant list sample frame can be regarded as a random sample of the overall food stamp participant population at a given point in time. An additional 304 interviews came from the RDD frame.[2]

In-Person Participant Household Survey from List Frame. A total of 1,109 in-person interviews were completed with FSP participants from the list frame. These interviews were conducted in person to obtain data on participant households' food use and shopping behaviors. The in-person participant survey was clustered in a limited number of locations, both to allow efficiencies in obtaining the samples (see below) and to limit interviewer travel costs. Thirty-five "primary sampling units" (PSUs), usually counties, were randomly selected from throughout the country, with probabilities of selection proportional to size. Next, machine-readable lists of FSP participants were obtained from state or local programs for each of these PSUs, and random samples of participants were drawn and then interviewed.

This data collection was conducted in respondents' homes through computer-assisted personal interviewing (CAPI) on laptop computers. In general, it consisted of two main parts. First, after

[1]All households that got this far in the assignment process had reported gross incomes less than 150 percent of the poverty level, since otherwise they would have been screened out during the initial part of the RDD screener interview.

[2]Sample sizes were based on targets set during the design stage of the project, based on trade-offs between precision requirements and costs.

setting up an appointment by telephone, the data collector visited the respondent's home and conducted an interview of about one to one-and-one-half hours, which covered all the survey topics other than those related to the household's food use. At the end of the first appointment, the household was given instructions about how to maintain food use records for the coming week, and a repeat appointment was scheduled for seven days later. During this second interview, which typically took between 90 and 150 minutes, information about the households' food use for the previous week was recorded through a paper and pencil data collection instrument. The number of in-person FSP participant interviews conducted was determined largely based on statistical precision requirements for the analysis of the food use data.

Telephone Participant Household Surveys from List Frame. An additional 1,041 participant interviews were completed by telephone with computer-assisted telephone interviewing (CATI) using an additional sample from the FSP participant list frame. It was efficient to conduct some of the participant interviews over the telephone rather than in person, since the questions about food use and detailed shopping behaviors were not administered to all participants. Therefore, a second sample of participants was drawn from the same set of 35 PSUs discussed in the previous section. While clustering was not necessary for the actual data collection with this second sample, there were still considerable costs in assembling the sample frames of participants, so at least some clustering was still efficient. As a result, it was decided that using exactly the same PSUs for the telephone participant survey as for the in-person survey would yield maximum efficiencies. The numbers of CATI interviews from the list of sample frames were chosen based on trade-offs between desired levels of statistical precision in the planned analysis and data collection costs.

Telephone Participant Household Surveys from the RDD Frame. While the main purpose of the RDD sample frame was to identify nonparticipants, a number of FSP participants were also

identified. To supplement the list frame sample, these households were administered a slightly modified version of the list frame participant interview. A total of 304 households were identified through the RDD calls as being FSP participants and agreed to be interviewed.

2. Response Rates

Table II.1 summarizes the response rates that were obtained in the various parts of the data collection. With the field list sample, 1,109 (1,070 + 39) laptop CAPI interviews were obtained out of 2,200 sample points released. However, 596 of the sample points proved to be ineligible for the survey by the time they were contacted, usually because they were no longer receiving food stamps. When these ineligibles are removed from the base, the response rate is 69 percent. A small number of the in-person cases completing the first part of the interview failed to complete the food-based second part a week later, leading to a response rate for the food use data of 67 percent.

In the telephone sample, 1,041 responses were obtained out of a total eligible sample of 1,535, a 68 percent response rate.

For the RDD sample, 14,514 numbers were released, of which 5,219 were determined ineligible for the screener, mostly because they were either nonworking or business numbers. Another 1,807 could not be determined. Of the remainder, 6,429 completed the screener, for a completion rate of 75 percent. At the next stage of this interviewing, 1,159 households completed full interviews out of a total of 1,456 (1,159 + 297) that had passed the screen, yielding a response rate of 80 percent for the full interview, conditional upon passing the screen. The combined overall response rate for this sample is 60 percent.

TABLE II.1

SURVEY RESPONSE RATES

Field List Sample	
Total Released	2,200
Eligible Completes with Food Use	1,070
Eligible Completes with No Food Use	39
Eligible Noncompletes	495
Ineligibles	596
CAPI Response Rate	.69[a]
Food Use Response Rate (if CAPI portion completed)	.96[b]
Combined CAPI-Food Use Response Rate	.67[c]
Phone List Sample	
Total Released	2,121
Eligible Completes	1,041
Eligible Noncompletes	494
Ineligibles	586
Response Rate	.68[d]
RDD Sample[e]	
Total Released	14,514
Screener	
Eligible completes	6,429
Eligible noncompletes	1,059
Ineligible	5,219
Undetermined	1,807
Screener response rate	.75[f]

TABLE II.1 *(continued)*

Interview	
Eligible completes	1,159
Eligible noncompletes	297
Ineligible	4,973
Interview response rate	.80[g]
Overall Response Rate	.60[h]

[a]Computed as 1,109/(1,109 + 495).

[b]Computed as 1,070/1,109.

[c]Product of previous two rates.

[d]Computed as 1,041/(1,041 + 494).

[e]The RDD response rates are adjusted to account for (1) inability to determine whether some of the telephone numbers in the original sample were eligible for the screener; and (2) of those eligible for the screener, inability to determine whether households were eligible for the full survey. The derivation of these response rates, taking these factors into account, is displayed below:

[f]Screener response rate:
$$\frac{12{,}707}{14{,}514} \cdot \frac{6{,}429}{7{,}488} = \frac{6{,}429}{6{,}429 + 1{,}059 + 1{,}807 \cdot ER} = .7517$$

where screener eligibility rate adjustment *ER* equals:

$$\frac{6{,}429 + 1{,}059}{6{,}429 + 1{,}059 + 5{,}219} = .5894$$

[g]Interview response rate:
$$\frac{1{,}159}{1{,}159 + 297} = .7960$$

[h]Combined screener-interview response rate:

$$\frac{12{,}707}{14{,}514} \cdot \frac{6{,}429}{7{,}488} \cdot \frac{1{,}159}{1{,}456} = \frac{1{,}159}{1{,}159 + 297 + 1{,}509 \cdot ER \cdot ER2} = .5984$$

where interview eligibility rate *ER2* equals:

$$\frac{1{,}159 + 297}{1{,}159 + 297 + 4{,}973} = .2265$$

B. ANALYSIS METHODS

The research questions for this study are descriptive. Such issues as distance to stores most frequented or satisfaction with shopping opportunities can be addressed directly from the relevant data. Therefore, the analysis is based largely on tabulations of the relevant data. The sections below highlight a number of issues that have been addressed in implementing this overall approach.

1. Weighting

The survey was designed to achieve a nationally representative sample by obtaining essentially the same number of list frame interviews in each PSU, except for self-representing PSUs, where the target sample sizes were adjusted upward to reflect their relative sizes appropriately.[3] However, because of a variety of practical considerations, achieving this goal of equal sample sizes was not always completely possible, and as a result households in different PSUs effectively had somewhat different probabilities of selection. Weighting was used to adjust for this and make the sample representative of the national caseload. The weights used were based on the inverses of the probabilities of selection.

Weighting was also used when combining the three participant samples (list frame in-person, list frame phone, and RDD). Each of these samples was self-representing (except for the issues discussed in the previous paragraph), but because of their different sample sizes, combining the three directly by weighting observations from each equally was not statistically efficient in terms of minimizing variances. As a result, weights were constructed that reflected the different variances implicit in the different sample sizes. (See Appendix B.)

[3]Self-representing PSUs are ones that by themselves contained at least one thirty-fifth of all food stamp cases nationwide and were therefore taken into the sample with certainty.

Weighting was used for the nonparticipant sample for a different reason. There was concern that the sample would not be representative, because the RDD data collection methodology that was used meant that only households with telephones could be included in the sample. To correct for this at least partially, it was decided to post-stratify the nonparticipant sample, so that it would better reflect the population of low-income households who do not receive food stamps. This was done by assigning weights based on household characteristics, such that the weighted sample was similar to control data from the Census Bureau's Current Population Survey with regard to those characteristics. The methods used in doing this are presented in Appendix B.[4]

2. Calculation of Variances

Because of the clustering of the sample and the weighting factors used, the standard methods for computing the variances of sample estimates that are applicable to simple self-weighting samples (and are routinely generated by most statistical software programs) do not apply to most of the tabulations presented in this report. In general, the variances of estimates from the current sample are higher than those that would be applicable to a simple self-weighting sample. This has been taken into account in the analysis.

Appendix C presents, for selected variables, variances that have been computed using the STATA analysis package, which uses Taylor's Series methods for taking into account the sample design. As shown in that appendix, the design effects for the participant sample tend to be on the

[4]Whereas FSP participant households without phones were included in the in-person list sample frame, such households were not included in either the CATI participant list frame or the RDD frame. Thus, an issue regarding coverage of households without phones is also relevant for the participant sample. However, the number of FSP participants identified from the RDD frame is small (304 cases, or 12 percent of the unweighted FSP sample). In addition, some of the phone list sample cases without phones were followed up in person by field staff using cellular phones to complete the interview. Therefore, it was decided that the statistical gain from adjusting the participant sample for telephone coverage did not warrant the costs.

order of "3," meaning that variances are about three times those that would be observed in a simple self-weighting sample of the same size. This in turn implies that confidence interval widths around descriptive statistics are increased by a factor of about 1.76. Design effects are in general considerably lower for the nonparticipant sample, since this sample was not clustered into a limited number of PSUs.

C. LIMITATIONS OF THE DATA AND ANALYSIS

The data assembled for the study represent a solid basis for examining the research questions highlighted earlier. As with all survey data, however, they have limitations that should be noted in interpreting the analysis. The most important of these are discussed below.

1. Lags Between Participant Sampling and Data Collection

The list frame participant sample was obtained in spring 1996; however, the data collection extended into early 1997. This means that by the end of the survey, the sample was about eight months old, and considerable numbers of participants had dropped off food stamps by the time they were contacted. Since many of the research questions involved active participants, these dropouts were not interviewed. As a result, the sample tends to have too many long-term food stamp participants and too few short-term participants.

2. Lack of Nonparticipants Without Telephones

As noted above, the sampling methodology effectively limited the nonparticipant sample to households with telephones. While the sample has been post-stratified in an attempt to correct for this, the correction is probably not complete. To the extent that the differences between

nonparticipants without phones and those with phones were not adjusted for, the non-telephone households are not reflected in the analysis.

3. Accuracy of Nonparticipant Eligibility Determination

At the beginning of the interview, nonparticipant eligibility was determined with a short screening instrument. It was not possible in this context to fully replicate all the complex eligibility criteria the FSP used in assessing applicant eligibility. Further, even for the full interviews, in which more-detailed data on income, household expenses, and living arrangements were obtained, the data were not sufficient to fully replicate the information obtained during an FSP application. As a result, the determinations of "FSP-eligible" and "FSP-near-eligible" used in the analysis must be taken as approximations; some households were undoubtedly misclassified.

D. DESCRIPTION OF THE SAMPLES OF PARTICIPANTS AND NONPARTICIPANTS

Interviews were completed with a total of 3,309 households for the NFSPS: 2,454 households participating in the FSP and 855 households not participating (450 estimated eligible nonparticipant households and 405 ineligible nonparticipant households). This section presents (weighted) descriptive statistics for the samples of participants and nonparticipants.

FSP participants, eligible nonparticipants, and near-eligible nonparticipants differ substantially on their economic and demographic characteristics (Table II.2). FSP participant households are more disadvantaged economically than eligible nonparticipant and near-eligible nonparticipant households. Average annual gross income of FSP participant households is approximately $8,468, which is about $1,500 less than for eligible nonparticipants and more than $6,000 less than for near-eligible nonparticipants. FSP households were substantially more likely to be on AFDC (now TANF) than eligible nonparticipant households (30 percent versus 1 percent) or receive SSI (22

TABLE II.2

CHARACTERISTICS OF FOOD STAMP PARTICIPANT AND NONPARTICIPANT HOUSEHOLD SAMPLES
(Percentage of Households, Unless Stated Otherwise)

Characteristic	Participants	Nonparticipants	
		Eligible[a]	Near-Eligible[b]
Household Characteristics			
Average Household Size	3.0	2.7	3.1
Household Contains:			
Elderly[c]	26.5	44.2	31.5
Single person[d]	24.5	31.0	21.5
Children[e]	63.5	40.4	50.4
Single parent with children[f]	34.9	6.0	10.8
Multiple adults with children[g]	28.6	34.4	39.6
Household Receives:			
Earned income	32.5	52.7	67.0
No income	6.0	0.0	8.4
Aid to Families with Dependent Children (AFDC)	30.0	1.1	1.2
General Assistance (GA)	5.7	0.9	0.5
Supplemental Security Income (SSI)	22.3	6.8	3.9
Social Security Income	28.3	37.2	27.4
Average Annual Gross Income	$8,468	$9,953	$14,906
Average Monthly Food Stamp Benefit	$166	n.a.	n.a.
Residential Location			
Urban	52.2	45.3	38.5
Mixed	28.7	30.3	32.7
Rural	13.3	18.1	19.0
Missing	5.9	6.4	9.4
Demographic Characteristics of Respondent[h]			
Race/Ethnicity			
African American (not of Hispanic origin)	32.7	16.8	11.6
Asian/Pacific Islander	1.8	1.4	2.6
Hispanic	16.1	14.9	14.1
Native American	1.3	1.3	1.5
White (not of Hispanic origin)	46.9	64.7	69.7
Other	1.1	0.9	0.5
Missing	0.1	1.5	2.4
Age			
Less than 20 years	2.9	2.2	2.7
20 to 49 years	67.3	49.1	58.3
50 to 59 years	10.5	11.2	13.6
60 years or more	19.3	37.4	25.5
Female	84.8	76.6	72.5
Marital Status			
Never married	35.0	15.3	13.8
Currently married (formal or consensual union)	18.6	44.8	49.5
Separated or divorced	33.1	18.0	21.9
Widowed	12.7	21.1	13.8
Missing	0.6	0.8	1.0

TABLE II.2 *(continued)*

Characteristic	Participants	Nonparticipants	
		Eligible[a]	Near-Eligible[b]
Highest Grade Completed			
Less than high school	43.1	36.0	28.3
High school/GED	37.7	44.1	46.2
Associate/BA	8.9	11.4	12.7
Vocational certificate	4.1	3.1	3.8
Other	6.2	5.3	9.0
Missing	0.1	1.4	2.8
Sample Size	**2,454**	**450**	**405**

SOURCE: 1996 Food Stamp Survey, weighted data.

[a]Households that meet the income and asset tests for eligibility for food stamps.

[b] Households that do not meet the income or asset tests for eligibility for food stamps and whose gross income does not exceed two times the poverty level for their household size, do not have non-vehicle or non-house assets greater than $15,000, and do not have vehicle assets that exceed $25,000.

[c]Households that contain at least one member age 60 years or older.

[d]Households that contain only one member.

[e]Households that contain at least one member age 18 or younger.

[f]Households that contain only one member older than age 18 and children (at least one member age 18 or younger).

[g]Households that contain two or more members older than age 18 and children (at least one member age 18 or younger).

[h]Respondent most responsible for the finances of the household.

n.a. = not applicable.

percent versus 7 percent). About one-third of households participating in the FSP have earnings, compared with somewhat more than half of eligible nonparticipants and two-thirds of near-eligible nonparticipants.

Households were classified as urban if they lived in a zip code where 90 percent or more of the population lived in a Census-defined "urbanized area." Those with zip codes where 10 percent or fewer households lived in an urbanized area were classified as rural.[5] The remainder were classified as mixed. As shown in the table, 52 percent of the participant sample is classified as urban, 29 percent as mixed, and 13 percent as rural. The relevant data are missing for six percent of the sample.

Among the three study groups, there are also important differences in household composition. FSP households are substantially more likely to contain children, and particularly to be single-parent households with children. Nearly two-thirds of FSP households have children, and one-third are headed by a single parent. Of eligible nonparticipating households, 40 percent contain children, while only 6 percent are headed by a single parent. FSP households are less likely to contain elderly people: about 27 percent of FSP households contain at least one elderly member, compared with 44 percent of eligible nonparticipating households.

With regard to demographic characteristics of the person responsible for the finances of the household, FSP participants are more likely than eligible and near-eligible nonparticipants to be African American, between 20 and 49 years of age, and unmarried/separated/divorced (Table II.2).

[5]These conventions for defining urban and rural parallel those used in the FNS Authorized Retailer Characteristics Study (Montovani, Daft, Macaluso, and Hoffman 1997), Technical Report IV, page IV-6.

E. COMPARISONS OF THE FOOD STAMP SAMPLE WITH OTHER DATA ON FOOD STAMP RECIPIENTS

As noted above, there is at least one significant reason for believing that the sample of food stamp participants is not fully representative--the lags in the sampling and interviewing processes, which resulted in some of the sample having left food stamps before being contacted. Other reasons for differences could include (1) statistical sampling variance in either stage of the sampling process (PSUs and participants); and (2) nonresponse bias, which could be present if some categories of FSP participants are less likely than others to be located and to agree to an interview.

To assess the representativeness of the sample, tabulations were generated of two other national data sources that have characteristics of samples of food stamp participants. One of these sources, the Food Stamp Quality Control Sample (FSQC), is a data set compiled from FSP administrative records. The second source, the Survey of Income and Program Participation (SIPP), is an ongoing survey of American households conducted by the Bureau of the Census, with a special emphasis on examining households' participation in programs for low-income families.

Comparisons with these other nationally representative samples of FSP participants reveal that the current NFSPS contains more participating households with elderly people and fewer receiving welfare payments than do the other sources (Table II.3). Twenty-seven percent of NFSPS participant households contain elderly people, compared with 16 percent of FSP participants in the FSQC and 18 percent of FSP participants in the SIPP. Thirty percent of NFSPS participants receive AFDC, compared with 38 percent of FSQC participant households and 45 percent in the SIPP. Nearly one-third of NFSPS households participating in the FSP reported having earnings, compared with 21 percent and 22 percent, respectively, for FSP participants in the FSQC and SIPP data sets. In general, FSP participants in the NFSPS reported higher income and lower food stamp benefits than participants in the FSQC and SIPP (Table II.4). The reason for this latter finding is not clear.

TABLE II.3

CHARACTERISTICS OF HOUSEHOLDS RECEIVING FOOD STAMPS

Selected Characteristics of Food Stamp Households	Percentage of Households			Average Number of Persons per Household		
	SIPP	FSQC	NFSPS	SIPP	FSQC	NFSPS
Demographic Characteristics						
Households That Contain:						
Elderly[a]	18.1	16.0	26.5	1.3	1.4	2.3
Single person[b]	29.3	35.9	24.5	1.0	1.0	1.0
Children[c,f]	65.5	59.7	60.8	3.6	3.4	4.0
Single parent with children[d,f]	48.2	41.6	31.9	3.2	3.1	3.3
Multiple adults with children[e,f]	16.2	14.9	28.8	4.7	4.5	4.7
Economic Characteristics						
Households That Receive:						
Aid to Families with Dependent Children (AFDC)	44.8	38.3	30.0	3.4	3.3	3.9
Supplemental Security Income (SSI)	22.1	22.6	22.3	1.9	1.9	2.3
General Assistance (GA)	5.1	7.2	5.7	2.1	1.4	3.0
Social Security	21.2	18.6	28.3	1.7	1.7	2.3
Earned income	22.0	21.4	32.5	3.6	3.3	3.9
Unearned income	83.5	86.8	82.0	2.7	2.6	2.9
No income	5.7	9.7	6.0	2.2	1.6	2.8

SOURCE: 1994 Survey of Income and Program Participation (SIPP): Eligible Reporter Units--households that reported receiving food stamps and that are simulated as eligible based on reported income, assets, and other information; summer 1995 Food Stamp Quality Control Sample (FSQC); 1996 National Food Stamp Program Survey (NFSPS).

NOTE: All data are weighted.

[a] Households that contain at least one member age 60 years or older.

[b] Households that contain only one member.

[c] Households that contain at least one member under age 18.

[d] Households that contain only one member age 18 or older and children (at least one member under age 18).

[e] Households that contain two or more members age 18 or older and children (at least one member under age 18).

[f] NFSPS tabulations based on CAPI Food Stamp Program participant sample only (n = 1,109). The telephone data were excluded from these comparisons in order to ensure comparability with the food stamp quality control data. In the telephone interviews, in order to minimize interview time, detailed age data on each household member were not obtained, and it was not possible to fully replicate the definition of children used in the food stamp quality control data.

TABLE II.4

AVERAGE MONTHLY INCOME AND FOOD STAMP BENEFITS FOR FOOD STAMP HOUSEHOLDS, BY SELECTED CHARACTERISTICS
(In Dollars)

	Income per Household			FSP Benefits per Household		
Selected Characteristics of FSP Household	SIPP	FSQC	NFSPS	SIPP	FSQC	NFSPS
All FSP Households	590	529	706	193	177	166
Demographic Characteristics						
Households That Contain:						
Elderly[a]	569	561	677	67	94	94
Single person[b]	433	359	471	67	66	66
Children[c,f]	650	618	758	254	240	219
Single parent with children[d,f]	571	547	631	246	233	231
Multiple adults with children[e,f]	904	877	894	287	275	206
Economic Characteristics						
Households That Receive:						
Aid to Families with Dependent Children (AFDC)	549	542	752	260	246	235
Supplemental Security Income (SSI)	642	630	730	104	97	105
General Assistance (GA)	541	360	629	143	127	189
Social Security	644	630	796	87	83	95
Earned income	880	867	1121	214	191	182
Unearned income	595	580	721	186	176	162
No income	0	0	0	230	172	176

SOURCE: 1994 Survey of Income and Program Participation (SIPP): Eligible Reporter Units--households that reported receiving food stamps and that are simulated as eligible based on reported income, assets, and other information; summer 1995 Food Stamp Quality Control Sample (FSQC); 1996 National Food Stamp Program Survey (NFSPS).

NOTE: Amounts expressed in 1996 dollars. All data are weighted.

[a]Households that contain at least one member age 60 years or older.

[b]Households that contain only one member.

[c]Households that contain at least one member under age 18.

[d]Households that contain only one member age 18 or older and children (at least one member under age 18).

[e]Households that contain two or more members age 18 or older and children (at least one member under age 18).

[f]NFSPS tabulations based on CAPI Food Stamp Program participant sample only (n = 1,109). The telephone data were excluded from these comparisons in order to ensure comparability with the food stamp quality control data. In the telephone interviews, in order to minimize interview time, detailed age data on each household member were not obtained, and it was not possible to fully replicate the definition of children used in the food stamp quality control data.

While the differences between the NFSPS and the other sources are greater than had been anticipated, this degree of nonrepresentativeness in the sample probably is unlikely to have materially affected any of the conclusions drawn in the chapters that follow. In part, this is based on an analysis of differences in the data between subgroups of the sample. Two notable areas where the NFSPS profile is different from that of the FSQC is presence of an elderly person (the NFSPS has too many households with an elderly person) and receipt of AFDC income (the NFSPS has too few AFDC recipients). Key findings were compared from later analyses for the sample as a whole to results for just the elderly subsample and for just the AFDC subsample. The differences are not great. For instance, for the sample as a whole, approximately 31 percent of households live within a mile of their most frequently used store. The comparable numbers for the elderly and the AFDC subsamples are also 32. Or, to look at a different example, 78 percent of the entire sample usually shops at fewer than three food stores in a typical month. The corresponding numbers are 80 percent and 77 percent for the elderly and AFDC subsamples. Thus, while some differences in key variables between the different subgroups do exist, these differences are relatively small. They probably are not likely to have substantially affected the analysis that follows.

F. FOOD USE DATA COLLECTION

An important component of the in-person data collection was obtaining seven-day food use data from households in the sample. The procedures used for this essentially followed the protocols used for similar data collection during the last several Nationwide Food Consumption Surveys, as well as the San Diego, Alabama, and Washington State Food Stamp Cashout evaluations. Here, a description is given of how the data collection was done and how the resulting information should be interpreted.

1. Objectives

The objective of the food use data collection was to record all the foods the household used from the home food supply during the seven-day period covered by the data collection. This includes foods used within the home, as well as foods (such as school lunches) prepared in the home but then taken elsewhere for consumption. Both purchased food and food obtained at zero cost, such as home-grown produce, are included. The food covered in the food use concept also includes any food wastage, including plate waste, occurring within the home. For each food used, information is obtained on the type of food, the form of the food as brought into the home (for example, fresh, frozen, canned), the amount used, the amount purchased, and the cost.

In understanding this objective, it is important to note that "food use," as the term is used here, differs significantly from "food eaten" (usually measured by 24-hour-intake interviews). In particular, food use does *not* include foods bought and eaten outside the home. On the other hand, it *does* include foods that were in the home food supplies but were then wasted (not eaten).

The obvious analytic disadvantage with focusing on "food use" rather than "food eaten" is that there is not a direct link to actual nutrient consumption. On the other hand, advantages include the following: (1) unlike 24-hour recall data, the food use data can be used directly to examine food expenditures; (2) the food use information focuses directly on foods from home food supplies, which are the foods the FSP seeks to influence; and (3) given the techniques available for collecting food use data, as discussed below, it is usually possible to cover a longer period (for example, seven days) for a food use data collection than can, in practical terms, be covered through intake data. (Covering

a longer period is valuable in the analysis, because it essentially yields more data, thus minimizing variance due to day-to-day fluctuation in eating patterns.)

2. Interviewing Method

A week before the data collection interview, MPR field personnel discussed the data collection in person with the respondent, establishing the boundaries of the seven-day period covered, explaining the food use concept, and requesting that the respondent keep grocery receipts, food labels, and other material that would help her or him provide information on the foods used during the relevant period. For storing receipts and labels, the respondent was given an envelope, which also contained a grid for recording the foods used each day.

The interview itself was conducted as soon as possible after the conclusion of the observation period--usually within 24 hours. It proceeded as a detailed assisted-recall process, based on a set of categories of foods listed in the data collection instrument. In particular, within the instrument, all possible foods were divided into major categories, such as meats, fish, fruits, sweets, baby food, and so forth. A separate page on the instrument corresponded to each category. For each page, the interviewer first asked if any of the category (for example, meats) was used during the seven-day period. If the respondents said no, the interviewer recorded that answer and went on to the next page. When the respondent replied that the household had eaten something from a food category, the interviewer then read a detailed list of possible items to identify what item or items the person had used (for example, pork chops, ground beef, veal cutlets). This information was then recorded, along with auxiliary information about prices, costs, and so forth, and this process continued until all the foods used in a category had been recorded. After one category was finished, the next was asked about, until all the categories had been covered.

The data collection was usually done in the respondents' kitchen. This allowed the respondent to refer to packages and containers when supplying information about the foods recorded (for example, the size of the oatmeal box the household typically uses).

3. Nutrient Conversion

The recorded data were entered into microcomputers, which derived information on "nutrient availability" from the quantity information, using software that associates nutrient content with standardized amounts of various foods. This process followed standard nutrient conversion protocols and took account of likely cooking methods in assigning nutrient values. For foods that are almost always eaten cooked, such as fish, a correction factor for the entire amount recorded reflected the fact that nutrients are lost during the cooking process. On the other hand, for foods eaten in substantial amounts both raw and cooked, such as carrots, the relevant correction factor for the nutrient loss from cooking was applied only to a portion of the food, based on estimates of the overall national average proportion of the food eaten cooked.

4. Price Data

For foods that were bought, data were obtained on the amount bought by the household and on the total cost. This then made it possible to compute a per-pound price. For foods that had not been bought, or for foods where the cost data were missing, prices were imputed, usually from the prices for the same food recorded for other households on the data set.

III. SHOPPING PATTERNS AMONG LOW-INCOME HOUSEHOLDS

To begin the analysis of access to food retailers by low-income households, this chapter presents descriptive data on the shopping patterns of low-income households, including FSP participants, eligible nonparticipants, and near-eligible nonparticipants. The analysis examines the types of stores where these households shop and also the degree of care with which they do their shopping, in terms of such factors as paying attention to prices and using shopping lists.

Separate tabulations are performed for two subsamples of households, those containing an elderly member and those with AFDC income, since these two groups traditionally have been of particular interest in the FSP. Households with an elderly member have somewhat less stringent program eligibility requirements than most households, and households entirely composed of AFDC recipients (now TANF recipients) are categorically eligible for the FSP.

A. THE STORES WHERE HOUSEHOLDS SHOP

Most households in the sample--nearly 90 percent--reported that they usually purchased food from a supermarket (Table III.1). The small number of households who did not shop primarily at a supermarket tended to shop at neighborhood grocery stores; this store type was mentioned by seven percent of participants, nine percent of eligible nonparticipants, and six percent of near-eligibles. The only other store type frequently mentioned was warehouse or discount stores, which were the primary source of food for approximately two to three percent of the various samples. Fewer than one percent of each sample reported that they relied primarily on such other food sources as convenience stores or specialty stores.

TABLE III.1

TYPES OF STORES WHERE HOUSEHOLDS SHOP[a]
(Entries Are Percentage of Household in Column)

Characteristic	Participants	Nonparticipants	
		Eligible	Near-Eligible
Type of Store Usually Shop At			
Supermarket	89.6	87.1	88.1
Neighborhood grocery	7.0	8.6	5.7
Specialty store	0.2	0.0	0.8
Convenience store	0.3	0.2	0.5
Warehouse or discount store	2.1	3.5	2.8
Other kind of store	0.5	0.7	1.8
Don't know or missing	0.2	0.0	0.3
Sample Size	2,391	430	395
Other Types of Stores Sometimes Used, Besides Main Type			
Supermarket	7.7	11.5	9.8
Neighborhood grocery	50.2	46.6	48.2
Convenience store	41.6	43.5	47.8
Bakery	35.8	37.6	41.2
Meat store	24.8	23.3	23.3
Produce stand	32.6	47.1	43.4
Farmers' market	21.1	33.4	31.9
Health food store	10.1	18.4	18.2
Drug or department store	21.6	35.0	39.3
Food discounter or warehouse store	17.6	27.8	35.2
Food wholesaler	6.3	13.0	13.7
Truck	6.1	10.5	13.2
Food cooperative	2.6	4.6	5.8
Home delivery supplier	1.8	1.8	1.7
Other	3.6	7.0	6.5
Average Number of Other Stores Used, Besides Main Type	2.8	3.6	3.8
Sample Size	2,391	430	395

SOURCE: 1996 National Food Stamp Program Survey, weighted data.

[a] Sum of percentages exceeds 100 percent because households could give multiple responses.

However, even though the *main* type of store used was the supermarket, substantial numbers of respondents also indicated that they sometimes bought food in various other types of stores. For instance, among FSP participants, 50 percent of those not using neighborhood stores as their main source said that they nevertheless sometimes shopped at this type of store. Similarly, 42 percent used convenience stores, 36 percent used bakeries, 33 percent sometimes shopped at produce stands, and 21 percent used farmers' markets. Further, of the approximately 10 percent of participants who did not use supermarkets as their main type of store, most (80 percent of the 10 percent, or about 8 percent overall) indicated that they sometimes used supermarkets. Similar patterns are observed among nonparticipants. Most of the households that do not use supermarkets as their main type of store nevertheless use supermarkets on occasion. A total of 99 percent of eligible nonparticipants and 98 percent of near-eligibles report that they at least sometimes use supermarkets, slightly higher than the comparable estimate of 97 percent for the participants.

Households that include elderly members report similar patterns for the type of store most often used. For this group, 89 percent of program participants, 90 percent of eligible nonparticipants, and 87 percent of the near-eligibles usually shopped at a supermarket, with most of the rest using neighborhood stores (Table III.2).

When asked what types of stores they used other than their main type, elderly respondents tended to mention fewer others. This probably reflects their more limited mobility. An interesting exception to the pattern, however, was that elderly people were slightly more likely to report using a produce stand. Households receiving AFDC also indicated about the same reliance on supermarkets as their main shopping place as did the sample as a whole (Table III.3).

TABLE III.2

TYPES OF STORES WHERE ELDERLY HOUSEHOLDS SHOP[a]
(Entries Are Percentage of Household in Column)
(Sample Limited to Households with Members Over 60 Years Old)

Characteristic	Participants	Nonparticipants	
		Eligible	Near-Eligible
Type of Store Usually Shop At			
Supermarket	89.3	90.0	86.8
Neighborhood grocery	8.3	7.4	7.3
Specialty store	0.1	0.0	0.8
Convenience store	0.7	0.0	0.8
Warehouse or discount store	0.9	2.6	1.6
Other kind of store	0.1	0.0	1.7
Don't know or missing	0.6	0.0	0.9
Sample Size	632	188	120
Other Types of Stores Sometimes Used, Besides Main Type[a]			
Supermarket	6.9	7.3	9.9
Neighborhood grocery	43.9	37.2	42.5
Convenience store	32.9	34.0	37.7
Bakery	32.3	31.4	32.7
Meat store	18.8	19.1	23.0
Produce stand	34.5	39.6	44.7
Farmers' market	20.4	30.8	32.5
Health food store	8.5	14.4	15.7
Drug or department store	18.1	32.1	34.1
Food discounter or warehouse store	12.4	19.3	28.4
Food wholesaler	4.7	7.9	10.8
Truck	5.3	8.4	7.4
Food cooperative	1.2	3.7	5.2
Home delivery supplier	1.2	2.1	2.4
Other	4.7	7.4	5.2
Average Number of Other Stores Used, Besides Main Type	2.8	3.6	3.8
Sample Size	632	188	120

SOURCE: 1996 National Food Stamp Program Survey, weighted data.

[a] Sum of percentages exceeds 100 percent because households could give multiple responses.

TABLE III.3

TYPES OF STORES WHERE AFDC HOUSEHOLDS SHOP[a]
(Entries Are Percentage of Household in Column)
(Sample Limited to Households with AFDC Income)

Characteristic	Participants	Nonparticipants[a]	
		Eligible	Near-Eligible
Type of Store Usually Shop At			
Supermarket	88.0	NA	NA
Neighborhood grocery	6.6	NA	NA
Specialty store	0.2	NA	NA
Convenience store	0.3	NA	NA
Warehouse or discount store	4.0	NA	NA
Other kind of store	0.8	NA	NA
Don't know or missing	0.1	NA	NA
Sample Size	732	NA	NA
Other Types of Stores Sometimes Used, Besides Main Type[b]			
Supermarket	8.1	NA	NA
Neighborhood grocery	55.9	NA	NA
Convenience store	46.2	NA	NA
Bakery	38.3	NA	NA
Meat store	29.8	NA	NA
Produce stand	31.4	NA	NA
Farmers' market	21.0	NA	NA
Drug or department store	24.3	NA	NA
Food discounter or warehouse store	22.0	NA	NA
Food wholesaler	9.7	NA	NA
Truck	6.9	NA	NA
Health food store	11.0	NA	NA
Food cooperative	2.6	NA	NA
Home delivery supplier	2.1	NA	NA
Other	2.6	NA	NA
Average Number of Other Stores Used, Besides Main Type	2.8	3.6	3.8
Sample Size	732	NA	NA

SOURCE: 1996 National Food Stamp Program Survey, weighted data.

[a] There are too few nonparticipant households with AFDC income to allow reliable estimates.

[b] Sum of percentages exceeds 100 percent because households could give multiple responses.

For the overall sample, the most common reasons for not using a supermarket were that there was no supermarket nearby and that the supermarket was too expensive (Table III.4). Some respondents also mentioned reasons related to lack of transportation. For the elderly, not having a supermarket close by was the main reason mentioned by those who did not use supermarkets. (It is possible that elderly people, with their limited mobility, had a more limited concept of "nearby" when responding to the question.) However, responses to this question were quite different for AFDC respondents, who were more likely to indicate that they thought supermarkets were too expensive.

B. GETTING TO THE STORE

A majority of low-income households report only shopping at one store in a month (Table III.5). However, between 22 and 24 percent, depending on the exact sample, said they used two stores in a month, and another 17 to 22 percent shopped at more than two stores.

Forty-five percent of program participants said they drove to their food shopping, with another 31 percent getting rides with friends or relatives. The third most common way of getting to the store for this group was walking (14 percent). The eligible nonparticipant and the near-eligible groups, both of which have higher average incomes than the participant sample, were much more likely to drive a car to their food shopping (71 percent and 86 percent, respectively).[1]

[1]These patterns are broadly consistent with data from the 1995 Nationwide Personal Transportation Survey, which found that low-income Americans are more likely than the population as a whole to rely on getting rides from friends and relatives, or on walking, to meet their transportation needs. (See "Our Nation's Travel, 1995 NPTS Early Results Report" and an associated document, "Public Release of the 1995 Nationwide Personal Transportation Survey in September.") The former is available at http://www-cta.ornl.gov/npts.

TABLE III.4

REASONS HOUSEHOLDS DO NOT SHOP AT A SUPERMARKET[a,b]
(Entries Are Percentage of Households in Column)

Characteristic	Participants	Nonparticipants	
		Eligible	Near-Eligible
All Households			
No supermarket close by	41.2	46.5	36.2
No transportation	17.2	3.5	4.3
Costs too much to get there	8.2	3.5	2.4
Can't find ethnic/specialty foods there	3.2	0.0	0.0
Too expensive	37.1	35.9	48.8
Dirty store	3.6	1.8	2.4
Convenience	1.0	5.3	2.2
Poor quality food	2.3	0.0	2.4
Other	17.7	12.4	8.7
Sample Size	218	56	46
Households with Elderly Members			
No supermarket close by	65.1	58.3	39.8
No transportation	26.1	10.3	13.1
Costs too much to get there	3.5	5.1	0.0
Can't find ethnic/specialty foods there	5.1	0.0	0.0
Too expensive	15.5	31.2	40.4
Dirty store	1.3	0.0	0.0
Convenience	2.8	5.2	0.0
Poor quality food	1.4	0.0	7.3
Other	5.7	5.3	6.7
Sample Size	62	19	15
AFDC Households			
No supermarket close by	26.2	NA	NA
No transportation	7.7	NA	NA
Costs too much to get there	9.4	NA	NA
Can't find ethnic/specialty foods there	4.2	NA	NA
Too expensive	58.5	NA	NA
Dirty store	0.0	NA	NA
Convenience	0.8	NA	NA
Poor quality food	1.1	NA	NA
Other	12.9	NA	NA
Sample Size	74	NA	NA

SOURCE: 1996 National Food Stamp Program Survey, weighted data.

[a] Calculated for only those households that go shopping but usually do not shop at a supermarket.

[b] Sum of percentages exceeds 100 percent because households could give multiple responses.

NA = not available.

TABLE III.5

GETTING TO THE STORE[a,b]
(Entries Are Percentage of Households in Column)

Characteristic	Participants	Nonparticipants	
		Eligible	Near-Eligible
All Households			
Number of Stores Typically Shopped at in Month			
1 or none	54.2	60.9	55.9
2	24.1	22.2	22.6
3	15.8	11.2	16.6
4	4.3	4.6	3.6
5 or more	1.6	1.2	1.3
Sample Size	2,385	430	394
Transportation Usually Used to Go Food Shopping			
Drive a car	44.5	71.0	86.4
Get a ride with friend or relatives	31.3	13.7	6.5
Walk	13.8	5.1	3.5
Bus	3.8	2.7	0.7
Other	6.6	7.6	3.0
Sample Size	2,454	450	405
Percentage with Out-of-Pocket Costs	21.6	10.0	2.5
Sample Size	2,393	433	397
Costs, for Those with Out-of-Pocket Costs			
Less than $2.00	3.5	2.5	11.0
$2.00 to $3.99	19.3	32.8	10.7
$4.00 to $5.99	40.2	29.9	10.7
$6.00 to $$9.99	9.3	17.9	10.6
$10.00 or more	27.7	17.2	57.0
Average	$6.54	$5.54	$8.58
Sample Size	509	40[c]	9[c]
Elderly			
Number of Stores Typically Shopped at in Week			
1 or none	57.8	56.2	55.2
2	22.2	27.3	23.8
3	12.8	11.7	15.2
4	5.0	3.3	4.2
5 or more	2.1	1.6	1.7
Sample Size	629	186	119
Transportation Usually Used to Go Food Shopping			
Drive a car	32.9	66.5	74.7
Get a ride with friend or relatives	36.1	17.0	16.6
Walk	16.6	4.5	3.2
Bus	2.6	2.5	0.8
Other	11.8	9.5	4.7
Sample Size	670	199	127

TABLE III.5 *(continued)*

Characteristic	Participants	Nonparticipants	
		Eligible	Near-Eligible
Percentage with Out-of-Pocket Costs	20.9	9.5	3.3
Sample Size	633	189	122
Costs, for Those with Out-of-Pocket Costs			
Less than $2.00	5.8	0.0	0.0
$2.00 to $3.99	21.0	27.0	0.0
$4.00 to $5.99	35.0	33.1	0.0
$6.00 to $$9.99	9.7	20.6	0.0
$10.00 or more	28.7	19.4	100
Average	$6.64	$5.60	$12.29
Sample Size	121	15[c]	3[c]
AFDC			
Number of Stores Typically Shopped at in Week			
1 or none	50.8	NA	NA
2	25.8	NA	NA
3	17.6	NA	NA
4	4.0	NA	NA
5 or more	1.7	NA	NA
Sample Size	731	NA	NA
Transportation Usually Used to Go Food Shopping			
Drive a car	44.8	NA	NA
Get a ride with friend or relatives	34.0	NA	NA
Walk	12.7	NA	NA
Bus	4.3	NA	NA
Other	4.1	NA	NA
Sample Size	737	NA	NA
Percentage with Out-of-Pocket Costs	25.8	NA	NA
Sample Size	732		
Costs, for Those with Out-of-Pocket Costs			
Less than $2.00	0.9	NA	NA
$2.00 to $3.99	20.9	NA	NA
$4.00 to $5.99	40.5	NA	NA
$6.00 to $$9.99	9.6	NA	NA
$10.00 or more	28.1	NA	NA
Average	$6.63	NA	NA
Sample Size	184		

SOURCE: 1996 National Food Stamp Program Survey, weighted data.

[a] Calculated for only those households that go shopping but usually do not shop at a supermarket.

[b] Sum of percentages exceeds 100 percent because households could give multiple responses.

[c] Small sample sizes limit the reliability of these results.

NA = not available.

About 22 percent of the participants and 10 percent of the eligible nonparticipants reported that they incurred some out-of-pocket costs for their food shopping. Of those participants with out-of-pocket costs, the average cost was about $6.54 per trip. The corresponding average for the near-eligibles was $5.54. However, some households reported costs as high as $10 or more.

In general, elderly people are somewhat less likely to drive themselves when shopping and somewhat more likely to get rides with somebody else. Despite this, however, they reported a somewhat lower incidence of incurring out-of-pocket costs. The data on "getting to the store" for AFDC households largely mirrored that for the overall sample.

Interestingly, the number of stores respondents reported shopping at in a month did not vary substantially between urban and rural households (Table III.6). However, as one might expect, the method of transportation usually used to go food shopping varied substantially, with the numbers driving a car ranging from 35 percent in urban areas to 59 percent in rural areas. Urban residents were much more likely than rural respondents to walk.

C. USE OF "CAREFUL SHOPPING" STRATEGIES

Most of the FSP participants in the sample reported engaging in shopping activities designed to save money or obtain particularly nutritious foods (Table III.7). The most commonly used "careful shopping" strategy was looking for grocery "specials." More than half the participants reported doing this on most shopping trips, and another 17 percent said they did it "fairly often." However, 16 percent said that they never looked for specials. Participants were slightly less likely to use store coupons than they were to look for specials. About 41 percent indicated that they used coupons on most trips, with 21 percent saying that they never did it.

The careful shopping activity *least* reported by respondents was going to stores other than their usual store to shop for advertised specials. Only about 39 percent of participants indicated that they did this either on most shopping trips or fairly often.

Interestingly, the low-income households in the sample report considerably more use of careful shopping activities than is the case for the overall population. For instance, while 51 percent of the overall population reports looking in the newspaper for grocery specials at least "fairly often," the comparable percentage for food stamp participants is 68.8, and the difference is statistically significant (Table III.7).[2] Similarly, in the overall population, 56 percent report stocking up at least fairly often when they find a bargain, whereas in the current survey the estimate is 65.2, with the difference again being statistically significant.

Reported use of careful shopping activities varied only slightly by subgroups of the participant population defined by age or economic circumstances (Table III.8). For four out of six of the activities examined, elderly people tended to be somewhat less likely than other participant subgroups to engage in the careful shopping activities studied. However, in general the difference between them and other groups was quite small. For instance, 54 percent of elderly participants reported that they used coupons either on most shopping trips or at least fairly often. This compares to 61 percent for households with AFDC or wage income and to 56 percent for households below 100 percent of the poverty level.

[2]Statistical significance was assessed, based on "t" tests for differences of proportions. For the overall population data, the relevant variance was estimated as (p)(1-p)/n, where p is the estimated proportion and "n" is the sample size reported in Food Marketing Institute (1998). For the NFSPS data, the same estimation formula was used, except the variance was doubled to take into account possible design effects in the sample, as discussed in Appendix C.

TABLE III.6

GETTING TO THE STORE: FSP PARTICIPANTS, BY URBANICITY
(Entries Are Percentage of Households in Column)

	Nonparticipants		
Characteristic	Urban	Mixed	Rural
All Households			
Number of Stores Typically Shopped at in Month			
1 or none	52.4	54.0	54.5
2	23.1	25.9	25.4
3	18.0	14.4	13.4
4	4.3	4.7	5.2
5 or more	2.1	0.9	1.4
Sample Size	1,207	696	318
Transportation Usually Used to Go Food Shopping			
Drive a car	35.2	53.9	58.7
Get a ride with friend or relatives	30.2	30.0	35.5
Walk	21.6	6.3	1.8
Bus	6.2	1.6	0.4
Other	6.7	8.1	3.6
Sample Size	1,237	722	326
Percentage with Out-of-Pocket Costs	25.1	16.0	20.8
Costs, for Those with Out-of-Pocket Costs			
Less than $2.00	2.5	5.2	5.8
$2.00 to $3.99	20.8	21.4	8.7
$4.00 to $5.99	39.1	43.0	38.5
$6.00 to $$9.99	10.4	7.6	8.7
$10.00 or more	27.3	22.8	38.3
Average	$6.52	$5.47	$7.29
Sample Size	300	115	67

SOURCE: 1996 National Food Stamp Program Survey, weighted data.

TABLE III.7

USE OF SELECTED "CAREFUL SHOPPING" ACTIVITIES
(Entries on Percentage of Households in Row)

	Frequency of Doing Activities				
	Most Shopping Trips	Fairly Often	Occasionally	Never	Missing
Food Stamp Participants					
Look for Grocery Specials	51.8	17.0	14.6	16.2	0.4
Use Store Coupons or "Cents-Off" Coupons	40.5	16.3	21.8	21.1	0.4
Stock Up on Grocery Bargains	42.3	22.9	24.8	9.6	0.4
Compare Prices Across Supermarkets	41.4	18.6	19.9	19.5	0.6
Go to Different Stores for Advertised Specials	18.3	20.9	37.1	22.9	0.8
Use a Shopping List	50.3	11.5	13.6	24.4	0.3
National Sample of All Households					
Look for Grocery Specials	31	20	22	24	3
Use Store Coupons or "Cents-Off" Coupons	23	23	32	20	3
Stock Up on Grocery Bargains	24	32	33	8	3
Compare Prices Across Supermarkets	19	18	35	26	3
Go to Different Stores for Advertised Specials	6	15	47	29	3
Use a Shopping List	NA	NA	NA	NA	NA

SOURCE: Participants: 1996 National Food Stamp Program Survey, weighted data.
All Households: Food Marketing Institute (1998, Table 30).

NA = not available.

TABLE III.8

SELECTED "CAREFUL SHOPPING" BY FOOD STAMP HOUSEHOLD CHARACTERISTICS
(Entries Are Percentages of Households Performing the Selected Activity Either on Most Trips or "Fairly Often")

	Characteristic of Household			
Activity	With Elderly Member	With AFDC Income	With Wage Income	Income Below 100 Percent of Poverty
Look for Grocery Specials	70.7	69.7	69.0	68.9
Use Store Coupons or "Cents-Off" Coupons	54.1	60.9	61.3	55.9
Stock Up on Grocery Bargains	56.9	73.6	68.6	65.5
Compare Prices Across Supermarkets	56.3	63.9	63.0	60.8
Go to Different Stores for Advertised Specials	38.7	42.0	40.4	39.9
Use a Shopping List	65.3	63.6	64.1	60.7

SOURCE: 1996 National Food Stamp Program Survey, weighted data.

IV. MEASURES OF EFFECTIVE ACCESS TO STORES

A key objective of the research was to assess the degree to which FSP participants and other low-income households have access to retail food stores. This chapter considers this issue by analyzing data on several measures of access and by examining the nutritional efficiency of purchases.

A. INDICATORS OF STORE ACCESS

1. Distance to the Food Store Most Often Used

FSP participants report quite a broad distribution of distances to their most commonly used stores (Table IV.1). About 31 percent of FSP participants reported that the stores they most often used were within a mile of where they lived, while about a third reported distances of between one and four miles. About 34 percent live four miles or more from their stores.

Very similar patterns are observed for the eligible nonparticipants. The near-eligibles, who on average have higher income, tend to go somewhat farther from their homes to obtain food. Approximately 41 percent of the near eligibles travel four miles or more.

As might be expected from the distances reported, most survey respondents indicated that the travel times to their main food stores were short. Between 65 and 69 percent of the households reported round-trip travel times of under a half hour, with the mean being 22 to 24 minutes.

2. Distance to the Nearest Supermarket

The above data, coupled with the finding noted in Chapter III that most of the households in the sample use a supermarket as their main food store, suggest that a substantial majority of low-income households live near a supermarket--at least within four miles. Direct evidence that supports this

TABLE IV.1

DISTANCE AND TRAVEL TIME TO STORE MAINLY USED AND DISTANCE TO NEAREST SUPERMARKET
(Entries Are Column Percentages)

	Study Group		
		Nonparticipants	
Characteristic	Participants	Eligible	Near-Eligible
Reported Distance to Most-Often-Used Store			
Less than 0.5 mile	2.3	4.0	2.7
0.5 to 0.99 miles	28.6	23.3	21.5
1 to 1.99 miles	15.3	18.8	14.6
2 to 3.99 miles	19.4	17.7	20.2
4 to 5.99 miles	9.5	12.8	12.0
Over 6 miles	24.8	23.5	29.1
Average	4.9	4.9	5.6
Sample Size	2,243	408	379
Reported Travel Time for Round Trip to Most-Often-Used Store			
Less than 30 minutes	66.3	65.1	69.0
Between 30 minutes and one hour	24.3	23.9	22.8
Between one hour and two hours	7.2	9.4	7.2
Over two hours	2.3	1.6	1.0
Sample Size	2,243	426	391
Average Duration (in Minutes) of Round Trip to Most-Often-Used Store	23.9	23.2	21.6
Distance to Nearest Supermarket (Based on Geocoded Data)[a]			
Less than 0.5 miles	26.4	NA	NA
0.5 miles to 0.99 miles	27.6	NA	NA
1 to 1.99	21.8	NA	NA
2 to 3.99 miles	13.2	NA	NA
4 to 5.99 miles	4.6	NA	NA
Over 6 miles	6.4	NA	NA
Average	1.8	NA	NA
Sample Size	589	NA	NA

SOURCE: 1996 National Food Stamp Program Survey, weighted data.

[a] Based on in-person interviews that met the following conditions: (1) the respondent supplied the name and/or location of the nearest supermarket; (2) based on information the respondent supplied, together with FNS data on authorized retailers, it was possible to geocode the location of the store; and (3) it was possible to geocode the location of the respondent's address.

NA = not available.

is provided by data from the FSP participants who were interviewed in person. Each respondent was asked to supply the name and address of the supermarket nearest his or her home. Where sufficient data were provided, the geographical coordinates of the nearest supermarket were geocoded and the distance to the respondent's home was estimated. There are, however, a number of limitations to these data. In particular, only about 60 percent of the relevant observations could be coded, and there is some evidence that coding success was correlated with proximity between home and store. (See Appendix E.) Nevertheless, the coded distance data, as shown in the bottom of Table IV.1, provide additional insight into these households' access to food shopping activities. In assessing these data, it should be noted that the calculated distances are straight-line distances from the respondents' homes to the stores. They are thus closely related to, but not directly comparable to, the travel distances reported by the respondents in describing their shopping trips.

More than half (54 percent) of the households for which data could be coded lived within one mile of a supermarket. Only about 11 percent lived four miles or more. If the subsample of observations that could be coded is typical, most FSP participants live quite close to a supermarket.

The data on the distance to the nearest store, combined with data on the distance that respondents travel to shop, suggest that a substantial number of food stamp households choose to shop at a store other than the nearest one. The percentage of FSP participant households for which the nearest store is greater than four miles was 11, which is much lower than the 34 percent who reported actually traveling four miles or more. As already noted, these data should be treated with some caution, because there is evidence that the success in coding may have biased the coded sample in the direction of having too many "close" stores and not enough "far" stores and because the distances to the nearest stores are computed as straight-line distances rather than travel distances. However, as discussed in Appendix E, even when similar data are compared (geocoded data for both

distance to the store used and distance to the nearest store), the tabulations make it clear that many respondents do not shop at the stores nearest to them.[1] In addition, the substantial magnitude of the differences between the distances to the closest store and the reported distances traveled suggests that it is unlikely that the findings can be attributable mainly to differences in how distances are calculated.

Findings in Table IV.1 are consistent with analysis of geocoded data from the Evaluation of the Expanded EBT Demonstration in Maryland. Among the conclusions drawn by Cole (1997), based on analysis of the Maryland data, are: (1) "FSP households in Maryland have good access to at least some program-authorized retailers, although variation in access exists across regions"; (2) "FSP households usually bypass the nearest program-authorized store when shopping"; and (3) "although the statewide average distance between a FSP household and the nearest supermarket is 0.8 miles, the average distance traveled to a supermarket is 2.8 miles."

Similarly, the findings tend to support those of the FNS Authorized Retailer Characteristics Study. Mantovani et al. (1996) conclude that "these analyses indicate that a large majority of low-income households are in close proximity to a full-line grocery store or supermarket" and that "food stamp recipients tended to use their benefits in areas other than those in which they lived" (Technical Report III).

[1]Later in this chapter, data are presented that indicate that, for respondents who do not shop in their neighborhoods, the most common reason for not doing so is that there are no suitable stores close to their homes. At first, this may seem inconsistent with the conclusion discussed in the text that many households do not shop at their closest store. However, a likely reconciliation of these findings is that once a household undertakes the costs of shopping outside its neighborhood, it does not necessarily limit its journey to the nearest store but, rather, may bypass one or more stores to shop at one that best meets its needs.

Households with elderly members have similar patterns regarding distance to the food stores usually used (Table IV.2). The corresponding data for AFDC families (Table IV.3) are also quite similar to those for the sample as a whole.

3. Distances to the Store by Degree of Urbanization

When the distance data for the FSP participant sample are examined separately by the urban/rural status (Table IV.4), the results indicate that, as might be expected, distances are substantially higher for rural households. For the analysis, urban households are defined as those living in zip code areas where at least 90 percent of households in the zip code area live in a Census-defined urbanized place. Rural households are defined as those in zip codes where at least 90 percent of the population is not in an urbanized place, and "mixed" households are those in zip code areas falling between these extremes. Under these definitions, the reported average distance to the most used store rises from 2.5 miles in the urban sample, to 4.4 miles in the "mixed" group, to 14.4 miles in the rural group.

Average travel times are similar for the urban and "mixed" samples at just over 20 minutes but are nearly 36 minutes for residents of rural areas. Similarly, the geocoded distance to the nearest store is similar for the first two groups but considerably greater for the rural group.

B. REASONS FOR OBSERVED SHOPPING PATTERNS AND PERCEPTIONS ABOUT ACCESS

Considerable insight into how households perceive their access to shopping opportunities can be obtained by examining responses to a set of questions about whether households did most of their shopping in their neighborhoods and, if not, why they didn't.[2] Sixty-two percent of FSP participants

[2]The question did not define "neighborhood," so there may be some variation in how respondents understood the term. As described below, the data suggest that many respondents used a relatively broad definition.

TABLE IV.2

DISTANCE TO STORE MAINLY USED AND TO NEAREST SUPERMARKET, HOUSEHOLDS WITH ELDERLY MEMBERS
(Entries Are Column Percentages)

	Study Group		
		Nonparticipants	
Characteristic	Participants	Eligible	Near-Eligible
Reported Distance to Most-Often-Used Store			
Less than 0.5 mile	3.3	4.6	6.5
0.5 to 0.99 miles	29.0	24.9	25.4
1 to 1.99 miles	14.5	18.2	16.1
2 to 3.99 miles	18.2	16.0	17.4
4 to 5.99 miles	8.8	12.0	8.9
Over 6 miles	26.2	24.3	25.9
Average	5.2	4.6	5.1
Sample Size	589	176	111
Reported Travel Time for Round Trip to Most-Often-Used Store			
Less than 30 minutes	64.9	62.6	64.6
Between 30 minutes and one hour	23.1	26.5	26.9
Between one hour and two hours	9.4	9.2	7.6
Over two hours	2.6	1.6	.8
Sample Size	604	184	117
Average Duration (in Minutes) of Round Trip to Most-Often-Used Store	25.7	24.0	22.2
Distance to Nearest Supermarket (Based on Geocoded Data)[a]			
Less than 0.5 miles	30.4	NA	NA
0.5 miles to 0.99 miles	33.1	NA	NA
1 to 1.99	17.8	NA	NA
2 to 3.99 miles	9.7	NA	NA
4 to 5.99 miles	3.4	NA	NA
Over 6 miles	5.7	NA	NA
Average	1.5	NA	NA
Sample Size	142	NA	NA

SOURCE: 1996 National Food Stamp Program Survey, weighted data.

NOTE: All entries are weighted.

NA = not available.

[a] Based on in-person interviews that met the following conditions: (1) the respondent supplied the name and/or location of the nearest supermarket; (2) based on information the respondent supplied, together with FNS data on authorized retailers, it was possible to geocode the location of the store; and (3) it was possible to geocode the location of the respondent's address.

TABLE IV.3

DISTANCE TO STORE MAINLY USED AND TO NEAREST SUPERMARKET, HOUSEHOLDS WITH AFDC INCOME
(Entries Are Column Percentages)

	Study Group		
		Nonparticipants	
Characteristic	Participants	Eligible	Near-Eligible
Reported Distance to Most-Often-Used Store			
Less than 0.5 mile	1.9	NA	NA
0.5 to 0.99 miles	29.6	NA	NA
1 to 1.99 miles	16.4	NA	NA
2 to 3.99 miles	19.7	NA	NA
4 to 5.99 miles	9.6	NA	NA
Over 6 miles	22.8	NA	NA
Average	4.7	NA	NA
Sample Size	668		
Reported Travel Time for Round Trip to Most-Often-Used Store			
Less than 30 minutes	68.7	NA	NA
Between 30 minutes and one hour	23.3	NA	NA
Between one hour and two hours	6.2	NA	NA
Over two hours	1.9	NA	NA
Sample Size	726		
Average Duration (in Minutes) of Round Trip to Most-Often-Used Store	22.8	NA	NA
Distance to Nearest Supermarket (Based on Geocoded Data)[a]			
Less than 0.5 miles	23.1	NA	NA
0.5 miles to 0.99 miles	32.9	NA	NA
1 to 1.99	23.6	NA	NA
2 to 3.99 miles	9.1	NA	NA
4 to 5.99 miles	6.3	NA	NA
Over 6 miles	5.1	NA	NA
Average	1.6	NA	NA
Sample Size	210	NA	NA

SOURCE: 1996 National Food Stamp Program Survey, weighted data.

NOTE: All entries are weighted.

NA = not available. Very few FSP nonparticipants receive AFDC.

[a] Based on in-person interviews that met the following conditions: (1) the respondent supplied the name and/or location of the nearest supermarket; (2) based on information the respondent supplied, together with FNS data on authorized retailers, it was possible to geocode the location of the store; and (3) it was possible to geocode the location of the respondent's address.

TABLE IV.4

DISTANCE AND TRAVEL TIME TO STORE MAINLY USED AND DISTANCE TO NEAREST SUPERMARKET PARTICIPANTS, BY URBANICITY
(Entries Are Column Percentages)

Characteristic	Urban	Mixed	Rural
Reported Distance to Most-Often-Used Store			
Less than 0.5 mile	3.0	2.0	0.7
0.5 to 0.99 miles	38.9	23.2	6.8
1 to 1.99 miles	16.4	18.8	4.2
2 to 3.99 miles	21.9	21.5	5.1
4 to 5.99 miles	9.7	11.4	5.5
Over 6 miles	10.1	23.2	77.8
Average Distance (Miles)	2.5	4.4	14.4
Sample Size	1,116	659	309
Reported Travel Time for Round Trip to Most-Often-Used Store			
Less than 30 minutes	70.1	71.3	42.7
Between 30 minutes and one hour	22.6	23.0	34.1
Between one hour and two hours	5.2	4.1	19.9
Over two hours	2.1	1.7	3.2
Average Duration (in Minutes) of Round Trip to Most-Often-Used Store	22.0	21.2	35.7
Sample Size	1,184	684	315
Distance to Nearest Supermarket (Based on Geocoded Data)[a]			
Less than 0.5 miles	25.1	30.3	*
0.5 miles to 0.99 miles	27.9	33.2	*
1 to 1.99	24.9	19.6	*
2 to 3.99 miles	14.1	11.7	*
4 to 5.99 miles	4.5	1.6	*
Over 6 miles	3.4	3.7	*
Average Distance (Miles)	1.5	1.4	5.9
Sample Size	344	181	30

SOURCE: 1996 National Food Stamp Program Survey, weighted data.

[a] Detailed data on store location was obtained only in the in-person participant interviews.

*Too few observations for reliable estimates.

and slightly larger percentages of eligible and near-eligible nonparticipants (66 and 68 percent, respectively) reported that they usually did food shopping within what they considered to be their neighborhoods (Table IV.5). This suggests a reasonably high degree of shopping access for most low-income households.

1. Reasons for Not Using Neighborhood Stores

Among those who did not shop in their neighborhoods, the most common reason was that there was no store nearby. Slightly over 50 percent of households who left their neighborhoods to shop gave this explanation.[3] The other major reasons for not shopping within the neighborhood were high prices (33 to 47 percent of the various samples) and limited food selection (7 to 14 percent). Neither security issues nor concern about embarrassment at being seen by neighbors while using food stamps seemed to be important determinants of shopping location for most respondents.

2. Satisfaction with Neighborhood Shopping Opportunities

Among respondents who shopped within their neighborhoods, more than 85 percent characterized themselves as either very satisfied or somewhat satisfied with the neighborhood shopping opportunities. About seven percent were very dissatisfied.

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[3]The average distance to the most often used store and the average geocoded distance to the nearest supermarket were computed for the respondents who indicated that their reason for not shopping in their neighborhoods was that there was no store nearby. As expected, the average distances for this subgroup reporting no nearby stores were considerably higher than for the sample as a whole. Among participants, for instance, the average reported distance to the most often used store was 9.2 miles for the subgroup reporting no nearby stores, as compared to 4.9 miles for the overall sample. The corresponding numbers for the geocoded distance to the nearest supermarket were 3.3 miles as compared to 1.8 miles.

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TABLE IV.5

PERCEPTIONS OF ADEQUACY OF ACCESS TO STORES

Characteristic	Participants	Nonparticipants	
		Eligible	Near-Eligible
Percentage Who Shop in Stores in Neighborhood	61.6	65. 5	67.7
Among Those Who Do Food Shopping in the Neighborhood, Degree of Satisfaction with Food Shopping Situation in Neighborhood			
Very satisfied	61.6	58.5	52.8
Somewhat satisfied	25.8	27.7	36.1
Somewhat dissatisfied	4.5	3.5	1.5
Very dissatisfied	7.0	7.5	7.4
Don't know or missing	1.1	2.8	2.2
Sample Size	1,413	281	266
Percentage Who Do Not Shop in Stores in Neighborhood	38.4	34.5	32.3
Reasons Households Do Not Shop in the Neighborhood[a]			
No stores close by	50.8	49.1	57.5
Crime	1.4	0.0	0.8
High prices	46.8	40.8	33.2
Limited food selection	13.5	7.4	8.7
Embarrassed to use food stamps near home	2.2	0.0	0.0
Do food shopping as part of multipurpose trip	2.3	2.7	1.5
Get rides with people who shop outside neighborhood	5.3	1.4	2.3
Other reasons	7.8	11.3	8.7
Sample Size	970	147	128
Among Those Who Do Not Food Shop in the Neighborhood, Degree of Satisfaction with Food Shopping Situation in Neighborhood			
Very satisfied	18.3	18.4	28.0
Somewhat satisfied	22.6	38.5	35.2
Somewhat dissatisfied	34.1	18.5	13.3
Very dissatisfied	21.6	21.1	19.6
Don't know or missing	3.4	3.4	3.9
Sample Size	970	147	128
Percentage Who Would Like Changes or Improvements in Food Shopping Situation	54.9	56.3	64.4
Among Those Who Would Like Changes or Improvements in the Food Shopping Situation, Percentage of Individuals by Type of Improvements to Food Shopping Situation in the Neighborhood[b]			
More large national chain supermarkets in area	34.7	22.0	21.1
Better security at or near area stores	2.0	0.4	0.8
More direct public transportation	2.6	0.4	0.0
Transportation service provided by store	2.6	0.4	0.0
Stores that stay open for 24 hours	3.0	0.0	0.4
Stores than open early and close late	2.7	0.9	0.8
More selection	10.6	16.0	18.4
Lower prices	46.1	49.6	48.2

TABLE IV.5 *(continued)*

Characteristic	Participants	Nonparticipants	
		Eligible	Near-Eligible
Large supermarkets/stores located within walking distance	12.8	6.6	5.1
More stores that accept food stamps and WIC benefits	2.4	0.4	0.0
Stores that sell bulk items at discount	6.5	3. 6	2.0
Other reasons	14.0	12.7	11.1
Percentage of Individuals Who Regard as Excellent/Good the Store Where Most Food Is Purchased with Regard to			
Cleaniness and neatness	87.9	88.6	88.9
Courteous employees	85.8	86.1	87.7
Low prices	70.9	65.6	63.7
Quality of produce	82.7	80.6	79.7
Quality of meat	81.6	81.4	79.2
Wide selection	86.5	85.5	85.2
Private labels or store brands	84.7	77.8	80.3
Items on sale	82.5	79.4	78.9
Convenient location	83.5	88.8	87.0
Safe area or good security	85.8	85.2	86.4
Fast checkout	69.7	74.6	69.2
Sample Size	1,276	243	255

SOURCE: 1996 National Food Stamp Program Survey, weighted data.

NOTE: All entries are weighted.

[a] Calculated only for households that do not shop in the neighborhoods.

[b] Percentages sum to greater than 100, because multiple answers were possible.

Not surprisingly, satisfaction levels were lower among households who did not regularly shop in their neighborhoods. However, even among this group, between 41 percent (for participants) and 63 percent (for near-eligible nonparticipants) indicated that they were very satisfied or somewhat satisfied with the food shopping available to them where they lived.

When asked about the types of improvements they would like to see in the shopping situations of their neighborhoods, respondents commonly mentioned the introduction of more supermarket shopping opportunities. In addition, many respondents cited lower prices and better selection of foods.

3. Satisfaction with the Store Most Often Used

Respondents were also asked to rate the stores where they did most of their food shopping, in terms of such criteria as cleanliness, quality of products sold, and convenience of location. The results suggest that, by and large, respondents are satisfied with stores available. For most of the different criteria asked about in the interview, between 80 and 90 percent of FSP participants rated their stores as either "excellent" or "good." This was true, for instance, regarding cleanliness, courtesy of employees, safety, and convenience of location. Categories where the stores tended to get somewhat lower ratings included low prices and checkout speed; however, even in these categories, substantial majorities of respondents indicated satisfaction with their shopping situations. Patterns similar to those summarized for participants also are observed for the two nonparticipant groups.

It is of interest to compare reported levels of satisfaction with various store attributes for FSP participants with similar data for the overall U.S. population (Table IV.6). In general, food stamp recipients appear to rate their stores somewhat lower than does the population in general. Differences in satisfaction tend to be relatively large with regard to "convenient location" (84

TABLE IV.6

PERCENTAGE OF INDIVIDUALS WHO REGARD AS EXCELLENT/GOOD
THE STORE WHERE MOST FOOD IS PURCHASED WITH REGARD TO:

Characteristic	Food Stamp Program Participants	Overall U.S. Population
Cleanliness and neatness	88	92
Courteous employees	86	87
Low prices	71	76
Quality of produce	83	87
Quality of meat	82	85
Private labels or store brands	85	83
Items on sale	83	84
Convenient location	84	91
Safe area or good security	86	71
Fast checkout	70	73
Sample Size	2,391	1,002

SOURCE: 1996 National Food Stamp Program Survey, weighted data and Food Marketing Institute (1998) Table 8.

NOTE: All entries are weighted.

percent of the participants have high ratings versus 91 percent for the overall U.S. sample) and "low prices" (71 percent for participants versus 76 percent for the reference sample). However, most of the differences in percentages rating stores good or excellent tending to be relatively small--usually five percentage points or less--and not statistically significant.[4] One surprising exception to this is that food stamp participants appear to be more likely than the overall population to give a high rating to the security associated with stores.

4. Differences Across Subgroups

A comparison of the data for households with an elderly member (Table IV.7) and the data for households receiving AFDC income (Table IV.8) shows that elderly respondents shop more often in their own neighborhoods, but the difference is small. Reported differences are somewhat greater in the reasons the different FSP households give for not shopping in their neighborhoods. Elderly people tend to focus on not having a store close by (62 percent of the elderly respondents, compared to 41 percent of the AFDC respondents), while AFDC households focus more on avoiding high prices (51 percent of the AFDC participant respondents, compared to 43 percent of the elderly participants).

Reported levels of satisfaction with their shopping alternatives were quite similar for the two groups. However, it is interesting to note two differences. Elderly households were somewhat more likely than AFDC households to regard store employees as courteous (89 versus 83 percent) and elderly respondents were more likely to be satisfied with checkout speeds (76 versus 66 percent).

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[4]Statistical significance was assessed, based on "t" tests for differences of proportions. For the overall population data, the relevant variance was estimated as (p)(1-p)/n, where p is the estimated proportion and "n" is the sample size reported in Food Marketing Institute (1998). For the NFSPS data, the same estimation formula was used, except the variance was doubled to take into account possible design effects in the sample, as discussed in Appendix C.

TABLE IV.7

PERCEPTIONS OF ADEQUACY OF ACCESS TO STORES,
HOUSEHOLDS WITH AN ELDERLY MEMBER

Characteristic	Participants	Nonparticipants	
		Eligible	Near-Eligible
Percentage Who Shop in Stores in Neighborhood	61.0	68. 9	68.6
Among Those Who Do Food Shopping in the Neighborhood, Degree of Satisfaction with Food Shopping Situation in Neighborhood			
Very satisfied	62.6	64.6	56.6
Somewhat satisfied	24.8	19.4	34.0
Somewhat dissatisfied	3.7	5.3	1.2
Very dissatisfied	6.3	7.7	3.6
Don't know or missing	2.6	3.0	4.7
Sample Size	373	129	82
Percentage Who Do Not Shop in Stores in Neighborhood	38.4	34.5	32.3
Reasons Households Do Not Shop in the Neighborhood[a]			
No stores close by	61.7	62.3	64.5
Crime	1.7	0.0	0.0
High prices	42.8	27.6	28.1
Limited food selection	12.5	5.1	8.4
Embarrassed to use food stamps near home	1.5	0.0	0.0
Do food shopping as part of multipurpose trip	0.9	3.4	2.6
Get rides with people who shop outside neighborhood	6.8	3.4	5.3
Other reasons	5.8	13.5	5.3
Sample Size	256	58	37
Among Those Who Do Not Food Shop in the Neighborhood, Degree of Satisfaction with Food Shopping Situation in Neighborhood			
Very satisfied	28.4	31.0	34.6
Somewhat satisfied	20.3	27.6	27.0
Somewhat dissatisfied	32.2	17.0	11.1
Very dissatisfied	14.7	19.0	22.0
Don't know or missing	4.4	5.3	5.3
Sample Size	256	58	37
Percentage Who Would Like Changes or Improvements in Food Shopping Situation	48.6	45.4	54.3
Among Those Who Would Like Changes or Improvements in the Food Shopping Situation, Percentage of Individuals by Type of Improvements to Food Shopping Situation in the Neighborhood[b]			
More large national chain supermarkets in area	37.6	26.8	23.3
Better security at or near area stores	1.9	0.0	3.0
More direct public transportation	4.2	1.2	0.0
Transportation service provided by store	4.1	1.1	0.0
Stores that stay open for 24 hours	2.1	0.0	0.0
Stores than open early and close late	1.8	0.0	0.0
More selection	8.1	12.7	11.0
Lower prices	45.3	42.9	50.3

TABLE IV.7 *(continued)*

Characteristic	Participants	Nonparticipants	
		Eligible	Near-Eligible
Large supermarkets/stores located within walking distance	13.9	5.7	6.2
More stores that accept food stamps and WIC benefits	1.8	1.1	0.0
Stores that sell bulk items at discount	7.0	3.5	1.5
Other reasons	10.5	15.2	9.3
Sample Size	307	86	65
Percentage of Individuals Who Regard as Excellent/Good the Store Where Most Food Is Purchased with Regard to			
Cleanliness and neatness	87.1	90.0	93.4
Courteous employees	89.2	91.6	93.5
Low prices	70.4	63.8	68.4
Quality of produce	83.9	84.2	82.5
Quality of meat	84.6	87.9	88.3
Wide selection	90.3	88.8	93.2
Private labels or store brands	83.5	77.7	81.0
Items on sale	79.1	79.9	81.7
Convenient location	84.4	90.5	90.0
Safe area or good security	85.4	85.2	87.6
Fast checkout	76.4	83.1	80.7
Sample Size	632	188	120

SOURCE: 1996 National Food Stamp Program Survey, weighted data.

NOTE: All entries are weighted.

[a] Calculated only for households that do not shop in the neighborhoods.

[b] Percentages sum to greater than 100, because multiple answers were possible.

TABLE IV.8

PERCEPTIONS OF ADEQUACY OF ACCESS TO STORES,
HOUSEHOLDS WITH AFDC INCOME

Characteristic	Participants	Nonparticipants	
		Eligible	Near-Eligible
Percentage Who Shop in Stores in Neighborhood	58.2	NA	NA
Among Those Who Do Food Shopping in the Neighborhood, Degree of Satisfaction with Food Shopping Situation in Neighborhood			
Very satisfied	62.9	NA	NA
Somewhat satisfied	27.7	NA	NA
Somewhat dissatisfied	4.8	NA	NA
Very dissatisfied	4.5	NA	NA
Don't know or missing	0.2	NA	NA
Sample Size	423	NA	NA
Percentage Who Do Not Shop in Stores in Neighborhood	41.8	NA	NA
Reasons Households Do Not Shop in the Neighborhood[a]			
No stores close by	40.6	NA	NA
Crime	1.2	NA	NA
High prices	51.0	NA	NA
Limited food selection	13.1	NA	NA
Embarrassed to use food stamps near home	3.3	NA	NA
Do food shopping as part of multipurpose trip	2.4	NA	NA
Get rides with people who shop outside neighborhood	2.1	NA	NA
Other reasons	11.4	NA	NA
Sample Size	309	NA	NA
Among Those Who Do Not Food Shop in the Neighborhood, Degree of Satisfaction with Food Shopping Situation in Neighborhood			
Very satisfied	15.5	NA	NA
Somewhat satisfied	23.4	NA	NA
Somewhat dissatisfied	35.5	NA	NA
Very dissatisfied	22.3	NA	NA
Don't know or missing	3.3	NA	NA
Sample Size	309	NA	NA
Percentage Who Would Like Changes or Improvements in Food Shopping Situation	57.1	NA	NA
Among Those Who Would Like Changes or Improvements in the Food Shopping Situation, Percentage of Individuals by Type of Improvements to Food Shopping Situation in the Neighborhood[b]			
More large national chain supermarkets in area	35.6	NA	NA
Better security at or near area stores	3.0	NA	NA
More direct public transportation	3.1	NA	NA
Transportation service provided by store	3.4	NA	NA
Stores that stay open for 24 hours	3.7	NA	NA
Stores than open early and close late	3.6	NA	NA
More selection	10.2	NA	NA
Lower prices	45.6	NA	NA

TABLE IV.8 *(continued)*

Characteristic	Participants	Nonparticipants	
		Eligible	Near-Eligible
Large supermarkets/stores located within walking distance	13.4	NA	NA
More stores that accept food stamps and WIC benefits	2.1	NA	NA
Stores that sell bulk items at discount	6.7	NA	NA
Other reasons	15.7	NA	NA
Sample Size	410	NA	NA
Percentage of Individuals Who Regard as Excellent/Good the Store Where Most Food Is Purchased with Regard to			
Cleanliness and neatness	90.3	NA	NA
Courteous employees	82.8	NA	NA
Low prices	73.2	NA	NA
Quality of produce	85.4	NA	NA
Quality of meat	82.0	NA	NA
Wide selection	84.9	NA	NA
Private labels or store brands	86.3	NA	NA
Items on sale	86.1	NA	NA
Convenient location	83.0	NA	NA
Safe area or good security	87.0	NA	NA
Fast checkout	66.0	NA	NA
Sample Size	732	NA	NA

SOURCE: 1996 National Food Stamp Program Survey, weighted data.

NOTE: All entries are weighted.

[a] Calculated only for households that do not shop in the neighborhoods.

[b] Percentages sum to greater than 100, because multiple answers were possible.

NA = not available. Very few FSP nonparticipants receive AFDC.

5. Differences by Urban/Rural Status

As one might expect, rural households are much less likely than urban households to shop in their neighborhoods. (See Table IV.9, where the data are tabulated for the FSP participant sample.) Furthermore, rural households who do shop in what they characterize as their neighborhoods are considerably less likely to describe themselves as very satisfied with their shopping activities.

Urban and rural households vary somewhat in how they rate various aspects of the stores they usually use. For many attributes, the rural ratings are similar to those given by urban respondents. However, not surprisingly, rural respondents were less likely to be satisfied with the location of their stores but were more likely to feel that the security situation was good.

6. Differences by Whether Respondents Would Like Improvements in Their Shopping Situations

It is also interesting to examine perceptions of store adequacy for only those households who indicated that they would like improvements in their overall shopping situation. In particular, this provides an indication of the degree of unhappiness about their shopping situations experienced by the people wanting improvement. Table IV.10 examines this. The first column displays satisfaction level estimates for the respondents who did *not* indicate a desire for improvements in their shopping, while the second column shows data for those who said they *would like* improvements. Overall, the differences are in the expected direction but relatively small. The group who would like to see improvements has a somewhat lower "excellent/good" rating on all categories, but the differences tend to be less than 10 percentage points.

TABLE IV.9

PERCEPTIONS OF ADEQUACY OF ACCESS TO STORES: PARTICIPANTS BY URBANICITY

Characteristic	Urban	Mixed	Rural
Percentage Who Shop in Stores in Neighborhood	71.2	59.4	30.7
Among Those Who Do Food Shopping in the Neighborhood, Degree of Satisfaction with Food Shopping Situation in Neighborhood			
Very satisfied	60.2	66.9	48.2
Somewhat satisfied	27.4	22.6	28.8
Somewhat dissatisfied	4.7	3.2	7.2
Very dissatisfied	6.8	6.0	15.1
Don't know or missing	1.0	1.4	0.8
Sample Size	844	302	230
Reasons Households Do Not Shop in the Neighborhood[a]			
No stores close by	39.7	54.9	59.4
Crime	2.3	1.0	0.4
High prices	47.6	47.1	45.9
Limited food selection	15.9	12.1	10.6
Embarrassed to use food stamps near home	2.6	1.4	3.0
Do food shopping as part of multipurpose trip	1.6	2.9	2.5
Get rides with people who shop outside neighborhood	6.2	5.8	3.0
Other reasons	11.5	7.2	3.8
Sample Size	363	302	89
Among Those Who Do Not Food Shop in the Neighborhood, Degree of Satisfaction with Food Shopping Situation in Neighborhood			
Very satisfied	14.6	21.9	18.1
Somewhat satisfied	22.0	24.1	23.6
Somewhat dissatisfied	37.6	28.9	36.3
Very dissatisfied	23.1	14.3	20.5
Don't know or missing	2.7	5.7	1.4
Sample Size	363	302	230
Percentage Who Would Like Changes or Improvements in Food Shopping Situation	53.9	52.9	63.7
Among Those Who Would Like Changes or Improvements in the Food Shopping Situation, Percentage of Individuals by Type of Improvements to Food Shopping Situation in the Neighborhood[b]			
More large national chain supermarkets in area	29.1	32.7	53.8
Better security at or near area stores	3.3	0.4	1.3
More direct public transportation	2.8	2.3	1.5
Transportation service provided by store	3.3	2.8	0.7
Stores that stay open for 24 hours	3.5	2.3	2.4
Stores than open early and close late	3.2	2.6	1.8
More selection	11.2	8.2	10.8
Lower prices	42.7	50.8	49.9
Large supermarkets/stores located within walking distance	13.1	10.0	13.7
More stores that accept food stamps and WIC benefits	1.7	2.7	2.4
Stores that sell bulk items at discount	6.6	6.2	5.1
Other reasons	19.3	10.2	4.8

TABLE IV.9 *(continued)*

Characteristic	Urban	Mixed	Rural
Sample Size	624	353	209
Percentage of Individuals Who Regard as Excellent/Good the Store Where Most Food Is Purchased with Regard to			
Cleanliness and neatness	86.1	90.3	90.3
Courteous employees	83.4	87.5	91.9
Low prices	69.5	72.4	73.8
Quality of produce	82.1	85.4	82.1
Wide selection	87.4	85.7	86.0
Private labels or store brands	83.3	87.2	86.9
Items on sale	82.8	83.0	84.3
Convenient location	85.9	83.4	75.1
Safe area or good security	81.7	90.8	90.9
Fast checkout	67.4	70.7	79.7
Sample Size	1,211	698	319

SOURCE: 1996 National Food Stamp Program Survey, weighted data.

NOTE: All entries are weighted.

[a] Calculated only for households that do not shop in the neighborhoods.

[b] Percentages sum to greater than 100, because multiple answers were possible.

TABLE IV.10

SATISFACTION WITH STORE ATTRIBUTES BY WHETHER WOULD LIKE CHANGES IN SHOPPING SITUATIONS: FOOD STAMP PROGRAM PARTICIPANTS

Characteristic	Respondents Not Wanting Changes	Respondents Wanting Changes
Cleanliness and neatness	90.4	86.0
Courteous employees	90.1	82.4
Low prices	76.3	66.4
Quality of produce	87.6	79.1
Quality of meat	87.4	77.4
Wide Selection	92.4	82.2
Private labels or store brands	89.2	81.5
Items on sale	87.4	79.2
Convenient location	92.0	77.0
Safe area or good security	90.7	82.4
Fast checkout	74.8	65.5
Sample size	1,026	1,276

SOURCE: 1996 National Food Stamp Program Survey, weighted data.

C. TYPES OF STORES WHERE VARIOUS NUTRIENTS ARE PURCHASED AND VARIATIONS BY STORES IN THE NUTRIENT EFFICIENCY OF PURCHASES

During the part of the interview about foods used in the previous seven-day period, for each food that had also been purchased during that period, FSP participants were asked to indicate on which shopping trip they had bought the food. This information was then combined with data about the stores visited on each shopping trip to determine the types of stores where the foods had been bought. In addition, the data made it possible to estimate levels of "nutrient efficiency" experienced by households in their purchasing, defined as the amounts of various nutrients obtained per dollar spent at various kinds of stores.

The data linking foods and stores are available only for foods that were bought during the observation week, and they are probably skewed toward perishable items, which have to be purchased frequently. Nevertheless, the analysis can shed considerable light on shopping patterns as they relate to nutrition outcomes.

1. Stores Where Nutrients Are Purchased

As might be expected given the high numbers of households using supermarkets as their main source of food, supermarkets provided the greatest quantities of each of the nutrients examined. The percentages of nutrients obtained from supermarkets ranged narrowly, from 80 percent for calcium and vitamin A to 85 percent for folate (Table IV.11). The next-most-common sources of nutrients, roughly in their order of importance, were neighborhood grocery stores and specialty stores.

Interestingly, calcium is one of the nutrients in the table least likely to be obtained from supermarkets. This probably reflects the fact that milk, a major source of calcium, is frequently purchased at smaller local stores because of its perishability. The other nutrient in the table that is

TABLE IV.11

NUTRIENTS USED, BY TYPE OF STORE WHERE PURCHASED[a]
(Percentage Distribution)

	Supermarkets	Neighborhood Grocery Stores	Convenience Stores	Specialty Stores	Discount Stores	Other
Food Energy	83	5	2	3	4	3
Vitamin A	80	6	3	2	3	6
Vitamin C	84	5	1	3	3	3
Vitamin B_6	83	5	2	3	3	3
Folate	85	4	2	3	4	3
Calcium	80	6	3	3	5	4
Iron	84	5	2	3	3	3
Zinc	82	5	2	4	3	3
Sample Size						
Household	639	53	57	50	37	46
Food Items	8,201	501	265	262	265	258

SOURCE: 1996 National Food Stamp Program Survey; data on participants interviewed in person, weighted data.

NOTE: Entries are percentages of specific nutrients purchased in different types of stores. Sample size is based on data from 1,030 households. Entries are units of nutrients per dollar spent and store type shown.

[a]Because of constraints on the length of the interview, the data needed for these tabulations were only obtained for foods that were both bought and used in the seven days prior to the interview. Therefore, table entries are based on foods bought and used during week of data collection, where the type of store is known. This includes approximately 36 percent of all foods bought, in terms of food energy content. The data may be skewed toward perishable foods, which are more likely to be used soon after purchase. Frequency distributions in the table are based on 9,752 food items.

least likely to be bought in supermarkets is vitamin A, probably because milk is usually fortified with Vitamin A.

2. Nutrient Efficiency

The analysis also examined variation across stores in "nutrient efficiency," defined as nutrients obtained per dollar spent. There are at least two important reasons that a certain type of store may have a higher efficiency level for a nutrient than other types of stores. One is that the store type may have consistently lower prices. The other is that shoppers may concentrate their purchases of items containing a given nutrient in certain types of stores, giving a particular type of store a high efficiency for that nutrient but a lower ranking for others. Both of these influences are probably present in the data analyzed below.

It is also important to consider the nutrient efficiency estimates in terms of household shopping patterns. Different types of stores may fill different market "niches." For instance, neighborhood and convenience stores may provide relatively easy access to certain kinds of foods that households may buy more often than they go to supermarkets. As indicated below, there is evidence that FSP participants use different kinds of stores in different ways to choose a market basket that provides value in terms of nutrients acquired. In particular, the nutrient efficiency calculations do not display a clear pattern across stores or across nutrients (Table IV.12). Convenience stores have the highest nutrient efficiency for calcium and vitamin A, presumably reflecting the fact that many people rely on convenience stores for much of their milk. Interestingly, specialty stores, which include bakeries, meat markets, health food stores, and other food stores whose range of merchandise is limited, rank high in the distributions of food energy, vitamin A, and iron. Supermarkets are not at the top of any of the rankings, which probably reflects the fact that they sell a full range of products and,

TABLE IV.12

NUTRIENT AMOUNTS PER DOLLAR SPENT, BY TYPE OF STORE WHERE PURCHASED[a]

	Supermarkets	Neighborhood Grocery Stores	Convenience Stores	Specialty Stores	Discount Stores	Other Stores
Food Energy (Kcal)	751.3	782.9	829.5	859.2	904.7	742.4
Vitamin A (μRE/$)	389.5	434.0	563.6	313.6	329.2	323.0
Vitamin C (mg/$)	39.3	56.9	29.1	45.7	40.8	32.4
Vitamin B_6 (mg/$)	.62	.66	.47	.68	.66	.59
Folate (μg/$)	85.2	85.9	85.2	91.4	96.2	80.5
Calcium(mg/$)	345.6	371.2	608.6	307.7	402.4	329.3
Iron (mg/$)	4.7	4.2	4.4	6.4	5.4	4.7
Zinc (mg/$)	3.8	3.7	3.5	4.0	4.4	3.1
Sample Size						
Households	639	53	57	50	37	46
Food items	8,201	501	265	262	265	258

SOURCE: 1996 National Food Stamp Program Survey, data on FSP participants interviewed in person, weighted data.

NOTE: Sample size is based on data from 1,030 households. Entries are units of nutrients per dollar spent and store type shown.

[a]Because of constraints on the length of the interview, the data needed for these tabulations were only obtained for foods that were both bought and used in the seven days prior to the interview. Therefore, table entries are based on foods bought and used during week of data collection, where the type of store is known. This includes approximately 36 percent of all foods bought, in terms of food energy content. The data may be skewed toward perishable foods, which are more likely to be used soon after purchase. Frequency distributions in the table are based on 9,752 food items.

correspondingly, do not specialize in any particular area. Discount stores seem in general to have high efficiency ratios, perhaps reflecting their low prices.

An earlier study, the FNS Authorized Retailer Study, found that, overall, *for a fixed market basket of goods*, supermarkets had the lowest prices.[5] The findings on nutrient efficiency reported above suggest that shoppers may selectively buy different types of items in different kinds of stores, to take advantage of price and convenience differentials in specific types of foods with different patterns of nutrients.

The analysis also considered whether nutrient efficiency was associated with various measures of access to stores. In general, this did not seem to be the case (Table IV.13). For instance, as shown in the first panel of the table, households living an intermediate distance from the nearest store seem to have the highest nutrient efficiency for folate. But they had the lowest nutrient efficiency for vitamin C, and in general the differences are quite small.

For three of the four nutrients (vitamin C, folate, and iron), households with cars had slightly higher levels of nutrient efficiency than those without cars, as might be expected. However, the nutrient efficiency for food energy of households with cars is slightly lower, and again the differences are quite small.

[5]Mantovani, Daft, Macaluso, and Hoffman (1997).

TABLE IV.13

FOOD PURCHASING OUTCOMES, BY ACCESS MEASURE

Access Measure	Nutrients Per Dollar For Selected Nutrients				Food Expenditure Per Household Member
	Calories (Kcal)	Vit. C (μg)	Folate (μg)	Iron (μg)	
Distance to Nearest Supermarket					
Less than .5 miles	732.5	39.6	86.4	5.4	$21.80
.5 to 4 miles	756.4	38.9	90.8	5.2	$21.50
Over 4 miles	762.2	42.2	88.6	5.1	$22.84
Distance Traveled to Usual Food Store					
Less than .5 miles	693.9	38.4	84.7	5.1	$23.42
.5 to 4 miles	751.9	40.1	88.0	5.2	$20.81
Over 4 miles	785.1	41.1	85.4	5.3	$24.41
Have Car?					
Yes	754.6	38.4	90.5	5.3	$21.91
No	769.3	38.1	87.6	5.2	$23.07

SOURCE: 1996 National Food Stamp Program Survey, weighted data.

V. CONCLUSIONS

Previous research conducted as part of the FNS Authorized Retailer Characteristics Study (Mantovani, Daft, Macaluso, and Hoffman 1996) found that "a large majority of low-income households are in close proximity to a full-line grocery store or supermarket" but that distances to food stores were sometimes much larger for the minority of households living in rural areas. Similar conclusions were reached in the FNS Evaluation of the Expanded EBT Demonstration in Maryland (Cole 1997). Past research has also suggested that most Americans tend to rate the stores they use relatively highly on consumer satisfaction scales (Food Marketing Institute 1998).

As summarized below, the current research indicates that these earlier findings apply in general to FSP participants and eligible and near-eligible nonparticipants. The findings suggest that most low-income households, including both FSP participants and those not participating in the program, have good access to food retailers. Most households in the sample shop in their neighborhoods and express high levels of satisfaction with their shopping opportunities. Further, for the average household, the round trip to the favorite store is only about 20 minutes. For most households, this trip is done by car.

However, although most households are basically pleased with their shopping opportunities, a minority do not perceive themselves as having good access to shopping. For instance, even of the households that shop in their neighborhoods, seven percent indicated that they were very dissatisfied with shopping opportunities near where they lived. Similar responses were given by about a fifth of recipients who did not shop in their neighborhoods. These estimates are broadly consistent with a separate finding that, depending on the criterion, approximately 10 to 20 percent of respondents failed to rate the stores where they shopped as at least "good."

As with other Americans, the great majority of low-income households shop at supermarkets. However, considerable numbers of sample members supplement food from supermarkets with purchases at several other types of stores, including neighborhood grocery stores, convenience stores, bakeries, and produce stands.

Most of the low-income households in the sample reported that they frequently used such "careful shopping" techniques as stocking up on bargains, watching for grocery "specials," comparing prices across stores, and using shopping lists. At least 60 percent of respondents said that they did these activities "on most shopping trips" or at least "fairly often." However, for most of these activities, another 20 percent of respondents reported that they never did them.

Most of the nutrients that households in the sample obtain are purchased in supermarkets, with the next most common sources being neighborhood stores and convenience stores. There were no clear patterns across stores in the nutrient efficiency (nutrients obtained per dollar spent) of foods bought. Nutrient efficiency was also unrelated to the distance people traveled to their food stores.

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APPENDIX A

DATA COLLECTION METHODS

The survey of Food Stamp Program (FSP) participants and nonparticipants was conducted from June 1996 to January 1997. This appendix describes the methods used to select the sample, conduct the NFSPS, and process the data. It also includes response rates and reasons for ineligibility.

A. METHODS FOR SELECTING AND LOCATING RESPONDENTS

MPR used a dual frame approach to select the samples of FSP households and households containing eligibles who do not receive food stamps.

1. List Frame

List frame samples in this survey were selected from administrative lists of FSP participants. Before identifying the sample, an MPR sampling statistician randomly selected 35 primary sampling units (PSUs) systematically with probability proportional to size. The PSU was usually a county, but sometimes it was a state (in cases where county-level information was unavailable) or a city (the five boroughs of New York). Before selection, the PSUs were first sorted by region, then by state within a region, and finally by size (number of food stamp recipients) within state.[1] Because the three largest PSUs were the same size as or larger than the sampling interval, they were selected with certainty and removed from the systematic sampling process.[2] New York City had a size equivalent to two sampling intervals, so it counted as two PSUs. Thirty-one PSUs were then selected out of the remaining 2,862. Two of these were at the state level and so required subsampling. For the three certainty selections, the decision was made to subsample areas within counties. Three areas were

[1]These numbers were from spring 1995.

[2]Frame size before removing certainty selections was 10,858,961, and the sampling interval for selecting 35 PSUs was 310,256. The frame size after removing the certainty selections was 9,462,582.

sampled from Cook County, three areas from Los Angeles County, and two boroughs and three areas within each borough for New York City.

In spring 1996, FNS provided the names of contacts in the seven regional offices to assist with obtaining list samples for the survey. These regional contacts in turn provided the names of contacts in the state offices for the 34 areas selected for the survey. (In California, the state contact provided referrals to county offices.) These offices provided data files containing lists of all active food stamp cases as of the beginning of April 1996.[3]

As these data files were received from the field, the sampling statistician read them in from their various formats and standardized them into SAS data files. For most of the PSUs, 180 cases were selected systematically. For Cook County, 60 cases were selected systematically from each of the three subsampled areas. In Los Angeles County, 81 cases were selected from each of the three subsampled areas. In each of New York City's six selected areas (three from each of the two selected boroughs), 60 cases were selected. The selected cases were then sorted into a random order. The first two-thirds were then assigned to the field sample, and the last third was assigned to the telephone sample.

a. Field List Frame Sample

For the field sample, the targeted number of completes from each of the non-certainty sites was 29. For the selected areas in the three certainty selections, the targeted number of completes was 30 for Cook County (combined), 42 for Los Angeles County (combined), and 60 for New York City (combined). The total number of targeted completes for the field sample was 1,031. Cases were

[3]A trial run was conducted with most of the selected sites a couple of months prior to April, where they supplied their most current data file at the time. Through using information from this trial stage, the two selected states were subsampled and the three certainty selections were made.

released as needed in a random order by site from among the 4,242 cases selected for the field component. A total of 2,200 cases were ultimately released.

b. Telephone List Frame Sample

For the telephone sample, the targeted number of completes from each of the non-certainty sites was 14. For the selected areas in the three certainty selections, the targeted number of completes was 15 for Cook County (combined), 21 for Los Angeles County (combined), and 30 for New York City (combined). The total number of targeted completes for the telephone list sample was 500. Cases were released as needed in a random order by site from among the 2,121 cases selected for the telephone component. Ultimately, all 2,121 cases were released.

2. Random-Digit-Dialing Sample

For the random-digit-dialing (RDD) sample, software from Genesys, Inc. was used to obtain a stratified sample of 20,003 telephone numbers in working telephone banks in the United States. A telephone bank is defined as the first 8 digits of a 10-digit telephone number (area code plus exchange plus next two digits). The possible combinations of its last two digits create 100 telephone numbers for a bank to contain, and it is considered a working bank if at least one is a published residential telephone number. Each telephone number was defined as being in one of five strata based on the area code plus exchange (first 6 digits of the 10-digit telephone number). There was no oversampling by stratum. The five strata were defined by the estimated percentage of households with income less than $15,000:

- ***Low Income.*** Exchanges where estimated percentage $\geq$ 35 percent
- ***Mid-Low Income.*** Remaining exchanges where estimated percentage $\geq$ 25 percent
- ***Middle Income.*** Remaining exchanges where estimated percentage $\geq$ 15 percent

- ***Mid-High Income.*** Remaining exchanges where estimated percentage ≥ 10 percent
- ***High Income.*** Remaining exchanges (where estimated percentage < 10 percent)

After removing known nonworking and nonresidential telephone numbers, cases were released in a random order as needed to obtain the targeted number of completes: 495 participants and 990 eligible and near-eligible nonparticipants. A total of 14,514 telephone numbers was released.

3. Obtaining Contact Information

Contact information for the study sample was obtained with the original sample from state or county FSP offices. This information, current as of March 1996, included sample member name, address, telephone number (if available), date of birth, and, in some cases, a caseworker identifier. The information received varied widely by site in terms of completeness and accuracy.

a. Contacting Local FSP Offices

Local FSP offices were first contacted, with permission of the state offices, in May 1996. This contact served to inform the local offices about the survey so they could encourage participation and confirm the validity of the survey, should any of the recipients contact them.

MPR survey staff contacted the local offices in July to obtain updated contact information for recipients who could not be located. In addition, offices were asked to confirm if each sampled person was still receiving food stamps. Project staff provided the birth date of the recipient, and the client ID#, case ID#, or caseworker ID#, if this information was available, to assist the local offices in identifying the cases. All offices contacted were responsive to requests. Some offices consulted with the caseworkers, while others used their computer files or hard copy files to obtain the information.

The local offices were recontacted in August and September of 1996 to obtain information on additional recipients who could not be located. In September, selected field interviewers went to the local offices and worked with the local contacts to update contact information. Overall, these efforts yielded some addresses and telephone numbers, but the most helpful information provided was whether the recipients were still receiving food stamps and hence eligible for the survey.

b. MPR Locating Department

Telephone numbers were available for approximately 54.5 percent of the list frame telephone sample. However, many of these numbers were either nonworking or incorrect. As a first strategy, telephone interviewers called local directory assistance to obtain telephone numbers for cases with nonworking or incorrect numbers. When these efforts failed, FSP offices were contacted as discussed in the previous section. If the FSP offices could not update the information, MPR's Locating Department searched for sample members.

MPR's Locating Department made extensive use of a service bureau that searches using a crisscross or reverse directory, surnames, and the existing telephone number. The on-line system was accessed from a terminal in the Locating Department. MPR's Locating Department also utilized directory assistance, involving locations neighboring the sample member's city or town. In total, 642 cases were referred to the Locating Department. Reliable contact information was obtained for 16 percent (105) of these cases.

B. SELECTION AND TRAINING OF DATA COLLECTION STAFF

1. Hiring and Training of Field Staff

Field interviewers were hired in each of 35 PSUs. It was decided that some PSUs would require two interviewers, while one experienced interviewer would be sufficient for other areas. A single

interviewer was hired in each of 17 PSUs, while two interviewers were hired in each of the remaining 18 PSUs. Approximately one month after the start of the field period, six additional interviewers were hired because of attrition among original interviewers and a reevaluation of field needs. Field interviewers were recruited from three sources: an MPR database, local community contacts, and state job services. Preference was given to people with Computer-Assisted Personal Interviewing (CAPI) experience or experience in food management or nutrition. Twenty-eight of the 53 interviewers had experience conducting CAPI interviews. Three additional interviewers had some experience in field interviewing or field locating. Seventeen interviewers had no direct survey experience. Four PSUs were targeted as requiring bilingual interviewers. In addition, three of the interviewers were trained nutritionists. Three field supervisors were hired to manage the field effort. All field supervisors had experience conducting food use surveys. Two of the supervisors had experience working for MPR.

The main field interviewer training was held May 4-10, 1996. A two-day trainers' training was conducted for field supervisors, trainers, and assistant trainers at the MPR offices immediately before the general training session. This training included a question-by-question review of the survey instrument, and testing and practice on the CAPI questionnaire.

One week before the general training session, interviewers were sent an advance study manual that contained an introduction to the survey and a review of basic interviewing techniques. Interviewers were required to complete an assignment related to food use data collection before leaving their homes. They were also instructed to schedule a practice interview to be completed at the conclusion of training.

The six-day intensive training was held off site, at a conference and training center in Princeton, New Jersey. Two training formats were used: (1) large-group lecture format, and (2) small-group

practice sessions. During the training, interviewers moved from large format to small-group sessions as dictated by the agenda. Interviewers were divided into five small groups based on interviewing and computer experience. Each small group was led by one senior trainer and one assistant trainer. One-on-one CAPI enrichment sessions were also provided each evening. The first two-and-a-half days of training included a general introduction and background to the study, instruction and practice with the hard-copy screener and hands-on practice with the CAPI interview. In addition, an MPR training tape about the role of the interviewer was shown during an evening session, with discussion afterward. Training on the hard-copy food use instrument was conducted for three days by MPR staff, including MPR's nutritionist; Margaret Andrews, the Contracting Officer's technical representative; and Pat McKinney, an FNS nutritionist. In large-group sessions, trainers presented an overview to the food use module as well as specific rules for completing the food use instrument. In small-group sessions, interviewers were paired for one-on-one practice and question-by-question review. Key definitions of food categories and instruction in reporting food use quantities were reviewed in the smaller sessions. Trainers administered CAPI proficiency exercises and food use recording exercises to evaluate interviewer performance before the conclusion of training. A small number of interviewers were identified who required one-on-one supplementary training during evening sessions. Interviewers spent the final half day of training integrating data collection components, reviewing administrative issues, and meeting with field supervisors.

2. Hiring and Training of Telephone Interviewers

By early June 1996, 74 telephone interviewers were hired and trained to administer screening and survey instruments. The group contained experienced and inexperienced interviewers. Inexperienced interviewers received eight hours of general interviewer training prior to participating in project-specific training. Both experienced and inexperienced interviewers participated in project-

specific training, which included overviews of the program and study, sample member screening, item-by-item review of the questionnaire, role plays, questions and answers, and Computer-Assisted Telephone Interviewing (CATI) practice. Project-specific training lasted for close to eight hours. About seven percent of the interviewing staff was bilingual.

C. METHODS FOR COLLECTING THE DATA

1. Field Data Collection

Data collection for the in-person component included a telephone or in-person screener and a two-interview series. Part I of the main interview was administered by CAPI and collected information about the household, program access, food security, diet knowledge and attitudes, and food shopping patterns. Part II involved both CAPI and hard-copy administrations and included either a four- or a seven-day recording of foods used from the home food supply. Part II was conducted either four or seven days following Part I.

a. Survey Materials

In addition to Dell 486 Latitude laptop computers with English and Spanish versions of the CAPI instrument, materials for the survey included:

- ***Advance Letter.*** Mailed to the respondent three to five days before telephone contact was made
- ***Record of Contacts Form.*** For documenting attempts made to locate and interview sample persons
- ***Eligibility Screener.*** Brief hard-copy interview to determine respondent eligibility
- ***Reminder Postcard.*** To remind respondents of their appointment for the second part of the interview
- ***Food Use Instrument.*** Hard-copy instrument administered during Part II of the interview to obtain detailed information about household food use

- ***Food Use Checklist.*** To help respondents keep track of food use during the survey period

All hard-copy materials were available in both English and Spanish.

b. Components of the Interview

Advance Letter. All persons selected to participate in the NFSPS were notified of their selection by a letter in advance of any other form of contact. The advance letter explained the study, encouraged participation, and informed the sample member that the interviewer would be contacting him or her. Letters were mailed to respondents three to five days before the screening contact was made.

Screener. Next, the interviewers screened the respondents by telephone. They called their assigned sample members to introduce themselves, administer a brief eligibility screener, answer any questions the respondent might have, and schedule the two parts of the interview with the food manager for the household. (If telephone contact was not possible, this screening was done in person.)

Part I of Main Interview. Part I of the main interview was conducted by CAPI. At the conclusion of the interview, respondents were instructed to keep track of foods used and shopping trips made during the seven-day period before Part II of the interview. The interviewer provided materials to aid the respondent in keeping detailed records of all the food purchased and used by the household. These materials included a plastic bag for saving food receipts and a large envelope for the collection of food labels. Two days after completion of the Part I interview, interviewers mailed the respondent a reminder postcard that included the date of the appointment for the Part II interview.

Part II of Main Interview. The first section of the Part II interview was conducted by CAPI. This section collected information about shopping trips and identified household members and guests who used food from the household food supply. The second section of the interview used hard-copy administration. It identified what foods were used, with a level of detail sufficient to determine actual nutritional availability, such as calories, fat, and vitamins. This section also captured the cost of each of the foods. Upon the completion of the Part II interview, respondents were given a $20 incentive for their time and cooperation. (Respondents were told of this $20 payment when they were first contacted as an inducement to participate and maintain the food use records).

c. Field Management

Field interviewers reported progress to their field supervisor weekly by telephone at prearranged times. They reported hours worked, expenses, and field progress. During the reporting session, the supervisor reviewed each case being worked by the interviewer and suggested modifications to searching and interviewing techniques where appropriate. Supervisors also handled administrative needs (such as supply orders) and answered non-urgent questions. In turn, the supervisors reported summaries of field progress and expenses to an MPR survey specialist weekly. Interviewers were encouraged to contact the MPR help line immediately for urgent matters.

d. The MPR Help Line

Interviewers and field supervisors had 24-hour access to the survey director and to technical support staff by means of a toll-free number that reverted to a paging system during non-business hours.

e. Bonuses

To encourage interview productivity at the end of the project, MPR offered field interviewers a bonus of $10 for every interview completed after November 21, 1996. This kept enthusiasm high when sample was sparse. It also kept interviewers motivated to finish their final assignment rather than move to new projects.

2. Telephone Data Collection

For the telephone sample, CATI techniques were used to facilitate the screening and interviewing. Sample points were electronically assigned to individual interviewers, and the CATI system stored the results of interview attempts. An automated system reassigned unsuccessful attempts and scheduled callbacks. Interviewers who conducted the screening interviews also conducted the telephone interviews of both participants and nonparticipants. A senior staff member at the survey operations center supervised the interviewers, and assistant supervisors assessed interviewer performance by monitoring randomly selected segments of the interviewing.

a. Bonuses

A bonus system was instituted in the survey operations center on September 13, 1996, as an incentive to maintain interviewer interest and commitment when it became increasingly difficult to

obtain completed interviews. One dollar was offered for each completed RDD or list frame interview and one dollar and fifty cents for each refusal that was converted to a complete interview.

b. In-Person Locating of Telephone List Frame Sample Members

In mid-November, field locators with cellular telephones were deployed in 24 areas to locate telephone list frame sample members who could not be contacted by telephone. Locators received written training materials and participated in telephone training on implementing locating strategies and operating the telephone equipment.

Field locators searched for sample members by starting with the last known address and then contacting neighbors and community sources. After locating a sample member, if a telephone was available in the household, the locator was responsible for facilitating a phone call to MPR's survey operations center. Staff were available throughout the day and evening hours to conduct the interview. If the sample member could not participate in the interview at that time, a telephone number was obtained and communicated to the operations center. Appointments were made when possible. If a telephone was not available in the household, the locator saw that the interview was conducted by cell phone and remained with the sample member until it was completed. Within a six-week period, the locators were able to facilitate 122 interviews from the 625 sample members that were previously unlocatable by telephone. They also determined that an additional 44 sample members were ineligible for the study.

3. Problems Faced During the Survey Period

The data collection began at a time when the government was contemplating major changes in the welfare program. This news created nervousness among respondents. Uncertain about their

eligibility for food stamps and other entitlement programs, they were reluctant to participate in the study and had to be reassured that their responses would not affect their future eligibility.

Immigrant ethnic communities would have been severely affected by the policies considered. In contrast with previous successful interviewing in the Vietnamese community in California for the cashout evaluations, a Vietnamese interpreter and community worker was unsuccessful in facilitating interviews in that community. A Russian interpreter had a similar experience with the immigrant Russian community in New York City.

These factors may have lowered the survey response rates below what they would otherwise have been. There is no evidence as to whether this resulted in significant biases in any of the variables.

D. QUALITY ASSURANCE AND DATA PROCESSING

1. Transmittal and Tracking of Field Data

On a weekly basis, field interviewers submitted completed work to MPR by Federal Express. Weekly field shipments included the transmittal forms used to report cases submitted, hard-copy food use instruments, supporting food use materials, and data diskettes.

The packages were received by the MPR data clerk, who checked the contents against the transmittal form to verify that all materials had been included. An ACCESS database was developed to track the field cases. Interim status codes were entered on a weekly basis following receipt of supervisor reports. The database also included fields for entering dates when the MPR office received completed cases.

The database identified cases reported as complete but not received within 10 days after the supervisor's report. Using weekly reports, the data clerk made reminder calls to field interviewers who had outstanding cases.

After logging in completed cases, the data clerk delivered MPR diskettes to MPR's systems analyst for downloading into a SAS data file. Food use instruments and contact records were delivered to a coding center set up to implement coding using the Food Intake Analysis System (FIAS) developed by the University of Texas (see Appendix C).

Verification and Callbacks. FIAS coding center staff conducted verification of completed cases. Coders were required to telephone at least 10 percent of the respondents interviewed by each interviewer. Using a verification form designed by MPR, coders asked about the date and length of their interview, the mode of the interview (telephone or in person), and the names and locations of the stores the respondent used. Coders also asked about foods and recorded the answers on the food instrument.[4] Food use instruments that were not completed according to specifications were reviewed. As a result of the verification process, two interviewers were terminated and their cases assigned to other field staff. For each of these interviewers, the MPR survey director personally contacted each one of the households who had previously been submitted by the interviewers as completions to test their validity. In most instances, the interview could be validated and was retained. In a small number of instances, the interviews were assigned to a different interviewer or a supervisor to be redone.

[4]Because of the time that had elapsed, it was not usually possible to obtain information directly about specific food use during the period that had been covered by the original interview. However, frequently it was possible to obtain useful information about the *types* of foods the respondent households usually used, as they related to what had been recorded. For instance, if the amount of a food bought was unclear, the callback might have asked what size package of the food the household usually bought. Or if a written description was unclear for some type of food--say, an unusual form of rice--the callback might have asked for additional details. Similarly, if it wasn't clear whether chicken breasts were "with the bone" or "without the bone," it was possible to ask how the household usually bought its chicken breasts.

2. Food Coding

Analysis of home food use required coding all the foods from hard-copy food instruments, as well as data entry of all foods purchased and the prices paid by respondents. To facilitate these goals, a coding room was set up at MPR. Coders were hired, trained, and then provided with their own coding stations and reference materials in the coding room. A supervisor directed the flow of activity in the coding room and consulted with the MPR nutritionist or the co-principal investigators for the project to resolve problems arising from unavailable codes, missing data on the hard copy, or any other causes.

Hard-copy food instruments delivered to the coding room were logged into an ACCESS database by the coding supervisor and then filed according to interviewer. All coders were required to code instruments by all interviewers, and instruments were coded in chronological order so that those instruments received first were usually coded first. Coding entailed reading the nine-digit survey code on the food instrument, assigning a corresponding six-digit FIAS code, and then entering this six-digit code and the amount of the food that was *used* into the FIAS file.[5]

a. Staffing and Training of Food Coders

Following the recommendations of the FIAS staff at the University of Texas, coders were required to have completed high school (though some college education was preferred), to be the food manager at home, and to be familiar with simple mathematical computations. In addition, MPR required coders to have some basic computer experience.

[5]The six-digit coding system was developed by MPR and its subcontractor, ROW Sciences, Inc., to convert the food assumptions used in previous USDA food use studies to codes that were compatible with the FIAS coding system.

Including practice experience, coders were required to participate in 2.5 days of training at MPR. After being given an overview of the project, coders were shown how to start a new file in FIAS, how to move around while in FIAS, and how to close a file. Coders were then shown how to extract the nine-digit survey code from the food instrument and how to relate this code to its corresponding six-digit FIAS code. They were also taught how to input the six-digit FIAS code for each food into a FIAS file along with the amount of that food used during the seven-day period. For each food line, coders were also required to compute, if applicable, the total amount of food bought and the amount of money paid. The mathematical operations that facilitated these steps were reviewed, and coders were provided with a training manual, written by the project director and the MPR nutritionist, which contained all the topics covered during training. (At a later time during the project, coders were taught how to "clean" and data-enter the completed price-related data on the food instruments.)

Ongoing Procedures. The coders were responsible mainly for coding the hard-copy food instruments as outlined above. They also called the respondent when more-detailed information was required for a reported food. For example, if the amount of food used or purchased was missing or unclear or if the form of the food was not indicated (dehydrated, ready-to-eat, condensed, etc.), the coder called the respondent for clarification. Many food instruments generated questions about package size and price paid for a food item. Since some respondents were not able to remember these details, a list was constructed of all the foods that required information on package size or price paid. Two of the coders then went shopping at regular intervals to obtain this information.

Once most of the hard-copy food instruments had been coded and entered into FIAS, the coders were trained to data-enter the information on the food purchased and the price paid into a Lotus spreadsheet.

b. Problems Encountered in Coding

Five main problems delayed the food-coding process: (1) missing information about the food or the price paid for the food, (2) new foods that had no assigned nine-digit survey code or six-digit FIAS code, (3) nonfunctional six-digit FIAS codes, (4) foods that were miscoded in the instrument, and (5) ethnic foods (Russian, Vietnamese, Mexican, among others) that were unfamiliar to the coders.

Several approaches were used to resolve these problems. Information about the unit weight of a food, package size, or unit price was obtained from advertisements from food stores across the country and from food lists solicited from large supermarket chains. In addition, published reference material from the USDA, cookbooks, and food preparation books was used. Uncertainty about the type or amount of food recorded in the instrument was clarified by telephoning the respondent. In other instances, the coders kept a list of unknown package sizes or cost, and at regular intervals one or two of the coders themselves visited a large supermarket to ascertain this information. When none of the above measures supplied the resolution, the problem was referred to the MPR nutritionist, who in turn consulted with a nutritionist at MPR's subcontractor, ROW Sciences, Inc.

c. Data Cleaning

When all food items of a case were completely entered into FIAS and there were no outstanding problems, the case was "cleaned"--that is, all the foods were analyzed for specific nutrients and outlier foods, and cases were examined.

d. Data Entry and Edit Checks

After cleaning, price-related data on each case were also data entered into a Lotus file. The information required for data entry was the six-digit code, the amount of food *purchased*, and the total price paid for the food.

For each case, the FIAS analysis file and the Lotus file were used to generate a FIAS edit file and a Lotus edit file. For a given case, the FIAS edit resulted in a list of those foods that exceeded a preset standard for the normal consumption of specific nutrients in those foods, and the Lotus edit resulted in a list of foods that seemed to exceed the usual unit price, had different FIAS and Lotus codes, or showed a higher amount used than bought. The MPR nutritionist reviewed the FIAS edits and made appropriate adjustments, while the coders reviewed and corrected the Lotus edits, under the supervision of the coding supervisor.

While the coders were encouraged to use reference materials to resolve questions about package size or price, the MPR nutritionist resolved all questions about portion sizes, usual weekly amounts of consumption, and classification of unusual foods or foods not included in the food instrument. She also developed new codes for foods as appropriate and periodically reviewed completed files for quality control purposes.

E. COMPLETION AND OTHER FINAL STATUSES

Eligibility for Surveys. Among the 14,514 cases that were released for the RDD sample, 7,488 were determined to be working residential telephone numbers, making those numbers eligible to complete the income-screening questions (see Table A.1).[6] Among the remaining cases, 5,219 were

[6]This is derived as follows: 14,514 cases released minus 7,026 ineligible or undetermined cases (5,219 + 1,807) yields 7,488 working numbers.

TABLE A.1

ELIGIBILITY RATES AND REASONS FOR INELIGIBILITY

Eligibility Status	Reason	RDD Sample[a]	Phone List Sample	Field List Sample
Total Released		14,514	2,121	2,200
Undetermined	Did not determine if working residential telephone number	1,807		
Ineligible for Survey	Nonworking telephone number or non-residence	5,219		
	Income too high	4,973		
	Not receiving food stamps		546	508
	Deceased		7	7
	Institutionalized			25
	Moved		33	56
Eligible for Survey	Working residential telephone number meeting income criteria	1,456		
	Receiving food stamps in sampled area		1,535	1,604

SOURCE: Administrative files for the 1996 National Food Stamp Program Survey, Mathematica Policy Research, Inc.

[a]For the RDD sample, eligibility refers to the interview itself, not eligibility for the screener. Of course, if a household is ineligible for the screener, it is also ineligible for the interview. Similarly, if it is not determined that the telephone number is a working residential number, then eligibility for the interview is not determined either.

determined to be either nonworking telephone numbers or non-residences. It was not possible to make this determination for the remaining 1,807 cases. Among the 7,488 eligible to complete the income screener, 6,429 completed the screener. Among these cases, 4,973 were determined to be ineligible for the interview because the household income was too high, leaving 1,456 cases eligible for the interview.

For the telephone list sample, among the 2,121 released cases, 546 were determined not to be receiving food stamps at that time, 7 were deceased, and 33 had moved out of state. This left 1,535 eligible cases for the telephone list sample. For the in-person sample, among the 2,200 cases released, 508 were no longer receiving food stamps, 7 were deceased, 25 were institutionalized, and 56 had moved out of the sampled area. This left 1,604 eligible cases for the in-person sample.

Completion Status. Among the 1,456 known eligible cases in the RDD sample, 1,159 completed the interview (see Table A.2). Most of the remaining cases were refusals and broken appointments (n=144) or cases unable to be contacted by the end of the field period (n=134).

Among the 1,535 known eligible cases in the phone list sample, 1,041 completed the interview. One hundred five cases were nonrespondents due to refusal or broken appointment; 39 were cases of a language, cognitive, or physical barrier; 17 were cases where the person was hospitalized or too ill to complete the interview; and in 333 cases, the person was unable to be contacted or located.

The field sample had two parts to the interview. Among the 1,604 cases determined to be eligible for the interview, 1,109 completed at least Part I. There were 196 refusals or broken appointments, 41 with an illness or hospitalization, 123 cases unable to be contacted or located, 93 other cases that could not be resolved by the end of the field period, and 42 "other." Among the 1,109 cases that completed Part I, all but 39 completed Part II.

TABLE A.2

COMPLETION TOTALS AND REASONS FOR NONRESPONSE
(Among Known Eligibles)

Response Status	Reason	RDD Sample	Phone List Sample	Field List Sample Part I	Field List Sample Part II[a]
Completed Interview		1,159	1,041	1,109	1,070
Did Not Complete Interview	Refusal/broken appointment	144	105	196	39
	Language/cognitive/ physical barrier	10	39		
	Too ill or hospitalized		17	41	
	Unable to locate or contact		333	123	
	Exhausted attempts	134		93	
	Other	9		42	
Total Known Eligibles		**1,456**	**1,535**	**1,604**	**1,109**

SOURCE: Administrative files for the 1996 National Food Stamp Program Survey, Mathematica Policy Research, Inc.

[a] Among those who completed Part I.

APPENDIX B

WEIGHTING

This appendix describes the steps taken to calculate analysis weights for the 1996 NFSPS. Each of the following four groups is discussed separately, and combined results across the various groups are reviewed. The four groups are (1) the in-person list frame sample, (2) the telephone list frame sample, (3) the telephone random-digit-dialing (RDD) sample of Food Stamp Program (FSP) participants, and (4) the telephone RDD sample of FSP-eligible and near-eligible nonparticipants.

A. IN-PERSON LIST FRAME SAMPLE

To estimate the in-person list frame sample weights, the probabilities of selection for each sample member were calculated. The inverses of these probabilities were then used to calculate an initial set of weights. Next, these initial weights were adjusted to reflect survey nonresponse. Section 1 below describes how the selection probabilities were calculated. Section 2 then describes the nonresponse adjustments.

1. Sampling Weight

The first step in calculating weights for the in-person list frame sample was to determine the probability of selection. Both the in-person and the telephone list frame samples originated from the same sample frames. For the in-person list frame cases, probabilities of selection were computed as the product of five terms:

*overall prob selection = prob [PSU] * prob [sub-PSU\PSU] * prob [local area\PSU and subPSU]*

** prob [case selected for either the in-person or field samples\earlier stages]*

** prob [case selected for the in-person sample\previous step]*

a. First Stage

The first step in the process was to select with probability proportional to size (PPS) the 35 primary sampling units (PSUs), which were counties (or sometimes states, if county-level size measures not available) in the contiguous United States.[1] Four PSUs were set aside as certainty selections because their measures of size were larger than the sampling interval: New York City (which counted for two selections), Cook County, and Los Angeles County. Once these four PSUs were removed, 31 other counties were selected PPS. So the first term in the equation for the probability of selection (for the noncertainty selections) was:

$$P(PSU_i) = \frac{31 \cdot MOS_i}{\sum_{j=1}^{2862} MOS_j}$$

where MOS_i was the measure of size of PSU *i*. Note that 2,862 non-certainty PSUs were eligible for selection, with a combined measure of size of 9,462,582. For the certainty selections, the first term in the equation was simply 1. The three certainty PSUs had a combined measure of size of 1,396,379.

b. Second and Third Stages

For the three certainty selections and for two PSUs that were at the state level, there were one or two more stages of selection prior to the selection of FSP participants. Each of these will be discussed in turn:

[1]The measures of size used were figures reported to FNS in spring 1995.

Maine. One county within Maine was selected PPS, based on November 1995 counts provided by the state. The second term of the equation for the probability of selection was then:

$$P(county_k \backslash PSU_{Maine)} = \frac{1 \cdot CMOS_k}{\sum_{j=1}^{16} CMOS_j}$$

where $CMOS_k$ was the measure of size for county k in Maine.

Cook County. Three offices were selected PPS, based on counts provided by Cook County in January 1996. The second term of the equation for the probability of selection was then:

$$P(office_k \backslash PSU_{Cook}) = \frac{3 \cdot OMOS_k}{\sum_{j=1}^{25} OMOS_j}$$

where $OMOS_k$ was the measure of size for office k in Cook County.

Los Angeles County. Three districts were selected PPS, based on December 1995 counts provided by Los Angeles County. The second term of the equation for the probability of selection was then:

$$P(district_k \backslash PSU_{LA}) = \frac{3 \cdot DMOS_k}{\sum_{j=1}^{29} DMOS_j}$$

where $DMOS_k$ was the measure of size for district k in Los Angeles County.

Oregon. One district within Oregon was selected PPS, based on October 1995 counts provided by the state. The second term of the equation for the probability of selection was then:

$$P(district_l \backslash PSU_{Oregon}) = \frac{1 \cdot DMOS_l}{\sum_{j=1}^{15} DMOS_j}$$

where $DMOS_l$ was the measure of size for district *l* in Oregon. Because each district contained multiple counties, one county was selected PPS within the selected district. The third term of the equation was then:

$$P(county_k \backslash district_l) = \frac{1 \cdot CMOS_k}{\sum_{j=1}^{5} CMOS_j}$$

where $CMOS_k$ was the measure of size for county *k* in selected district *l* in Oregon.

New York City. Two boroughs were selected PPS, based on December 31, 1995, counts provided by the state. The second term of the equation for the probability of selection was then:

$$P(borough_l \backslash PSU_{NYC}) = \frac{2 \cdot BMOS_l}{\sum_{j=1}^{5} BMOS_j}$$

where $BMOS_l$ was the measure of size for borough *l* in New York City. Then three zip codes were selected PPS within each selected borough. The third term of the equation was then:

$$P(zipcode_k \backslash borough_l) = \frac{3 \cdot ZMOS_k}{\sum_{j=1}^{J} ZMOS_j}$$

where $ZMOS_k$ was the measure of size for zip code *k* in selected borough *l* in New York City.

All Other PSUs. For the other 29 PSUs, the second and third terms of the equation for the probability of selection were equal to 1. For Maine, Cook County, and Los Angeles County, the third term of the equation was equal to 1.

c. Fourth and Fifth Stages

The last terms in the equation for the probability of selection pertain to the selection of cases within the last stage selected (county, office, district, zip code). Cases were selected with equal probability at the last stages. The fourth term of the equation was:

$$P(case_m \backslash laststage_k) = \frac{n_k}{N_k}$$

where n_k was the number of cases selected from, and N_k was the frame size for, last-stage unit *k*. From these selected cases, two-thirds were randomly selected for the in-person sample. From these two-thirds, a certain number of cases were actually released. For estimates being made from only the in-person list sample, this sample was treated as if it were independent from the telephone list sample, in which case the fifth and last term of the equation would be:

$$P(case_m \backslash selected\ for\ in\&person\ sample\ [independent]) = \frac{2}{3} \div \frac{f_k}{n_k \div 2/3} = \frac{f_k}{n_k}$$

where f_k was the number of cases released for the in-person (or "field") list sample from last-stage unit *k*. However, as discussed below, estimates were made combining the two list samples, in which case this sample must not be treated as independent from the telephone list sample. The fifth and last term of the equation would then be quantified as:

$$P(case_m \backslash selected\ from\ N_k) \;=\; \frac{f_k}{n_k} \;+\; \left(1-\frac{f_k}{n_k}\right)\;\frac{t_k}{n_k-f_k} \;=\; \frac{f_k \;+\; t_k}{n_k}$$

when the two list samples were being used to produce an estimate, and where t_k was the number of cases released for the telephone list sample from last-stage unit *k*. The second term in this formula accounts for the fact that the case could have been selected into either the in-person sample or the telephone sample (but not both).

d. Summary

The probability of selection for each selected case was the product of these five terms. The sampling weight was the reciprocal of the probability of selection. All released cases (including nonrespondents and those later found to be ineligible) have a sampling weight greater than zero.

2. Weighting Adjustments

The sampling weight was then adjusted to account for nonresponse. To do this, all released cases were classified as one of the following: eligible respondent, eligible nonrespondent, ineligible, or eligibility status undetermined. Here, "eligible" means part of the target population, rather than eligible for the survey, so that movers were classified as undetermined for weighting purposes.

To carry out this nonresponse adjustment, weighting classes were formed that met both of the following criteria: (1) information used to form these classes must be available for all released cases (that is, it must be information provided on the sample file), and (2) the cases within each class should be relatively homogeneous with respect to characteristics expected to be related to study (dependent) variables and the propensity to respond. In addition, each class should have at least 20 respondents and the adjustment factor (described below) for each class should be less than or equal

to 2. Classes were collapsed with similar classes when they failed to meet these criteria. Classes defined by the site (generally, the PSU) usually met these criteria.

The first step adjusted for the determination of eligibility. Only movers fell into the undetermined eligibility category. The first adjustment factor was:

$$s_c = \frac{\sum_{i \in c} SWT_i}{\sum_{i \in c_{det}} SWT_i}$$

where SWT_i was the sampling weight for case *I*, *c* was the weighting class indicator for the in-person list sample (site), and c_{det} was the subgroup within class *c* for which eligibility status was determined. Those with undetermined eligibility have s_c set equal to 0. Then the eligibility-adjusted weight was calculated as:

$$EWT_i = SWT_i \times s_c$$

The next step adjusted for interview nonresponse among those known to be eligible. This adjustment factor was calculated as:

$$r_c = \frac{\sum_{i \in c_{elig}} EWT_i}{\sum_{i \in c_{resp}} EWT_i}$$

where c_{elig} was the subgroup within class *c* determined to be eligible, and c_{resp} was the subgroup within class *c* for which the interview was completed. Those with undetermined eligibility and those

known to be ineligible have r_c set equal to 1, and those who were eligible but did not respond have r_c set equal to 0. Then the nonresponse-adjusted weight was calculated as:

$$WT_i = EWT_i \times r_c$$

Finally, outlier weights (both too small and too large) were examined and it was determined whether to truncate and smooth the weights. In this sample, no truncation was indicated.

B. TELEPHONE LIST FRAME SAMPLE

1. Sampling Weight

The first four terms of the equation for the probability of selection were the same as for the in-person list frame sample. From the n_k cases selected from last-stage unit *k*, one-third were randomly selected for the telephone sample. From this one-third, a certain number of cases were actually released. For estimates being made from only the telephone list sample, this sample is treated as if it were independent from the in-person list sample, in which case the fifth and last term of the equation would be:

$$P(case_m \mid \text{selected for telephone sample [independent]}) = \frac{1}{3} \times \frac{t_k}{n_k \times 1/3} = \frac{t_k}{n_k}$$

However, as discussed below, estimates were made combining the two list samples, in which case this sample must not be treated as independent from the in-person list sample. The fifth and last term of the equation would then be quantified as:

$$P(case_m \mid \text{selected from } N_k) = \frac{t_k}{n_k} + \left(1 - \frac{t_k}{n_k}\right) \frac{f_k}{n_k - t_k} = \frac{t_k + f_k}{n_k}$$

when the two list samples were being used to produce an estimate. The second term in this formula accounts for the fact that the case could have been selected into either the telephone sample or the in-person sample (but not both). The probability of selection for each selected case was the product of these five terms. The sampling weight was the reciprocal of the probability of selection. Again, all released cases (including nonrespondents and those later found to be ineligible) have a sampling weight greater than zero.

2. Weighting Adjustments

The weighting adjustments for the telephone list frame sample were carried as outlined above for the in-person list frame sample, again using site as the weighting class. No weight truncation was indicated.

C. TELEPHONE RDD SAMPLE OF PARTICIPANTS, ELIGIBLE NONPARTICIPANTS, AND NEAR-ELIGIBLE NONPARTICIPANTS

1. Sampling Weight

The RDD sample was selected in multiple steps, and the procedures employed in each of these steps determine the probabilities of selection. In the first step, a stratified random sample of telephone numbers was selected. The second and third steps consisted of using the Genesys ID procedure to identify presumptively nonworking telephone numbers and then releasing other numbers for calling by interviewers. In the fourth step, numbers were screened to identify whether they reached households and, if so, whether the household was eligible for the survey (that is, contained food stamp participants or eligible or near-eligible nonparticipants). While consideration was given to sampling these subgroups differentially, this was not done. Thus in the RDD sample, probabilities of selection may vary somewhat by stratum, but not by characteristics among survey-eligible households.

The sample weight was the inverse of a case's overall probability of selection, which in turn was the product of the probabilities of selection for those steps where sampling took place:

$$W_s RDD_{jh} = \frac{1}{P(RDD)_{jh}} \times \frac{1}{P(init)_h P(rel)_j (numphone_{ih})}$$

$$P(init)_h = \frac{n(ph.num)_h}{N(ph.num)_h}$$

$$P(rel)_j = \frac{n(rel)_j}{\sum_{h=1}^{H} n(ph.num.)_{jh}}$$

where:

$P(RDD)_{jh}$ was the cumulative probability of selection for a case sampled in stratum *h*;

$P(init)_h$ was the initial probability of selection for a telephone number sampled in stratum *h*;

$P(rel)_j$ was the probability of releasing a telephone number for calling in group *j*; there were two groups: (1) "bads" were those listed as business numbers or those that, when dialed with an automatic dialer, returned a signal indicating a disconnected or nonworking number; and (2) "goods," which included all other sampled numbers.[2]

$numphone_{ih}$ was the number of unique telephone numbers that can be called to reach the *ith* household in stratum *h*; *numphone* was assumed to be 1, since the data on number of telephones were not collected;

$n(ph.\ num.)_h$ was the number of phone numbers initially selected in stratum *h*;

[2]Numbers were identified as "bad" using Genesys Sampling Systems' proprietary ID software.

$N(ph.\ num.)_h$ was the population of phone numbers in stratum h;[3]

$n(rel)_j$ was the total number of telephone numbers released for calling in group j; strata were pooled for released of sample; 150 "bads" were released, chiefly to see if any bias was introduced by the method used to identify them.

$n(ph.\ num.)_{jh}$ was the number of phone numbers selected in stratum h and assigned to group j.

2. Weighting Adjustments

Nonresponse adjustments employed procedures similar to those specified above for the list frame samples. For the RDD sample, the cells were defined by sampling strata, and no collapsing of cells was necessary. However, the RDD survey had different types of eligibility criteria from those of the two list samples.

The first step adjusted for the determination of telephone eligibility; that is, whether it was determined if the selected telephone number was a working number associated with a residence. The first adjustment factor was:

$$s_c = \frac{\sum_{i \in c} SWT_i}{\sum_{i \in c_{det}} SWT_i}$$

where SWT_i was the sampling weight for case I, c was the weighting class indicator for the RDD sample (stratum), and c_{det} was the subgroup within class c for which telephone eligibility status was

[3] $N(ph.\ num.)_h$ was the number of phone numbers available for sampling in stratum h; the list-assisted method used to select the RDD sample restricts selection to consecutive banks of 100 (a bank would include XXXYYYZZ00 through XXXYYYZZ99) 10-digit telephone numbers in which at least one number was published in a telephone company residential directory.

determined. Those with undetermined telephone eligibility had s_c set equal to 0. Then the telephone eligibility-adjusted weight was calculated as:

$$EWT_i = SWT_i \times s_c$$

The next step adjusted for the determination of income eligibility among known residences, that is, whether the income questions were answered. This adjustment factor was:

$$i_c = \frac{\sum_{i \in c_{res}} EWT_i}{\sum_{i \in c_{inc}} EWT_i}$$

where c_{res} was the subgroup within class c determined to be residences and c_{inc} was the subgroup within class c for which income was determined. Those with undetermined telephone eligibility and those known to be telephone-ineligible had i_c set equal to 1. Those with undetermined income eligibility had i_c set equal to 0. Then the income eligibility-adjusted weight was calculated as:

$$IWT_i = EWT_i \times i_c$$

The next step adjusted for interview nonresponse among those known to be income-eligible. This adjustment factor was calculated as:

$$r_c = \frac{\sum_{i \in c_{elig}} IWT_i}{\sum_{i \in c_{resp}} IWT_i}$$

where c_{elig} was the subgroup within class c determined to be income-eligible, and c_{resp} was the subgroup within class c for which the interview was completed. Those with undetermined telephone eligibility, those known to be telephone-ineligible, those with undetermined income, and those with ineligible income had r_c set equal to 1; those who were income-eligible but did not respond had r_c set equal to 0. Then the nonresponse-adjusted weight was calculated as:

$$WT_i = IWT_i \times r_c$$

Four RDD weights were determined to be outliers. The range of the weights after the above adjustments was 17,692.46 to 21,064.07, except for four outlier weights having values equal to approximately 400,000. These four weights were trimmed to the value 21,064.07, and their excess values were not redistributed to the rest of the sample.

3. Post-Stratification Adjustments

Because the nonparticipants were the only group targeted in the survey whose non-telephone-accessible members were not covered by any of the samples, a ratio adjustment was done for this group so that they better reflected the targeted population.[4] An iterative raking procedure was used

[4]Whereas FSP participant households without phones were included in the in-person list sample frame, such households were not included in either the CATI participant list frame or the RDD frame. Thus, the issue regarding coverage of households without phones is also relevant for the participant sample. However, the number of FSP participants identified from the RDD frame is (continued...)

[4](...continued)
small (304 cases, or 12 percent of the unweighted FSP sample). In addition, some of the phone list sample cases without phones were followed up in person by field staff using cellular phones to complete the interview. Therefore, it was decided that the statistical gain from adjusting the participant sample for telephone coverage did not warrant the costs.

to adjust their weighted proportions so that certain distributions matched those found on the March 1996 and March 1997 Current Population Survey (CPS) estimates for households with gross income under 150 percent of the poverty guideline and not receiving food stamps.

First, the weights of the nonparticipants were adjusted so that the proportion in various poverty level ranges matched the 1997 CPS. The next adjustment was for household size, followed by an adjustment for race of the householder (using the 1996 CPS). The weights were then adjusted once more by poverty level. The last step was to do an overall post-stratification adjustment so that weights for this group summed to the same total they had prior to the raking procedure.

4. Combining List Frame and RDD Participants

When the combined list frame sample (including both in-person and telephone together) was pooled with the RDD participant sample, a weighting system was used that was designed to maximize the statistical efficiency--that is, minimize the variances--of the resulting estimates. This was done by making the relative weights for the two samples proportional to the effective sample sizes for the two samples. This gives more weight to the sample with the larger effective sample size while still giving some weight to the information contained in the sample with the smaller effective sample size. In implementing this approach, the focus was on *effective* sample sizes, rather than actual sample sizes, to take into account the impacts on the relevant variances of the design effects associated with the two samples. Following is a more formal treatment.

[4](...continued)
small (304 cases, or 12 percent of the unweighted FSP sample). In addition, some of the phone list sample cases without phones were followed up in person by field staff using cellular phones to complete the interview. Therefore, it was decided that the statistical gain from adjusting the participant sample for telephone coverage did not warrant the costs.

As an initial step, the weights were normalized by scaling both the combined list frame weights and the RDD weights so that the weighted sums were the same. (The number each is scaled to does not matter for the tabulations included in the report; in fact, it was decided to scale both sets of weights to an estimate of the approximate size of the food stamp household population, 10,060,000.) This involved multiplying the list frame weights by 1.40 and the RDD weights by 1.81.

Now to derive the relative weights, assume it is desired to estimate the combined estimate $\hat{y}_T$ as follows:

$$\hat{y}_T = f_1 \hat{y}_{LF} + f_2 \hat{y}_{RDD}$$

where $\hat{y}_{LF}$ and $\hat{y}_{RDD}$ are the estimates for the statistic y from the LF and RDD samples.

The weights f_1 and f_2 are defined as follows:

$$f_1 = \frac{n_{LF}^{eff}}{n_{LF}^{eff} + n_{RDD}^{eff}} = \frac{n_{LF} / deff(\hat{y}_{LF})}{n_{LF} / deff(\hat{y}_{LF}) + n_{RDD} / deff(\hat{y}_{RDD})}$$

$$f_2 = 1 - f_1$$

where $deff(\hat{y}_{LF})$ and $deff(\hat{y}_{RDD})$ are the design effects of the estimates $\hat{y}_{LF}$ and $\hat{y}_{RDD}$, and n_{LF} and n_{RDD} are the actual sample sizes for the LF and RDD samples.

In implementing these algorithms, it was assumed, based on tabulations of selected illustrative variables, that the list frame design effect was 3.78 and the RDD design effect was 1.13 (see Appendix C). The effective sample sizes were then calculated as (2150/3.78 = 569) and (304/1.13 = 269), respectively. The final weights were then calculated as .68 and .32.

APPENDIX C

VARIANCES

This appendix describes the estimation of variances for representative variable estimates reported in the text. First, the overall approach is discussed. Then, selected variance estimates are presented.

A. APPROACH

The "Design Effect" Concept. A common way of characterizing the changes (usually increases) in variances in estimated variables due to survey design features is to focus on the "design effect (deff)." The deff is defined as the proportional change in variance caused by the survey design as compared to the variance that could be achieved by a simple random sample of the same size. In most contexts, design effects are greater than 1, meaning that variances are increased as a result of the survey design features.

Approach Being Followed. A very large number of variable estimates are being made in the current study, and, while procedures exist for making individual estimates of the true variances, their application to all the estimates included in the study would be unwieldy. Hence, the overall approach is to estimate the true variances for a number of representative variables and to compute average design effects based on these variables. These design effects can then be used by readers of the report to approximate variances associated with other variables.

The STATA computer program was used to estimate the true variances of selected variables. This package is based on a Taylor Series approximation of the true variances. It directly computes the estimated variances and design effects using standard formulas that relate the size of the design effect to the relative sizes of two variables: (1) the component of the variances of those variables due to variation within individual clusters in the survey design, and (2) the component of the variances due to differences between clusters in the relevant underlying population characteristics.

B. FINDINGS

The following tables present illustrative design effects for selected variables from the analysis. Tables C.1 to C.5 report typical design effects for the in-person sample of participants, the combined in-person and telephone survey of participants, the RDD sample of participants, the sample of eligible nonparticipants, and the sample of "near-eligible" nonparticipants. It is likely that these design effects are typical of those which would be found more generally.

Implications for the Width of Confidence Intervals. In general, 95 percent confidence intervals extend ± 1.96 times the true standard error of an estimate, which is equal to the square root of the variance of the estimate. Design effects are defined as a multiplier on the *variance*, while confidence intervals are based on the *standard error*, which is the *square root of the variance*. Therefore, observed design effects in the range of 2 and 4 imply that the size of confidence intervals are increased by a factor of between 1.7 and 2, relative to what they would be with a simple random sample. For instance, if, for a given sample size, a confidence interval around an estimated percentage--say 55 percent--was plus-or-minus 4 percentage points in a simple random sample, the confidence interval would have a width of 6.9 percentage points with a design effect of 3.

Illustrative Confidence Intervals. Given information about the size of the design effects, it is relatively straightforward to compute estimated confidence intervals for estimates of *proportions*, such as the proportion of food stamp households whose heads of households are female, or the proportion receiving AFDC. Table C.6 presents representative confidence intervals for different sample sizes and different assumed design effects.

TABLE C.1

ILLUSTRATIVE DESIGN EFFECTS FOR THE COMBINED IN-PERSON AND TELEPHONE SURVEY SAMPLE OF PARTICIPANTS

Variable	Sample Size	Mean[a]	Estimated Design Effect	"Corrected" Standard Error of Estimated Mean
Household Size	2,150	3.0	4.2	.079
Annual Earnings	2,074	$3,043	2.3	186
Whether Household Has an Elderly Member	2,150	.274	3.0	.017
Whether Single-Person Household	2,150	.257	2.2	.014
Whether Household Has AFDC Income	2,123	.311	4.1	.020
Whether Household Has General Assistance Income	2,134	.061	6.8	.014
Average Design Effect			3.8	

SOURCE: 1996 National Food Stamp Program Survey, weighted data.

[a]Mean may differ slightly from those reported in text due to slight differences in samples.

TABLE C.2

ILLUSTRATIVE DESIGN EFFECTS FOR THE IN-PERSON INTERVIEW SAMPLE OF PARTICIPANTS

Variable	Sample Size	Mean[a]	Estimated Design Effect	"Corrected" Standard Error of Estimated Mean
Household Size	1,109	3.0	2.0	.074
Annual Earnings	1,071	$2,858	1.5	204
Whether Household Has an Elderly Member	1,109	.266	1.8	.018
Whether Single-Person Household	1,109	.255	1.6	.018
Whether Household Has AFDC Income	1,089	.351	3.2	.026
Whether Household Has General Assistance Income	1,099	.061	7.9	.020
Average Design Effect			3.0	

SOURCE: 1996 National Food Stamp Program Survey, weighted data.

[a]Mean may differ slightly from those reported in text due to slight differences in samples.

TABLE C.3

ILLUSTRATIVE DESIGN EFFECTS FOR THE RDD SURVEY SAMPLE OF PARTICIPANTS

Variable	Sample Size	Mean[a]	Estimated Design Effect	"Corrected" Standard Error of Estimated Mean
Household Size	304	3.1	1.0	.107
Annual Earnings	296	$3,811	1.0	369
Whether Household Has an Elderly Member	304	.245	1.0	.025
Whether Single-Person Household	304	.220	1.0	.023
Whether Household Has AFDC Income	301	.278	1.0	.026
Whether Household Has General Assistance Income	299	.047	1.0	.012
Average Design Effect			1.0	

SOURCE: 1996 National Food Stamp Program Survey, weighted data.

[a]Mean may differ slightly from those reported in text due to slight differences in samples.

TABLE C.4

ILLUSTRATIVE DESIGN EFFECTS FOR THE RDD SURVEY
SAMPLE OF ELIGIBLE NONPARTICIPANTS

Variable	Sample Size	Mean[a]	Estimated Design Effect	"Corrected" Standard Error of Estimated Mean
Household Size	450	2.1	.9	.066
Annual Earnings	450	$4,180	1.1	279
Whether Household Has an Elderly Member	450	.514	1.4	.027
Whether Single-Person Household	450	.493	1.4	.027
Whether Household Has AFDC Income	449	.012	1.3	.006
Whether Household Has General Assistance Income	449	.008	1.0	.004
Average Design Effect			1.2	

SOURCE: 1996 National Food Stamp Program Survey, weighted data.

[a]Mean may differ slightly from those reported in text due to slight differences in samples.

TABLE C.5

ILLUSTRATIVE DESIGN EFFECTS FOR THE RDD SURVEY
SAMPLE OF "NEAR-ELIGIBLE" NONPARTICIPANTS

Variable	Sample Size	Mean[a]	Estimated Design Effect	"Corrected" Standard Error of Estimated Mean
Household Size	405	2.5	1.0	.090
Annual Earnings	347	$8,118	1.0	$509
Whether Household Has an Elderly Member	405	.407	1.3	.029
Whether Single-Person Household	405	.379	1.4	.030
Whether Household Has AFDC Income	405	.008	[b]	.004
Whether Household Has General Assistance Income	405	.004	[b]	.003
Average Design Effect			1.2	

SOURCE: 1996 National Food Stamp Program Survey, weighted data.

[a]Mean may differ slightly from those reported in text due to slight differences in samples.

[b]Design effects could not be estimated satisfactorily because of the very low probability being computed.

TABLE C.6

WIDTH OF 95 PERCENT CONFIDENCE INTERVALS
WHEN ESTIMATING A PROPORTION

	Proportion Being Estimated		
Variable	.1	.2	.5
If Design Effect =1 and:			
N=200	±.04	±.06	±.07
N=400	±.03	±.04	±.05
N=600	±.02	±.03	±.04
N=800	±.02	±.03	±.03
N=1,200	±.02	±.02	±.03
If Design Effect =2 and:			
N=200	±.06	±.08	±.10
N=400	±.04	±.06	±.07
N=600	±.03	±.05	±.06
N=800	±.03	±.04	±.05
N=1,200	±.02	±.03	±.04
If Design Effect =3 and:			
N=200	±.07	±.10	±.12
N=400	±.05	±.07	±.08
N=600	±.04	±.06	±.07
N=800	±.04	±.05	±.06
N=1,200	±.03	±.04	±.05
If Design Effect =4 and:			
N=200	±.08	±.11	±.14
N=400	±.06	±.08	±.10
N=600	±.05	±.06	±.08
N=800	±.04	±.06	±.07
N=1,200	±.03	±.05	±.06

APPENDIX D

CONVERSION OF FOOD USE DATA INTO NUTRIENT AVAILABILITY ESTIMATES

During the in-person survey, data were collected on the foods used by the household over a seven-day period. (See Section II.E and Appendix A.) This appendix describes how those data were converted into estimates of the nutrient contents of those foods, through use of a modified version of the Food Intake Analysis System (FIAS), developed by the University of Texas at Houston.

First, a summary of the steps involved in the nutrient coding/conversion process is provided. Subsequent sections then provide details of how each step was performed.

SUMMARY

The following steps were followed in the nutrient conversion work:

- Development of FIAS recipe files and recipe codes. It was necessary to create a coding structure that linked each food code used in the current survey data collection instrument to a "recipe" that was expressed in constituent food codes and quantities and that could be used to access the nutrient data base used in FIAS. (Of course, in many instances, a recipe consisted of a single ingredient; in such cases the recipe file served to translate the coding structure on the survey to a coding structure that could access the FIAS nutrient database.)

- Setting up a coding center and hiring staff.

- Manual entry of food recipe codes and the weights of the foods used into the FIAS system.

- Manual entry of the survey data on amounts bought and prices paid into a separate LOTUS spreadsheet format, to determine unit prices, which were subsequently merged back into the food quantity data.

- Calculation of nutrient values.

- Quality control checks of the FIAS entry process, together with extensive edits of the FIAS data at the individual food level, using "high" value checks.

- Aggregation of the individual food-level data to the household level by summing over food lines.

- Additional household-level edits, based on "high" and "low" value checks.

- Imputation of prices for foods that had not been bought or whose purchase price was unknown.

These steps are described below.

1. Preliminary Development of Recipe Files

To support the entry of food data into FIAS, a preliminary set of FIAS recipe codes was developed. For every food item covered by the survey, a recipe was entered into FIAS, using the FIAS recipe feature. In general, these recipes were taken from similar ones that were used in coding the 1987-88 Nationwide Food Consumption Survey (NFCS). In some instances, the recipes consisted of a single ingredient. For instance, orange juice was orange juice. In such situations, the use of the FIAS recipe codes simply translated the coding structure of the survey into a coding structure for which FIAS could supply nutrient information. In other instances, recipes had more than one ingredient and also embodied cooking assumptions, as discussed below.

The recipes served several purposes:

- As noted above, the recipes allowed conversion of the coding structure of the instrument to that of FIAS. A "link file" was used from the Washington State Food Stamp Cashout Demonstration Evaluation to convert the codes used on the survey for that study to 11-digit USDA codes that were then linked to FIAS codes. (The Washington State survey had used the same codes as in the current study.)

- The use of recipes provided a convenient way of incorporating the assumptions from the 1987-1988 NFCS coding into the current coding procedures.

- The recipes provided a context for dealing with "mixtures," where assumptions had to be made as to what is included in foods with multiple ingredients. For instance, a "Big Mac" sandwich, which might have been brought into respondents' homes as a take-out food item, consists of bread, ground beef, vegetables, and other ingredients. To account for this, recipe files were read into FIAS to link individual food codes from the survey (in this case, the code for a Big Mac) into their individual constituent ingredient codes.

- The FIAS recipes also allowed incorporation of assumptions about cooking methods used for the foods reported. In the current food use survey, as in previous food use surveys, it was not known how the foods brought into the home were ultimately cooked, and thus what their ultimate nutrient availability was (since cooking can affect nutrient availability). For example, the nutrient availability of raw carrots differs from that of cooked carrots, so "retention codes" were used to account for nutrient loss (or gain) from cooking. Previous USDA surveys had dealt with this matter by creating recipes even for some single-ingredient foods. For instance, a recipe for a food that can be eaten raw or cooked might consist of a certain proportion (for example, 30 percent) of the food being eaten raw and the remainder (for example, 70 percent) being cooked, with, for the latter, an appropriate retention code indicating how the cooking changed nutrient availability. This convention was followed in the current survey coding.

- Recipes allowed for situations where a single survey code may track into several possible, slightly different food codes. For instance, if a respondent reported using frankfurters but didn't know what kind, an assumption had to be made about whether they were made from beef or pork. This was done using a recipe that assumed part pork and part beef, based on how common the two kinds of frankfurters are estimated to be.

In developing FIAS recipes for use in the coding work, it was necessary to take into account that some foods encountered in the survey were not in the previous USDA files that formed the basis of most of the recipe-coding work.[1] An example is that "no-fat cream cheese" had not been developed when the previous files were created. Ethnic foods for recent immigrant groups were also frequently not represented in the earlier files. Therefore, project nutritionists created new FIAS recipes, using a variety of information sources, including information from food labels, information from food manufacturers, a later version of FIAS (FIAS-3, which became available midway through the survey), and recipe books.[2] A total of 6,090 recipes were used. Of these, 5,724 were developed

[1]The USDA recipe files that were used were ones that had been used in the 1987-88 NFCS coding. Each food was identified by an 11-digit USDA code.

[2]Two types of recipes were created, depending on the nature of a new food. If a new food could be characterized in terms of a combination of foods already in the FIAS database, then a "regular" FIAS recipe was created. If a food was so different that it couldn't be characterized in terms of existing foods, then FIAS's "user data set" feature was used, making it possible to enter nutritional information directly into the database.

from previous USDA recipes, 213 were new recipes composed using nutrient data on the FIAS files, and 153 were recipes for which new nutrient data had to be entered into the FIAS system.

The FIAS recipe database that was created can be interpreted as showing the food ingredients and their retention factors (expressed in terms of the seven-digit USDA food codes and the USDA "primary data set" codes) assumed to have been associated with a unit amount--such as 100 grams--of each of the foods reported in the survey. MPR's subcontractor, ROW, Inc., under the supervision of one of the principal investigators, used the recipe creation feature of FIAS to enter the recipes into FIAS as FIAS recipe files and assigned them six-digit codes. Both principal investigators undertook extensive spot-checking to ensure the accuracy of this entry.

Besides recipe files, the coding required a set of "refuse" factors, reflecting the fact that not all of certain foods are available for eating. For instance, a whole cauliflower gets trimmed before cooking, and thus some of the original weight is thrown away as refuse. Similarly, a significant amount of a whole fish is discarded in preparation. The 1987-88 NFCS recipe files, in addition to listing ingredients and their codes, noted these refuse factors where appropriate, and these codes were carried over into the files for the current survey.

Once FIAS recipe files were assembled for this project, they were tested with completed data collection instruments that had been used in the San Diego Food Stamp Cashout Evaluation. (These data collection instruments had been coded by National Analysts, Inc., the same firm that coded the most recent several Nationwide Food Consumption Surveys.) A sample of the San Diego cases was coded using the FIAS-based procedure, and the nutrient values computed with FIAS were compared line by line to the values of the nutrients on the San Diego database. These tests proved satisfactory

in that most of the food lines yielded the same nutrients in both coding structures, and the discrepancies were, in general, explicable in terms of either coding errors or likely changes in the underlying nutrient databases.

2. Setting Up the Coding Center and Hiring Staff

To facilitate the work, MPR set up a separate coding room. Coders were hired and trained and then provided with their own coding stations and reference materials in the coding room. A supervisor was also selected from MPR's ongoing coding staff to direct the flow of activity in the coding room.

Following the recommendations of the FIAS staff at the University of Texas, coders were required to have completed high school with, preferably, some college education; to be the food manager at home; and to be familiar with simple mathematical computations. In addition, MPR required coders to have some basic computer experience.

Including practice experience, coders were required to participate in 2.5 days of training at MPR. After being given an overview of the project, coders were shown how to start a new file in FIAS, how to move around while in FIAS, and how to close a file. Coders were then shown how to extract the nine-character survey code from the food instrument and how to relate this code to its corresponding six-digit FIAS recipe code. They were also taught how to input the six-digit FIAS code for each food into a FIAS file, along with the amount of that food that was used during the seven-day period. The mathematical operations that facilitated these steps were reviewed. Coders were provided with a training manual, written by the project director and the MPR nutritionist, containing all the topics covered during training. (At a later time during the project, coders were taught how to "clean" and data-enter the completed price-related data on the food instruments.)

3. Manual Entry of Foods into FIAS

Once the FIAS recipe files were set up, coding work could be started. This section describes how the food coding was done.

As data collection instruments were received in Princeton, they were logged into an ACCESS database and then taken to the coding room at MPR's Princeton facility. Upon arrival in the coding room, cases were given a quick line-by-line review to determine whether all the necessary information was available. Frequently, additional information was needed about a quantity or a type of food. When possible, the problem was resolved through a call-back to the respondent, either by telephone directly from Princeton or by the original interviewer.

a. Entering Food Data

After the necessary data were available, the coder determined the survey code of the food being used, for each coded line on the food use instrument. Then, using either a hard-copy look-up table or an automated look-up program, the coder accessed a database to determine the six-digit FIAS recipe code (see the previous section) that had been assigned to that food and also noted whether or not there was a refuse factor associated with it. The appropriate FIAS recipe code was then entered into FIAS.

If the quantity of a food was expressed in weight, the coder then entered the weight directly into FIAS, after subtracting the "refuse factor" amount, if appropriate. If the quantity was expressed in some other way, such as "units" or a volume measure, then the coder attempted to identify a factor for converting that quantity to a weight, often using food label information that had been obtained from the respondents during the interviews. In other situations, the weight equivalent codes built

into FIAS were used to determine the weights of various measures, such as a medium apple.[3] Other sources, such as supermarket flyers, recipe books, the household weight file used in the 1987-88 NFCS, and visits to stores, were also sometimes used. (The visits to the stores were done to weigh unit quantities of various produce and to examine food labels.) After weights were determined, refuse factors were subtracted where appropriate, and the weights were then entered into FIAS.

Any problems (such as lack of a recipe for a food or uncertainty about how to translate an amount into a weight) were referred to the project nutritionist.[4] If the project nutritionist was not able to resolve a problem, the nutritionist who acted as the co-principal investigator for the project made final resolution.

In addition to entering food items into FIAS, coders also entered from the hard copy the approximate number of meals eaten during the observation period. This information was entered into an unused field in one of the preliminary FIAS data entry screens for each case. This household size variable was not used in the final analysis, since a more accurate meal count was available in the CAPI portion of the interview. But the appropriate meal count was useful in conducting edit checks, before the food data and the CAPI data had been merged.

The project nutritionist and the project director reviewed the first two or three cases coded by each coder. After that, the project nutritionist reviewed random cases for quality control. In

[3]No information on portion sizes or weight equivalents was directly available for the recipes read into FIAS. However, the coders could access unit weight information in FIAS by independently entering the name of the food and viewing the relevant screen. Having observed that information, the coder had to exit from the FIAS portion screen and enter the relevant weight directly into the original screen where the food code had been entered.

[4]The project nutritionist had a master's degree in nutritional science and extensive experience in food preparation.

addition, the extensive edit-checking the project nutritionist (see below) conducted provided additional quality control. Any problems were brought to the attention of the coder for resolution.

The coders were responsible mainly for coding the hard-copy food instruments as outlined above. They also called the respondent when more-detailed information was required for a reported food. If the amount of food used or purchased was missing or unclear, or if the form of the food was not indicated (for example, dehydrated/ready-to-eat/condensed), the respondent was called for clarification. Many food instruments generated questions about package size and price paid for a food item. Since some respondents were not able to remember these details, a list was constructed of all the foods that required information on package size or price paid. Two of the coders then went shopping locally to obtain this information.

Once most of the hard-copy food instruments had been coded and entered into FIAS, the coders were trained to data-enter the information on the food purchased and the price paid into a LOTUS spreadsheet. (See Section 4.)

4. Entry of Data on Amounts Bought and Prices

The data collection instrument also obtained information on the amounts of foods bought (as opposed to the amounts used, as discussed above) and on the prices paid for the foods. Because there was no obvious way of incorporating these data into the FIAS software, they were data-entered separately and then merged with the FIAS information through use of SAS.

The data on amounts bought and on prices paid were keyed into a LOTUS spreadsheet. Each case had a separate spreadsheet, and each line in the spreadsheet corresponded to a food line in FIAS. The data were entered twice, by different coders, on two different spreadsheets, and then

reconciled against each other to detect and correct data entry errors. Missing price data were left blank in the file and were then imputed at a later step (see below).

5. Assigning Nutrient Values to Foods

The standard FIAS software and its corresponding nutrient database were used to assign nutrient values to the foods consumed. This procedure drew on the fact that the FIAS recipes were expressed in terms of the foods in the database. In a small number of cases, the project nutritionist had to use the "user dataset" of FIAS to add foods to the database to reflect new foods encountered in the survey. Nutrient values were assigned on the basis of food labels, manufacturer information, a later version of FIAS, and recipe information.[5]

6. Edit Checks

After each case was entered and nutrient values were assigned to the foods, edit checks were run line by line on each food to identify foods that exceeded threshold quantities of key nutrients. In particular, the nutrients and their cutoff limits for the edits for the first round of checks were:

Nutrient	Edit Threshold
Food Energy	7700 kc* (household size)
Calcium	3200 mg* (household size)
Vitamin A (RE)	2700 µg* (household size)
Vitamin C	160 mg* (household size)
Riboflavin	4.8 mg* (household size)

[5]FIAS 3 became available partway through the survey. Although it was not practical at that point to convert the coding operation to the new version, the new version was often useful in providing information to help the coding, particularly with regard to new foods.

These cutoffs are considerably higher than the standard edit thresholds built into the FIAS system. They were set higher because the current study focused on food used for the entire household during the week, rather than 24-hour intake for an individual. Thus, quantities tended to be much larger than with individual intakes. For instance, a food line on the present survey might typically include 5 or 10 pounds of potatoes, rather than an individual serving of potatoes, as would be the case as with an intake record. The threshold cutoffs were chosen so as to be low enough to identify potentially erroneous entries but high enough to discriminate between likely problems and likely correct entries.

Typically, on the first round of edits, about four to six foods for each case were highlighted by the edit runs. Each of these flagged food items was manually checked by the project nutritionist, who consulted the hard-copy data collection instrument if an item appeared questionable based on the printout information. Changes were made as appropriate.

On a subsequent round of edits, essentially the same computer checks were performed, but the cutoff thresholds were set approximately three times higher. Typically, this caused about half the cases to be flagged, usually with just one to three items highlighted. On this round, the project director for the study reviewed the output and manually identified food entries that appeared problematic. These were then reviewed against the hard copy by coding personnel, who made any changes needed to correct clear errors. The results of this coder review were then examined by the project director, who made final edit determinations.

An additional type of automated checking was a comparison, for all foods, of the amounts reported used during the week and the amounts reported bought. All items where the amount consumed exceeded the amount bought were flagged for manual review against the hard copy. In most situations, the food item was found to be coded correctly, since it was sometimes the case that

the amount used was based on more than one shopping trip, but only the latest one was reported. However, this set of edits was also found to be useful in identifying miscoded cases.

All the checks described so far were based on the *individual food items*. In addition, the foods for a household were aggregated, and editing was performed at the *household* level. In particular, for food energy, vitamin A, vitamin B_6, vitamin B_{12}, calcium, and vitamin C, the households with the highest levels of each nutrient per meal were reviewed manually, food line by food line, and any apparently problematic entries were examined against the hard copy.

Editing on the food prices computed from the data was done for each food code. Whenever one of the reported prices for a food code was more than twice or less than half the median price, the relevant data were printed out and reviewed manually. In addition, the 50 lowest prices and the 50 highest prices in the data set were printed out and reviewed manually to identify any apparent errors.

7. Price Imputations

In some instances, respondents were unable to remember the prices they had paid for the foods they had used. In other instances, there was no actual price, because the food was home produced, received as a gift, or otherwise obtained without a direct payment. For estimation of the value of all food used by households, prices had to be imputed in these instances. For each food code where a price imputation was needed, the following algorithm was used:

1. If there were at least five valid reported prices for a food code (that is, at least five respondents had reported price information for that item), then the median of the reported prices was automatically imputed.

2. If there were between one and four valid prices in a food code, the project director reviewed the range of prices and considered the food at issue to determine whether or not the median represented a reasonable estimate of the price. If it was judged to be reasonable, the median was imputed; if not, Step 3 below was used.

3. If there were no reported prices for the food code or if it was determined that the median was not appropriate, then a price was imputed, usually either from the price of a similar food or from store prices. This was done using the rules summarized in Exhibit D.1.

EXHIBIT D.1

IMPUTATION PROCEDURES WHEN INSUFFICIENT DATA WERE AVAILABLE FOR IMPUTING BASED ON OTHER PRICES OF THE SAME FOOD

1. If the project nutritionist determined that there was in the data set a very similar food that did have a valid price, then the median price of that similar food was imputed. For instance, the price of low-sodium canned corn might be imputed from the price of regular canned corn.

2. If the project nutritionist determined that two foods were essentially the same except that their "form" led to different refuse factors, the median price of the food for which a price was available was used to impute the other, adjusting for the refuse factor. For instance, suppose that for a certain type of fish a price was available for the fillet, but not for the whole fish, including head and bones. And assume that, on the basis of the refuse factor, the fillet weight was known to be approximately 60 percent of the whole weight. Then the per-pound price of the whole fish was imputed as the median per-pound price of the fillets times .60.

3. If none of the above methods applied, the price was estimated by examining the prices in a supermarket in a low-income area in central New Jersey. (This was necessary in only about half of one percent of the foods.)

4. For a very small number of foods, mostly game, where no reasonable direct market price could be found, the price was imputed based on the price of similar foods. For instance, the price of venison was imputed based on the price of beef. To be sure, a price for venison could conceivably have been found in a specialty shop. But all instances of venison in the data were of venison obtained through hunting, and it was judged that the price of beef provided a better representation of the value of the meat to the households. The number of foods for which this type of imputation was done was less than 40 out of a total of more than 40,000 food lines in the data set.

APPENDIX E

GEOCODING

This appendix describes the development of the database on geographic locations of households and stores, the database used to compute certain of the distance measures cited in the report. Potential biases in the data are also assessed.

Basic Procedures

During the in-person survey operations, information was obtained on the locations of (1) the respondents' homes, (2) the stores where they shopped, and (3) the supermarkets nearest their homes. Both the address and the name of the nearest cross street were obtained, when possible. In addition, for the store data, an attempt was made to identify the stores on hard-copy lists the interviewers carried of authorized food stamp retailers. When possible, the data were linked through the store program identification codes used in administering the program.

All the address information was then transmitted to a geocoding vendor, Geographic Data Technology (GDT) of Lebanon, New Hampshire, which, when they could locate the address, returned precise longitude and latitude of the location. Interview information on the stores and household locations GDT could not code on the first attempt was printed out at MPR, manually edited, and then sent to GDT a second time, leading to the identification of additional locations. Altogether, these procedures produced geocodes for about 80 percent of the households and 70 percent of the stores. Reflecting these "hit" rates, geocoded distance to the nearest store was available for approximately 58 percent of the in-person sample, while geocoded distance to the store most often used was available in about 55 percent of the cases.

Potential Biases in the Data

Because about 40 percent of the store/home pairs of locations could not be fully geocoded, it is important to examine whether there may be biases implicit in the resulting data. For examination of this issue, Table E.1 displays two sets of data on distance to the store usually shopped: one set based on the geocoding and the other on a direct question asked during the interview. Comparison of the two columns shows that the geocoded data clearly imply shorter distances, on average, than the direct interview data. This suggests the possibility that the stores that could not be geocoded may be disproportionately the ones at greater distances from respondents. Based on the interviewing and coding experience, it is likely that this type of bias may indeed have occurred, since it tended to be harder for respondents to supply detailed address information for stores that were outside their own neighborhoods.

This potential bias needs to be taken into account in interpreting data based on the geocoding. It is unlikely, however, that it reverses any conclusions made in the report. This issue is examined further in the next section.

Reassessment of Whether Respondents Frequently Travel Farther than the Nearest Supermarket to Shop, in Light of the Possible Biases in the Geocoded Data

The analysis in Chapter IV concludes that FSP participants frequently travel farther than the nearest supermarket for their food shopping. However, as noted in that discussion, the conclusion may be influenced by the fact that direct survey responses about distances to the store most often used are being compared with geocoded information about the nearest supermarket. (Use of the two different types of data maximized available sample sizes. No direct interview data are available on distance to the nearest supermarket.)

TABLE E.1

DISTANCE TO STORE USUALLY USED, WITH
ALTERNATIVE DATA SOURCES
(Percentage of FSP Participants)

	Direct Response to Survey Question	Geocoding
Less than .5 miles	8.3	16.2
.5 to .99 miles	22.6	19.4
1 to 1.99 miles	22.0	24.3
2 to 3.99 miles	11.2	20.0
Over 4 miles	35.9	20.2
Sample Size	**1,091**	**635**

SOURCE: Unweighted data from the 1996 National Food Stamp Program Survey.

NOTE: Percentages may not add to exactly 100 due to rounding.

However, while comparable direct interview data are not available, comparable geocoded data for both the most-used stores and the nearest stores are available for the subset of the sample for which full geocoding was possible. It is therefore possible to make comparisons of the relevant distances with consistent data. These comparisons, as shown in Table E.2, suggest that, even when the analysis is confined to the same type of data, the analysis still supports the conclusion that substantial numbers of households do their primary shopping at stores more distant than the closest stores. For instance, 53 percent of households with full geocode data have a supermarket within a mile of their residence, but only 36 shop within a mile. Further, only 11 percent of the nearest supermarkets are more than four miles away from the households, but 20 percent say they usually go more than four miles to shop.

Our assessment, therefore, is that, even though there may be some bias in comparing the direct interview estimates of distance with geocode-based distance estimates, the conclusions reached in the report are not caused by this bias. Even with comparable data, the analysis suggests that many households in the sample travel beyond their nearest supermarket to shop.[1]

[1]Some of the discrepancies discussed in the text could be due to the fact that the geocoding process estimated straight line distances, whereas the distances reported in interviews are, in general, either walking or driving distances. However, the differences discussed are too large for this computational issue to be the main factor in explaining them.

TABLE E.2

DISTANCES TO STORE USUALLY USED AND TO NEAREST SUPERMARKET, BASED ON COMPARABLE DATA SOURCES
(Percentage of FSP Participants)

	Distance to Store Usually Used	Distance to Nearest Supermarket
Less than .5 miles	16.2	25.9
.5 to .99 miles	19.4	26.8
1 to 1.99 miles	24.3	22.2
2 to 3.99 miles	20.0	13.9
Over 4 miles	20.2	11.2
Sample Size	**635[a]**	**598[b]**

SOURCE: Unweighted data from the 1996 National Food Stamp Program Survey.

NOTE: Percentages may not add to exactly 100 due to rounding.

[a]Sample consists of all households for which full geocode data were available on the household location and the location of the store usually used.

[b]Sample consists of all households for which full geocode data were available on the household location and the location of the nearest supermarket.

APPENDIX E

GEOCODING

This appendix describes the development of the database on geographic locations of households and stores, the database used to compute certain of the distance measures cited in the report. Potential biases in the data are also assessed.

Basic Procedures

During the in-person survey operations, information was obtained on the locations of (1) the respondents' homes, (2) the stores where they shopped, and (3) the supermarkets nearest their homes. Both the address and the name of the nearest cross street were obtained, when possible. In addition, for the store data, an attempt was made to identify the stores on hard-copy lists the interviewers carried of authorized food stamp retailers. When possible, the data were linked through the store program identification codes used in administering the program.

All the address information was then transmitted to a geocoding vendor, Geographic Data Technology (GDT) of Lebanon, New Hampshire, which, when they could locate the address, returned precise longitude and latitude of the location. Interview information on the stores and household locations GDT could not code on the first attempt was printed out at MPR, manually edited, and then sent to GDT a second time, leading to the identification of additional locations. Altogether, these procedures produced geocodes for about 80 percent of the households and 70 percent of the stores. Reflecting these "hit" rates, geocoded distance to the nearest store was available for approximately 58 percent of the in-person sample, while geocoded distance to the store most often used was available in about 55 percent of the cases.

Potential Biases in the Data

Because about 40 percent of the store/home pairs of locations could not be fully geocoded, it is important to examine whether there may be biases implicit in the resulting data. For examination of this issue, Table E.1 displays two sets of data on distance to the store usually shopped: one set based on the geocoding and the other on a direct question asked during the interview. Comparison of the two columns shows that the geocoded data clearly imply shorter distances, on average, than the direct interview data. This suggests the possibility that the stores that could not be geocoded may be disproportionately the ones at greater distances from respondents. Based on the interviewing and coding experience, it is likely that this type of bias may indeed have occurred, since it tended to be harder for respondents to supply detailed address information for stores that were outside their own neighborhoods.

This potential bias needs to be taken into account in interpreting data based on the geocoding. It is unlikely, however, that it reverses any conclusions made in the report. This issue is examined further in the next section.

Reassessment of Whether Respondents Frequently Travel Farther than the Nearest Supermarket to Shop, in Light of the Possible Biases in the Geocoded Data

The analysis in Chapter IV concludes that FSP participants frequently travel farther than the nearest supermarket for their food shopping. However, as noted in that discussion, the conclusion may be influenced by the fact that direct survey responses about distances to the store most often used are being compared with geocoded information about the nearest supermarket. (Use of the two different types of data maximized available sample sizes. No direct interview data are available on distance to the nearest supermarket.)

TABLE E.1

DISTANCE TO STORE USUALLY USED, WITH
ALTERNATIVE DATA SOURCES
(Percentage of FSP Participants)

	Direct Response to Survey Question	Geocoding
Less than .5 miles	8.3	16.2
.5 to .99 miles	22.6	19.4
1 to 1.99 miles	22.0	24.3
2 to 3.99 miles	11.2	20.0
Over 4 miles	35.9	20.2
Sample Size	**1,091**	**635**

SOURCE: Unweighted data from the 1996 National Food Stamp Program Survey.

NOTE: Percentages may not add to exactly 100 due to rounding.

However, while comparable direct interview data are not available, comparable geocoded data for both the most-used stores and the nearest stores are available for the subset of the sample for which full geocoding was possible. It is therefore possible to make comparisons of the relevant distances with consistent data. These comparisons, as shown in Table E.2, suggest that, even when the analysis is confined to the same type of data, the analysis still supports the conclusion that substantial numbers of households do their primary shopping at stores more distant than the closest stores. For instance, 53 percent of households with full geocode data have a supermarket within a mile of their residence, but only 36 shop within a mile. Further, only 11 percent of the nearest supermarkets are more than four miles away from the households, but 20 percent say they usually go more than four miles to shop.

Our assessment, therefore, is that, even though there may be some bias in comparing the direct interview estimates of distance with geocode-based distance estimates, the conclusions reached in the report are not caused by this bias. Even with comparable data, the analysis suggests that many households in the sample travel beyond their nearest supermarket to shop.[1]

[1]Some of the discrepancies discussed in the text could be due to the fact that the geocoding process estimated straight line distances, whereas the distances reported in interviews are, in general, either walking or driving distances. However, the differences discussed are too large for this computational issue to be the main factor in explaining them.

TABLE E.2

DISTANCES TO STORE USUALLY USED AND TO NEAREST SUPERMARKET, BASED ON COMPARABLE DATA SOURCES
(Percentage of FSP Participants)

	Distance to Store Usually Used	Distance to Nearest Supermarket
Less than .5 miles	16.2	25.9
.5 to .99 miles	19.4	26.8
1 to 1.99 miles	24.3	22.2
2 to 3.99 miles	20.0	13.9
Over 4 miles	20.2	11.2
Sample Size	**635[a]**	**598[b]**

SOURCE: Unweighted data from the 1996 National Food Stamp Program Survey.

NOTE: Percentages may not add to exactly 100 due to rounding.

[a]Sample consists of all households for which full geocode data were available on the household location and the location of the store usually used.

[b]Sample consists of all households for which full geocode data were available on the household location and the location of the nearest supermarket.