

APPENDIX A

RELATIONSHIP OF COLLECTED DATA TO STUDY OBJECTIVES

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RELATIONSHIP OF COLLECTED DATA TO STUDY OBJECTIVES

ERS's stated mission is to anticipate economic and policy issues related to agriculture, food, the environment, and rural development, and conduct economic research that broadly and specifically informs public program and policy decisions. To support this mission, ERS is sponsoring the National Food Study to collect information that will meet a variety of research needs, including estimating household food demand systems and understanding the role of food assistance programs in influencing food choice, food expenditures, and food security.

Individual and household demand for food (generally) and individual food items (specifically) results from a complicated interplay of many different factors, including:

- attributes (e.g., nutrients, taste) of the food product being considered
- the food product's price;
- the price and attributes of similar foods (possible substitutes);
- the price and attributes of complementary foods (e.g., cheese with crackers);
- one's income and wealth;
- one's knowledge about nutrition and diet;
- the presence of food allergies;
- one's perceptions of his or her health, especially with regard to weight and health risks associated with obesity;
- time available to prepare meals at home;
- the stocked food items at stores conveniently accessible; and
- the presence of nearby restaurants offering a variety of menus and prices.

For persons shopping for a household, the preferences of other household members also impact household demand for food.

The planned data collection involves multiple instruments and sources in order to efficiently capture the many elements needed to understand and statistically model the overall household demand for food. To begin, the National Food Study will collect information on foods acquired for consumption by all household members both at home (FAH) and away from home (FAFH) because households have a choice whether to, say, prepare meals at home or go out to a restaurant. The survey will also collect information on foods acquired for free (e.g., vegetables from the garden, food from Food Banks, meals eaten at the homes of friends or relatives) as well as those purchased. Information on food prices and total household income will be collected to estimate the proportion of household income spent on food versus non-food items, on FAH versus FAFH, and by food group (e.g., proportion of total food budget spent on fruits and vegetables). Collected data on prices and total income will enable estimation of the income and price elasticities of food. This detailed information is vital to support ERS's mission to inform public program and policy decisions.

To better understand the role of food assistance programs in influencing food choice, food expenditures, and food security, the National Food Study will collect information from participants in the nation's largest food assistance program, the Supplemental Nutrition Assistance Program (SNAP) as well as from low-income households that choose not to participate in SNAP. ERS is interested in understanding how household demand differs between these two low-income groups as well as between lower- and higher-income households.

This appendix contains two tables. Table A1 presents the study's research objectives and identifies which data sources provide information needed to address each objective.

Table A1. Relationship of Collected Data to Study Objectives

Study Objective	Data Source
1. Describe the food and beverage purchases and acquisition patterns of the population universe and subgroups.	
<p>a. What food items do household members acquire from the following sources:</p> <ul style="list-style-type: none"> i. Purchases from food retailers primarily for preparation and consumption at home (FAH), and ii. Purchases of prepared foods and beverages from food service establishments (e.g., restaurants, cafeterias, and vending machines primarily for consumption away from home (FAFH) (e.g., meals at restaurants, unsubsidized school meals, snacks or beverages from vending machines)? 	<p>Food book, scanner data</p> <p>Food books, telephone reporting of foods-away-from-home</p>
<p>b. What are the quantities and purchase prices (or implicit values) of the above foods, snacks, and meals? Measures will include:</p> <ul style="list-style-type: none"> i. Sources, quantities, and prices of items purchased ii. Sources and quantities of non-priced items that are acquired 	<p>For FAH, the scanner captures item quantities and scanned barcodes are mapped to item package sizes. Prices are added from receipts, Nielsen price files, or imputed values.</p> <p>For FAFH, quantities and prices are recorded in food books and/or indicated on receipts and reported during the telephone reporting of FAFH.</p>
<p>c. What non-priced food items do household members acquire for consumption either at home or away from home? What are the quantities and sources (e.g., food pantries, emergency kitchens, Meals-on-Wheels, home gardens or farms, fishing and hunting trips, gifts, compensation for work, meals at the homes of family or friends) of these foods and beverages?</p>	<p>For FAH, the scanner captures items, quantities, and the source is recorded in the food book (blue page).</p> <p>For FAFH, items and quantities are recorded in food books (red page) and reported during the telephone reporting of FAFH.</p>
<p>d. How are these foods characterized in terms of food groups and subgroups (including units of USDA food pyramid groups: grains, vegetables, fruits, milk, meat and beans, oils)?</p>	<p>Mathematica will map UPCs and FAFH acquisitions to food groups, utilizing the food groupings in the UPC data dictionary and building on food group schema developed on other USDA projects to apply to USDA food codes.</p>
<p>e. For each household member, what purchase/acquisition occasions occur during each day of the reporting period?</p>	<p>Acquisitions will be reported in food books (Daily Lists, Blue pages, Red Pages).</p>
<p>f. For each household member (or guest), what meals and snacks (i.e., breakfast, morning snack, lunch, afternoon snack, dinner, evening snack, and other) are consumed each day of the reporting period?</p>	<p>Meals and snacks will be reported on the Meals and Snacks Form.</p>
<p>g. For questions a through f above, how do the food acquisition patterns vary by population group (e.g., SNAP households, nonparticipating low-income households, and higher-income households)?</p>	<p>Households are asked about SNAP participation in the screener. SNAP participation will be validated by a match to administrative data, for households providing consent for an administrative data match.</p>
<p>h. How do food acquisition patterns (e.g., days of week when household members obtain subsidized school lunches) and funding sources (e.g., cash, credit, SNAP benefits via EBT card, WIC food instruments) for purchased items vary throughout the month in relationship to when program benefits and/or other income are received?</p>	<p>Food books capture total purchase amount and funding source; receipts will be used to fill missing data and for quality control. Timing of food assistance benefit receipt is asked during Initial Household Interview and confirmed by SNAP administrative data.</p>
<p>i. What are average weekly food expenditures? What share of average weekly household expenditures do food costs represent? How are weekly food expenditures allocated across food groups and subgroups? How do these measures vary by population group?</p>	<p>Average weekly food expenditures will be calculated from information reported in food books for FAH and FAFH, overall and by food group and subgroup. Average weekly non-food expenditures will be calculated from information collected in the Final Household Interview.</p>

Table A1 (continued)

Study Objective	Data Source
<p>1-j What proportion of low-income households not participating in SNAP are likely to be program eligible based on their gross and net income and resources? How do these households compare to SNAP households in terms of weekly food expenditures, food acquisition and nutrition patterns, and food security?</p>	<p>Food books and receipts capture what foods are acquired, where food is acquired, food quantities and prices. Income, resource, and expenditure information to estimate SNAP eligibility collected by Final Household Interview.</p>
<p>2. Characterize the nutritional quality of households' food purchases and acquired food.</p>	
<p>a. Considering all sources of food acquisition, characterize the food choices and nutritional quality of households' acquired foods. What are the differences in USDA pyramid food group units and nutritional quality between food purchased primarily for at home (FAH) versus away from home (FAFH) consumption?</p>	<p>Acquired food items will be matched with nutrient data from USDA's Standard Reference Database (SR21). MyPyramid units will be merged by SR21 food codes.</p>
<p>b. How do these measures vary by population group (e.g., SNAP households, nonparticipating low-income households, and higher-income households)?</p>	<p>Above analyses by population group.^a</p>
<p>c. How do these measures vary between SNAP households and eligible but nonparticipating households?</p>	<p>Acquired food items will be matched with nutrient data from USDA's Standard Reference Database (SR21). MyPyramid units will be merged by SR21 food codes. Income, resource, and expenditure information to estimate SNAP eligibility collected by Final Household Interview.</p>
<p>3. Characterize the nature of food access of the population universe and groups.</p>	
<p>a. Where do respondents shop for food (type of source/vendor and geographic proximity to household), and how do decisions about where to shop vary by household characteristics? How do decisions about where to shop vary by time of month relative to program issuance dates and/or pay dates? Do shopping choices of population groups vary and, if so, how?</p>	<p>FAH shopping locations are reported in the food books (Daily List and Blue pages) and observed on receipts. The exact location of usual shopping locations is collected during Initial Household Interview, along with travel modes and travel cost. Geographic distance will be calculated as driving distance from respondents' homes to usual shopping locations.</p> <p>FAFH locations are reported in food books (Daily List and Red pages) and reported and confirmed during telephone interviews. Geographic distance will be calculated as driving distance from respondents' homes.</p> <p>Timing of food assistance benefit receipt is asked during Initial Household Interview and confirmed by SNAP administrative data.</p>
<p>b. How long does it take for shoppers to travel to their main food stores? What mode(s) of transport do they use? What costs (time and out-of-pocket) do households in the sample incur when they shop for food?</p>	<p>Initial Household Interview includes questions about usual shopping behavior, modes of transport, and travel costs.</p>
<p>c. For both SNAP participants and nonparticipants, in what other food assistance programs do they and household members participate (e.g., WIC, school meals, snacks or meals in daycare, after-school programs, Food Distribution Program on Indian Reservations (FDPIR), Commodity Supplemental Food Program (CSFP), food kitchens, and food pantries), and with what frequency? What is the relationship of program participation to decisions regarding the source of food purchases?</p>	<p>Initial Household Interview includes questions about program participation, shopping behavior, and food access. Actual shopping destinations are reported in food books.</p>

Table A1 (continued)

Study Objective	Data Source
<p>3-d. What are the characteristics of food outlets that are available to survey respondents? Do these characteristics (e.g., location, type of store, and availability of nutritious foods) vary by population group?</p>	<p>The final database for the National Food Study will include characteristics of food outlets within proximity to each survey respondent. These characteristics will be provided in summary form (counts of retailers by type) after identifying retailers within certain radii of each survey respondent using a commercial directory of food stores and eating places loaded in mapping software.</p>
<p>4. Estimate the influence of income and prices on food purchases, including, to the extent feasible, income, own-price, and cross-price elasticities for purchased food items (both at home and away.)</p>	
<p>a. For the sample population as a whole, what are the income and price elasticities of major food categories and subcategories?</p> <p>b. How do the estimated elasticities above vary across SNAP participants, nonparticipating low-income households, and higher income households?</p>	<p>Elasticities of demand for food can be estimated using: household income reported in Final Household Interview; FAH prices obtained from receipts, Nielsen data, or imputed; FAFH prices reported in telephone interviews, obtained from receipts, or imputed.</p>
<p>5. Assess levels of food security of the population universe and subgroups using the 30-day, adult food security measure.</p>	
<p>a. To what extent do levels of food security vary across different food acquisition patterns? For instance, do households that have lower levels of food security also have a higher propensity to obtain foods and prepared meals from friends or relatives?</p>	<p>Final Household Interview includes the food security module. Sources of food are identified in food books.</p>
<p>b. To what extent do levels of food security relate to measures of current food expenditures, program participation, access to and utilization of various types of stores, and frequency of food shopping?</p>	<p>Final Household Interview includes food security questions. Food expenditures and shopping frequency are derived from FAH and FAFH records. Initial Household Interview includes program participation. Food store access is derived from household and retailer locations in proximity to respondents' homes.</p>
<p>c. How do levels of food security vary among the population groups: SNAP participants, nonparticipating low-income households, and higher-income households?</p>	
<p>d. How do levels of food security vary between SNAP households and eligible but nonparticipating households?</p>	<p>Final Interview Interview includes food security questions. Income, resource, and expenditure information to estimate SNAP eligibility collected by Final Household Interview.</p>
<p>6. Assess levels of knowledge about diet, nutrition, and health.</p>	
<p>a. What do responding households know about diet, nutrition, and health? What are the relationships between respondents' knowledge and the foods they purchase or otherwise acquire? To what extent do relationships between knowledge and food acquisition patterns vary by population group?</p>	<p>Final Household Interview includes questions about diet, nutrition, and health knowledge.</p>

Table A1 (continued)

7. Assess why food purchase and food security outcomes differ for SNAP participants and low-income nonparticipants, and identify the factors that account for those differences.		
a.	What are the roles of a household's current socioeconomic characteristics, such as current income and current household structure?	Initial Household Interview includes questions about household structure (household roster), and recent changes in composition;
b.	What other dynamic factors at the household level might affect outcomes, including the role of income volatility and recent or unexpected household events, such as changes in household composition and changes in employment status?	Final Household Interview includes questions about current household income. Final Household Interview includes questions about major life events (dynamic factors).
c.	What are the roles of other broad components of household expenditures (e.g., medical expenses or housing costs) that might be large relative to those of other households of similar income or to the household's past expenditure patterns?	Final Household Interview includes questions about non-food household expenditures.
8. Identify subject areas and groups of SNAP households for which additional information about diet, nutrition and health could have the greatest potential impact on improved food choices.		
a.	Identify groups of SNAP households with food acquisition patterns and food choices that indicate possible nutrient deficiencies.	Acquired food items will be matched with nutrient data from USDA's Standard Reference Database (SR21). MyPyramid units will be merged by SR21 food codes.

^a Analyses by "population group" will compare SNAP participants with low-income and higher-income nonparticipants.

Table A2 prioritizes the research objectives and the data that will support the corresponding research efforts. When the National Food Study uses multiple data sources for a single data element, the table also ranks the sources in terms of their expected contributions for the data element. For example, for food items acquired primarily for consumption at home (FAH), the National Food Study will rely on three separate sources of data: respondent scanning of barcodes on food items; respondent listing of items on the Blue Pages of their food books; and grocery receipts. These three sources are ranked as a, b, and c, respectively, because the best source of information is scanned barcodes. The study asks respondents to list a food item on a Blue Page of their food book *only if the item's barcode cannot be successfully scanned*. Finally, the study will use item information from the grocery receipt *only if a food item was not scanned and was not listed on a Blue Page*. Grocery receipts will be used primarily to provide information on item prices and use of store cards and manufacturers' coupons. Receipts generally provide only limited descriptions of the items purchased and, for this reason, are ranked last among sources of information about what food items have been purchased and in what quantities.

The symbol "x" is used to denote some rankings in Table A2. An "x" indicates that the data sources for the corresponding data element are ranked under a different research objective, as identified in the table.

To reiterate, the rankings in Table A2 represent the hierarchy of sources for a data element. The National Food Study includes a great deal of complementary data collection that, at first glance, may appear to be redundant. Alternative sources of data are used only when a higher-ranked source is not available or when they provide other information that is not available elsewhere, as with prices on grocery receipts.

Table A2. Data Element Priorities / Data Source Rankings

Study Objective	Rank	Data Element / Source
Priority 1: Food item prices and quantities		
1-a-i		Identification of food items acquired primarily for consumption at home (FAH)
1-a-i	a	Scanned barcodes
1-a-i	b	For items that cannot be scanned, listed items on Blue Pages
1-a-i	c	Receipts, when they provide detailed information
1-b-i		Quantities of food items acquired primarily for consumption at home (FAH)
1-b-i	a	Scanned barcodes
1-b-i	b	For items that cannot be scanned, listed items on Blue Pages
1-b-i	c	Receipts, when they provide detailed information
1-b-i		Prices of food items acquired primarily for consumption at home (FAH)
1-b-i	a	Receipts
1-b-i	b	If receipt is missing, Blue Pages provide total cost of purchase and whether coupons or store card were used
1-b-i	c	Match of barcode information to retailer-specific data base
1-b-i	d	Match of barcode information to other price data base like Nielsen
1-a-ii		Identification of prepared foods and beverages acquired primarily for consumption away from home (FAFH)
1-a-ii	a	Respondent phone calls to Survey Operations Center (SOC)
1-a-ii	b	If calls not completed, review of receipt
1-a-ii	c	If calls not completed, item descriptions from Red Pages
1-b-i		Quantities of prepared foods and beverages acquired primarily for consumption away from home (FAFH)
1-b-i	a	Respondent phone calls to Survey Operations Center (SOC)
1-b-i	b	If calls not completed, review of receipt
1-b-i	c	If calls not completed, item descriptions from Red Pages
1-b-i		Prices of prepared foods and beverages acquired primarily for consumption away from home (FAFH)
1-b-i	a	Respondent phone calls to Survey Operations Center (SOC)
1-b-i	b	If calls not completed, review of receipt
1-b-i	c	If calls not completed, item descriptions from Red Pages
1-i		Weekly food expenditures
1-i	x	Based on data elements described in Objective 1-b-i
4-a		Price elasticities of major food categories and subcategories
4-a	x	Based on data elements described in Objective 1-b-i
Priority 2: Nutritional measures; SNAP participation and eligibility; household income		
1-d		Nutrient characteristics of food items acquired primarily for consumption at home (FAH)
1-d	a	Match of barcode/other information to food groupings in UPC data dictionary
1-d	b	Match of barcode/other information to USDA's Standard Reference Database (SR21)
1-d		Nutrient characteristics of prepared foods and beverages acquired primarily for consumption away from home (FAFH)
1-d	a	Match of product information to food groupings in UPC data dictionary
1-d	b	Match of product description to USDA's Standard Reference Database (SR21)
1-e		For each household member, what purchase/acquisition occasions occur each day?
1-e	a	Daily Lists
1-g		Total household income
1-g	a	Final Household Interview
1-g	b	Screener
1-g		Household participation in SNAP
1-g	a	Match with State administrative data after survey period
1-g	b	Self-report during screener
1-g	c	SNAP list at beginning of survey

Note: Hierarchy of rankings is a, b, c, x, with x indicating that rankings are provided elsewhere in table.

Table A2 (continued)

Study Objective	Rank	Data Element / Source
2-b		Nutritional measures by population subgroups
2-b	x	SNAP participation and total household income based on data elements described in Objective 1-g
2-b	x	Household characteristics based on data elements described in Objective 3-a
2-c		Nutritional measures among households eligible for SNAP but not participating
2-c	x	Based on data elements described in Objectives 1-j and 2-a
3-a		Household characteristics
3-a	a	Initial Household Interview for age, gender, education, race/ethnicity, disabilities, marital status, employment
3-a	b	Final Household Interview for special dietary needs, health status
4-a		Income elasticities of major food categories and subcategories
4-a	x	Based on total household income and food item descriptions and quantities described in Objective 1-g
4-b		Variation of income and price elasticities across SNAP participants, nonparticipating low-income households, and higher-income households
4-b	x	Based on data elements described in Objective 1-g
Priority 3: Factors affecting household demand for food; eligible non-participants		
1-f		For each household member, what meals and snacks are consumed each day?
1-f	a	Meals and Snacks Form
1-j		SNAP-eligible nonparticipants
1-j	x	Total household income based on data elements in Objective 1-g
1-j	a	Net household income based on expenditures on utility, medical, dependent care and child support costs
1-j	b	Asset test regarding total assets and vehicle ownership
2-a		MyPyramid food group units of food items acquired primarily for consumption at home (FAH)
2-a	a	Match of barcode/other information to food groupings in UPC data dictionary
2-a	b	Match of barcode/other information to USDA's Standard Reference Database (SR21)
2-a		MyPyramid food group units of food items acquired primarily for consumption away from home (FAFH)
2-a	a	Match of product information to food groupings in UPC data dictionary
2-a	b	Match of product description to USDA's Standard Reference Database (SR21)
3-a		Where respondents shop
3-a	a	Daily Lists, Blue Pages, Red Pages for shopping during data collection week
3-a	b	Initial Household Interview for "usual" shopping destinations
3-b		Travel times and cost
3-b	a	Initial Household Interview
3-c		Participation in food assistance programs other than SNAP
3-c	a	Initial Household Interview
3-c	b	Blue Pages indicate when WIC purchases are made
5-a		Household food security-variation by food acquisition patterns
5-a	a	Final Household Interview includes food security questions
5-a	x	Sources of food based on data elements described in Objective 3-a
5-b		Household food security-variation by food expenditures, program participation, access to stores, and food shopping frequency
5-b	a	Final Household Interview includes food security questions
5-b	x	Food expenditures based on data elements described in Objective 1-b-i
5-b	x	Program participation based on data elements described in Objectives 1-g and 3-c
5-b	x	Store access based on data elements described in Objective 3-d
5-b	x	Food shopping frequency based on data elements described in Objective 1-e
5-c		Household food security-variation by SNAP participation and total household income
5-c	a	Final Household Interview includes food security questions
5-c	x	SNAP participation and total household income based on data elements described in Objective 1-g
5-d		Food security among households eligible for SNAP but not participating
5-d	x	Based on data elements described in Objectives 1-j and 2-a

Note: Hierarchy of rankings is a, b, c, x, with x indicating that rankings are provided elsewhere in table.

Table A2 (continued)

Study Objective	Rank	Data Element / Source
7-a		Factors that account for differences in food purchases and food security-household socioeconomic characteristics
7-a	x	Household socioeconomic characteristics based on data elements described in Objectives 1-g and 3-a
7-b		Dynamic factors that account for differences in food purchases and food security
7-b	a	Final Household Interview includes questions about major life events (dynamic factors)
7-c		Other major expenditures that account for differences in food purchases and food security
7-c	a	Final Household Interview includes questions about major expenditure categories
8-a		Characteristics of SNAP households with food acquisition patterns that indicate possible nutrient deficiencies
8-a	x	Characteristics of SNAP households based on data elements described in Objectives 1-g and 3-a
8-a	x	Nutrient characteristics based on data elements described in Objectives 1-d and 2-a
Priority 4: Timing of acquisitions; diet, nutrition, and health		
1-h		Timing of food acquisitions
1-h	a	Receipts
1-h	b	If receipt not available, use day/date information from Daily Lists, Blue Pages, Red Pages
1-h		Timing of food acquisitions relative to paydays and benefit issuance days
1-h	a	Initial Household Interview
1-h	b	Match with State administrative data after survey period
3-d		Characteristics of food outlets
3-d	a	Match of survey record to STARS database of SNAP-authorized retailers
3-d	b	Match of survey record to commercial directory of food stores and eating places
6-a		Knowledge about diet, nutrition and health
6-a	a	Final Household Interview includes questions about knowledge about diet, nutrition and health
6-a		Knowledge about diet, nutrition and health-variation by foods acquired
6-a	x	Acquired foods based on data elements described in Objectives 1-a-i, 1-a-ii, 1-b-i, and 1-b-ii
6-a		Knowledge about diet, nutrition and health-variation by population group
6-a	x	Population groups based on data elements described in Objectives 1-g, 3-a, and 3-c

Note: Hierarchy of rankings is a, b, c, x, with x indicating that rankings are provided elsewhere in table.