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# Lessons learned from the national household food acquisition and purchase survey in the United States

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ABSTRACT

The National Household Food Acquisition and Purchase Survey conducted in 2012 (FoodAPS-1) was an ambitious survey of Americans' food acquisitions sponsored by the U.S. Department of Agriculture (USDA). The survey was challenging due to its goals of collecting comprehensive acquisition information and including data from extant sources to broaden the survey's research capabilities. Some challenges were foreseen, and efforts were taken to overcome them through survey design features. Other challenges came as a surprise. This paper shares the experiences of the authors and others at USDA with survey design, survey implementation, and post-survey processing of data to ensure the availability of high-quality data to the research community. Lessons from FoodAPS-1 can inform similar future data collections both in the U.S. and abroad.

## 1. Introduction

The National Household Food Acquisition and Purchase Survey conducted in 2012 was an ambitious survey of Americans' food acquisitions sponsored by the U.S. Department of Agriculture (USDA).[3] Prior to this survey, which we refer to as FoodAPS-1[4], data containing detailed information about specific household food purchases, including quantities and prices for both food-at-home (FAH) and food-away-from-home (FAFH) events[5], were limited or nonexistent in the U.S. The premier source of food expenditure data in the U.S., the Consumer Expenditure Survey, provides spending information for about 100 food categories but does not capture prices or quantities. A report by the Committee on National Statistics (CNSTAT) at the National Academies (National Research Council, 2005) identified the need to have such data, and noted that linking such data to other datasets, such as program administrative records and geographic locations of food stores and restaurants, would greatly enhance our ability to study U.S. household food choices. The USDA sponsored FoodAPS-1 to address these data gaps and to expand research possibilities on the relationships between foods acquired and diet quality, health, food insecurity, and food assistance program participation.

FoodAPS-1 is unique in that it collected detailed information about all foods acquired, by all household members, over seven days. This included purchases from grocery stores and restaurants, as well as free or subsidized foods (from schools, work, own production, food pantries, community centers, and family and friends). The survey also collected individual- and household-level information about food assistance program participation and other characteristics relevant to the study of food choices and health outcomes. Not only was content unique, the survey contractor[6] incorporated novel design and collection procedures. For instance, administrative data from the Supplemental Nutrition Assistance Program (SNAP) were used to create a sampling frame of SNAP households and to later confirm survey households' participation in the program. For the first time ever in a national government

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[2] Both authors are employees of the U.S. Department of Agriculture (USDA), Economic Research Service, and USDA provided funding for the survey. Both authors have been working on this survey since its inception. The views expressed are those of the authors, however, and should not be attributed to the Economic Research Service or the U.S. Department of Agriculture.
[3] The Economic Research Service (ERS) and the Food and Nutrition Service (FNS), both agencies within the U.S. Department of Agriculture, funded the survey.
[4] Previously referred to as 2012 FoodAPS or simply FoodAPS, ERS now uses "FoodAPS-1" to refer to the survey conducted primarily in 2012. ERS is currently planning a second FoodAPS survey (FoodAPS-2).
[5] "Food-at-home" generally refers to food purchased at grocery stores and later used at home to prepare meals and snacks. In contrast, "food-away-from-home" covers meals at restaurants, snacks from vending machines, meals at work or school, and other free or purchased acquisitions generally of already-prepared food. The distinction between the two categories of food is discussed in Section 4.1.
[6] FoodAPS-1 was designed and implemented by Mathematica Policy Research, under a contract with ERS.

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survey, households used handheld scanners to record information about their purchases. In addition, a variety of outside data sources were merged to the survey, such as information about local food environments and State-level SNAP administrative policies. Nearly 5,000 households participated in the study between April 2012 and January 2013, with an oversampling of low-income households participating and not participating in SNAP.

The objective of this paper is to share with the research community and survey designers what ERS has learned from FoodAPS-1. In particular, given the unique aspects of this survey and its importance to understanding household demand for food, many features of its instrumentation, sample design, interviewer and respondent training, data collection protocols, and use of extant data may serve as models for future data collections with similar goals to understand household food demand, both in the U.S. and abroad. But we can and should learn from our mistakes as well as our successes. Many challenges were faced while designing and implementing FoodAPS-1. In most instances these challenges were overcome, and the value and quality of the FoodAPS-1 data are being revealed by the research currently being done with them. In other instances, however, the challenges were overwhelming, and we did not achieve all our goals. The USDA is planning a FoodAPS-2 data collection, and we are examining all facets of the FoodAPS-1 experience looking for areas where we might improve the next data collection. That improvement could be in any combination of lower overall cost, improved response rates, better ways of identifying when household members did not report all food acquisitions, lower item non-response, lower respondent burden, and more efficient and timely processing of the data into analysis files.

We first discuss why FoodAPS-1 was needed. Then, we describe the survey in detail, focusing on the sampling design, the in-person interviews, the reporting of food acquisitions, and other instruments. This detail is needed for two reasons. First, some of the lessons we have learned pertain to specific details about the survey, Second, for readers to most effectively benefit from ERS' experience with FoodAPS-1, they need to know how FoodAPS-1 is similar to or different from their own planed surveys. The various extant data sources that were used and/or appended to the FoodAPS-1 data are then described. Along with the description of each component of the survey, we provide commentary about what we have learned so far about what worked well and what could be improved upon in future surveys of similar nature.

## 2. Why invest in a survey like FoodAPS?

Primary data on the food choices of American consumers are critical for understanding dietary patterns. In addition, detailed information about participants in the USDA food assistance programs and other vulnerable populations is essential to increasing the effectiveness and efficiency of Federal programs that address food insecurity, nutritional deficiencies, and public health issues such as obesity, diabetes, and the metabolic syndrome. Despite these research needs, the United States has been among a handful of developed countries that does not systematically and regularly gather data on expenditures, prices, and quantities of food bought by its populace.

Big questions about food assistance programs remain unanswered, especially for the $74 billion dollar program called SNAP (previously the Food Stamp Program) (Oliveira, 2016). These questions include:

- How does program participation affect household food choices, expenditures, and consumption?
- Does the food environment around a participant's home affect access to the types of retailers from which food is acquired, the foods that are purchased and the prices that are paid?
- What is the relationship between program participation decisions and food security?

To address these and other research questions, an "ideal" dataset would include information on food expenditures, where food is acquired, what food items are acquired and their unit price, and nutritional content. Household characteristics and eligibility for and participation in food assistance programs also are essential for understanding food demand. Information such as individuals' knowledge about nutrition and safe food preparation and handling practices, dietary restrictions and health conditions, and length of program participation would enhance research.

A number of existing data sources contain some, but not all, of these features for the United States, including the Consumer Expenditure Survey (CES), the Current Population Survey (CPS), and the National Health and Nutrition Examination Survey (NHANES). However, no single existing data source provides all of the information needed to answer the wide-ranging research questions associated with diet, health, and food assistance programs. FoodAPS-1 was designed to help fill the gaps in data needed to address many questions related to nutrition assistance and diet quality. In particular, and unlike many earlier surveys, FoodAPS-1 pays equal attention to FAH and FAFH food acquisitions, recognizing that FAFH is playing an ever-greater role in Americans' food choices. In addition, the FoodAPS-1 sample design oversampled households with SNAP participants and low-income households not participating in SNAP so that the role of Federal nutrition assistance programs on food demand and consequent nutrition, health, and food security outcomes could be better understood.

## 3. Sampling design

The survey employed a complex, multi-stage sample design with a goal of collecting data from 5000 households representative of the contiguous United States and of four target groups: households receiving SNAP benefits; non-SNAP households with income less than the poverty threshold; non-SNAP households with income between 100 and 184 percent of the poverty threshold; and non-SNAP households with income equal to or greater than 185 percent of the poverty threshold. The final sample size was 4826 households containing 14,317 individuals. FoodAPS-1 was unable to meet targeted sample sizes for low-income, non-SNAP households in part because screener respondents often under-reported household income compared to information provided in the final interview (see section 4.3).

FoodAPS-1 employed a unique strategy to more efficiently sample SNAP and non-SNAP residential addresses. SNAP agencies in the 27 States with one or more of the survey's 50 selected primary sampling units (PSUs) were asked to provide addresses for all SNAP units enrolled in the program in February 2012. These lists were merged with an Address-Based Sampling (ABS) list obtained from the United States Postal Service Delivery Sequence File for each of the eight secondary sampling units (SSUs) selected per PSU. Addresses that appeared on the SNAP list were identified as SNAP addresses and all other as non-SNAP addresses, resulting in two separate sample frames from which addresses could be selected at different rates.

Although the sampling frames were designed to sample SNAP and non-SNAP households more efficiently, it was recognized that the SNAP address lists would become less useful over time as SNAP households moved or left the program. The FoodAPS-1 team considered asking State agencies to provide updated lists throughout the field effort, but decided that such a request would be too burdensome to the agencies. As it was, four State agencies did not provide a list of SNAP addresses, and a fifth agency provided its list too late to be incorporated into the sampling process.

Finding and recruiting non-SNAP households with incomes below 185 percent of the poverty level, and especially those below the poverty line, was particularly challenging. Increasing the likelihood of selecting areas with higher percentages of lower-income households was one way to increase the sample size of these households. In addition, the screener was designed to determine a household's target group by directly asking about household size and total income (the determinants