USDA SURVEYS: PAST AND PRESENT

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The 1980's ushered in a new era in USDA's food consumption surveys. The Continuing Survey of Food Intakes by Individuals (CSFII), initiated in 1985, was the first nationwide dietary intake survey in this country to be conducted on a year-by-year basis. This innovative survey was designed to provide continuous data on the adequacy of diets of selected population groups and early indications of changes in food consumption practices.

April 1 marks the completion of data collection for the second year of the CSFII and it also marks the beginning of the USDA's next decennial survey--the Nationwide Food Consumption Survey of 1987 (NFCS 1987). It is timely, therefore, to talk about our experiences with the CSFII and our plans for future surveys.

THE CSFII EXPERIENCE

Methodology. The core of the CSFII was a sample of women 19 to 50 years of age and their children 1 to 5 years. These age groups were selected because previous surveys have shown that they are more likely than other population groups to have diets low in certain nutrients. In each of the first 2 years of the survey, data were collected from approximately 1,500 women and 500 of their children. In addition, the CSFII included separate samples of low-income women and children in 1985 and 1986 and of men in 1985.

Backed by 3 years of preliminary studies and investigations, several new methodological approaches were instituted in the CSFII:

1. The use of a panel of respondents who were asked to provide 6 individual days of dietary data over a 1-year period. Each day's data were collected with a 1-day dietary recall at intervals of approximately 2 months. The use of the panel differs from previous surveys in which individuals were asked to provide either 1 day of data or 3 consecutive days of data. The panel approach assumes that surveying days spaced over the year provides a better measure of usual intake for an individual than surveying adjacent days.
2. The use of the telephone to collect dietary data. The first day of data in the CSFII was collected in a personal interview; subsequent days of data were collected by telephone. The personal interview in the first wave built rapport with the respondent prior to telephone interviews in later waves. The telephone interviews were cost-effective, requiring less time for data collection and processing since the calls were made from the main office. However, the capability to conduct personal interviews in the field was important because of the relatively large percentage of households that did not have phones. For example, in 1985, 9 percent of the core sample and 30 percent of the low-income sample did not have telephones. In addition, a significant number of telephones were "disconnected" during the 2 years of the CSFII.
3. The collection of information on the use of fat in the preparation of the food and, if used, the type. Information was also obtained on use of salt in food preparation. These questions were asked of the main meal planner/preparer--not of all individuals.
4. The use of a computer-assisted system for coding foods reported by survey respondents. In previous surveys, foods had been coded on the questionnaire before being entered into the data processing system. The new system reduced coding to one operation, reducing processing time substantially and improving the quality of the data because of the reduction in coding errors.

The better measure of usual intake available with the panel approach was accompanied by several drawbacks. Response rates dropped substantially between the first and sixth days. The number of respondents in the first wave was 1,459, compared with 902 in the sixth wave. The

largest drops occurred after the first and second waves. Only 692 women provided all 6 days of intake data.

Part of the decline in response rates was built into the survey design. Because funds were limited, respondents were not followed if they moved out of their original area. During the survey year, 145 respondents (10 percent of the women) moved. Analysis of the data, as well as interviewer debriefing, indicates that a number of socioeconomic characteristics are associated with the likelihood of dropping out. Factors associated with being less likely to participate in four or more waves included: being younger, having a low income, having poor health, being on a special diet, having one or more children, being suburban, being black, or working. For the most part, the opposite characteristics were associated with the women who participated for four or more waves.

Prior to the initiation of the CSFII, several exploratory studies were conducted to determine the best method for collecting information from a panel of respondents. In a study of individuals of all incomes, the response rates obtained with the telephone were as good as those obtained by in-person interviews. Actual experience with telephones in the CSFII was not as good as the preliminary studies had predicted.

A second drawback of the panel approach was the apparent conditioning effect that occurred between day 1 and subsequent days. Food energy intake declined by 10 percent between day 1 and day 2. There were further declines following day 2, but the decline was greatest between the first two waves. Analysis of both the core sample and the low-income sample indicated that the switch from personal to telephone interview method was not responsible for the drop in food energy. Those households who were interviewed in wave 2 by personal interview reported a drop in calories similar to those interviewed by telephone.

In addition to food energy, the number of food items consumed each day declined. We are in the process of investigating which foods declined. Nutrient intakes also declined between day 1 and 2 and, to a lesser degree, after day 2. On a nutrient density basis, however, the intakes of many nutrients per 1,000 kilocalories remained fairly consistent or increased slightly on a wave-by-wave basis.

Results. The CSFII demonstrated that frequent surveys can provide timely indications of dietary changes. For example, between 1977 and 1985 the percentage of individuals drinking whole milk declined, while the percentage drinking lowfat/skim milk increased. Data from the 1986 CSFII indicate a continuation of this trend.

The CSFII results also indicate a drop in meat intakes between 1977 and 1985. Previous surveys, including the 1977 survey, have shown the consumption of meat to be higher at successively higher income levels. In 1977, high-income women--those from households with incomes over 300 percent of the poverty level--reported 20 percent more meat than women from households under 131 percent of the poverty level. In 1985, however, high-income women reported 25 percent less meat than low-income women. Although meat intake by all three income groups was lower in 1985 than in 1977, the decline was greatest for the high-income group.

The CSFII confirmed findings of the 1977-78 NFCS that multiple days of data are necessary to explain the variability of intakes among individuals and the day-to-day variability for a specific individual. A single 1-day recall provides adequate information for deriving population means. However, it can be misleading for showing the distribution of intakes or the percentage of intakes that meet a defined level, such as the Recommended Dietary Allowance (RDA).

For example, we looked at 1-day intakes and 4-day intakes at the 5th and 95th percentiles for food energy and selected nutrients. For all nutrients, the spread of nutrient intakes is wider for 1-day intakes than for 4-day intakes. For example, for food energy, the 4-day intake at the 5th percentile is 47 percent below the intake at the median, but the 1-day intake is 60 percent below.

The difference between the 1-day and 4-day intakes at the 5th and 95th percentiles differs among food components. Food energy intakes have the smallest difference; vitamin A intakes have the greatest. For some food components--in particular, vitamins A, C, and B-12, cholesterol, vitamin E, calcium, polyunsaturated fat, and folacin--the difference in 1-day and 4-day ranges at the 95th percentile is very large. These are generally food components that are provided in large amounts by certain food types that some people eat and others do not. For example, several vegetables, especially dark-green and deep-yellow ones, are rich in vitamin A and citrus fruits in vitamin C. People who eat these vegetables and fruits, even in reasonable amounts, consume well above the median intakes of vitamins A and C. Over 4 days, their selections of some items less rich in these nutrients tend to reduce the average vitamin A and C intakes.

We have used the average intake for 4 days of CSFII 1985 to take a first look at the proportions of women who achieved specified fat and cholesterol levels. These preliminary averages indicate how many women might meet the goals recommended by some groups.

Fat: Of the women reporting 4 days of food intake, only 12 percent ate fat furnishing the less than 30 percent of calories suggested by some authorities, such as the National Cancer Institute and the American Heart Association (AHA). But these low-fat diets were not all good. The mean levels of calcium, iron, and zinc in these lower fat diets were below levels for women who had higher fat diets. Only 10 percent of the women reported 4-day diets with saturated fat below 10 percent of calories, as AHA suggests. These women also had mean intakes of iron and zinc that were especially low. From these findings, it appears that women need food selection guidance to help them to improve nutrient levels while controlling fat in their diets. Studies are under way to illustrate dietary changes that might be required to meet various goals suggested.

Cholesterol: The 300 milligrams or less of cholesterol suggested by AHA in 1978 was achieved in 62 percent of the women's 4-day diets. However, the more recent recommendation of less than 100 milligrams of cholesterol per 1,000 calories was achieved by only 9 percent of the women. We question the soundness and the practicality of this recommendation.

The last point I want to make on the CSFII experience relates to the timely release of results. In previous dietary surveys, the data had been published several years following the completion of data collection. With the CSFII, however, the first report from each of the 2 years of data collection was available about 6 months after the completion of data collection. This is a commitment HNIS made before the CSFII, and we are proud to be one of the first agencies to provide data of this complexity on such a timely basis.

SURVEY PLANS

The NFCS 1987. The contract for the Nationwide Food Consumption Survey 1987 (NFCS 1987) was signed in September 1986. Data collection started April 1, 1987, and will run for a year. The NFCS 1987 is the seventh in a series of surveys conducted at approximately 10-year intervals. NFCS 1987 consists of two samples--a basic sample of 6,000 households of all incomes and a sample of 3,600 low-income households.

As in 1977, NFCS 1987 includes two parts: a household food use phase and an individual intake phase. In the household phase, respondents are asked to provide information on the food used by the household for a 1-week period and on the prices paid for purchased foods used. The household phase of the NFCS 1987 will differ from that of NFCS 1977-78 in that the interviewer will ask questions as presented on a computer screen and enter responses directly into the computer. This procedure will reduce data-processing time, making survey results available on a more timely basis than for previous surveys.

In the individual intake phase, household members are asked to provide 3 days of food intake

information. This information is collected by asking individuals to recall the food they have eaten in the previous 24 hours and then to keep a diary of food eaten for 2 additional days. This method is similar to that used in the 1977-78 survey but differs from the 6-day panel approach used in the CSFII. In other aspects, the individual intake phase of the NFCS 1987 will be similar to the CSFII. However, the NFCS includes individuals of all ages rather than the specific age groups surveyed in the CSFII.

In addition to the household and individual intake information, the NFCS 1987 will obtain socioeconomic information such as income, education, employment, and participation in food assistance programs. Also, individuals are being asked to evaluate their health status and household food managers are asked to assess the sufficiency of their food.

In preparation for the NFCS 1987 and in response to requests from the Congress, the National Academy of Sciences, and others that the NFCS surveys be better linked to the National Health and Nutrition Examination Surveys (NHANES), several working groups were formed to investigate comparability and to make recommendations for linkage. One working group reviewed variables to be used in NFCS 1987 and planned for NHANES III. Thirty-eight variables were studied. One set of variables was found to be conceptually so similar that only minor changes were suggested if any--urbanization, sex, age, education, pregnancy status, reported height, and self-evaluation of general health status. Another set had similar intent, and suggestions were made for attaining closer linkage through inclusion of one or more common questions, alterations in reference time periods, or other dimensional change--race, employment status, farm, lactating female, breastfed child, reported weight, cigarette-smoking, and surrogate respondent. A third set of variables had major conceptual differences which precluded comparability through modification of questions or definitions--income, five household-versus-family variables, and physical activity. Some of these differences are necessary because the purposes of the surveys differ. Staff developing the NFCS also reviewed variables from the Current Population Survey and the Survey of Income and Program Participation and reworded questions as appropriate.

A total of 19 reports are planned for NFCS 1987; the first two, covering the first quarter of data, are planned for release late this year or early in 1988. Initial in-depth analytical studies to be conducted extramurally have been planned, and the Requests For Proposals will be issued shortly.

The CSFII. Plans to reinstate a modified CSFII in 1989 are now nearing completion. The two CSFII surveys in 1985 and 1986 demonstrated that continuous monitoring of population groups in the years between the large decennial surveys can provide timely notice of changes in foods eaten by individuals and in their dietary status. Also, continuous monitoring of dietary status of the general population and of low-income Americans has been called for by the Congress. The CSFII proposed for 1989 and beyond will provide this continuous monitoring using a cost-effective "moving-average" approach recommended by two committees established by the Food and Nutrition Board of the National Academy of Sciences.

The CSFII that is to be initiated in 1989 and continued in following years will provide a 2-to-5-year moving average of the dietary status for all sex-age groups. Annual estimates for both men and women 19 to 50 years old will be provided after 2 years, while estimates for other sex-age groups will be provided after 3 to 5 years. The new CSFII will include two samples--a sample of all individuals in 1,500 households of all incomes and a sample of all individuals in 750 low-income households. Low-income households are defined as those with incomes of 130 percent of the poverty level or less. The survey will be designed so that low-income households in the general sample can be combined with households in the low-income sample. This will increase the number of low-income individuals for whom we have dietary data. Several other changes have been made for CSFII 1989. First, all individuals from a household will be included in the sample, rather than the specific age groups that were included in the 1985 and 1986 surveys.

Second, dietary intakes will be taken for three consecutive days by the recall/record method, as in the decennial survey, rather than for six 1-day recalls, as in the CSFII 1985/86. This approach is less costly and, we believe, will improve the response rates. Finally, at least part of the interview process will be computerized--in particular, the sociodemographic household data and the initial 24-hour recall.

The Human Nutrition Information Service has undertaken an ambitious program to meet the nutrition monitoring needs of the nation. In addition to conducting the two surveys, HNIS has committed its resources to maintaining and improving other research areas that either support or complement the survey activities. These include improvements in the Nutrient Data Bank, a continuation of the methodological research aimed at improving survey efficiency and data quality, and the release of survey results on a timely basis.