

Third National Health and Nutrition Examination Survey
(NHANES III), 1988-94

NHANES III SECOND EXAM FILE DOCUMENTATION

Series 11, No. 3A

July 1999

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Introduction

The National Center for Health Statistics (NCHS) of the Centers for Disease Control and Prevention (CDC) collects, analyzes, and disseminates data on the health status of U.S. residents. The results of surveys, analyses, and studies are made known through a number of data release mechanisms including publications, mainframe computer data files, CD-ROMs (Search and Retrieval Software, Statistical Export and Tabulation System (SETS)), and the Internet.

The National Health and Nutrition Examination Survey (NHANES) is a periodic survey conducted by NCHS. The third National Health and Nutrition Examination Survey (NHANES III), conducted from 1988 through 1994, was the seventh in a series of these surveys based on a complex, multi-stage sample design. It was designed to provide national estimates of the health and nutritional status of the United States' civilian, noninstitutionalized population aged two months and older.

The following table summarizes the NHANES III data which are currently available on CD-ROM, including this release.

Table 1. Available NHANES III CD-ROMs

CD-ROM Name	Release Date	Size in Megabytes	Data Files / Description
NHANES III, 1988-94, Series 11, No. 3A, ASCII Version (this release)	July 1999	33	Second exam sample files for dietary recall, examination, laboratory, additional laboratory analytes and documentation
NHANES III, 1988-94, Series 11, No. 2A, ASCII Version	April 1998	407	Dietary recall (replacement), electrocardiography, laboratory (additional analytes), and vitamins/medicines data files and documentation
NHANES III, 1988-94, Series 11, No. 1, Revised SETS Version 1.22a	October 1997	285	Adult and youth household questionnaire, examination, and laboratory data files and documentation, plan and operation, analytic and reporting guidelines, weighting and estimation methodology, field operations, non-response bias
NHANES III, 1988-94, Series 11, No. 1A, ASCII Version	July 1997	454	Adult and youth household questionnaire, dietary recall, examination, and laboratory data files and documentation
NHANES III, 1988-94, Series 11, No. 1, SETS Version 1.22a *	July 1997	285	Adult and youth household questionnaire, examination, and laboratory data files and documentation
NHANES III Reference Manuals and Reports October 1996	October 1996	152	Plan and operation, analytic and reporting guidelines, weighting and estimation methodology, field operations, non-response bias

* Do not use this CD-ROM It had technical problems and has been superseded by the revised SETS version 1.22a, Series 11, No. 1, released in October 1997.

This CD-ROM, Series 11 No. 3A, contains data obtained from a second exam of selected survey participants who had a primary exam. This release does not replace the previous NHANES III data releases series 11 Nos. 1A and 2A).

Table 2. Location of the interview and examination components in the NHANES III public use data files

Data File

Topic	HA	HY	EXAM	LAB	DIET	VMS	ECG
Sample weights	X	X	X	X	.	.	X
Age/race/sex	X	X	X	X	.	.	X
Ethnic background	X	X	.	.	.	.	.
Household composition	X	X	.	.	.	.	.
Individual characteristics	X	X	.	.	.	.	.
Health insurance	X	X	.	.	.	.	.
Family background	X	X	.	.	.	.	.
Occupation of family head	X	X	.	.	.	.	.
Housing characteristics	X	X	.	.	.	.	.
Family characteristics	X	X	.	.	.	.	.
Orientation	X	X	.	.	.	.	.
Health services	X	X	.	.	.	.	.
Selected health conditions	X	X	X	.	.	.	.
Diabetes questions	X	.	.	.	.	.	.
High blood pressure and cholesterol questions	X	.	.	.	.	.	.
Cardiovascular disease questions	X	.	.	.	.	.	.
Musculoskeletal conditions	X	.	.	.	.	.	.
Physical functioning questions	X	.	.	.	.	.	.
Gallbladder disease questions	X	.	.	.	.	.	.

Table 2. (continued) Location of the interview and examination components in the NHANES III public use data files

	Data File							
Topic	HA	HY	EXAM	LAB	DIET	VMS	ECG	
Kidney conditions	X	.	.	.	.	.	.	.
Respiratory and allergy questions	X	X	.	.	.	.	.	.
Diet questions	X	.	.	.	.	.	.	.
Food frequency	X	.	X	.	.	.	.	.
Vision questions	X	X	.	.	.	.	.	.
Hearing questions	X	X	.	.	.	.	.	.
Dental care and status	X	X	.	.	.	.	.	.
Tobacco	X	.	X	.	.	.	.	.
Occupation	X	.	.	.	.	.	.	.
Language usage	X	X	.	.	.	.	.	.
Exercise	X	.	.	.	.	.	.	.
Social support/residence	X	.	.	.	.	.	.	.
Vitamin/mineral/medicine usage	X	X	X	.	.	.	.	.
Blood pressure measurement	X	.	X	.	.	.	.	.
Birth	.	X	X	.	.	.	.	.
Infant feeding practices/diet	.	X	.	.	.	.	.	.
Motor and social development	.	X	.	.	.	.	.	.
Functional impairment	X	X	.	.	.	.	.	.
School attendance	.	X	.	.	.	.	.	.
Cognitive function	.	X	X	.	.	.	.	.

Table 2. (continued) Location of the interview and examination components in the NHANES III public use data files

Data File

Topic	HA	HY	EXAM	LAB	DIET	VMS	ECG
Alcohol and drug use	.	.	X	.	.	.	.
Reproductive health	.	.	X	.	.	.	.
Diagnostic interview schedule	.	.	X	.	.	.	.
Activity	.	.	X	.	.	.	.
Physician's examination	.	.	X	.	.	.	.
Height and weight	.	.	X	.	.	.	.
Body measurements	.	.	X	.	.	.	.
Dental examination	.	.	X	.	.	.	.
Allergy skin test	.	.	X	.	.	.	.
Audiometry	.	.	X	.	.	.	.
Tympanometry	.	.	X	.	.	.	.
WISC and WRAT	.	.	X	.	.	.	.
Spirometry	.	.	X	.	.	.	.
Bone densitometry	.	.	X	.	.	.	.
Gallbladder ultrasonography	.	.	X	.	.	.	.
Central nervous system function evaluation	.	.	X	.	.	.	.
Fundus photography	.	.	X	.	.	.	.
Physical function evaluation	.	.	X	.	.	.	.
Fasting questions	.	.	.	X	.	.	.

Table 2. (continued) Location of the interview and examination components in the NHANES III public use data files

	Data File							
Topic	HA	HY	EXAM	LAB	DIET	VMS	ECG	
Laboratory tests on blood and urine	.	.	.	X	.	.	.	.
Total nutrient intakes	.	.	X	.	.	.	.	.
Individual foods	.	.	.	.	X	.	.	.
Combination foods	.	.	.	.	X	.	.	.
Ingredients	.	.	.	.	X	.	.	.
Prescription Medicines	X	X	.	.	.	X	.	.
Vitamins and Minerals	X	X	.	.	.	X	.	.
Electrocardiography	.	.	.	.	.	.	.	X

Data File Definitions

- HA - Household Adult Data File
- HY - Household Youth Data File
- EXAM - Examination Data File
- LAB - Laboratory Data File and Second Laboratory Data File
- DIET - Dietary Recall Data Files
- VMS - Vitamin Mineral Supplement Data File
- ECG - Electrocardiography Data File

This document includes the documentation for the NHANES III Second Exam Individual Foods File and also contains a general overview of the survey and the use of the data files. The general overview includes five sections. The first section, entitled "Guidelines for Data Users," contains important information about the use of the data files. The second section, "Survey Description," is a brief overview of the survey plan and operation. The third section, "Sample Design and Analysis Guidelines," describes some technical aspects of the sampling plan and discusses some analytic issues particularly related to the use of data from complex sample surveys. The "Data Preparation and Processing Procedures" section describes the editing conventions and the codes used to represent the data. The last and fifth section, "General References," includes a reference list for the survey overview sections of the document.

Public Use Data Files for the third National Health and Nutrition Examination Survey will also be available from the National Technical Information Service (NTIS). A list of NCHS public use data tapes available for purchase from NTIS may be obtained from the Data Dissemination Branch at NCHS. Information regarding a bibliography (on disk) of journal articles

citing data from all the NHANES and the availability of NHANES III data in CD-ROM/SETS software format can be obtained from the Data Dissemination Branch at:

Data Dissemination Branch
National Center for Health Statistics
Room 1018
6525 Belcrest Road
Hyattsville, Maryland 20782

Phone: (301)458-4636

URL:<http://www.cdc.gov/nchswww>

NTIS can be contacted at:

NTIS - Computer Products Office
5285 Port Royal Road
Springfield, Virginia 22161
(703) 487-4807

Copies of all NHANES III questionnaires and data collection forms are included in the Plan and Operation of the Third National Health and Nutrition Examination Survey, 1988-94 (NCHS, 1994; U.S. DHHS, 1996). This publication, along with detailed information on NHANES procedures, interviewing, data collection, quality control techniques, survey design, nonresponse, and sample weighting can be found on the NHANES III Reference Manuals and Reports CD-ROM (U.S. DHHS, 1996). Information on how to order this CD-ROM is also available from the Data Dissemination Branch at NCHS at the address and telephone number given above.

NHANES III Second Exam Sample

The NHANES III Second Exam Sample was a sub-study of NHANES III, conducted for research purposes. These research files are intended to provide additional data for use with special statistical methods to improve estimates from the main survey data and for methodologic investigations. Following this description of the Second Exam Sample is information on the overall survey which is also relevant for the Second Exam Sample, including: general guidelines for data users, a description of the survey, sample design, analysis guidelines and a description of the data preparation and processing procedures.

Sample design and survey description

No statistical sampling design was applied for the second exam. However, a nonrandom sample of about five percent was obtained by selecting approximately 20

participants from the roughly 400 sample persons examined at each survey location. The following general guidelines were used by the MEC staff to select participants for the second exam:

- 1) select mainly adults, 2) half between the ages of 20-39 years, and half over 40 years; 3) select about half men and half women. The sample obtained consists of 2,603 persons, with 1,205 males (46 percent) and 1,398 females (54 percent).

Age group	2nd # of Exams	Percentage of 2nd Exams
< 12	212	8
12-19	231	9
20-39	809	31
40-59	578	22
> 60	773	30

The second exams were scheduled after the first or primary exams, when possible at the same time of day as the first exam. The second exams were conducted over the same time period as the primary exams for a particular survey location by the

same MEC staff, although priority was given to scheduling and completing primary exams. The second exams were administered following the same protocols as for the primary exam, with the following exceptions: the food frequency questionnaire

was not administered to adolescents 12-16 years; the WISC/WRAT was not administered to youths 6-16 years, and hand/knee x-rays were not re-administered on adults aged 60 and over.

Analytic Issues

Due to the research nature of these data, special caution should be used in analysis. All analyses should include thorough investigation of the potential selection bias of this small non-random sub-sample. Careful attention to identifying and evaluating differences in important characteristics (e.g., age and race-ethnicity) between the subsample and the main sample should be considered along with other issues.

The second exam data can be linked to the primary exam data and the household interview data using the unique identifier (SEQN). This is necessary to obtain the demographic data for the sample. NCHS recommends that the survey design variables (e.g., sample weights) not be linked with the second exam data, since the survey design variables were created for the full sample. There are no sample weights or other design variables specifically created for the second exam sample. There are weights labeled as "replicate...weight," but these are Fay's BRR Replicate Interview Weights. These weights are to be applied to the primary exam sample, with software which uses the balanced repeated replication (BRR) method. They should not be used with the Second Exam Sample.

Because the second exams were identical to the primary exams, with the exceptions noted above, the file structure for the second exams is the same as for the

primary exam files. The variable nomenclature is the same with the following important distinction: the first or primary exam variable names have a 'p' in the third position while the second or "replicate" exam variable names have a 'r' in the third position (e.g., 'BMPWT' or 'BMRWT').

GUIDELINES FOR DATA USERS

Please refer to the following important information before analyzing data.

NHANES III Background Documents

- o The Plan and Operation of the Third National Health and Nutrition Examination Survey, 1988-94, (NCHS, 1994; U.S. DHHS, 1996) provides an overview of the survey and includes copies of the survey forms.
- o The sample design, nonresponse, and analytic guidelines documents on the NHANES III Reference Manuals and Reports CD-ROM (U.S. DHHS, 1996) discuss the reasons that sample weights and the complex survey design should be taken into account when conducting any analysis.
- o Instruction manuals, laboratory procedures, and other NHANES III reference manuals on the NHANES III Reference Manuals and Reports CD-ROM (U.S. DHHS, 1996) are also available for further information on the details of the survey.

Analytic Data Set Preparation

- o Most NHANES III survey design and demographic variables are found only on the Adult and Youth Household Data Files available on the first release. In preparing a data set for analysis, other data files must be merged with either or both of these files to obtain many important analytic variables.
- o All of the NHANES III public use data files are linked with the common survey participant identification number (SEQN). Merging information from multiple NHANES III data files using this variable ensures that the appropriate information for each survey participant is linked correctly.
- o NHANES III public use data files do not have the same number of records on each file. The Household Questionnaire Files (divided into two files, Adult and Youth) contain more records than the Examination Data File because not everyone who was interviewed completed the examination. The Laboratory Data File contains data only for persons aged one year and older. The Individual Foods Data File based on the dietary recall has multiple records for each person rather than the one record per sample person contained in the other data files.
- o For each data file, SAS program code with standard variable names and labels is provided as separate text files on the CD-ROM that contains the data files. This SAS program code can be used to create a SAS data set from the data file.
- o Modifications were made to items in the questionnaires, laboratory, and examination components over the course of the survey; as a result, data may not be available for certain variables for the full six years. In addition, variables may differ by phase since some changes were implemented between phases. Users are encouraged to read the Notes

sections of this document carefully for information about changes.

- o Extremely high and low values have been verified whenever possible, and numerous consistency checks have been performed. Nonetheless, users should examine the range and frequency of values before analyzing data.
- o Some data were not ready for release at the time of this publication due to continued processing of the data or analysis of laboratory specimens. A listing of those data are available in the general information section of each data file.
- o Confidential and administrative data are not being released to the public. Additionally, some variables have been recoded to help protect the confidentiality of the survey participants. For example, all age-related variables were recoded to 90+ years for persons who were 90 years of age and older.
- o Some variable names may differ from those used in the Phase 1 NHANES III Provisional Data Release and some variables included in the Phase 1 provisional release may not appear on these files.
- o Although the data files have been edited carefully, errors may be detected. Please notify NCHS staff (301-458-4636) of any errors in the data file or the documentation.

Analytic Considerations

- o NHANES III (1988-94) was designed so that the survey's first three years, 1988-91, its last three years, 1991-94, and the entire six years were national probability samples. Analysts are encouraged to use all six years of survey results.
- o Sample weights are available for analyzing NHANES III data. One of the following three sample weights will be appropriate for nearly all analyses: interviewed sample final weight (WTPFQX6), examined sample final weight (WTPFEX6), and mobile examination center (MEC)- and home-examined sample final weight (WTPFH6). Choosing which of these sample weights to use in any analysis depends on the variables being used. A good rule of thumb is to use "the least common denominator" approach. In this approach, the user checks the variables of interest. The variable that was collected on the smallest number of persons is the "least common denominator," and the sample weight that applies to that variable is the appropriate one to use for that analysis. For more detailed information, see the Analytic and Reporting Guidelines for NHANES III (U.S. DHHS, 1996).

Referencing or Citing NHANES III Data

- o In publications, please acknowledge NCHS as the original data source. For instance, the reference for the NHANES III Laboratory Data File on this CD-ROM is:

U.S. Department of Health and Human Services (DHHS). National Center for Health Statistics. Third National Health and Nutrition

Examination Survey, 1988-1994, NHANES III Second Laboratory Data File (CD-ROM, Series 11, No. 3A). Hyattsville, MD.: Centers for Disease Control and Prevention, 1999.

- o Please place the acronym "NHANES III" in the titles or abstracts of journal articles and other publications in order to facilitate the retrieval of such materials in bibliographic searches.

SURVEY DESCRIPTION

The third National Health and Nutrition Examination Survey (NHANES III) was the seventh in a series of large health examination surveys conducted in the United States beginning in 1960. Three of these surveys, the National Health Examination Surveys (NHES), were conducted in the 1960's (NCHS, 1965; NCHS, 1967; NCHS, 1969). In 1970, an expanded nutrition component was added to provide data with which to assess nutritional status and dietary practices, and the name was changed to the National Health and Nutrition Examination Survey (Miller, 1973; Engel, 1978; McDowell, 1981). A special survey of Hispanic populations in the United States was conducted during 1982-1984 (NCHS, 1985).

The general structure of the NHANES III sample design was similar to that of the previous NHANES. All of the surveys used complex, multi-stage, stratified, clustered samples of civilian, noninstitutionalized populations. NHANES III was the first NHANES without an upper age limit; in fact, the age range for the survey was two months and older. A home examination option was employed for the first time in order to obtain examination data for very young children and for elderly persons who were unable to visit the mobile examination center (MEC). The home examination included only a subset of the components used in the full MEC examination since it would have been difficult to collect some types of data in a home setting. A detailed description of design specifications and copies of the data collection forms can be found in the Plan and Operation of the Third National Health and Nutrition Examination Survey, 1988-1994 (NCHS, 1994; U.S. DHHS, 1996).

NHANES III was conducted from October 1988 through October 1994 in two phases, each of which comprised a national probability sample. The first phase was conducted from October 18, 1988, through October 24, 1991, at 44 locations. The second phase was conducted from September 20, 1991, through October 15, 1994, at 45 different locations. In NHANES III, 39,695 persons were selected over the six years; of those, 33,994 (86%) were interviewed in their homes. All interviewed persons were invited to the MEC for a medical examination. Seventy-eight percent (30,818) of the selected persons were examined in the MEC, and an additional 493 persons were given a special, limited examination in their homes.

Data collection began with a household interview. Several questionnaires were administered in the household: Household Screener Questionnaire, Family Questionnaire, Household Adult Questionnaire, and Household Youth Questionnaire.

At the MEC, an examination was performed, and five automated questionnaires or interviews were administered: MEC Adult Questionnaire, MEC Youth Questionnaire, MEC Proxy Questionnaire, 24-Hour Dietary Recall, and Dietary Food Frequency (ages 12-16 years). The health examination component included a variety of tests and procedures. The examinee's age at the time of the interview and other factors determined which procedures were administered. Blood and urine specimens were obtained, and a number of tests and measurements were performed including body measurements, spirometry, fundus photography, x-rays, electrocardiography, allergy and glucose tolerance tests, and ultrasonography. Measurements were taken of bone density, hearing, and physical, cognitive, and central nervous system

functions. A physician performed a limited standardized medical examination and a dentist performed a standardized dental examination. While some of the blood and urine analyses were performed in the MEC laboratory, most analyses were conducted elsewhere by contract laboratories.

A home examination was conducted for those sample persons aged 2-11 months and aged 20 years or older who were unable to visit the mobile examination center. The home examination consisted of an abbreviated version of the tests and interviews performed in the MEC. Depending on age of the sample person, the components included body measurements, blood pressure, spirometry, venipuncture, physical function evaluation, and a questionnaire to inquire about infant feeding, selected health conditions, cognitive function, tobacco use, and reproductive history.

SAMPLE DESIGN AND ANALYSIS GUIDELINES

Sample Design

The general structure of the NHANES III sample design is the same as that of the previous NHANES. Each of these surveys used a stratified, multi-stage probability design. The major design parameters of the two previous NHANES and the special Hispanic HANES, as well as NHANES III, have been previously summarized (Miller, 1973; McDowell, 1981; NCHS, 1985; NCHS, 1994). The NHANES III sample was designed to be self-weighting within a primary sampling unit (PSU) for subdomains (age, sex, and race-ethnic groups). While the sample was fairly close to self-weighting nationally for each of these subdomain groups, it was not representative of the total population, which includes institutionalized, non-civilian persons that were outside the scope of the survey.

The NHANES III sample represented the total civilian, noninstitutionalized population, two months of age or over, in the 50 states and the District of Columbia of the United States. The first stage of the design consisted of selecting a sample of 81 PSU's that were mostly individual counties. In a few cases, adjacent counties were combined to keep PSU's above a minimum population size. The PSU's were stratified and selected with probability proportional to size (PPS). Thirteen large counties (strata) were chosen with certainty (probability of one). For operational reasons, these 13 certainty PSU's were divided into 21 survey locations. After the 13 certainty strata were designated, the remaining PSU's in the United States were grouped into 34 strata, and two PSU's were selected per stratum (68 survey locations). The selection was done with PPS and without replacement. The NHANES III sample therefore consists of 81 PSU's or 89 locations.

The 89 locations were randomly divided into two groups, one for each phase. The first group consisted of 44 and the other of 45 locations. One set of PSU's was allocated to the first three-year survey period (1988-91) and the other set to the second three-year period (1991-94). Therefore, unbiased estimates (from the point of view of sample selection) of health and nutrition characteristics can be independently produced for both Phase 1 and Phase 2 as well as for both phases combined.

For most of the sample, the second stage of the design consisted of area segments composed of city or suburban blocks, combinations of blocks, or other area segments in places where block statistics were not produced in the 1980 Census. In the first phase of NHANES III, the area segments were used only for a sample of persons who lived in housing units built before 1980. For units built in 1980 and later, the second stage consisted of sets of addresses selected from building permits issued in 1980 or later. These are referred to as "new construction segments." In the second phase, 1990 Census data and maps were used to define the area segments. Because the second phase followed within a few years of the 1990 Census, new construction did not account for a significant part of the sample, and the entire sample came from the area segments.

The third stage of sample selection consisted of households and certain types of group quarters, such as dormitories. All households and eligible

group quarters in the sample segments were listed, and a subsample was designated for screening to identify potential sample persons. The subsampling rates enabled production of a national, approximately equal-probability sample of households in most of the United States with higher rates for the geographic strata with high Mexican-American populations. Within each geographic stratum, there was a nearly equal-probability sample of households across all 89 stands.

Persons within the sample of households or group quarters were the fourth stage of sample selection. All eligible members within a household were listed, and a subsample of individuals was selected based on sex, age, and race or ethnicity. The definitions of the sex, age, race or ethnic classes, subsampling rates, and designation of potential sample persons within screened households were developed to provide approximately self-weighting samples for each subdomain within geographic strata and at the same time to maximize the average number of sample persons per sample household. Previous NHANES indicated that this increased the overall participation rate. Although the exact sample sizes were not known until data collection was completed, estimates were made. Below is a summary of the sample sizes for the full six-year NHANES III at each stage of selection:

Number of PSU's	81
Number of stands (survey locations)	89
Number of segments	2,144
Number of households screened	93,653
Number of households with sample persons	19,528
Number of designated sample persons	39,695
Number of interviewed sample persons	33,994
Number of MEC-examined sample persons	30,818
Number of home-examined sample persons	493

More detailed information on the sample design and weighting and estimation procedures for NHANES III can be found in the Plan and Operation of the Third National Health and Nutrition Examination Survey, 1988-94 (NCHS, 1994; U.S. DHHS, 1996) and in the Analytic and Reporting Guidelines: Third National Health and Nutrition Examination Survey (NHANES III), 1988-94 (U.S. DHHS, 1996).

Analysis Guidelines

Because of the complex survey design used in NHANES III, traditional methods of statistical analysis based on the assumption of a simple random sample are not applicable. Detailed descriptions of this issue and possible analytic methods for analyzing NHANES data have been described earlier (NCHS, 1985; Yetley, 1987; Landis, 1982; Delgado, 1990). Recent analytic and reporting guidelines that should be used for most NHANES III analyses and publications are contained in Analytic and Reporting Guidelines (U.S. DHHS, 1996). These recommendations differ slightly from those used by analysts for previous NHANES surveys. These suggested guidelines provide a framework to users for producing estimates that conform to the analytic design of the survey. All users are strongly urged to review these analytic and reporting guidelines before beginning any analyses of NHANES III data.

It is important to remember that this set of statistical guidelines is not absolute. When conducting analyses, the analyst needs to use his/her subject matter knowledge (including methodological issues) as well as

information about the survey design. The more one deviates from the original analytic categories defined in the sample design, the more important it is to evaluate the results carefully and to interpret the findings cautiously.

In NHANES III, 89 survey locations were randomly divided into two sets or phases, the first consisting of 44 and the other of 45 locations. One set of PSU's was allocated to the first three-year survey period (1988-91) and the other set to the second three-year period (1991-94). Therefore, unbiased national estimates of health and nutrition characteristics can be independently produced for each phase as well as for both phases combined. Computation of national estimates from both phases combined (i.e., total NHANES III) is the preferred option; individual phase estimates may be highly variable. In addition, individual phase estimates are not statistically independent. It is also difficult to evaluate whether differences in individual phase estimates are real or due to methodological differences. That is, differences may be due to changes in sampling methods or data collection methodology over time. At this time, there is no valid statistical test for examining differences between Phase 1 and Phase 2. Therefore, although point estimates can be produced separately for each phase, no test is available to test whether those estimates are significantly different from each other.

NHANES III is based on a complex, multi-stage probability sample design. Several aspects of the NHANES design must be taken into account in data analysis, including the sample weights and the complex survey design. Appropriate sample weights are needed to estimate prevalence, means, medians, and other statistics. Sample weights are used to produce correct population estimates because each sample person does not have the same probability of selection. The sample weights incorporate the differential probabilities of selection and include adjustments for noncoverage and nonresponse. A detailed discussion of nonresponse adjustments and issues related to survey coverage have been published (U.S. DHHS, 1996). With the large oversampling of young children, older persons, black persons, and Mexican-Americans in NHANES III, it is essential that the sample weights be used in all analyses. Otherwise, a misinterpretation of results is highly likely. Other aspects of the design that must be taken into account in data analyses are the strata and PSU pairings from the sample design. These pairings should be used to estimate variances and test for statistical significance. For weighted analyses, analysts can use special computer software packages that use an appropriate method for estimating variances for complex samples such as SUDAAN (Shah, 1995) and WesVarPC (Westat, 1996).

Although initial exploratory analyses may be performed on unweighted data using standard statistical packages and assuming simple random sampling, final analyses should be done on weighted data using appropriate sample weights. A summary of the weighting methodology and the type of sample weights developed for NHANES III is included in Weighting and Estimation Methodology (U.S. DHHS, 1996).

The purpose of weighting the sample data is to permit analysts to produce estimates of statistics that would have been obtained if the entire sampling frame (the United States) had been surveyed. Sample weights can be considered as measures of the number of persons the particular sample

observation represents. Weighting takes into account several features of the survey: the specific probabilities of selection for the individual domains that were oversampled as well as nonresponse and differences between

the sample and the total U.S. population. Differences between the sample and the population may arise due to sampling variability, differential undercoverage in the survey among demographic groups, and possibly other types of response errors, such as differential response rates or misclassification errors. Sample weighting in NHANES III was used to:

1. Compensate for differential probabilities of selection among subgroups (i.e., age-sex-race-ethnicity subdomains where persons living in different geographic strata were sampled at different rates);
2. Reduce biases arising from the fact that nonrespondents may be different from those who participate;
3. Bring sample data up to the dimensions of the target population totals;
4. Compensate, to the extent possible, for inadequacies in the sampling frame (resulting from omissions of some housing units in the listing of area segments, omissions of persons with no fixed address, etc.); and
5. To reduce variances in the estimation procedure by using auxiliary information that is known with a high degree of accuracy.

In NHANES III, the sample weighting was carried out in three stages. The first stage involved the computation of weights to compensate for unequal probabilities of selection (objective 1, above). The second stage adjusted for nonresponse (objective 2). The third stage used post stratification of the sample weights to Census Bureau estimates of the U.S. population to accomplish the third, fourth, and fifth objectives simultaneously. In NHANES III, several types of sample weights (see the sample weights table that follows) were computed for the interviewed and examined sample and are included in the NHANES III data file. Also, sample weights were computed separately for Phase 1 (1988-91), Phase 2 (1991-94), and total NHANES III (1988-94) to facilitate analysis of items collected only in Phase 1, only in Phase 2, and over six years of the survey. Three sets of pseudo strata and PSU pairings are provided to use with SUDAAN in variance estimation. Since NHANES III is based on a complex, multi-stage sample design, appropriate sample weights should be used in analyses to produce national estimates of prevalence and associated variances while accounting for unequal probability of selection of sample persons. For example, the final interview weight, WTPFQX6, should be used for analysis of the items or questions from the family or household questionnaires, and the final MEC examination weight, WTPFEX6, should be used for analysis of the questionnaires and measurements administered in the MEC. Furthermore, for a combined analysis of measurements from the MEC examinations and associated medical history questions from the household interview, the final MEC examination weight, WTPFEX6, should be used. We recommend using SUDAAN (Shah, 1995) to estimate statistics of interest and the associated variance. However, one can also use other published methods for variance estimation. Application of SUDAAN and alternative methods, such as the average design effect approach, balance repeated replication (BRR) methods, or jackknife methods for variance estimation, are discussed in Weighting and Estimation Methodology (U.S. DHHS, 1996).

Appropriate Uses of the NHANES III Sample Weights

Final interview weight, WTPFQX6

Use only in conjunction with the sample interviewed at home and with items collected during the household interview.

Final examination (MEC only) weight, WTPFEX6

Use only in conjunction with the MEC-examined sample and with interview and examination items collected at the MEC.

Final MEC+home examination weight, WTPFHX6

Use only in conjunction with the MEC+home-examined sample and with items collected at both the MEC and home.

Final allergy weight, WTPFALG6

Use only in conjunction with the allergy subsample and with items collected as part of the allergy component of the exam.

Final CNS weight, WTPFCNS6

Use only in conjunction with the CNS subsample and with items collected as part of the CNS component of the exam.

Final morning examination (MEC only) subsample weight, WTPFSD6

Use only in conjunction with the MEC-examined persons assigned to the morning subsample and only with items collected in the MEC exam.

Final afternoon/evening examination (MEC only) subsample weight, WTPFMD6

Use only in conjunction with the MEC-examined persons assigned to the afternoon/evening subsample and only with items collected in the MEC exam.

Final morning examination (MEC+home) subsample weight, WTPFHSD6

Use only in conjunction with the MEC- and home-examined persons assigned to the morning subsample and with items collected during the MEC and home examinations.

Final afternoon/evening examination (MEC+home) weight, WTPFHMD6

Use only in conjunction with the MEC- and home-examined persons assigned to the afternoon/evening subsample and with items collected during the MEC and home examinations.

DATA PREPARATION AND PROCESSING PROCEDURES

Automated data collection procedures for the survey were introduced in NHANES III. In the mobile examination centers, data for the interview and examination components were recorded directly onto a computerized data collection form. With the exception of a few independently automated systems, the system was centrally integrated. This operation allowed for ongoing monitoring of much of the data. Before the introduction of the computer-assisted personal interview (CAPI), the household questionnaire data were reviewed manually by field editors and interviewers. CAPI (1992-1994 only) questionnaires featured built-in edits to prevent entering inconsistencies and out-of-range responses. The multi-level data collection and quality control systems are discussed in detail in the Plan and Operation of the Third National Health and Nutrition Examination Survey, 1988-1994 (NCHS, 1994; U.S. DHHS, 1996). All interview, laboratory, and examination data were sent to NCHS for final processing.

Guidelines were developed that provided standards for naming variables, filling missing values and coding conventional responses, handling missing records, and standardizing two-part quantity/unit questionnaire variables. NCHS staff, assisted by contract staff, developed data editing specifications that checked data sets for valid codes, ranges, and skip pattern consistencies and examined the consistency of values between interrelated variables. Comments, collected in both interviews and examination components, were reviewed and recoded when possible. Responses to "Other" and "Specify" were recoded either to existing code categories or to new categories. The documentation for each data set includes notes for those variables that have been recoded and standardized and for those variables that differ significantly from what appears in the original data collection instrument. While the data have undergone many quality control and editing procedures, there still may be values that appear extreme or illogical. Values that varied considerably from what was expected were examined by analysts who checked for comments or other responses that might help to clarify unusual values. Generally, values were retained unless they could not possibly be true, in which case they were changed to "Blank but applicable." Therefore, the user must review each data set for extreme or inconsistent values and determine the status of each value for analysis.

Several editing conventions were used in the creation of final analytic data sets:

1. Standardized variables were created to replace all two-part quantity/unit questions using standard conversion factors. Standardized variables have the same name as the variable of the two-part question with an "S" suffix. For instance, MAPF18S (Months received WIC benefits) in the MEC Adult Questionnaire was created from the two-part response option to question F18, "How long did you receive benefits from the WIC program?," using the conversion factor 12 months per year.
2. Recoded variables were created by combining responses from two or more like variables, or by collapsing responses to create a summary variable for the purpose of confidentiality. Recoded variables have the original variable name with an R suffix. For example, place of birth

variable (HFA6X) in the Family Questionnaire was collapsed to a three level response category (U.S., Mexico, Other) and renamed HFA6XR. Generally, only the recoded variable has been included in the data file.

3. Fill values, a series of one or more digits, were used to represent certain specific conditions or responses. Below is a list of the fill values that were employed. Some of the fill values pertain only to questionnaire data, although 8-fill and blank-fill values are found in all data sets. Other fill values, not included in this list, are used to represent component-specific conditions.

6-fills = Varies/varied. (Questionnaires only)

7-fills = Fewer than the smallest number that could be reported within the question structure (e.g., fewer than one cigarette per day). (Questionnaires only)

8-fills = Blank but applicable/cannot be determined. This means that a respondent was eligible to receive the question, test, or component but did not because of refusal, lack of time, lack of staff, loss of data, broken vial, language barrier, unreliability, or other similar reasons.

9-fills = Don't know. This fill was used only when a respondent did not know the response to a question and said, "I don't know." (Questionnaires only)

Blank fills = Inapplicable. If a respondent was not eligible for a questionnaire, test, or component because of age, gender, or specific reason, the variable was blank-filled. In the questionnaire, if a respondent was not asked a question because of a skip-pattern, variables corresponding to the question were blank-filled. For examination or laboratory components, if a person was excluded by a defined protocol (e.g., screening exclusion questions) and these criteria are included in the data set, then the corresponding variables were blank-filled for that person. For home examinees, variables for examination components and blood tests not performed as part of the home examination protocol were blank-filled.

4. For variables describing discrete data, codes of zero (0) were used to mean "none," "never," or the equivalent. Value labels for which "0" is used include: "has not had," "never regularly," "still taking," or "never stopped using." Unless otherwise labeled, for variables containing continuous data, "zero" means "zero."
5. Where there are logical skip patterns in the flow of the questionnaire or examination component, the skip was indicated by placing the variable label of the skip destination in parentheses as part of the value label of the response generating the skip. For example, in the Physical Function Evaluation, the variable PFPWC (in wheelchair) has a value label, "2 No (PFPSCOOT)" that means that the next item for persons not in a wheelchair would be represented by the variable, PFPSCOOT.

Variable Nomenclature

A unique name was assigned to every NHANES III variable using a standard convention. By following this naming convention, the origin of each variable is clear, and there is no chance of overlaying similar variables across multiple components. Variables range in length from three to eight characters. The first two variable characters represent the topic (e.g., analyte, questionnaire instrument, examination component) and are listed below alphabetically by topic. For questionnaires administered in the household, the remainder of the variable name following the first two characters indicates the question section and number. For example, data for the response to the Household Adult Questionnaire question B1 are contained in the variable HAB1. For most laboratory and examination variables, as well as some other variables, a "P" in the third position refers to "primary" and the remainder of the variable name is a brief description of the item. For instance, in the Laboratory Data File, information on the length of time the person fasted before the first blood draw is contained in the variable PHPFAST. The variable PHPFAST was derived as follows: characters 1-2 (PH) refer to "phlebotomy," character 3 (P) refers to "primary," characters 4-8 (FAST) refer to an abbreviation for "fasting."

CODE	TOPIC
AT	Alanine aminotransferase (from biochemistry profile)
AM	Albumin (from biochemistry profile)
AP	Alkaline phosphatase (from biochemistry profile)
AL	Allergy skin test
AC	Alpha carotene
AN	Anisocytosis
TM	Antimicrosomal antibodies
TA	Antithyroglobulin antibodies
AA	Apolipoprotein (AI)
AB	Apolipoprotein (B)
AS	Aspartate aminotransferase (from biochemistry profile)
LA	Atypical lymphocyte
AU	Audiometry
BA	Band
BO	Basophil
BS	Basophilic stippling
BC	Beta carotene
BX	Beta cryptoxanthin
BL	Blast
BU	Blood urea nitrogen (BUN) (from biochemistry profile)
BM	Body measurements
BD	Bone densitometry
C1	C-peptide (first venipuncture)
C2	C-peptide (second venipuncture)
CR	C-reactive protein
UD	Cadmium
CN	Central nervous system function evaluation
CL	Chloride (from biochemistry profile)
CO	Cotinine
CE	Creatinine (serum)(from biochemistry profile)

UR

Creatinine (urine)

CODE	TOPIC
DM	Demographic
DE	Dental examination
MQ	Diagnostic interview schedule
DR	Dietary recall (total nutrient intakes)
EO	Eosinophil
EP	Erythrocyte protoporphyrin
FR	Ferritin
FB	Fibrinogen
RB	Folate (RBC)
FO	Folate (serum)
FH	Follicle stimulating hormone (FSH)
FP	Fundus photography
GG	Gamma glutamyl transferase (GGT) (from biochemistry profile)
GU	Gallbladder ultrasonography
GB	Globulin (from biochemistry profile)
G1	Glucose (first venipuncture)
G2	Glucose (second venipuncture)
SG	Glucose (from biochemistry profile)
GH	Glycated hemoglobin
GR	Granulocyte
C3	HCO ₃ (Bicarbonate)(from biochemistry profile)
HD	HDL cholesterol
HP	Helicobacter pylori antibody
HT	Hematocrit
HG	Hemoglobin
AH	Hepatitis A antibody (HAV)
HB	Hepatitis B core antibody (anti-HBc)
SS	Hepatitis B surface antibody (anti-HBs)
SA	Hepatitis B surface antigen (HBsAg)
HC	Hepatitis C antibody (HCV)
DH	Hepatitis D antibody (HDV)
H1	Herpes 1 antibody
H2	Herpes 2 antibody
HX	Home examination (general)
HO	Homocysteine
HF	Household family questionnaire
HA	Household adult questionnaire
HQ	Household questionnaire variables (composite)
HS	Household screener questionnaire
HY	Household youth questionnaire
HZ	Hypochromia
I1	Insulin (first venipuncture)
I2	Insulin (second venipuncture)
UI	Iodine (urine)
FE	Iron
SF	Iron (from biochemistry profile)
LD	Lactate dehydrogenase (from biochemistry profile)
L1	Latex antibody
LC	LDL cholesterol (calculated)
PB	Lead
LP	Lipoprotein (a)
LH	Luteinizing hormone

CODE	TOPIC
LU	Lutein/zeaxanthin
LY	Lycopene
LM	Lymphocyte
MR	Macrocyte
MC	Mean cell hemoglobin (MCH)
MH	Mean cell hemoglobin concentration (MCHC)
MV	Mean cell volume (MCV)
PV	Mean platelet volume
MA	MEC adult questionnaire
MX	MEC examination (general)
FF	Dietary food frequency (ages 12-16 years)
MP	MEC proxy questionnaire
MY	MEC youth questionnaire
ME	Metamyelocyte
MI	Microcyte
MO	Monocyte
MN	Mononuclear cell
ML	Myelocyte
IC	Normalized calcium (derived from ionized calcium)
OS	Osmolality (from biochemistry profile)
PH	Phlebotomy data collected in MEC (e.g., questions)
PS	Phosphorus (from biochemistry profile)
PF	Physical function evaluation
PE	Physician's examination
PL	Platelet
DW	Platelet distribution width
PK	Poikilocytosis
PO	Polychromatophilia
SK	Potassium (from biochemistry profile)
PR	Promyelocyte
RC	Red blood cell count (RBC)
RW	Red cell distribution width (RDW)
RE	Retinyl esters
RF	Rheumatoid factor antibody
RU	Rubella antibody
WT	Sample weights
SE	Selenium
SI	Sickle cell
NA	Sodium (from biochemistry profile)
SH	Spherocyte
SP	Spirometry
SD	Survey design
TT	Target cell
TE	Tetanus
TH	Thyroid Stimulating Hormone (TSH)
T4	Thyroxine
TB	Total bilirubin (from biochemistry profile)
CA	Total calcium
SC	Total calcium (from biochemistry profile)
TC	Total cholesterol
CH	Total cholesterol (from biochemistry profile)
TI	Total iron binding capacity (TIBC)
TP	Total protein (from biochemistry profile)
TX	Toxic granulation

CODE	TOPIC
TO	Toxoplasmosis antibody
PX	Transferrin saturation
TG	Triglycerides
TR	Triglycerides (from biochemistry profile)
TY	Tympanometry
UA	Uric acid (from biochemistry profile)
UB	Urinary albumin
VU	Vacuolated cells
VR	Varicella antibody
VA	Vitamin A
VB	Vitamin B12
VC	Vitamin C
VD	Vitamin D
VE	Vitamin E
WC	White blood cell count (WBC)
WW	WISC/WRAT cognitive test

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INDIVIDUAL FOODS FILE

Introduction

This release of the NHANES III Individual Foods File for the Second Exam Sample corresponds to the Series 11, No. 2A versions of the NHANES III Individual Food File for the first or primary exam. Analysts are referred to the description of the Second Exam Sample section of this documentation for more information on this subsample.

The NHANES III Individual Foods File

The NHANES III Second Exam Individual Foods File (IFFSE) is comprised of food records. Each IFFSE food record includes a meal number (DRRMN), a food number (DRRFN), and a component number (DRRCN). The IFFSE was sorted by sequence number

(SEQN), meal number, food number (within meals), and component number (within foods). Meals are comprised of foods. Foods are comprised of one or more components. Most components in the IFFSE are foods. There are some ingredient-type components (salt, water, cornmeal, etc.) in the IFFSE.

Components

were either eaten alone or in combination with other foods. The term "component foods" may be used for most of the components in the IFFSE. Components may have ingredient records associated with them. Ingredient information is reported separately in the NHANES III Variable Ingredients File (VIFSE).

The IFFSE contains information on all component level foods and beverages reported

by examinees whose dietary recalls have a final dietary recall status code (DRRSTAT) equal to 1, 2, or 5; the documentation for this file includes an explanation of DRRSTAT values. Partial foods data are reported in the IFFSE for examinees with incomplete recalls (DRRSTAT=2) and for nursing infants and children (DRRSTAT=5). If total dietary intake information is required for data analysis, only examinees with DRRSTAT=1 should be selected for analysis.

The IFFSE can be linked to the other NHANES III foods files by sequence number, meal number (DRRMN), food number (DRRFN), component number (DRRCN), and ingredient number (DRRIN). Multi-component or combination foods have a combination foods flag (DRRCFF) value equal to 1 in the IFFSE; combination foods are described in the Combination Foods File (CFFSE). Some component foods in the

IFFSE have variable ingredients (DRRVIF=1); the Variable Ingredients File (VIFSE)

contains information about these ingredients. Data users should refer to the documentation sections for each of the NHANES III foods files to learn more about

the content and uses of these data.

Coding Foods Reported During NHANES III

The NHANES III data files were coded using two different databases: 1) the U.S. Department of Agriculture (USDA) Survey Nutrient Database System; variables are denoted by 'DRR' prefix; and 2) the University of Minnesota Nutrition Coordinating Center (NCC) database; NCC database variables are denoted by 'NCR' prefix. Updates were made to the USDA and NCC databases throughout the survey.

A brief description of the NHANES III coding methodology follows.

Coding to the USDA SNDB

The underlying principle of NHANES III Dietary Data Collection (DDC) System database maintenance was to use U.S. Department of Agriculture (USDA) Survey Nutrient Data Base (SNDB) files as the primary data source for reporting NHANES III findings. Beginning with Hispanic HANES, 1982-84, the SNDB has been the primary source of data for coding and reporting HANES dietary findings. Continued use of the SNDB data bases during NHANES III served to maintain consistency with Hispanic HANES (HHANES) data for nutrition monitoring purposes.

The USDA SNDB files that were used included food codes (Codebook File), recipes (Recipe File), and nutrient data (Nutrient File). In Series 11, No. 1A release of the NHANES III foods files, hereafter referred to as the USDA version, most of the foods and beverages reported during NHANES III were coded with USDA SNDB food codes. A small number of non-USDA food codes were included in the data release files because there were no USDA food codes for spices and a small number of recipe ingredients. All component food codes (DRRFCD) reported in the IFFSE match the food codes in the primary file variable, DRPFCD.

The DRPFCD is linked to text descriptions in the look-up table called "CODEBOOK".

Many of the component foods reported during NHANES III were coded using the food code that USDA would use in its food consumption surveys. A different coding method was used in the following instances:

1. The DDC system foods database was more specific than the USDA database with respect to recipe ingredient specification. Ingredient information was used to compute the nutrient content of recipe foods reported in NHANES III.
2. A brand name product was not in the USDA database. The DDC system included more than 6,000 brand names in approximately 30 food categories; the USDA database contains fewer brand name products. NCC assigned USDA food codes to all brand-name foods in the DDC system. The coding decisions for brand-name foods were based upon USDA, NCC, and manufacturer information.
3. The brand name was in the USDA database, but the University of Minnesota Nutrition Coordinating Center (NCC) coded it differently from USDA. For example, NCC and USDA used different criteria to code brand-name cookies, salad dressings, and crackers; NCC nutrient criteria were used to assign USDA food codes to commercial products in these food groups.
4. An NCC recipe was used instead of the USDA recipe.
5. The food was not in the USDA database.

Descriptive Information About Foods

Descriptive information about foods reported during NHANES III is based on USDA and NCC database information. The section that follows describes the types of foods that were reported, the approach used to code and report the foods, and other data fields in the IFFSE. With the exception of a small number of spice codes, no NCC food codes are included in the NHANES III foods files.

Food Type Categories

All component foods in the Individual Foods File (IFFSE) are divided into two food type categories as denoted by the variable "DRRREC." The food category determines the method used to code foods and assign nutrient values to foods.

The first food category type is "elemental" foods. Elemental foods are denoted by DRRREC=0 ("non-recipe food"). Elemental foods include milk, fresh fruits and vegetables, ready-to-eat breakfast cereal, sweeteners, and fats and oils. Some mixture foods also are classified as elemental foods in the DDC system foods database. USDA food codes were assigned to elemental foods. The USDA food code for elemental foods (DRRFCODE) has a direct link to the USDA SNDB Nutrient File that was used to assign nutrient values to all elemental foods.

The second category of foods is "recipe" foods. Recipe foods are denoted by DRRREC=1. The survey files for recipe foods contain ingredient records; the ingredient records for each recipe food are linked together by a USDA food code. The USDA food codes for recipe foods (DRRFCODE) are reported in the IFFSE.

The nutrient values for recipe foods were calculated using recipe ingredient nutrient values found in the USDA SNDB Nutrient Files provided for use in NHANES III. The USDA Nutrient Files for NHANES III are slightly different from the standard public release USDA SNDB Nutrient Files because special food codes for recipe ingredients (usually denoted by food codes that begin with numbers "00") were added to the USDA file at NCHS's request. The nutrient values for recipe ingredients were summed to produce the nutrient values for all recipe foods in the IFFSE.

A USDA food code was assigned to recipe foods as a means of linking the recipe ingredient records to a food for reporting purposes. The USDA food code that is used to report the recipe food is used only to provide a basic food description for the food and was not used to assign nutrient values to recipe foods. Further, a USDA food code may be used to code more than one type of recipe food; this was because the DDC system included more food description options. All food codes (DRRFCODE) match the food codes in the primary file variable DRPFcode, which has text descriptions in a look-up table called "CODEBOOK".

To summarize, the distinctions between elemental foods and recipe foods are: 1) recipe foods have ingredient records associated with them and elemental foods do not; 2) recipe ingredient information was used to compute the nutrient values of recipe foods reported during the survey.

Using Ingredient Information to Calculate Nutrient Values of Foods

Recipe foods have ingredient records associated with them in the comprehensive DDC System output files. Many of the ingredients used to prepare recipe foods

were "variable" ingredients meaning that respondents could specify the types of ingredients that were used to prepare the foods they ate. The variable ingredient flag (DRRVIF) denotes the recipe foods that had variable ingredients. The ability to vary the types of ingredients that were used to prepare recipe foods is important because this means that the nutrient values for recipe foods that have a particular food code (DRPFCODE) can have a range of values for each nutrient rather than a single nutrient profile. To illustrate, take the example of a homemade macaroni and cheese casserole. There were two variable ingredient probes in the DDC system for this entry. One probe pertained to the type of cheese used, and the second probe was for the type of milk used in the recipe. Assume that the same basic recipe was used for this dish. If one respondent used low-fat cheddar cheese and skim milk, and a second respondent used regular-fat cheddar cheese and whole milk, the nutrient content of the two dishes would differ because two major recipe ingredients had different nutrient values.

A second example would be for a commercial food prepared at home. Many commercial foods were defined as recipe foods in the DDC system so that specific information about the ingredients used to prepare commercial foods could be ascertained. One example of a commercial food product with variable ingredient probes was commercial breaded chicken that was purchased in frozen form and fried at home. The DDC system probes included the type of fat used to fry the chicken and a probe for the addition of salt during food preparation. A second example of a commercial product with variable ingredients was a brand-name meal replacement beverage that was reconstituted with fluid milk; the type of milk used to prepare the beverage was a variable ingredient. These examples illustrate how preparation ingredients produce variations in the nutrient content of the prepared foods.

Notes to Analysts

Ordinarily, respondents were not asked to report plain drinking water during the dietary interview because a separate set of questions addressed plain drinking water consumption. Plain drinking water was a component of certain foods, however. This occurred when foods were diluted with extra water or when modified recipes were entered by individual components that included plain drinking water. In these instances, drinking water was included in the file as a component record, and the nutrients contributed from the drinking water were included in the IFFSE and the Total Nutrient Intake File (EXAMDRSE).

Respondents also were not asked to quantify the amount of salt added during food preparation or at the table. A separate set of questions was administered to determine categories of salt use at the table. This information was reported in the Total Nutrient Intake File (EXAMDRSE). Salt appears in the IFFSE as a component record for some foods that were reported as having modified recipes. If a food was entered by ingredient-type food components that included salt, a component record for salt was included in the IFFSE. (Note: Also refer to the documentation for the Combination Foods File, CFFSE.)

Food Descriptions

1. Brand-name foods

The DDC system foods database contains more than 6,000 brand-name foods. DDC system brand-name products are grouped into more than 30 food categories and include commercial frozen entrees, "fast food" restaurant menu items, ready-to-eat breakfast cereals, candy, fats and margarine, and juice drink beverages. The brand name foods in the IFFSE have a USDA food code and a numeric brand product code (DRRCOMM); DRRCOMM matches the food codes in the primary file variable, DRPCOMM, which is linked to text descriptions in a look-up table called "BRANDS".

2. Generic foods

Generic foods in the IFFSE have USDA food codes assigned to them; the USDA food codes are linked to a food code description in the look-up table called "CODEBOOK". Many generic foods have expanded food descriptions in the IFFSE. The food identification code (DRRFID) variable matches the primary file variable DRPFID, which is linked to an expanded food description in the look-up table "IDCODE".

Two examples are provided to illustrate the use of food identification codes (DRRFID). The first example is trout. The DDC system probes for several types of trout -- rainbow, brown, speckled, and so forth. The USDA Codebook does not distinguish among types of trout but uses the same food code for all varieties of trout. The food identification codes (DRRFID) in the IFFSE can be used to distinguish between different types of trout that were reported in the Survey. In this example, if a respondent reported eating rainbow trout, the DRRFID would be a specific code for rainbow trout.

A second example relates to cuts of meat such as beefsteak. The DDC system probes for the cut of steak reported -- sirloin, round, tenderloin, and so forth. In summary, the food identification codes often provide more specific, descriptive information for foods that have the same USDA food code.

Food Amount Information

The DDC system data entry screens usually displayed several options for entering food amount data. In general, the DDC system food amount options corresponded to the food amount options listed in the USDA SNDB Codebook. In addition to weight and volume options, many foods could be quantified by means of "food specific units" (FSUs). For foods such as whole chicken parts, pork chops, commercial sliced bread, sliced luncheon meats, and so forth, the FSU was the preferred method for quantifying such foods because their dimensions were difficult to estimate. All DDC system food amount entries, including the food models, volume amounts, and FSUs, were converted into gram weights automatically during final data processing and preparation. All food amounts in the IFFSE were reported as grams of food eaten.

Unusually large amounts of food were verified during the dietary interview. The DDC system quality control features included a "maximum amount check verification screen" for each food item. This screen appeared whenever large food-specific amounts of food and beverages were entered during the interview. Interviewers were required to verify that the amount of food or beverage reported was correct.

Default Selections for Foods and Food Amounts

1. Default Selections for Foods

The DDC system was designed to collect specific information about foods, yet respondents' knowledge about the foods they ate varied. When respondents were unable to provide specific information about the foods they ate, the dietary interviewers used the DDC system default selection options to complete data entry for foods reported during the survey. The DDC system had default selection options for the type of food, ingredients used to prepare foods, and food preparation methods. DDC system default options were available for many home prepared and commercially prepared foods. When the origin of the food (i.e., commercially prepared or homemade) was unknown, a system default option "unknown as to whether commercially prepared or homemade" was selected by the interviewer. Default selections also were available for food preparation methods and the ingredients used to prepare foods. The DDC system default food selections have USDA food codes associated with them that are linked to the USDA SNDB files described earlier.

2. Default Food Amounts

Some foods were not quantified at the time of the dietary interview for by a number of reasons.

Example #1: Food amounts were known but were reported using an amount option that was not available to the interviewer at the time of the interview. Therefore, an amount could not be entered using the DDC system. The interviewer noted the amount description provided by the respondent. NCHS and USDA staff completed the research required to quantify these foods. New food amount options were added to the DDC system throughout the survey.

Example #2: The respondent was unable to quantify the amount of food consumed, but the food was from a small list of foods for which the interviewers were permitted to calculate a default amount. The dietary interviewer initially "flagged" the food amount as having an unknown amount. All information provided by the respondent that could be used to calculate a default amount was recorded by the interviewer. During the interviewer's edit, amounts of certain foods, including sandwich condiments, catsup and barbecue sauce on meat, coffee creamer, butter and margarine added to bread, and milk added to beverages and cereal, were calculated. NCHS reviewed the interviewers' calculations to verify that the calculation was performed correctly.

Example #3: The amount of food consumed was unknown, and no default amount standard existed for the food. This problem was most common when the recall involved infants and young children who attended day care or school on the day of the recall. The interviewers were instructed to flag the food

as having an unknown amount. In the meantime, the dietary interviewers attempted to obtain information from day care providers, schools, etc. If the amount could not be entered, NCHS assigned a default food amount. The default food amounts usually were based on a "not further specified amount" for a similar food in the USDA SNDB Codebook. NCHS developed editing guidelines that were used to assign food amounts to many types of foods.

Examples #2 and #3 describe situations in which food was consumed but for which the respondents could not quantify the food. In both instances, the amount consumed was entered initially into the DDC system as an "unknown amount." A food amount was assigned later. The default amount flag (DRRCAUF) in the IFFSE denotes the foods described in examples #2 and #3 that had default amounts assigned; if DRRCAUF=1, a default amount was assigned to the component food.

Food Preparation Information

The IFFSE includes information on food preparation methods and ingredients used to prepare foods. The interview probes for food preparation methods varied according to the type of foods reported. For example, the probes for vegetables usually began with the name of the vegetable and whether it was eaten raw or if it was cooked from fresh, frozen, canned, etc. If the vegetable was cooked, the cooking method and use of preparation ingredients, such as marinades, fat, and salt, were ascertained. The interview probes for mixed dishes began with a brand name probe or a question to ascertain whether the dish was commercially prepared or homemade; the questions that followed dealt with cooking methods, preparation ingredients, and so forth (U.S. DHHS, 1996).

NCC uses special formulas for certain types of recipe foods called "preparation algorithms." The NCC preparation algorithms were part of the DDC system foods database. NCC preparation algorithms were used to add preparation ingredients such as fat, salt, soy sauce, and breading to meat, fish and poultry, rice, pasta, popcorn, and vegetables that were reported during the survey. Preparation ingredients were added automatically to a base food -- usually a plain version of the food reported. The IFFSE variable DRRPPDC (preparation description code) lists more than 100 food preparation methods. The variable DRRPPDC matches the primary file variable DRPPDC, which is linked to text descriptions in a look-up table called "PREPD".

One example was boiled rice prepared with fat and salt. The base ingredient in the recipe was plain, boiled rice. Using the NCC preparation algorithm, 0.5 teaspoon of fat was added per 0.5 cup of rice. The type of fat used to prepare the food was a variable ingredient; the respondent could specify any type of fat -- butter, margarine, a specific type of animal fat, etc. Salt use was ascertained by asking the respondent if the rice was cooked in salted or unsalted water; one-half teaspoon of salt per half-cup of rice was assumed if salted water was used. Ingredients used to prepare foods were variable ingredients and have been included in the Variable Ingredients File (VIFSE).

A second example was boiled carrots. Made from fresh carrots, fat and salt were added during preparation. The NCC preparation algorithm adds 0.5 teaspoon

of fat and 0.08 teaspoon of salt per half cup of boiled carrots.

A third example was breaded fried chicken. The NCC data base contains the information required to convert the portion of chicken reported during the interview into ounces of white or dark meat, with or without the poultry skin. The NCC preparation algorithm added the preparation ingredients specified by the respondent, such as marinade, breading, basting, or frying fat, to a base dish of plain, roasted chicken. Commercially prepared meats, vegetables, and so forth usually were coded using either the USDA food code or ingredient information obtained from manufacturers. Preparation ingredient information for commercial restaurant foods was not reported by most respondents.

To summarize, the NCC preparation algorithms automatically added the amounts of preparation ingredients to many of the recipe foods reported during NHANES III. The nutrient values for these foods were computed in a manner similar to other recipe foods using the preparation ingredient information. As with other recipe foods, the component food code provides the closest food code description match to the USDA data base. Food identification codes (DRRFID) are also provided for many foods that have NCC preparations; the text descriptions for these codes provide additional descriptive information about these foods.

The NHANES III Nutrient Data Bases

Each HANES used nutrient data bases that were appropriate for the time period of the survey. NCHS compiled the nutrient data bases used for NHANES I and NHANES II; a variety of data sources were used in the data bases including USDA, selected manufacturer data, and Tulane University food composition data. In 1982, NCHS began using the USDA database exclusively; all foods reported during HHANES were coded using USDA food codes and their corresponding USDA nutrient values. Several new food items commonly eaten by the Hispanic subgroups surveyed during HHANES were added to the USDA database for HHANES.

Following HHANES, NCHS staff continued to work closely with the USDA's Agricultural Research Service (ARS) staff to update the USDA database with new foods, food weights, and recipes in preparation for NHANES III (1988-94). Hundreds of new food codes for ethnic foods, including Mexican-American and Asian foods, new commercial products, homemade soups, and bakery products, were added to the USDA data base for NHANES III. NCHS and NCC incorporated new recipes into the DDC system for certain Mexican-American foods; some of the recipe changes were required to meet the data base maintenance requirements of the DDC system but do not appear in the USDA data base.

The nutrient data bases for NHANES III were provided to NCHS by ARS and can be purchased from the Department of Commerce, National Technical Information Service (NTIS), Springfield, Virginia. (Please refer to the Introduction to this documentation file for information about contacting NTIS.)

The NHANES III, Phase 1 (1988-91) data base consisted of a slightly modified version of the USDA file that was used with the 1989 USDA Continuing Survey of Food Intake by Individuals (CSFII). ARS assigned Release Number 5.1 to the nutrient data base for Phase 1. In addition to Release 5.1, ARS provided revised data for a small number of food items to reflect changes in foods that occurred in 1990 and 1991. ARS provided an updated version of the SNDB for NHANES III, Phase 2 (1991-94).

The USDA Survey Nutrient Data Base includes total energy and 29 nutrient data fields. All nutrient and dietary fiber intakes for individuals were calculated using the gram amounts of food consumed and the USDA Survey Nutrient Data Base (SNDB) nutrient values for the food expressed per 100 grams of food. NCHS computed percentages of total food energy intake from all energy sources. The energy conversion factors used were 4 kcal per gram for protein and carbohydrate, 7 kcal per gram for alcohol, and 9 kcal per gram for total fat and fatty acids. The total number of kilocalories from each energy source was divided by the individual energy source's total energy intake and multiplied by 100 to produce the percentage contributions. Information pertaining to specific nutrient variables is found in the Technical Notes.

University of Minnesota Nutrition Coordinating Center (NCC) Database Nutrient Values

The Series 11, No. 2A release of the NHANES III foods files includes NCC nutrient database values for foods and beverages that were reported during the survey. The files were produced using the NCC version of the NHANES III code generator processing program. The output from the program produces a file with NCC food codes. Once coded with NCC food codes, the food records were merged with the NCC nutrient database (NCC, 1996). The NCC version of the foods files includes information for more than eighty nutrients and food components, including individual fatty acids, caffeine, selenium, and vitamin D. The NCC nutrient variables are denoted by the prefix 'NCR'.

NHANES III Individual Foods Data File from the Dietary Recall Index

Description	Variable Name	Positions
GENERAL INFORMATION		
Respondent identification number	SEQN	1-5
Recall Status Code	DRRSTAT	6
Interviewer ID	DRRIID	7-8
Meal number	DRRMN	9-10
Food number	DRRFN	11-12
Component number	DRRCN	13-14
Meal name code	DRRMNC	15-16
Meal place code	DRRMPC	17-18
Meal time of eating	DRRMTOE	19-26
Recipe or preparation food flag (1/0)	DRRREC	27
Variable ingredient flag (1/0)	DRRVIF	28
Combination food flag (1,0)	DRRCFF	29
Type of combination code	DRRTCC	30-31
USDA food code. Food ID1	DRRFCD	32-38
Food ID2. Look-up NCC description	DRRFID	39-42
Brand ID or fast food code	DRRCOMM	43-47
Preparation description code	DRRPPDC	48-50
Component amount unknown flag (1/0)	DRRCAUF	51

SECOND EXAM DATA

USDA SURVEY NUTRIENT DATABASE

IFF Total grams of food or beverage	DRRIGW	52-55
IFF Alcohol (gm)	DRRIALCO	56-58
IFF Calcium (mg)	DRRICALC	59-62
IFF Carbohydrate (gm)	DRRICARB	63-67
IFF Carotenes (RE)	DRRICARO	68-71
IFF Cholesterol (mg)	DRRICHOL	72-75
IFF Copper (mg)	DRRICOPP	76-78
IFF Total dietary fiber (gm)	DRRIFIBE	79-82
IFF Folicin (mcg)	DRRIFOLA	83-86
IFF Iron (mg)	DRRIIRON	87-90
IFF Food energy (Kcal)	DRRIKCAL	91-94
IFF Magnesium (mg)	DRRIMAGN	95-97
IFF TOT Monounsaturated fatty acids (gm)	DRRIMFAT	98-102
IFF Niacin (mg)	DRRINIAC	103-106

NHANES III Individual Foods Data File from the Dietary Recall Index

Description	Variable Name	Positions
IFF TOT Polyunsaturated fatty acids (gm)	DRRIPFAT	107-110
IFF Phosphorus (mg)	DRRIPHOS	111-114
IFF Potassium (mg)	DRRIPOTA	115-118
IFF Protein (gm)	DRRIPROT	119-123
IFF Total saturated fatty acids (gm)	DRRISFAT	124-127
IFF Sodium (mg)	DRRISODI	128-132
IFF Total fat (gm)	DRRITFAT	133-137
IFF Vitamin A (IU)	DRRIVAIU	138-142
IFF Vitamin A (RE)	DRRIVARE	143-147
IFF Thiamin (mg)	DRRIVB1	148-151
IFF Riboflavin (mg)	DRRIVB2	152-155
IFF Vitamin B6 (mg)	DRRIVB6	156-159
IFF Vitamin B12 (mcg)	DRRIVB12	160-165
IFF Ascorbic acid (mg)	DRRIVC	166-168
IFF Vitamin E (alpha tocopherol equivalent)	DRRIVE	169-173
IFF Water (gm)	DRRIWATE	174-177
IFF Zinc (mg)	DRRIZINC	178-181

SECOND EXAM DATA

NUTRITION COORDINATING CENTER DATABASE

IFF Total grams of food or beverage	NCRIGW	182-185
IFF Water (gm)	NCRIWATE	186-189
IFF Calories (kcal)	NCRIKCAL	190-193
IFF Protein (gm)	NCRIPROT	194-198
IFF Total fats (gm)	NCRITFAT	199-203
IFF Total saturated fatty acids (gm)	NCRISFAT	204-208
IFF Tot monounsaturated fatty acids (gm)	NCRIMFAT	209-213
IFF Tot polyunsaturated fatty acids (gm)	NCRIPFAT	214-217
IFF Cholesterol (mg)	NCRICHOL	218-221
IFF Total carbohydrates (gm)	NCRICARB	222-226
IFF Dietary fiber (gm)	NCRIFIBE	227-230
IFF Alcohol (gm)	NCRIALCO	231-233
IFF Total vitamin A (IU)	NCRIVAIU	234-238
IFF Retinol (mcg)	NCRIRETI	239-243
IFF Beta-carotene (mcg)	NCRIBCAR	244-248
IFF Total alpha-tocopherol equiv. (mg)	NCRIVE	249-253
IFF Vitamin C (mg)	NCRIVC	254-256
IFF Thiamin (mg)	NCRIVB1	257-260

NHANES III Individual Foods Data File from the Dietary Recall Index

Description	Variable Name	Positions
IFF Riboflavin (mg)	NCRIVB2	261-264
IFF Niacin (mg)	NCRINIAC	265-268
IFF Vitamin B6 (mg)	NCRIVB6	269-272
IFF Folic acid (mcg)	NCRIFOLA	273-276
IFF Vitamin B12 (mcg)	NCRIVB12	277-282
IFF Calcium (mg)	NCRICALC	283-286
IFF Phosphorous (mg)	NCRIPHOS	287-290
IFF Magnesium (mg)	NCRIMAGN	291-293
IFF Iron (mg)	NCRIIRON	294-297
IFF Zinc (mg)	NCRIZINC	298-301
IFF Copper (mg)	NCRICOPP	302-304
IFF Sodium (mg)	NCRISODI	305-309
IFF Potassium (mg)	NCRIPOTA	310-313
IFF Crude Fiber (gm)	NCRICFIB	314-317
IFF Ash (gm)	NCRIASH	318-321
IFF Caffeine (mg)	NCRICAFE	322-325
IFF Selenium (mcg)	NCRISELE	326-330
IFF Pantothenic acid (mg)	NCRIPACI	331-334
IFF Alpha-tocopherol (mg)	NCRIATOC	335-338
IFF Beta-tocopherol (mg)	NCRIBTOC	339-341
IFF Gamma-tocopherol (mg)	NCRIGTOC	342-346
IFF Delta-tocopherol (mg)	NCRIDTOC	347-350
IFF Vitamin D (mcg)	NCRIVD	351-354
IFF SFA 4:0 (gm)	NCRIS040	355-357
IFF SFA 6:0 (gm)	NCRIS060	358-360
IFF SFA 8:0 (gm)	NCRIS080	361-363
IFF SFA 10:0 (gm)	NCRIS100	364-366
IFF SFA 12:0 (gm)	NCRIS120	367-370
IFF SFA 14:0 (gm)	NCRIS140	371-373
IFF SFA 16:0 (gm)	NCRIS160	374-377
IFF SFA 17:0 (gm)	NCRIS170	378-380
IFF SFA 18:0 (gm)	NCRIS180	381-384
IFF SFA 20:0 (gm)	NCRIS200	385-387
IFF SFA 22:0 (gm)	NCRIS220	388-390
IFF MFA 14:1 (gm)	NCRIM141	391-393
IFF MFA 16:1 (gm)	NCRIM161	394-396
IFF Oleic acid (MFA 18:1) (gm)	NCRIM181	397-400
IFF MFA 20:1 (gm)	NCRIM201	401-403
IFF MFA 22:1 (gm)	NCRIM221	404-406

NHANES III Individual Foods Data File from the Dietary Recall Index

Description	Variable Name	Positions
IFF Linoleic acid (PFA 18:2) (gm)	NCRIP182	407-410
IFF Linolenic acid (PFA 18:3) (gm)	NCRIP183	411-413
IFF PFA 18:4 (gm)	NCRIP184	414-416
IFF PFA 20:4 (gm)	NCRIP204	417-419
IFF PFA 20:5 (gm)	NCRIP205	420-422
IFF PFA 22:5 (gm)	NCRIP225	423-425
IFF PFA 22:6 (gm)	NCRIP226	426-428
IFF Glucose (gm)	NCRIGLUC	429-433
IFF Fructose (gm)	NCRIFRUC	434-438
IFF Galactose (gm)	NCRIGALA	439-441
IFF Sucrose (gm)	NCRISUCR	442-446
IFF Lactose (gm)	NCRILACT	447-450
IFF Maltose (gm)	NCRIMALT	451-454
IFF Water insoluble dietary fiber (gm)	NCRIIFIB	455-458
IFF Water soluble dietary fiber (gm)	NCRISFIB	459-462
IFF Pectin (gm)	NCRIPECT	463-465
IFF Starch (gm)	NCRISTAR	466-470
IFF Aspartame (mg)	NCRIASPR	471-475
IFF Tryptophan (gm)	NCRITRYP	476-478
IFF Threonine (gm)	NCRITHRE	479-482
IFF Isoleucine (gm)	NCRIISOL	483-486
IFF Leucine (gm)	NCRILEUC	487-490
IFF Lysine(gm)	NCRILYSI	491-494
IFF Methionine (gm)	NCRIMETH	495-497
IFF Cystine (gm)	NCRICYST	498-500
IFF Phenylalanine (gm)	NCRIPHAL	501-504
IFF Tyrosine (gm)	NCRITYRO	505-508
IFF Valine (gm)	NCRIVALI	509-512
IFF Arginine (gm)	NCRIARGI	513-516
IFF Histidine (gm)	NCRIHIST	517-520
IFF Alanine (gm)	NCRIALAN	521-524
IFF Aspartic Acid (gm)	NCRIASPA	525-528
IFF Glutamic Acid (gm)	NCRIGLUT	529-532
IFF Glycine (gm)	NCRIGLYC	533-536
IFF Proline (gm)	NCRIPROL	537-540
IFF Serine (gm)	NCRISERI	541-544
IFF Saccharin (mg)	NCRISACC	545-549
IFF Animal Protein (gm)	NCRIAPRO	550-554
IFF Vegetable Protein (gm)	NCRIVPRO	555-558

NHANES III Individual Foods Data File from the Dietary Recall Index

Description	Variable Name	Positions
IFF Oxalic Acid (mg)	NCRIOXAA	559-564
IFF Phytic Acid (mg)	NCRIPHYA	565-570

NHANES III Individual Foods Data File from the Dietary Recall

SECOND EXAM DATA

 GENERAL INFORMATION

Positions SAS name	Counts	Item description and code	Notes
6 DRRSTAT	25669 58	Recall status code 1 Reliable and complete 2 Reliable, but incomplete	See note
7-8 DRRIID	25727	Interviewer ID code 01-10	
9-10 DRRMN	25727	Meal number 01-14	See note
11-12 DRRFN	25727	Food number 01-14	See note
13-14 DRRCN	25727	Component number 01-13	See note
15-16 DRRMNC	5338 224 5546 5475 7995 35 14 184 172 283 69 289 103	Meal name code 01 Breakfast 02 Brunch 03 Lunch 04 Snack/beverage 05 Dinner/supper 07 Extended consumption 08 Other 09 Desayuno (Spanish) 10 Almuerzo (Spanish) 11 Comida (Spanish) 12 Merienda (Spanish) 13 Cena (Spanish) 14 Entre comidas/bebida (Spanish)	See note

NHANES III Individual Foods Data File from the Dietary Recall

SECOND EXAM DATA

 GENERAL INFORMATION

Positions SAS name	Counts	Item description and code	Notes
17-18 DRRMPC		Meal place code	See note
	19027	01 Home	
	1600	02 Work	
	866	03 School	
	41	04 Day care/day camp	
	584	05 Fast food/take out	
	17	06 Delicatessen	
	1418	07 Restaurant	
	140	08 Cafeteria/self-serve buffet	
	48	09 Store	
	940	10 Friend's/someone's home	
	42	11 Community feeding program	
	360	12 Transit (walking, car, plane, etc.)	
	644	13 Other	
19-26 DRRMTOE		Meal time of eating	See note
	25727	00:00:00-23:59:00	
27 DRRREC		Recipe flag	See note
	19364	0 Non-recipe food	
	6363	1 Recipe food	
28 DRRVIF		Variable ingredient flag	See note
	21030	0 No variable ingredients	
	4697	1 Variable ingredients	
29 DRRCFF		Combination food flag	See note
	11207	0 Non-combination food	
	14520	1 Combination food component	

NHANES III Individual Foods Data File from the Dietary Recall

SECOND EXAM DATA

GENERAL INFORMATION

Positions SAS name	Counts	Item description and code	Notes
30-31		Type of combination code	
DRRTCC	3417	01 Sandwich	
	2	02 Frozen meal	
	1295	03 Salad	
	417	04 Mixed dish	
	324	05 Mixed dish with additions	
	129	06 Soup or stew	
	2810	07 Beverage	
	670	08 Other foods eaten together	
	1438	09 Bread with additions	
	1392	10 Cereal with additions	
	684	11 Meat, fish, or poultry with additions	
	897	12 Vegetable with additions	
	112	13 Vegetable combination	
	266	14 Dessert	
	667	15 Tortilla with additions	
	11207	Blank	
32-38		Component food code	See note
DRRFCD	25727	0001143-9350500	
39-42		Food ID code	See note
DRRFID	21562	0007-7295	
	4165	Blank	
43-47		Brand ID or fast food code	See note
DRRCOMM	4165	00044-10478	
	21562	Blank	
48-50		Preparation description code	See note
DRRPPDC	2747	001-108	
	22980	Blank	

NHANES III Individual Foods Data File from the Dietary Recall

SECOND EXAM DATA

GENERAL INFORMATION

Positions		Item description	
SAS name	Counts	and code	Notes
	51	Component amount unknown flag	See note
DRRCAUF	25406	0 No	
	321	1 Yes	

NHANES III Individual Foods Data File from the Dietary Recall

SECOND EXAM DATA

 USDA SURVEY NUTRIENT DATABASE

Positions SAS name	Counts	Item description and code	Notes
52-55 DRRIGW	25727	USDA database IFF Total grams of food 0000-6000	See note
56-58 DRRIALCO	25727	USDA database IFF Alcohol (gm) 000-159	
59-62 DRRICALC	25727	USDA database IFF Calcium (mg) 0000-2059	
63-67 DRRICARB	25727	USDA database IFF Carbohydrate (gm) 00000-404.3	
68-71 DRRICARO	25727	USDA database IFF Carotenes (RE) 0000-6593	
72-75 DRRICHO	25727	USDA database IFF Cholesterol (mg) 0000-1476	
76-78 DRRICOPP	25727	USDA database IFF Copper (mg) 000-6.5	
79-82 DRRIFIBE	25727	USDA database IFF Total dietary fiber (gm) 0000-72.7	
83-86 DRRIFOLA	25727	USDA database IFF Folacin (mcg) 0000-1214	
87-90 DRRIIRON	25727	USDA database IFF Iron (mg) 0000-62.3	
91-94 DRRIKCAL	25727	USDA database IFF Food energy (kcal) 0000-3934	

NHANES III Individual Foods Data File from the Dietary Recall

SECOND EXAM DATA

 USDA SURVEY NUTRIENT DATABASE

Positions SAS name	Counts	Item description and code	Notes
95-97 DRRIMAGN	25727	USDA database IFF Magnesium (mg) 000-424	
98-102 DRRIMFAT	25726 1	USDA database IFF Total monounsaturated fatty acids (gm) 00000-102.3 Blank	
103-106 DRRINIAC	25727	USDA database IFF Niacin (mg) 0000-60.2	
107-110 DRRIPFAT	25726 1	USDA database IFF Total polyunsaturated fatty acids (gm) 0000-78.9 Blank	
111-114 DRRIPHOS	25727	USDA database IFF Phosphorus (mg) 0000-3045	
115-118 DRRIPOTA	25727	USDA database IFF Potassium (mg) 0000-4699	
119-123 DRRIPROT	25727	USDA database IFF Protein (gm) 00000-425.7	
124-127 DRRISFAT	25726 1	USDA database IFF Total saturated fatty acids (gm) 0000-86.1 Blank	
128-132 DRRISODI	25727	USDA database IFF Sodium (mg) 00000-13476	
133-137 DRRITFAT	25727	USDA database IFF Total fat (gm) 00000-229.4	

NHANES III Individual Foods Data File from the Dietary Recall

SECOND EXAM DATA

USDA SURVEY NUTRIENT DATABASE

Positions SAS name	Counts	Item description and code	Notes
138-142 DRRIVAIU	25727	USDA database IFF Vitamin A (IU) 00000-83336	
143-147 DRRIVARE	25727	USDA database IFF Vitamin A (RE) 00000-24763	
148-151 DRRIVB1	25727	USDA database IFF Thiamin (mg) 0000-5.86	
152-155 DRRIVB2	25727	USDA database IFF Riboflavin (mg) 0000-04.8	
156-159 DRRIVB6	25723 4	USDA database IFF Vitamin B6 (mg) 0000-6.49 Blank	
160-165 DRRIVB12	25727	USDA database IFF Vitamin B12 (mcg) 000000-146.24	
166-168 DRRIVC	25727	USDA database IFF Ascorbic acid (mg) 000-528	
169-173 DRRIVE	25727	USDA database IFF Vitamin E (alpha tocopherol equivalents) 00000-120.6	
174-177 DRRIWATE	25727	USDA database IFF Water (gm) 0000-5958	
178-181 DRRIZINC	25727	USDA database IFF Zinc (mg) 0000-99.1	

NHANES III Individual Foods Data File from the Dietary Recall

SECOND EXAM DATA

NUTRITION COORDINATING CENTER DATABASE

Positions SAS name	Counts	Item description and code	Notes
182-185 NCRIGW	25727	NCC database IFF Total grams of food 0000-6000	
186-189 NCRIWATE	25727	NCC database IFF Water (gm) 0000-5958	
190-193 NCRIKCAL	25727	NCC database IFF Food energy (kcal) 0000-4218	
194-198 NCRIPROT	25727	NCC database IFF Protein (gm) 00000-364.9	
199-203 NCRITFAT	25727	NCC database IFF Total fat (gm) 00000-231.4	
204-208 NCRISFAT	25727	NCC database IFF Total saturated fatty acids (gm) 00000-118.9	
209-213 NCRIMFAT	25727	NCC database IFF Total monounsaturated fatty 00000-102.6	
214-217 NCRIPFAT	25727	NCC database IFF Total polyunsaturated fatty 0000-78.6	
218-221 NCRICHOL	25727	NCC database IFF Cholesterol (mg) 0000-1486	
222-226 NCRICARB	25727	NCC database IFF Carbohydrate (gm) 00000-467.9	

NHANES III Individual Foods Data File from the Dietary Recall

SECOND EXAM DATA

NUTRITION COORDINATING CENTER DATABASE

Positions SAS name	Counts	Item description and code	Notes
227-230 NCRIFIBE	25727	NCC database IFF Total dietary fiber (gm) 0000-77.1	
231-233 NCRIALCO	25727	NCC database IFF Alcohol (gm) 000-156	
234-238 NCRIVAIU	25727	NCC database IFF Vitamin A (IU) 00000-74926	
239-243 NCRIRETI	25727	NCC database IFF Retinol (mcg) 00000-20250	
244-248 NCRIBCAR	25727	NCC database IFF Beta-carotene (mcg) 00000-27054	
249-253 NCRIVE	25727	NCC database IFF Vitamin E (alpha tocopherol) 00000-120.6	
254-256 NCRIVC	25727	NCC database IFF Ascorbic acid (mg) 000-551	
257-260 NCRIVB1	25727	NCC database IFF Thiamin (mg) 0000-5.82	
261-264 NCRIVB2	25727	NCC database IFF Riboflavin (mg) 0000-8.61	
265-268 NCRINIAC	25727	NCC database IFF Niacin (mg) 0000-88.7	
269-272 NCRIVB6	25727	NCC database IFF Vitamin B6 (mg) 0000-5.36	

NHANES III Individual Foods Data File from the Dietary Recall

SECOND EXAM DATA

NUTRITION COORDINATING CENTER DATABASE

Positions SAS name	Counts	Item description and code	Notes
273-276 NCRIFOLA	25727	NCC database IFF Folicin (mcg) 0000-1541	
277-282 NCRIVB12	25727	NCC database IFF Vitamin B12 (mcg) 000000-259.59	
283-286 NCRICALC	25727	NCC database IFF Calcium (mg) 0000-2388	
287-290 NCRIPHOS	25727	NCC database IFF Phosphorus (mg) 0000-2898	
291-293 NCRIMAGN	25727	NCC database IFF Magnesium (mg) 000-850	
294-297 NCRIRON	25727	NCC database IFF Iron (mg) 0000-99.7	
298-301 NCRIZINC	25727	NCC database IFF Zinc (mg) 0000-66.6	
302-304 NCRICOPP	25727	NCC database IFF Copper (mg) 000-9.5	
305-309 NCRISODI	25727	NCC database IFF Sodium (mg) 00000-13467	
310-313 NCRIPOTA	25727	NCC database IFF Potassium (mg) 0000-5049	
314-317 NCRICFIB	25723	NCC database IFF Crude Fiber (gm) 0000-27.1	
	4	Blank	

NHANES III Individual Foods Data File from the Dietary Recall

SECOND EXAM DATA

NUTRITION COORDINATING CENTER DATABASE

Positions SAS name	Counts	Item description and code	Notes
318-321 NCRIASH	25726 1	NCC database IFF Ash (gm) 0000-48.1 Blank	
322-325 NCRICAFE	25727	NCC database IFF Caffeine (mg) 0000-3480	
326-330 NCRISELE	25601 126	NCC database IFF Selenium (mcg) 00000-510.3 Blank	
331-334 NCRIPACI	25724 3	NCC database IFF Pantothenic acid (mg) 0000-23.3 Blank	
335-338 NCRIATOC	25727	NCC database IFF Alpha-tocopherol (mg) 0000-0119	
339-341 NCRIBTOC	25727	NCC database IFF Beta-tocopherol (mg) 000-4.6	
342-346 NCRIGTOC	25727	NCC database IFF Gamma-tocopherol (mg) 00000-108.9	
347-350 NCRIDTOC	25727	NCC database IFF Delta-tocopherol (mg) 0000-32.9	
351-354 NCRIVD	25698 29	NCC database IFF Vitamin D (mcg) 0000-61.2 Blank	
355-357 NCRIS040	25727	NCC database IFF SFA 4:0 (gm) 000-2.9	See note

NHANES III Individual Foods Data File from the Dietary Recall

SECOND EXAM DATA

NUTRITION COORDINATING CENTER DATABASE

Positions SAS name	Counts	Item description and code	Notes
358-360 NCRIS060	25727	NCC database IFF SFA 6:0 (gm) 000-1.5	See note
361-363 NCRIS080	25727	NCC database IFF SFA 8:0 (gm) 000-2.7	See note
364-366 NCRIS100	25727	NCC database IFF SFA 10:0 (gm) 000-003	See note
367-370 NCRIS120	25727	NCC database IFF SFA 12:0 (gm) 0000-21.1	See note
371-373 NCRIS140	25727	NCC database IFF SFA 14:0 (gm) 000-012	See note
374-377 NCRIS160	25727	NCC database IFF SFA 16:0 (gm) 0000-50.7	See note
378-380 NCRIS170	25727	NCC database IFF SFA 17:0 (gm) 000-0.1	See note
381-384 NCRIS180	25727	NCC database IFF SFA 18:0 (gm) 0000-36.6	See note
385-387 NCRIS200	25727	NCC database IFF SFA 20:0 (gm) 000-0.8	See note
388-390 NCRIS220	25727	NCC database IFF SFA 22:0 (gm) 000-1.2	See note
391-393 NCRIM141	25727	NCC database IFF MFA 14:1 (gm) 000-1.1	See note
394-396 NCRIM161	25727	NCC database IFF MFA 16:1 (gm) 000-9.3	See note

NHANES III Individual Foods Data File from the Dietary Recall

SECOND EXAM DATA

NUTRITION COORDINATING CENTER DATABASE

Positions SAS name	Counts	Item description and code	Notes
397-400 NCRIM181	25727	NCC database IFF Oleic acid (MFA 18:1) (gm) 0000-93.5	See note
401-403 NCRIM201	25727	NCC database IFF MFA 20:1 (gm) 000-1.4	See note
404-406 NCRIM221	25727	NCC database IFF MFA 22:1 (gm) 000-4.1	See note
407-410 NCRIP182	25727	NCC database IFF Linoleic acid (PFA 18:2) (gm) 0000-78.3	See note
411-413 NCRIP183	25727	NCC database IFF Linolenic acid (PFA 18:3) (gm) 000-5.6	See note
414-416 NCRIP184	25727	NCC database IFF PFA 18:4 (gm) 000-0.4	See note
417-419 NCRIP204	25727	NCC database IFF PFA 20:4 (gm) 000-4.1	See note
420-422 NCRIP205	25727	NCC database IFF PFA 20:5 (gm) 000-002	See note
423-425 NCRIP225	25727	NCC database IFF PFA 22:5 (gm) 000-1.4	See note
426-428 NCRIP226	25727	NCC database IFF PFA 22:6 (gm) 000-6.5	See note

NHANES III Individual Foods Data File from the Dietary Recall

SECOND EXAM DATA

NUTRITION COORDINATING CENTER DATABASE

Positions SAS name	Counts	Item description and code	Notes
429-433 NCRIGLUC	25662 65	NCC database IFF Glucose (gm) 00000-107.2 Blank	
434-438 NCRIFRUC	25618 109	NCC database IFF Fructose (gm) 00000-117.1 Blank	
439-441 NCRIGALA	25721 6	NCC database IFF Galactose (gm) 000-3.8 Blank	
442-446 NCRISUCR	25721 6	NCC database IFF Sucrose (gm) 00000-369.4 Blank	
447-450 NCRILACT	25723 4	NCC database IFF Lactose (gm) 0000-54.3 Blank	
451-454 NCRIMALT	25722 5	NCC database IFF Maltose (gm) 0000-34.7 Blank	
455-458 NCRIFIB	25400 327	NCC database IFF Water insolu. dietary fiber (gm) 0000-57.3 Blank	
459-462 NCRISFIB	25400 327	NCC database IFF Water soluble dietary fiber (gm) 0000-19.7 Blank	

NHANES III Individual Foods Data File from the Dietary Recall

SECOND EXAM DATA

NUTRITION COORDINATING CENTER DATABASE

Positions SAS name	Counts	Item description and code	Notes
463-465 NCRIPLECT	21944 3783	NCC database IFF Pectin (gm) 000-8.6 Blank	
466-470 NCRISTAR	25725 2	NCC database IFF Starch (gm) 00000-263.1 Blank	
471-475 NCRIASPR	25727	NCC database IFF Aspartame (mg) 00000-00630	
476-478 NCRITRYP	25714 13	NCC database IFF Tryptophan (gm) 000-4.1 Blank	
479-482 NCRITHRE	25717 10	NCC database IFF Threonine (gm) 0000-15.9 Blank	
483-486 NCRIISOL	25717 10	NCC database IFF Isoleucine (gm) 0000-16.4 Blank	
487-490 NCRILEUC	25717 10	NCC database IFF Leucine (gm) 0000-28.8 Blank	
491-494 NCRILYSI	25717 10	NCC database IFF Lysine(gm) 0000-30.3 Blank	
495-497 NCRIMETH	25714 13	NCC database IFF Methionine (gm) 000-9.3 Blank	

NHANES III Individual Foods Data File from the Dietary Recall

SECOND EXAM DATA

NUTRITION COORDINATING CENTER DATABASE

Positions SAS name	Counts	Item description and code	Notes
498-500 NCRICYST	25714 13	NCC database IFF Cystine (gm) 000-4.1 Blank	
501-504 NCRIPHAL	25714 13	NCC database IFF Phenylalanine (gm) 0000-14.3 Blank	
505-508 NCRITYRO	25711 16	NCC database IFF Tyrosine (gm) 0000-12.2 Blank	
509-512 NCRIVALI	25717 10	NCC database IFF Valine (gm) 0000-17.7 Blank	
513-516 NCRIARGI	25714 13	NCC database IFF Arginine (gm) 0000-23.1 Blank	
517-520 NCRIHIST	25714 13	NCC database IFF Histidine (gm) 0000-12.5 Blank	
521-524 NCRIALAN	25711 16	NCC database IFF Alanine (gm) 0000-22.1 Blank	
525-528 NCRIASPA	25711 16	NCC database IFF Aspartic Acid (gm) 0000-33.4 Blank	
529-532 NCRIGLUT	25711 16	NCC database IFF Glutamic Acid (gm) 0000-54.8 Blank	

NHANES III Individual Foods Data File from the Dietary Recall

SECOND EXAM DATA

NUTRITION COORDINATING CENTER DATABASE

Positions SAS name	Counts	Item description and code	Notes
533-536 NCRIGLYC	25711 16	NCC database IFF Glycine (gm) 0000-19.9 Blank	
537-540 NCRIPROL	25711 16	NCC database IFF Proline (gm) 0000-16.1 Blank	
541-544 NCRISERI	25711 16	NCC database IFF Serine (gm) 0000-13.9 Blank	
545-549 NCRISACC	25727	NCC database IFF Saccharin (mg) 00000-528.8	
550-554 NCRIAPRO	25727	NCC database IFF Animal Protein (gm) 00000-364.9	
555-558 NCRIVPRO	25727	NCC database IFF Vegetable Protein (gm) 0000-73.6	
559-564 NCRIOXAA	25691 36	NCC database IFF Oxalic Acid (mg) 000000-001701 Blank	
565-570 NCRIPHYA	25724 3	NCC database IFF Phytic Acid (mg) 000000-3859.2 Blank	

NOTES

DRRSTAT: Status of interview

- 1 Reliable and complete: The information provided by the respondent was deemed to be reliable and complete.
- 2 Reliable but incomplete: The information provided by the respondent was reliable but incomplete. The Individual Foods File includes information for the partial dietary recall interview.
- 5 Breast-feeding infant or child: The foods reported during the dietary recall interview included human milk and the volume of milk consumed was not quantified. The number of minutes per feeding session was recorded, but it was not possible to calculate total nutrient intakes for infants and children who were breast-fed. Total nutrient intakes are coded "Blank but applicable" in the NHANES III Total Nutrients File. The other foods consumed by nursing infants and children are reported in the Individual Foods File.
- 8 Blank but applicable: The examinee should have a dietary recall interview but either was not interviewed or refused the dietary interview component. Some examinees do not have 24-hour dietary recall data because the proxy did not know what the examinee ate the day before. In some instances, the proxy was able to answer the post-recall questions pertaining to drinking water consumption, salt use, and food sufficiency.

Blank Home examinees were not eligible for the Dietary Interview component.

DRRMN: Meal number

Meal numbers in recalls that were complete and reliable (DRRSTAT=1) always begin with meal number=1; meal numbers increase by one for each consecutive meal or snack reported during the dietary interview. If a recall was coded reliable, but incomplete, (DRRSTAT=2) the meal numbers may not be consecutive; information is reported for meals that were reported during the dietary interview. Meal numbers are not sorted by the time of day.

DRRFN: Food number

Every food has a food number. Foods are numbered within meals. If the recall was coded complete and reliable (DRRSTAT=1), the first food in each meal has a food number=1, and the other foods reported in the same

meal are numbered consecutively. If the recall was coded reliable, but incomplete, (DRRSTAT=2) the food numbers may not be consecutive; information is reported for all foods that were reported by the respondent.

DRRCN: Component number

Foods are comprised of one or more components. An example of a single component food is a slice of bread. A sandwich is an example of a multiple component food or combination food; in this example, the component foods consist of bread and sandwich filling components.

If a recall was coded reliable and complete (DRRSTAT=1), all components are numbered consecutively within a given food; the component numbering sequence for the first food begins with component number=1 and increases by one for each additional component in the food. The numbering sequence is repeated for each additional food reported. If the recall was coded reliable, but incomplete, (DRRSTAT=2) the component numbers may not be consecutive; information is reported for the components that were reported by the respondent.

DRRIGW: Total grams of food

Grams of food were computed for foods that could be quantified. Blank values were assigned to food records of nursing infants and children when human milk intake was reported as "minutes nursed" because there was no way to actually quantify the amount of milk consumed; some human milk was reported in amount units that could be quantified and were included in the Individual Foods File.

DRRVIF: Variable ingredient flag

Recipe foods that have variable ingredients have DRRVIF=1; otherwise, DRRVIF=0.

DRRMNC: Meal name code

This is a numeric code that denotes the meal name that was specified by the respondent. Each numeric code has an English or Spanish language description.

DRRMPC: Meal place code

A numeric code was used to designate the place where the meal was consumed. The meal place code designates the location where foods were eaten rather than the source of the foods. For example, foods that were purchased at a carry-out restaurant and eaten at home, have a meal place code of "01" (eaten at home).

DRRCFF: Combination food flag

Combination foods (DRRCFF=1) are foods that are

comprised of more than one component food. Single component foods have DRRCFF=0.

DRRREC: Recipe flag

Recipe foods have ingredient records associated with them. Some recipe foods reported during the survey had variable ingredients that were specified by the respondent during the dietary interview. Variable ingredient information is reported in the Variable Ingredients File.

DRRFCODE: Component food code

A food code was assigned to all component foods reported in the survey. Most of the food codes that were assigned to the component foods were USDA Survey Nutrient Data Base food codes. A small number of NCC food codes were used when USDA food codes were not available; NCC nutrient values were used for components that were coded using NCC food codes. DRRFCODE matches the primary file variable, DRPFcode, which is linked to text descriptions in the look-up table called "CODEBOOK".

DRRFID: Food ID code

A unique 4-digit code that provides additional descriptive information about the component foods reported in the survey. All DRRFID codes match those is the primary file variable, DRPFID, which is linked to text descriptions in a look-up table called "IDCODE".

DRRCOMM: Brand ID or fast food code

All brand name and fast food restaurant items reported during NHANES III were assigned a 5-digit DRRCOMM. DRRCOMM codes match those in the primary file variable, DRPCOMM, which is linked to a look-up table called "BRANDS".

DRRCAUF: Unknown amount flag

Foods that were not quantified during the dietary interview have DRRCAUF=1; default food amounts were assigned to these foods. NCHS developed editing guidelines for the survey. Default amounts were either calculated using the survey editing guidelines or were assigned based upon reference values. A number of references were used including USDA Survey Nutrient Data Base Survey Codebook default amount gram weight data and food manufacturer information. No attempt was made to quantify human milk when the amount was reported as "minutes nursed".

DRRMTOE: Meal time of eating

The time when a meal or snack was eaten is reported in 24-hour clock or military time units.

DRRPPDC: Preparation description code

A food preparation description code was assigned to foods that had NCC preparations. The codes in DRRPPDC match those in the primary file variable, DRPPPDC, which is linked to text descriptions in a look-up table called "PREPD".

NCRIS040-NCRIS220: Saturated fatty acids (SFA)

Saturated fatty acids are reported for fatty acids with carbon chain lengths ranging from 4 to 22 carbon atoms.

NCRIM141-NCRIM221: Monounsaturated fatty acids (MFA)

Monounsaturated fatty acids are reported for fatty acids with a single double bond and carbon chain lengths ranging from 14 to 22 carbon atoms.

NCRIP182-NCRIP226: Polyunsaturated fatty acids (PFA)

18 Polyunsaturated fatty acids having carbon chain lengths ranging from to 22 carbon atoms in length; the number of double bonds in the PFA acids reported ranges from 2 to 6.

References

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