

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

NHANES III DIETARY SUPPLEMENT INFORMATION DATA FILE DOCUMENTATION

Series 11, No. 2A

April 1998

*Special Note:

(Descriptive information about each supplement in database)

This is the first of 2 look-up files for the dietary supplements concentration database. This file contains descriptive information about each supplement reported including the standardized supplement name and associated product code, the source of the nutrient/ingredient values added to the concentration database, the product type, the dosage on which the concentration is based, and other product information. This file also contains an overview discussion about the supplements concentration database as well as specific notes on selected variables.

Table of Contents

Introduction

Guidelines for Data Users.

Survey Description

Sample Design and Analysis Guidelines.

Data Preparation and Processing Procedures

General References

NHANES III Dietary Supplement Information Data

 General Information

 Data File Index

 Data File Item Descriptions, Codes, Counts, and Notes

 Appendices

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 plan. 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. 2A, ASCII Version (this release)	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 release, Series 11, No. 2A, contains previously unreleased data and corrections. Corrections were made to the vitamin/minerals portion of the adult and youth questionnaire data files as well as the dietary recall portion of the examination data file. For the laboratory component, some previously release variables have been augmented with NHANES III Phase 2 data. In addition several new laboratory variables have been added.

The following table shows which public use files contain information from the interview and examination components.

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

Topic	Data File							
	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 Dietary Supplement Information Data 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)436-8500

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.

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 (301-436-8500) 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 (WTPFHX6). 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. 2A). Hyattsville, MD.: Centers for Disease Control and Prevention, 1998.

- 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 poststratification 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

GENERAL REFERENCES

- Delgado JL, Johnson CL, Roy I, Trevino FM. Hispanic Health and Nutrition Examination Survey: methodological considerations. Amer J Pub Health 80(suppl.):6-10. 1990.
- Engel A, Murphy RS, Maurer K, Collins E. Plan and operation of the HANES I Augmentation Survey of Adults 25-74 Years, United States, 1974-75. National Center for Health Statistics. Vital Health Stat 1(14). 1978.
- Freeman DH, Freeman JL, Brock DB, Koch GG. Strategies in the multivariate analysis of data from complex surveys II: an application to the United States National Health Interview Survey. Int Stat Rev 40(3):317-30. 1976.
- Khare M, Mohadjer LK, Ezzati-Rice TM, Waksberg J. An evaluation of nonresponse bias in NHANES III (1988-91). 1994 Proceedings of the Survey Research Methods section of the American Statistical Association. 1994.
- Landis JR, Lepkowski JM, Eklund SA, Stehouwer SA. A statistical methodology for analyzing data from a complex survey, the first National Health and Nutrition Examination Survey. National Center for Health Statistics. Vital Health Stat 2(92). 1982.
- McDowell A, Engel A, Massey JT, Maurer K. Plan and operation of the second National Health and Nutrition Examination Survey, 1976-80. National Center for Health Statistics. Vital Health Stat 1(15). 1981.
- Miller HW. Plan and operation of the Health and Nutrition Examination Survey, United States, 1971-1973. National Center for Health Statistics. Vital Health Stat 1(10a) and (10b). 1973.
- National Center for Health Statistics. Plan and initial program of the Health Examination Survey. Vital Health Stat 1(4). 1965.
- National Center for Health Statistics. Plan and operation of a health examination survey of U.S. youths 12-17 years of age. Vital Health Stat 1(8). 1969.
- National Center for Health Statistics. Plan and operation of the Hispanic Health and Nutrition Examination Survey, 1982-84. Vital Health Stat 1(19). 1985.
- National Center for Health Statistics. Plan and operation of the Third National Health and Nutrition Examination Survey, 1988-94. Vital Health Stat 1(32). 1994.
- National Center for Health Statistics. Plan, operation, and response results of a program of children's examinations. Vital Health Stat 1(5). 1967.
- Shah BV, Barnwell BG, Bieler GS. SUDAAN User's Manual: Software for Analysis of Correlated Data. Research Triangle Park, NC: Research Triangle Institute. Release 6.04. 1995.

Skinner CJ. Aggregated analysis: standard errors and significance tests. In: Skinner CJ, Holt D, Smith TMF, eds. Analysis of complex surveys. New York: John Wiley and Sons, Inc. 1989.

U.S. Department of Health and Human Services (DHHS). National Center for Health Statistics. NHANES III reference manuals and reports (CD-ROM). Hyattsville, MD: Centers for Disease Control and Prevention, 1996. Available from National Technical Information Service (NTIS), Springfield, VA. Acrobat .PDF format; includes access software: Adobe Systems, Inc. Acrobat Reader 2.1.

Westat, Inc. A User's Guide to WesVarPC. Rockville, MD. Westat, Inc. 1996.

Yetley E, Johnson C. Nutritional applications of the Health and Nutrition Examination Surveys (HANES). Annu Rev Nutr 7:441-63. 1987.

NHANES III DIETARY SUPPLEMENT INFORMATION DATA FILE

General Information

Overview

NCHS staff created a dietary supplements database containing nutrient/ingredient values and product information for the vitamins, minerals and other dietary supplements reported in the NHANES III adult and youth household questionnaires. This also included the default supplements that NCHS staff created. The database consists of two look-up files. This look-up file, called "Supliden", contains descriptive information about each product. This includes the standardized supplement name and associated product code, the source of the nutrient/ingredient values added to the concentration database, the product type, the dosage on which the values in the concentration database are based, and other relevant product information. The second file, called "Suplconc", contains the nutrient/ingredient values for each supplement.

Interviewers did not have time during the NHANES III household interview to collect nutrient/ingredient content information from the label of each supplement. Instead, product content information was entered in the database after the completion of the survey. Each product was assigned nutrient/ingredient values based on the May 1996 version of the product. Consequently, the values in the data set may be different from the ones present in the supplement during the interval of the survey.

Guidelines for obtaining and adding nutrient/ingredient values to the dietary supplements concentration database

NCHS staff collected nutrient/ingredient values from several sources. These sources were ranked according to the perceived validity and "up-to-dateness" of the values. The rankings were, from highest to lowest: directly from manufacturers or distributors; product labels or packaging; product catalogs or similar references; estimated; or inferred from the product name. The staff used values from the highest ranked source that was available to them. Estimation was used when there was no other source for the information for brand name products, and for most default products. Inference was used primarily for single ingredient products, including the default supplements, where the concentration was implied in the name, and for generic substitute supplements.

NCHS staff first tried to contact supplement manufacturers/distributors to collect nutrient/ingredient values. In the case of store brand products (e.g., CVS or Safeway brands), staff contacted the store's main office for the information. Many times the information was obtained directly from the store, other times the staff were instructed to contact the company that produced the private label product.

Other sources were used when the manufacturers or distributors did not provide the information. The second source of information used was the product label or packaging. A significant number of supplements were purchased between June and September 1996, and the nutrient/ingredient values were recorded from the labels or packaging. Another source of information included printed reference books, such as "The Physician's Desk Reference" or "The Physician's GenRx" or similar compilations of drug information, product catalogs, and information packets collected from health stores or received from the manufacturers or

distributors. These references covered the years between 1988 and 1996. As a last resort, staff estimated or inferred nutrient/ingredient values for a supplement.

Nutrient names and values were standardized, but it was not possible to standardize the amounts in botanical supplements and similar products since a uniform standard did not exist. Coding of values for botanicals is described in more detail a little later.

The nutrients/ingredients shown in the concentration database (look-up file called "Suplconc") were expressed on the basis of the amounts present in one unit of the supplement (e.g., 1 tablet, 1 teaspoon, 1 milliliter, etc.). For supplements supplied in a packet, with several tablets per packet, the nutrients were expressed on the basis of the amount per packet. When the number of tablets or capsules contained in the packet was available, this information was recorded in the variable called product information note. Note, the dosage used for creating this database may not be the same as the manufacturer's recommended dose of the supplement or the dose the respondent took. Calculations must be performed when respondents report taking anything other than one unit of a supplement (e.g., 0.6 milliliters, 2 tablets).

When a manufacturer provided nutrient amounts as a percentage of the Recommended Daily Intakes (RDI), as was often the case with formula diets and sports drinks, calculations were performed to convert these values to milligrams, micrograms or International Units for recording in the database. These calculations were performed using the RDI amounts from the Food and Drug Administration listed in the Code of Federal Regulation, Section 21 (Food and Drugs), revised in April 1, 1996.

When manufacturers did not provide the elemental mineral amounts for some mineral compounds, the nutrient amounts were calculated as follows:

- * Calcium carbonate/40% elemental calcium
- * Calcium citrate/21% elemental calcium
- * Ferrous fumarate/33% elemental iron
- * Ferrous sulfate(dried)/30% elemental iron
- * Magnesium oxide/60% elemental magnesium
- * Zinc gluconate/14.3% elemental zinc

The elemental mineral amounts were not calculated for the following compounds: calcium caseinate, potassium bicarbonate, potassium chloride, potassium gluconate, potassium para-aminobenzoate, and sodium copper chlorophyllin.

For botanical supplements and similar products, it was impossible to express the amounts in a discrete type of supplement on a common basis since the composition of different brands were often expressed in different ways. For example, the values for garlic were reported as garlic, garlic fresh equivalent, garlic concentrate, garlic powder, and aged garlic extract powder, while the values for garlic oil were reported as garlic fresh equivalent, garlic oil, and concentrated garlic oil. Therefore, the amounts in botanical and similar supplements were listed in the forms provided by the manufacturer/distributor.

As previously mentioned nutrient/ingredient values were estimated for brand name products when no other source for this information was available, and for

most default products. Several criteria were used to estimate the values. In general, to fill in values for multi-nutrient supplements staff used values from the most frequently reported brand name supplement reported in NHANES III that was the same type of product. For example, "Centrum" was used for the default product Multivitamins and Minerals. There was an exception to this general rule. If the combined frequencies of two or more other supplements, which were made by the same manufacturer and had the same nutrients and amounts, exceeded that of the most frequently reported product, then values from the less frequently reported supplement were used. For example, the most frequent response for children's multivitamins and minerals was "Sesame Street Complete", but the combined totals of "Flintstones Complete" and "Bugs Bunny Complete", which are made by the same manufacturer and have the same nutrient values, exceeded that of Sesame Street Complete. Therefore, the estimated values for the default product, children's multivitamins and minerals, were based on the values in "Flintstones Complete".

For single nutrient/ingredient supplements, the lowest concentration of the nutrient/ingredient in the supplement that was commonly available on store shelves was used for the estimated value. For supplements containing only two or three nutrients/ingredients, e.g., calcium-magnesium or vitamins A and D, the lowest commonly available strength of the product was used for the estimated value. In cases where the nutrient/ingredient combination in the reported supplement was not a recognizable product, the values coded for the combination product were the ones used with the respective single nutrient/ingredient supplements.

Values were also estimated for botanicals and similar products when no other source for this information was available, and for default products. However, a standard commonly available strength could not always be determined for these types of products. In such cases, 500 mg was substituted for the amount since capsules containing botanicals commonly have a capacity of between 400 mg and 600 mg, on a weight basis.

Appendix 1 contains a list of the supplements or nutrient/ingredient amounts used to estimate values for supplements where no other source of information was available, and for most default products.

Inference was used to code values primarily for single ingredient products, including the default supplements, where the concentration was implied in the name, but there was no other source for the information (e.g., Vit. C, 500 mg; Co-enzyme Q-10, 30 mg). Inference was also used for generic substitute supplements.

There were 55 supplements where the reported names were too vague or they represented too broad a category to specifically identify the supplement (e.g., "vitamin B", "minerals - unidentified type", or "other dietary supplements"), or where the name was identifiable but the manufacturer did not provide NCHS with any nutrient/ingredient information, nor could the staff find this information listed anywhere else. Since the staff could not determine which nutrients/ingredients were in these products, yet they appeared to be dietary supplements, all the nutrient/ingredient fields were coded with "blank but applicable" (8-fill). Appendix 2 contains the names of these 55 supplements.

NHANES III Dietary Supplement Information Data File Index

Description	Variable Name	Positions
COMPOSITE HOUSEHOLD ADULT/YOUTH DATA		
Dietary Supplement Product Code	HQVMCODE	1-6
Dietary supplement name	HQKX3A	7-126
Source of Product Information	SRCPINFO	127-128
Flg for Chg in Nutr/Ingr Vals Since 1988	CHANGFLG	129-130
Information about Nutr/Ingr Changes	CHANGNOT	131-255
Product Type	HQKX3D	256-257
Product Dosage	DOSAGE	258-259
Form of Dosage	HQKX7A1	260-261
Product Information Note	PRODNOTE	262-461
Dosage Note	DOSENOTE	462-661

NHANES III Dietary Supplement Information Data File

DIETARY SUPPLEMENT PRODUCT INFORMATION

DESCRIPTIVE PRODUCT INFORMATION

Positions SAS name	Counts	Item description and code	Notes
131-255 CHANGNOT		Information about Nutrient/ Ingredient Changes	See note
	126	Long, free-form text	
	2312	Blank	
256-257 HQKX3D		Product Type	See note
	522	01 Vitamin supplement - single nutrient	
	379	02 Vitamin supplement - multiple nutrient	
	308	03 Mineral supplement - single nutrient	
	73	04 Mineral supplement - multiple nutrient	
	741	05 Vitamin - mineral combination	
	102	06 Other dietary supplement with vitamin(s)/mineral(s)	
	311	07 Other dietary supplement	
	2	88 Blank but applicable	
258-259 DOSAGE		Product Dosage	See note
	2408	01 All products reported in terms of a single unit	
	30	88 Blank but applicable	

NHANES III Dietary Supplement Information Data File

DIETARY SUPPLEMENT PRODUCT INFORMATION

DESCRIPTIVE PRODUCT INFORMATION

Positions SAS name	Counts	Item description and code	Notes
260-261 HQKX7A1	2229	Form of Dosage 01 Capsule, tablet or pill	See note
	41	02 Teaspoon	
	32	03 Tablespoon	
	8	04 Fluid ounces or ounces	
	6	05 Drops or droppers	
	19	06 Packs, packets or packages	
	67	07 Milliliters	
	5	08 Wafers	
	1	10 Other, specify	
	30	88 Blank but applicable	
262-461 PRODNOTE	69	Product Information Note Long, free-form text	See note
	2369	Blank	
462-661 DOSENOTE	43	Dosage Note Long, free-form text	See note
	2395	Blank	

Notes:

HQVMCODE: Dietary Supplement Product Code

This variable is a 6-digit product code associated with each of the standardized dietary supplement names that were created from the supplement name that the respondent or proxy reported, or the default supplements that NCHS staff created. This product code can be used to link records to the nutrient/ingredient concentration database (look-up file "Suplconc"). The codes are both product- and manufacturer/distributor-specific. The first 3 digits of each code represent the product's manufacturer or distributor, and the last three digits of the code represent a specific product in the manufacturer's/distributor's line of products. In general, default products begin with three 8s since the manufacturer or distributor is unknown. When the manufacturer or distributor was known the default products say "strength not indicated" or "type not indicated" in the supplement name, and the code for these products begins with the 3 digits associated with that manufacturer or distributor. (See dietary supplement name for a detailed discussion of default supplements.)

HQKX3A: Dietary Supplement Name

This variable contains the standardized dietary supplement name created from the name reported on the household questionnaire or the default supplement names that NCHS staff created. These products include vitamins, minerals and other types of dietary supplements. Product names were determined in several ways using the names, manufacturers/distributors and other information respondents described during the interview. When possible, brand name or private label supplements were identified based on the information the respondent reported. Default supplements were created and used when the reported supplement name and other information was not sufficient to match to a specific brand name or private label product. NCHS staff developed several different types of default supplements. Default supplements that were generic product-type names (e.g., multivitamins and minerals, children's multivitamins) were created when respondents reported general types of supplements (e.g., "vitamins with minerals", "children's vitamins"). Default products were also created for supplements that came in multiple strengths or different types of products, but the strength or type was not recorded during the interview (e.g., vitamin C; Tri Vit Drops w/Fluoride, strength not indicated; Aquasol, type not indicated). All of the default supplements just described have an asterisk after their names indicating they are not real products. The NCHS staff created other default supplements that do not have an asterisk after their names. These include generic substitutes for brand name supplements (e.g., Centrum generic substitute), or individual nutrients or combinations of nutrients assigned certain strengths (e.g., ferrous sulfate 300 mg, calcium 500 mg and vitamin D). Default nutrient/ingredient values were coded in the database for all of the default supplements.

SRCPINFO: Source of Product Information

This variable lists the source of the nutrient/ingredient values which NCHS staff added to the concentration database for each dietary supplement (look-up file "Suplconc"). The sources were ranked according to the perceived validity and up-to-dateness of the information. The rankings, from highest to lowest, were: directly from manufacturers, product labels or packaging, product catalogs or similar references, estimated, or inferred from the product name. The staff used values from the highest ranked source that was available to them. Estimation was used when there was no other source for the information for brand name products, and for most default products. The rules used for estimating values are discussed in more detail in documentation accompanying the supplements concentration database. Inference was used primarily for single ingredient products, including the default supplements, where the concentration was implied in the name (e.g., Calcium 600 mg), and generic substitute supplements.

CHANGFLG: Flag for Changes in Nutrient/Ingredient Values Since 1988

The nutrient/ingredient concentration database contains values for dietary supplements in May, 1996. This variable indicates whether there were any changes in these values between 1988, when the survey began, and 1996, when the composition data were collected.

CHANGNOT: Information about Nutrient/Ingredient Changes

This variable lists specific changes that occurred in the nutrient/ingredient composition between 1988 and 1996, or whether the product was discontinued, or the manufacturer/distributor went out of business during this interval.

HQKX3D: Product Type

This variable was created based on the supplement name that the respondent or proxy reported. All of the dietary supplements that were reported in the survey were classified into one of 7 broad product-type classes based on their general nutrient/ingredient composition. The first 5 classes were reserved for vitamin and/or mineral supplements as well as cod liver oil, dolomite, bone meal, liver, and supplements where the primary ingredient was a vitamin or mineral but the product also contained a botanical or other nonvitamin or nonmineral (e.g., vitamin C with rose hips). The last two classes were assigned to other dietary supplements which included botanicals, fiber, amino acids, lipotropics, formula diets, and so forth. Class 6 was assigned to other dietary supplements that also contained 2 percent or more of any of the nutrients listed in the National Research Council's Recommended Dietary Allowances (RDAs) or Estimated Safe and Adequate Daily Dietary Intake (ESADDI). Class 7 was assigned to other dietary supplements that either did not contain any of the RDA or ESADDI nutrients or they were present in amounts less than 2 percent of the recommended levels. While care was taken in assigning product classes to the supplements reported, it is possible that some supplements have been misclassified based on the guidelines given here.

DOSAGE: Product Dosage

The amounts of the nutrients/ingredients shown in the concentration database (look-up file "Suplconc") are expressed on the basis of the quantity shown in the two-part dosage variable. This variable is the first part of the two-part dosage variable, and lists the numeric amount of the dosage. The dosages were all standardized to one unit since the nutrient/ingredient values in the database are all expressed on the basis of one unit (e.g., 1 tablet, 1 teaspoon, 1 milliliter), regardless of the manufacturer's recommended dose of the supplement or the dose the respondent took. Calculations must be performed when respondents report taking anything other than one unit of a supplement (e.g., 0.6 milliliters, 2 tablets).

HQKX7A1: Form of Dosage

The amounts of the nutrients/ingredients shown in the concentration database (look-up file "Suplconc") are expressed on the basis of the quantity shown in the two-part dosage variable. This variable is the second part of the two-part dosage variable, and lists the unit of measurement associated with the dosage.

PRODNOTE: Product Information Note

This variable primarily lists pertinent composition and dosage information about the product. Only a few supplements contained in the database required

this additional explanation.

DOSENOTE: Dosage Note

This variable lists the amount a dropper of the product holds. Only a few supplements contained in the database list this information.

Appendix 1
Estimate Values

For certain categories of products, the estimated values were derived from the name-brand products listed below:

- * Amino acid combinations / Amino 1000 (GNC)
- * Antioxidant vitamins / Antioxidant A, C and E (Nature Made)
- * Aquasol, type not indicated / Aquasol A Drops (Astra USA, Inc)
- * Children's multivitamins / Flintstones (Bayer Corporation)
- * Children's multivitamins-drops / Poly-Vi-Sol (Mead Johnson)
- * Children's multivitamins-liquid / Vi-Daylin Multivitamin Liquid (Ross)
- * Children's multivitamins and minerals / Flintstones Complete (Bayer Corporation)
- * Children's multivitamins with extra C / Flintstones Plus Extra C (Bayer Corporation)
- * Children's multivitamins with fluoride / Poly-Vi-Flor Chewable (Mead Johnson)
- * Children's multivitamins with fluoride-drops / Poly-Vi-Flor Drops (Mead Johnson)
- * Children's multivitamins with iron / Flintstones Plus Iron (Bayer Corporation)
- * Children's multivitamins with iron-drops / Poly-Vi-Sol with Iron Drops (Mead Johnson)
- * Children's triple vitamins-drops / Tri-Vi-Sol Drops (Mead Johnson)
- * Children's triple vitamins with fluoride / Tri-Vi-Flor Chewable (Mead Johnson)
- * Children's triple vitamins with fluoride-drops / Tri-Vi-Flor Drops (Mead Johnson)
- * Geriatric multivitamins and minerals / Centrum Silver (Lederle)
- * Megadose multivitamins / used only vitamin values from Ultra Mega (GNC)
- * Megadose multivitamins and minerals / Ultra Mega (GNC)
- * Minerals - unknown type / no estimate value could be determined
- * Multiminerals / Calcium Complex (Shaklee)
- * Multivitamins / One-A-Day Essential (Bayer Corporation)
- * Multivitamins and minerals / Centrum (Lederle)
- * Multivitamins and minerals-liquid / Centrum Liquid (Lederle)
- * Multivitamins with calcium and iron / Unicap Plus (Upjohn)
- * Multivitamins with extra vitamin C / One-A-Day Plus Extra C (Miles)
- * Multivitamins with iron / vitamin values only from One-A-Day with Iron (Bayer Corporation); iron recorded at 18 mg
- * Other dietary supplements / no estimate value determined
- * Other dietary supplement with vitamins or minerals / no estimate value determined
- * Prenatal multivitamins and minerals / Materna (Lederle)
- * Stress formula multivitamins / Stresstabs (Lederle)
- * Stress formula multivitamins and minerals / One-A-Day Stressguard (Bayer Corporation)
- * Stress formula with iron / Stresstabs with Iron (Lederle)
- * Stress formula with zinc / Z-Bec (Robbins)
- * Vitamins for hair / NourishHair (GNC)
- * Vitamins for nails / no estimate value could be determined
- * Vitamins for vision / OcuVite (Lederle)
- * Vitamins - unknown type / no estimate value could be determined
- * Women's multivitamins and minerals / One-A-Day Women's (Bayer Corporation)

Appendix 1 continued.

The nutrient values listed below were used as the estimated values for these single-ingredient products:

- * Alfalfa - 500 mg
- * Barley Grass - 500 mg
- * Bee Pollen - 500 mg
- * Beet Powder - 500 mg
- * Beta Carotene - 100% of vitamin A
- * Biotin - 150 mcg
- * Black Cohosh - 500 mg
- * Black Currant - 500 mg
- * Burdock Root - 500 mg
- * Calcitriol - 0.25 mg
- * Calcium - 250 mg
- * Calcium - liquid - 23 mg/ml
- * Calcium Lactate - 42 mg of calcium
- * Cascara Sagrada - 500 mg
- * Cayenne - 500 mg
- * Chickweed - 500 mg
- * Chlorella - 500 mg
- * Chlorophyll - 50 mg
- * Choline - 250 mg
- * Chromium - 200 mcg
- * Co-Enzyme Q-10 - 10 mg
- * Cranberry - 500 mg
- * Dihydrotachysterol - 0.125 mg
- * DL-Phenylalanine - 500 mg
- * Dong Quai - 500 mg
- * Echinacea - 500 mg
- * Evening Primrose Oil - 500 mg
- * Ferrous Fumarate - 50 mg of iron
- * Ferrous Gluconate - 50 mg of iron
- * Ferrous Sulfate - 50 mg of iron
- * Ferrous Sulfate - drops - 25 mg/ml of iron
- * Ferrous Sulfate - elixir - 44 mg/tsp of iron
- * Fluoride - 0.25 mg
- * Folic Acid - 400 mcg
- * Garlic - 300 mg fresh equivalent
- * Ginkgo Bilboa - 30 mg
- * Ginseng, unspecified - 250 mg
- * Golden Seal - 500 mg
- * Hawthorn - 500 mg
- * Inositol - 250 mg
- * Iodine - 150 mg
- * Iron - 50 mg
- * Iron - drops - 25 mg/ml
- * Iron - elixir - 44 mg/tsp
- * Kelp - 150 mg
- * L-Glutamine - 500 mg
- * L-Lysine - 500 mg
- * L-Methionine - 500 mg
- * L-Tryptophan - 500 mg
- * Lactobacillus Acidophilus - 250 mg
- * Lecithin - 500 mg
- * Licorice Root - 500 mg
- * Manganese - 5 mg

Appendix 1 continued.

- * Marshmallow - 500 mg
- * Milk Thistle - 100 mg
- * Niacin - 100 mg
- * Niacinamide - 100 mg of niacin
- * Oat Bran - 850 mg
- * PABA - 50 mg
- * Pantothenic Acid - 50 mg
- * Papain - 6 mg
- * Parsley - 500 mg
- * Phosphorus - 95 mg
- * Potassium - 600 mg of potassium chloride
- * Potassium Bicarbonate - 975 mg
- * Potassium Chloride - 600 mg
- * Potassium Chloride - liquid - 1500 mg
- * Potassium Gluconate - 99 mg of potassium
- * Psyllium - 3.4 gm
- * Pycnogenol - 25 mg
- * Riboflavin - 25 mg
- * Rose Hips - 500 mg
- * Royal Jelly - 100 mg
- * Rutin - 50 mg
- * Scullcap - 500 mg
- * Selenium - 50 mcg
- * Shark Cartilage - 740 mg
- * Slippery Elm - 500 mg
- * Thiamin - 50 mg
- * Valerian Root - 500 mg
- * Vitamin A - 10,000 IU
- * Vitamin B-12 - 25 mg
- * Vitamin B-6 - 25 mg
- * Vitamin C - 250 mg
- * Vitamin D - 400 IU
- * Vitamin E - 100 IU
- * Vitamin K - 100 mcg
- * Wheat Bran - 500 mg
- * Wood Betony - 500 mg
- * Yohimbe - 500 mg
- * Zinc - 15 mg

Appendix 1 continued.

The nutrient values listed below were used as the estimated values for these multi-ingredient products:

- * Acidophilus and Pectin - 250 mg of lactobacillus acidophilus & 100 mg of citrus pectin
- * Alfalfa and Vitamin B-12 - 500 mg & 25 mg, respectively
- * Beta Carotene and Selenium - 10,000 IU of vitamin A, 100% of vitamin A is beta carotene, & 50 mcg selenium
- * Calcium and Magnesium - 158 mg & 90 mg, respectively
- * Calcium and Phosphorus - 116.67 mg & 90 mg, respectively
- * Calcium and Vitamin D - 500 mg & 125 IU, respectively
- * Calcium and Vitamins A, C and D - 333.33 mg, 1333.33 IU, 33.33 mg & 133.33 IU, respectively
- * Calcium, Magnesium and Potassium - 250 mg, 250 mg & 49.5 mg, respectively
- * Calcium, Magnesium and Vitamin D - 250 mg, 125 mg & 50 IU, respectively
- * Choline and Inositol - 250 mg & 250 mg, respectively
- * Garlic and Parsley - 1000 mg & 100 mg (fresh equivalents), respectively
- * Ginseng and Royal Jelly - 200 mg & 300 mg, respectively
- * Kelp, Lecithin and Vitamin B-6 - 5 mg, 200 mg, 100 mg, respectively, plus 50 mg cider vinegar
- * L-Arginine and L-Ornithine - 625 mg & 375 mg, respectively
- * Vitamin A with Beta Carotene - 10,000 IU & 100% of vitamin A, respectively
- * Vitamins A and D - 5,000 IU & 400 IU, respectively

The nutrient values listed below were used as the estimated values for these products:

- * Bone Meal - 213 mg of calcium; 96 mg of phosphorus
- * Brewer's Yeast - 0.06 mg of thiamin; 0.02 mg of riboflavin; 0.15 mg of niacin
- * Cod Liver Oil - 1,250 IU of vitamin A; 135 IU of vitamin D
- * Cod Liver Oil - liquid - 1,250 IU of vitamin A; 100 IU of vitamin D
- * Dolomite - 158 mg of calcium; 90 mg of magnesium
- * Ester C - 500 mg of vitamin C; 62 mg of calcium
- * Fish Oil - 180 mg of EPA; 120 mg of DHA

Appendix 2

LIST OF PRODUCTS WITH ALL EIGHT FILLS SORTED BY PRODUCT CODE
FOR VITAMIN AND MINERAL DOCUMENTATION

```

-----
PRODUCT   STANDARDIZED PRODUCT NAME
CODE
-----
005004    ATHLETE'S PAK
005006    SLENDER ALL
005007    STEROL COMPLEX 30
060001    CYBER GAIN
060003    PHASE I BODY BUILDING PROGRAM - ANABOLIC ACTIVATOR
060004    PHASE I BODY BUILDING PROGRAM - BIOGENIC AGENT
064002    FORMULA 303
118004    THERMOJECTICS WEIGHT-MANAGEMENT PRODUCT, TYPE NOT INDICATED*
118005    THERMOJETICS ACTIVATED FIBER
118006    THERMOJETICS BEIGE HERBAL TABLETS
118010    THERMOJETICS FORMULA 3 - CELL ACTIVATOR
118011    THERMOJETICS GREEN HERBAL TABLETS
142032    LEDERPLEX LIQUID
160001    MDR FITNESS TABS FOR MEN AND WOMEN
178002    TRI-ZYMES
185005    FEMCHANGE
185007    JUNIPER BERRY COMBINATION
185008    LB FORMULA CAPSULES
189001    A.M./P.M. ULTIMATE CLEANSE
190002    ALJ HERBAL FOOD COMBINATION
190016    ENERGY V
190017    GINKGO-HAWTHORN COMBINATION
190021    LBS II HERBAL FOOD COMBINATION
190023    LIV-J HERBAL FOOD COMBINATION
190035    SF HERBAL FOOR COMBINATION
190036    SN-X HERBAL FOOD COMBINATION
190040    X-A HERBAL FOOD COMBINATION
191001    B/P FORMULA
191013    MEN'S FORMULA APH
208002    ORIGINAL PEP
272001    HYLAND'S CALC FLUOR (CALCAREA FLUORICA)
273004    CYROFOOD TABLETS
282003    CALLI HERB FOOD BEVERAGE
286001    MYCOPRYL 400
308002    DISTEX
308004    LIGATEX
308005    PRIMACAL
315003    ANABOLIC MEGA PAK
315004    BIG CHEWABLES
315005    BIG WEIGHT GAIN POWDER
315006    BODY GRO MEGA PAK
315007    CARBO ENERGIZER CHEWABLE TABLET
315008    CARBO ENIGIZER POWDER
315010    DYNAMIC LIFE ESSENCE
315014    MEGABOLIC MULTI-POWER PAKS
315016    SIGNATURE BODY SHAPER
315017    VICTORY POST WORKOUT
315018    VICTORY POWER BASE
324002    FIBER GUARD
888130    MINERALS - UNIDENTIFIED TYPE*

```

888152 OTHER DIETARY SUPPLEMENTS*

Appendix 2 continued

LIST OF PRODUCTS WITH ALL EIGHT FILLS SORTED BY PRODUCT CODE
FOR VITAMIN AND MINERAL DOCUMENTATION

PRODUCT STANDARDIZED PRODUCT NAME
CODE

888197 VITAMIN B*
888236 VITAMINS - UNIDENTIFIED TYPE*
888244 VITAMINS B AND E*
888253 VITAMINS FOR NAILS*