Data Files Documentation
Dietary Supplement Ingredient Database - Release 4

The fourth release of the Dietary Supplement Ingredient Database (DSID-4) reports national estimates for ingredient levels in adult, children's and non-prescription prenatal multivitamin/mineral (MVM) dietary supplements (DS) and omega-3 fatty acid DS. On the 'Data Files' page of the DSID website (http://dsid.usda.nih.gov/Data_Files), 8 combined data files are provided in several formats. In addition, pilot study results for green tea DS are reported.

DSID-4 Adult MVM Data Files

The adult MVM data files contain national estimates for 18-21 vitamins and minerals from 2 adult MVM studies (adult MVM-1 and adult MVM-2). For more details about these studies, see the research summaries (PDF), which are available for download on the 'Multivitamins' page of the DSID-4 website.

For the adult MVM-1 study (study code 01), DSID statistical results are reported and data files with DSID linking codes for specific label information are applied to product information in the National Health and Nutrition Examination Survey (NHANES) DS data files for 2003-04, 2005-06, and 2007-08 (Tables 2, 3, 4 and 5). For the adult MVM-2 study (study code 05), DSID statistical results are reported and data files with linking codes for specific label information are applied to product information in the NHANES DS data files for 2009-10, 2011-12, and 2013-14 (Tables 2, 6, 7 and 8).

DSID-4 Children's MVM Data Files

The children's MVM data files contain national estimates for 16 vitamins and minerals in children's MVM products. The Supplement Facts labels on children's MVM products often have more than one age group and more than one serving size on the panel. Data associated with the serving sizes, '1 to <4 years' and '4 years and older' were analyzed separately (study codes 02A and 02 respectively) by regression analysis and reported in Table 1. More details are available in the Children's MVM research summary (PDF), which is available for download on the 'Multivitamins' page of the DSID-4 website.

NOTE: Only the data results for serving sizes '4 years and older' (study code 02) were provided in Tables 2, 4, 5 and 6 because NHANES reports only 1 serving size and age group for these products. Linking codes for specific label information are applied to product information in the NHANES DS data files for 2005-06, 2007-08 and 2009-10.

DSID-4 Non-prescription Prenatal MVM Data Files

The non-prescription prenatal MVM data files contain national estimates for 20 vitamins and minerals in non-prescription prenatal MVM products. For more details about this study, see the research summary (PDF), which is available for download on the 'Multivitamin' page of the DSID-4 website. For this study (study code 03), DSID statistical results are reported and data files (Tables 2, 5, 6 and 7) with linking codes for specific

label information are applied to product information in the NHANES DS data files for 2007-08 and 2009-10 and (and new to DSID-4: 2011-12).

DSID-4 Omega-3 Fatty Acids Data Files

The omega-3 fatty acid data files contain national estimates for the three major components of omega-3 fatty acid DS: ALA, EPA and DHA for products that provide individual label claims for these fatty acids. For more details about this study, see the research summary (PDF), which is available for download on the 'Omega-3 Fatty Acid' page on the DSID-4 website. The laboratory data for this study was converted to per serving and per day results and both were analyzed using regression techniques. In Table 1, the results for both are provided.

Only the data results per serving (study code 04) were provided in Tables 2, 4, 5 and 6 because NHANES data is per serving only. Linking codes for specific label information are applied to product information in the NHANES DS data files for 2005-06, 2007-08 and 2009-10. In NHANES, ALA, DHA and EPA each have two different names and ingredient IDs. The DSID ingredient name is listed below with the NHANES information.

DSID Ingredient Name	NHANES Ingredient Name	NHANES ingredient ID
ALPHA-LINOLENIC ACID (ALA)	ALPHA-LINOLENIC ACID	10000862
	OMEGA-3 (ALA)	10003041
DOCOSAHEXAENOIC ACID (DHA)	DHA (DOCOSAHEXAENOIC ACID)	10001271
	DOCOSAHEXAENOIC ACID (DHA)	10000121
EICOSAPENTAENOIC ACID (EPA)	EPA (EICOSAPENTAENOIC ACID)	10001311
	EICOSAPENTAENOIC ACID (EPA)	10000128

DSID-4 Data Files Description

Combined Data Files

This is a complete set of data files (available in Excel and Access) for MVMs and omega-3 fatty acid DS products, and includes tables 1 through 8.

Table 1. DSID-4 Statistical Results

This table lists regression equation parameter values that are based on analytical results for ingredients in the MVM and omega-3 DSID studies. A product category code indicates whether the row of parameters is for adult MVMs (01; 05), children's MVMs for serving sizes for ages 4 years and older (02), children's MVMs for serving sizes for ages 1 to <4 years (02A), non-prescription prenatal MVMs (03), omega-3 fatty acid products with data per serving (04), and per day (04A).

Predicted mean percent differences from label for each ingredient and standard errors (SE) at specific label levels within the regression range can be calculated using the information in this table. The equations for using these parameters are shown in the 'Example Calculations' document. This information is also provided on the second tab of the Excel file for Table 1.

For each equation, the intercept, linear and quadratic parameter values are listed. For use in estimating the SE, the cubic, quartic, quintic, sextic, septic, and octic parameter values are listed where applicable.

NOTE: The entire value for each parameter should be used during calculating regression results, because rounding these values produces results that may not match the numbers in Tables 2-8 and in the calculator.

Table 2. Predicted Ingredient Amounts

This table lists predicted ingredient mean values and SE based on the regression equation data in Table 1. In Table 2, DSID linking codes are provided that will apply these results to DS that meet the criteria specified (DS category, ingredient and labeled level). The labeled levels provided in Tables 3-8 reflect levels in DS reported in the NHANES DS files.

An example of the Table 2 format is illustrated below. Table 2 provides information on labeled levels (per serving) for specific ingredients in adult, children's and non-prescription prenatal MVMs and omega-3 fatty acid DS. A product category code is provided along each data record. Corresponding to each label level is the predicted mean value per serving calculated from the Table 1 regression data. The SE of the mean (SEM) and SE of an observation have also been calculated.

In Table 2, DSID linking codes are provided that allow the data in this file to link to data in Tables 3-8. The format for the linking codes is explained in Appendix C on the 'Data Files" page. The results for each DSID study are currently linked to a maximum of 3 NHANES cycles. If the fields for NHANES 2003-04, 2005-06, 2007-08, 2019-10, 2011-12 and 2013-14 are filled in with Y, then the linking code can be applied to one or more products reported in that cycle. If the field has an N, the study results are being applied to that cycle, but no products are reported with that ingredient at that labeled level. If the fields are blank, then those study results are not currently being applied to that NHANES cycle.

Table 2 is sorted first by DSID study category code in ascending order. Within the same study category code, data are sorted by DSID ingredient name by ascending alphabetical order. Within the same product and same ingredient, data are sorted by label amount per serving in ascending numerical order.

Table 2 Example:

	A	B	C	D	E	F	G	H	I	J	K	L
1	DSID Study Category Code	DSID Ingredient Name	NHANES Supplement Label Value per Serving	Unit per Serving	Predicted Mean Value per Serving	Standard Error of Predicted Mean Value	Standard Error of Predicted Observation Value	Predicted % Difference from Label for Predicted Mean	DSID Linking Code	NHANES 2003-04	NHANES 2005-06	NHANES 2007-08
2	01	CALCIUM	25	mg	32.3	1.3	3.9	29.3	3010025001030	Y	Y	Y
3	01	CALCIUM	26	mg	33.6	1.3	4	29.1	3010026001030	Y	N	N
4	01	CALCIUM	28	mg	36.1	1.4	4.3	28.8	3010028001030	N	Y	Y
5	01	CALCIUM	29	mg	37.3	1.4	4.5	28.7	3010029001030	N	Y	N
6	01	CALCIUM	30	mg	38.6	1.5	4.6	28.6	3010030001030	N	Y	Y
7	01	CALCIUM	31	mg	39.8	1.5	4.8	28.4	3010031001030	N	Y	Y
8	01	CALCIUM	32	mg	41.1	1.6	4.9	28.3	3010032001030	N	Y	N
9	01	CALCIUM	33	mg	42.3	1.6	5.1	28.2	3010033001030	N	N	Y
10	01	CALCIUM	33.3	mg	42.7	1.6	5.1	28.1	3010033301030	N	Y	N
11	01	CALCIUM	35	mg	44.8	1.7	5.4	27.9	3010035001030	Y	Y	Y
12	01	CALCIUM	39	mg	49.7	1.8	6	27.3	3010039001030	N	N	Y
13	01	CALCIUM	39.88	mg	50.7	1.8	6.1	27.2	3010039901030	Y	N	N
14	01	CALCIUM	40	mg	50.9	1.8	6.1	27.2	3010040001030	Y	Y	Y
15	01	CALCIUM	42	mg	53.3	1.9	6.4	26.9	3010042001030	Y	N	N

Table 3. DSID Codes applied to NHANES 2003-04

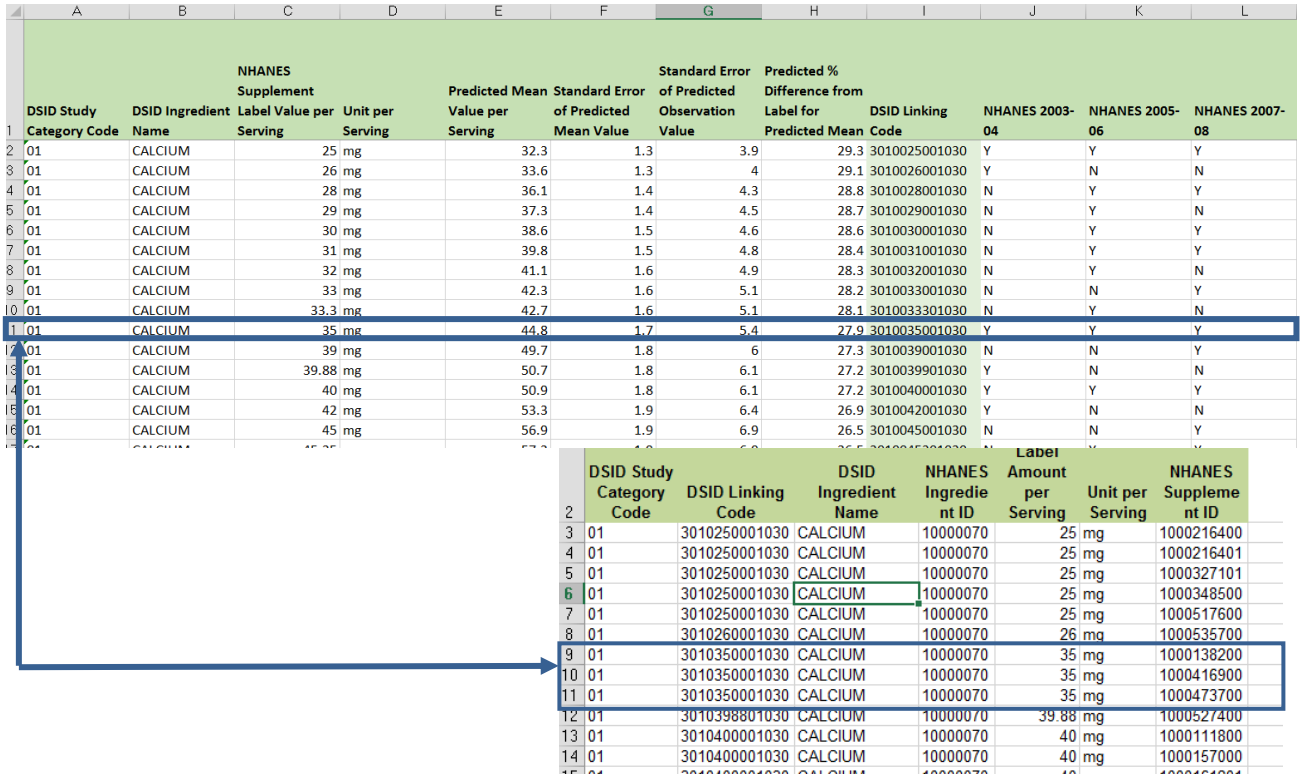
This table lists the NHANES 2003-04 supplement IDs, ingredient IDs and labeled ingredient levels which can be applied to DSID linking codes in Table 2. Only the adult MVM-1 data (category 01) are linked to NHANES 2003-04 DS records. The linking code is used to extract the appropriate predicted mean values per serving and SE from Table 2.

Tables 3-8 are all sorted in the same way: first sorted by DSID product category code in ascending order; within the same product category, records are sorted by DSID ingredient name in ascending alphabetical order; within the same ingredient name, records are sorted by label amount per serving in ascending numerical order.

Table 3 Example:

	A	B	C	D	E	F	G
1	DSID-3 Table 3 - DSID Applications to NHANES 2003-04						
2	DSID Study Category Code	DSID Linking Code	DSID Ingredient Name	NHANES Ingredient ID	Label Amount per Serving	Unit per Serving	NHANES Supplement ID
3	01	3010250001030	CALCIUM	10000070	25	mg	1000216400
4	01	3010250001030	CALCIUM	10000070	25	mg	1000216401
5	01	3010250001030	CALCIUM	10000070	25	mg	1000327101
6	01	3010250001030	CALCIUM	10000070	25	mg	1000348500
7	01	3010250001030	CALCIUM	10000070	25	mg	1000517600
8	01	3010260001030	CALCIUM	10000070	26	mg	1000535700
9	01	3010350001030	CALCIUM	10000070	35	mg	1000138200
10	01	3010350001030	CALCIUM	10000070	35	mg	1000416900
11	01	3010350001030	CALCIUM	10000070	35	mg	1000473700
12	01	3010398801030	CALCIUM	10000070	39.88	mg	1000527400
13	01	3010400001030	CALCIUM	10000070	40	mg	1000111800
14	01	3010400001030	CALCIUM	10000070	40	mg	1000157000

The following diagram illustrates the relationship between Table 2 and Table 3:



	A	B	C	D	E	F	G	H	I	J	K	L
1	DSID Study Category Code	DSID Ingredient Name	NHANES Supplement Label Value per Serving	Unit per Serving	Predicted Mean Value per Serving	Standard Error of Predicted Mean Value	Standard Error of Predicted Observation Value	Predicted % Difference from Label for Predicted Mean	DSID Linking Code	NHANES 2003-04	NHANES 2005-06	NHANES 2007-08
2	01	CALCIUM	25	mg	32.3	1.3	3.9	29.3	3010025001030	Y	Y	Y
3	01	CALCIUM	26	mg	33.6	1.3	4	29.1	3010026001030	Y	N	N
4	01	CALCIUM	28	mg	36.1	1.4	4.3	28.8	3010028001030	N	Y	Y
5	01	CALCIUM	29	mg	37.3	1.4	4.5	28.7	3010029001030	N	Y	N
6	01	CALCIUM	30	mg	38.6	1.5	4.6	28.6	3010030001030	N	Y	Y
7	01	CALCIUM	31	mg	39.8	1.5	4.8	28.4	3010031001030	N	Y	Y
8	01	CALCIUM	32	mg	41.1	1.6	4.9	28.3	3010032001030	N	Y	N
9	01	CALCIUM	33	mg	42.3	1.6	5.1	28.2	3010033001030	N	N	Y
10	01	CALCIUM	33.3	mg	42.7	1.6	5.1	28.1	3010033301030	N	Y	N
11	01	CALCIUM	35	mg	44.8	1.7	5.4	27.9	3010035001030	Y	Y	Y
12	01	CALCIUM	39	mg	49.7	1.8	6	27.3	3010039001030	N	N	Y
13	01	CALCIUM	39.88	mg	50.7	1.8	6.1	27.2	3010039901030	Y	N	N
14	01	CALCIUM	40	mg	50.9	1.8	6.1	27.2	3010040001030	Y	Y	Y
15	01	CALCIUM	42	mg	53.3	1.9	6.4	26.9	3010042001030	Y	N	N
16	01	CALCIUM	45	mg	56.9	1.9	6.9	26.5	3010045001030	N	N	Y

2	DSID Study Category Code	DSID Linking Code	DSID Ingredient Name	NHANES Ingredient ID	Label Amount per Serving	Unit per Serving	NHANES Supplement ID
3	01	3010250001030	CALCIUM	10000070	25	mg	1000216400
4	01	3010250001030	CALCIUM	10000070	25	mg	1000216401
5	01	3010250001030	CALCIUM	10000070	25	mg	1000327101
6	01	3010250001030	CALCIUM	10000070	25	mg	1000348500
7	01	3010250001030	CALCIUM	10000070	25	mg	1000517600
8	01	3010260001030	CALCIUM	10000070	26	mg	1000535700
9	01	3010350001030	CALCIUM	10000070	35	mg	1000138200
10	01	3010350001030	CALCIUM	10000070	35	mg	1000416900
11	01	3010350001030	CALCIUM	10000070	35	mg	1000473700
12	01	3010398801030	CALCIUM	10000070	39.88	mg	1000527400
13	01	3010400001030	CALCIUM	10000070	40	mg	1000111800
14	01	3010400001030	CALCIUM	10000070	40	mg	1000157000

For the three products in NHANES 2003-04 identified (in Table 3) as adult MVMs with calcium labeled at 35 mg/serving, the linking code can be used to identify the DSID predicted mean analytical estimate and SE (44.8 ± 1.7) in Table 2.

Table 4. DSID Codes for NHANES 2005-06

This table lists the NHANES 2005-06 supplement IDs, ingredient IDs and labeled ingredient levels which can be applied to DSID linking codes in Table 2. A study category code indicates whether the data record is for adult MVMs (01), children's MVMs (02) or omega-3 fatty acid products (04). The linking code is used to extract the appropriate predicted mean values per serving and SE from Table 2.

Table 5. DSID Codes for NHANES 2007-08

This table lists the NHANES 2007-08 supplement IDs, ingredient IDs and labeled ingredient levels which can be applied to DSID linking codes in Table 2. A study category code indicates whether the data record is for adult MVMs (01), children's MVMs (02), non-prescription prenatal MVMs (03) or omega-3 fatty acid products (04). The linking code is used to extract the appropriate predicted mean values per serving and SE from Table 2.

Table 6. DSID Codes for NHANES 2009-10

This table lists the NHANES 2009-10 supplement IDs, ingredient IDs and labeled

ingredient levels which can be applied to DSID linking codes in Table 2. A study category code indicates whether the data record is for children's MVMs (02), non- prescription prenatal MVMs (03), omega-3 fatty acid products (04) or adult MVM-2 (05).
The linking code is used to extract the appropriate predicted mean values per serving and SE from Table 2.

Table 7. DSID Codes for NHANES 2011-12

This table lists the NHANES 2011-12 supplement IDs, ingredient IDs and labeled ingredient levels which can be applied to DSID linking codes in Table 2. A study category code indicates whether the data record is for non-prescription prenatal MVMs (03) or adult MVM-2 products (05). The linking code is used to extract the appropriate predicted mean values per serving and SE from Table 2.

Table 8. DSID Codes for NHANES 2013-14

This table lists the NHANES 2013-14 supplement IDs, ingredient IDs and labeled ingredient levels which can be applied to DSID linking codes in Table 2. Only the adult MVM-2 data (category 05) are linked to NHANES 2013-14 DS records.). The linking code is used to extract the appropriate predicted mean values per serving and SE from Table 2.

Appendix A. DSID-4 Ingredients and Units

This reference table lists the vitamins, minerals and omega-3 fatty acids analyzed in the DSID studies. Also reported are ingredient names, abbreviations and units for the DSID, NHANES, USDA Standard Reference and the Food and Agriculture Organization (FAO).

Appendix B. DSID-4 Product Categories

This reference table defines the dietary supplement study category codes in the DSID release and the NHANES cycles applied for each product category.

Appendix C. DSID-4 Linking Code Schematic

A description of how the linking codes are assigned and how ingredient levels are adjusted.

Applications of DSID-4 Data

These release files are intended primarily for researchers estimating ingredient intake from surveys of reported dietary supplement use. The DSID data are reported by ingredient type and ingredient level for each product category. When applying the regression results, the predicted mean values are used to estimate the actual content of a supplement at a specific label level. For example, children's MVM products with a label level of 400 mcg of folic acid are estimated to contain, on average, 17.5% more than the labeled amount (470 ± 15 mcg/serving; mean ± SEM). The standard errors reported are indicators of the variability expected based on the analysis of representative supplement products in DSID studies.

Since many researchers obtain dietary supplement information from NHANES and track supplements and ingredients using NHANES ID numbers, NDL provides file formats with codes that are compatible with NHANES data so that users can merge DSID-4 data with NHANES data. For example, users may want to map DSID-4 data in Tables 2-8, which show predicted values for calcium in MVMs at specific label levels, to relevant NHANES products at the same label levels, so that the data can be used to better estimate the US population's calcium intake from MVM supplements and food.

DSID data are linked to the NHANES cycles corresponding most closely to the purchase of products for each study (currently, a maximum of 3 NHANES cycles per study).

Important Points to Remember for DSID-4

1) There are now 2 adult MVM datasets (categories 01 and 05) and the results are applied to different NHANES cycles.

2) For the first time, we report pilot study data for botanical DS. Three data tables with results for catechin and caffeine levels in green tea DS are reported with the research summary, available on the 'Data Files' page and on the 'Botanicals" page.