

Second Release of the DSID: Children's multivitamin/minerals (MVMs) results

Karen Andrews, Janet Roseland, Joanne Holden, Angela Middleton,
Ashley Solomon, Joel Palachuvattil, Johanna Dwyer, Regan Bailey, Leila
Saldanha, Larry Douglass

Nutrient Data Laboratory, BHNRC, ARS, USDA
Office of Dietary Supplements, NIH
Statistical Consultant, University of Maryland



The screenshot shows the home page of the Dietary Supplement Ingredient Database (DSID). At the top left is the logo for the Office of Dietary Supplements, National Institutes of Health. At the top right is the USDA logo. The main heading is "Dietary Supplement Ingredient Database". Below this is a navigation bar with links for Home, FAQ, Glossary, Contact, and Help. On the left side, there is a sidebar menu with categories: DSID RESEARCH AND DATA, ABOUT DSID, WHAT'S NEW, DATA FILES AND DOCUMENTATION, CALCULATORS, and PUBLICATIONS AND PRESENTATIONS. The main content area contains a welcome message and two paragraphs of text. The first paragraph describes the DSID's purpose and development. The second paragraph describes the second release of the DSID, which includes data for children's MVM products. A red text box at the bottom of the page contains the URL [//dietarysupplementdatabase.usda.nih.gov](http://dietarysupplementdatabase.usda.nih.gov).

Dietary Supplement Ingredient Database (DSID 2.0):

- **Provides national estimates of vitamin and mineral levels in Children's and Adult MVM products.**
- **DSID 2.0 replaces adult MVM data for selected ingredients from DSID 1.0.**

Collaboration with:

- **Office of Dietary Supplements (NIH)**
- **Food Composition Laboratory (USDA,ARS)**
- **National Center for Health Statistics (NCHS/CDC)**
- **the Food and Drug Administration (FDA)**
- **the National Institute of Standards and Technology (NIST)**

Goals of the DSID

- To develop reliable estimates of nutrients and other bioactive components in dietary supplement products**
- To support improved dietary intake assessments in research by providing analytical estimates of the ingredient content of marketed dietary supplements**
- To release and maintain a publicly available on-line composition database**

DSID Studies

- Laboratory and Methods Pilot Study¹**
Identify methods of analysis and labs qualified to analyze nutrients in dietary supplements
- Common Level Pilot Study**
Assess variability in adult MVMs at common labeled levels
- Caffeine Study²**
Assess caffeine content in selected dietary supplements
- Adult MVM Study**
Assess nutrient content and variability in children's MVMs
- Children's MVM Study**
Assess nutrient content and variability in adult MVMs

¹Roseland JM, et al (2008) Food Comp Anal 21:S69-S77

²Andrews KW, et al (2007) Anal Bioanal Chem 389:231-239

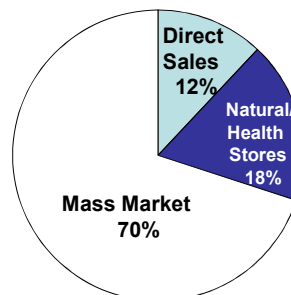
Children's MVM* Sampling Plan

Identification of products

NHANES 2003-04 and 2005-06 and other surveys

Sampled in NFNAP gCMSAs

Multiple lots of 64 products purchased from retail nationally and from direct channels



*Children's MVM defined as containing 3 or more vitamins

Protocols To Assess Quality of Analytical Results:

- ❑ Samples repackaged and sent for laboratory analysis in defined batches
- ❑ Analytical methods optimized for various matrices
- ❑ Quality Control Samples sent in each batch:
 - Blind duplicates
 - Standard Reference material (NIST SRM 3280)
 - In-house control materials



Children's MVM Labeling

Supplement Facts		
Serving Size	1/2 Tablet	1 Tablet
Servings Per Container	200	100
Amount Per Tablet	%DV for Children 2 and 3 years (1/2 Tablet)	%DV for Children 4 years and older (1 Tablet)
Calories 5	*	*
Total Carbohydrate <1 g	*	<1%
Sugars <1 g	*	*
Vitamin A 3,500 IU (28% as Beta-Carotene)	70%	70%
Vitamin C 60 mg	75%	100%
Vitamin D 400 IU	50%	100%
Vitamin E 36 IU	150%	100%
Vitamin K 10 mcg	*	13%
Thiamin 1.5 mg	107%	100%
Riboflavin 1.7 mg	106%	100%

45/64 products were labeled for both 1 to <4 year olds and ages 4 and older.

Two Datasets for Regression

4 years and older (n=59 Products)

- ❑ Determined to be the primary data set for applying regression analysis results to products
- ❑ Most common age group for Children's MVMs purchased
- ❑ Most products (45/64) contained serving sizes for both 4 years and older and 1>4 years. The analytical results for all 45 of these products are in both datasets.
- ❑ NHANES record only one serving size per product. In most cases the larger serving size is used.

Ages 1 TO <4 years (n=50 Products)

- ❑ Evaluated to look for significant differences
- ❑ Contains lower labeled levels so may be useful for extending regression range estimates

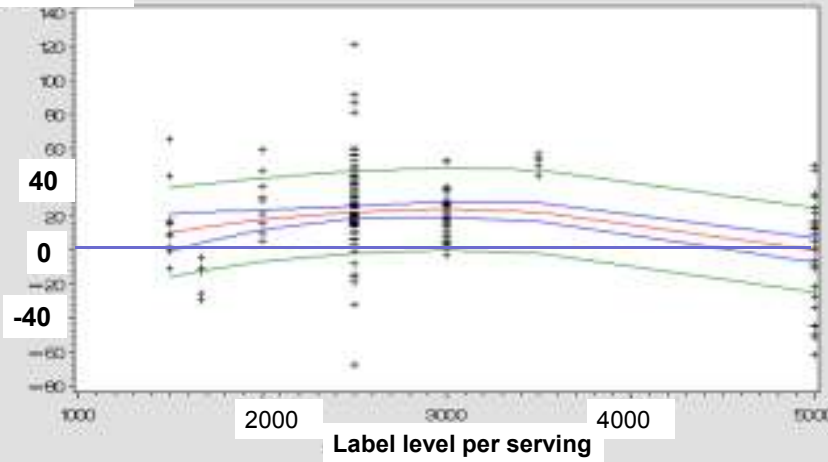
Summary of Data Evaluation

- ❑ Laboratory results calculated as percent difference from label and statistically evaluated per ingredient (Regression analyses n=16)
- ❑ Data weighted by market share
- ❑ Mean predicted % difference from label and SE determined
- ❑ Descriptive statistics were reported for chromium, manganese, potassium, and selenium

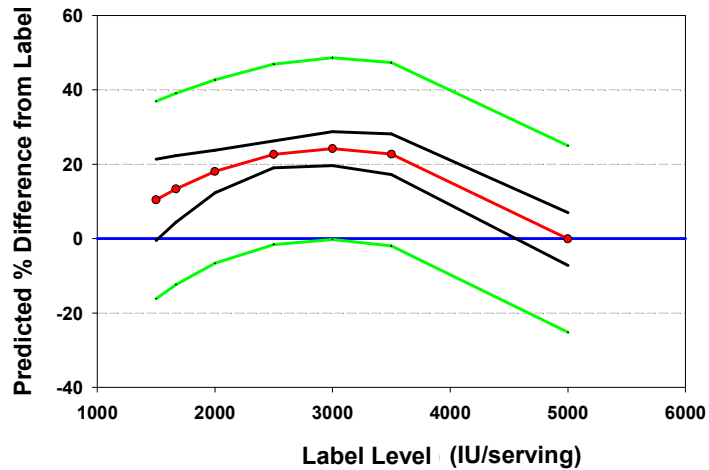
Vitamin A in Children's MVMs

+ = Observed data, Red = Prediction line, Blue = Mean Pred StErr belts, Green = Obs Pred StErr belts
 84 Observations and 85 Lots on 59 Products
 Supplement(s) deleted by Label Range Rule (*)
 Influential Supplement(s) (*) deleted

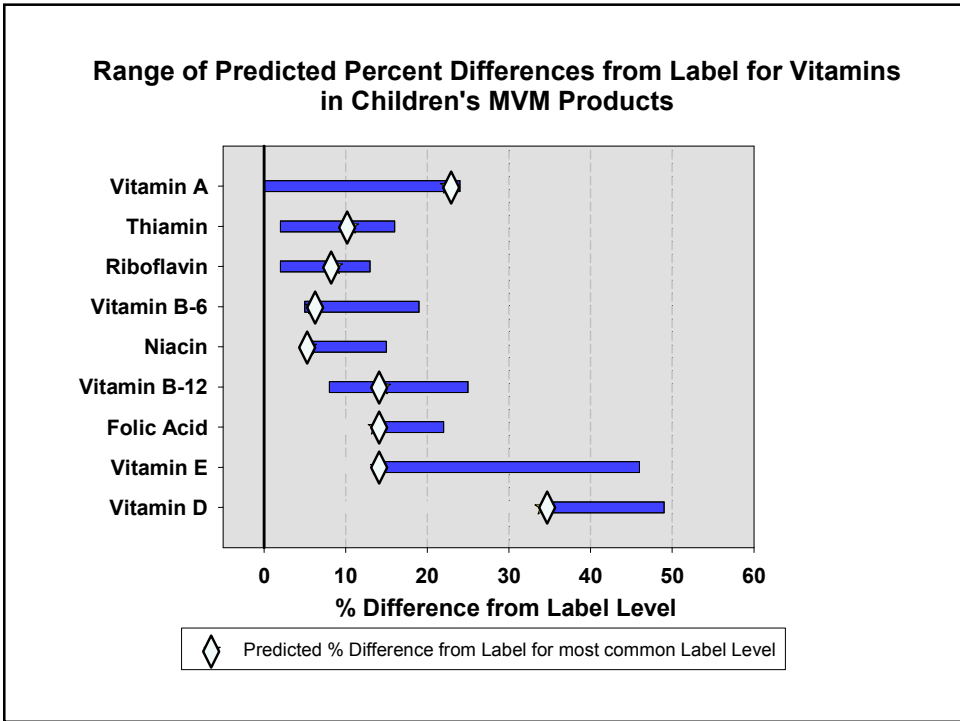
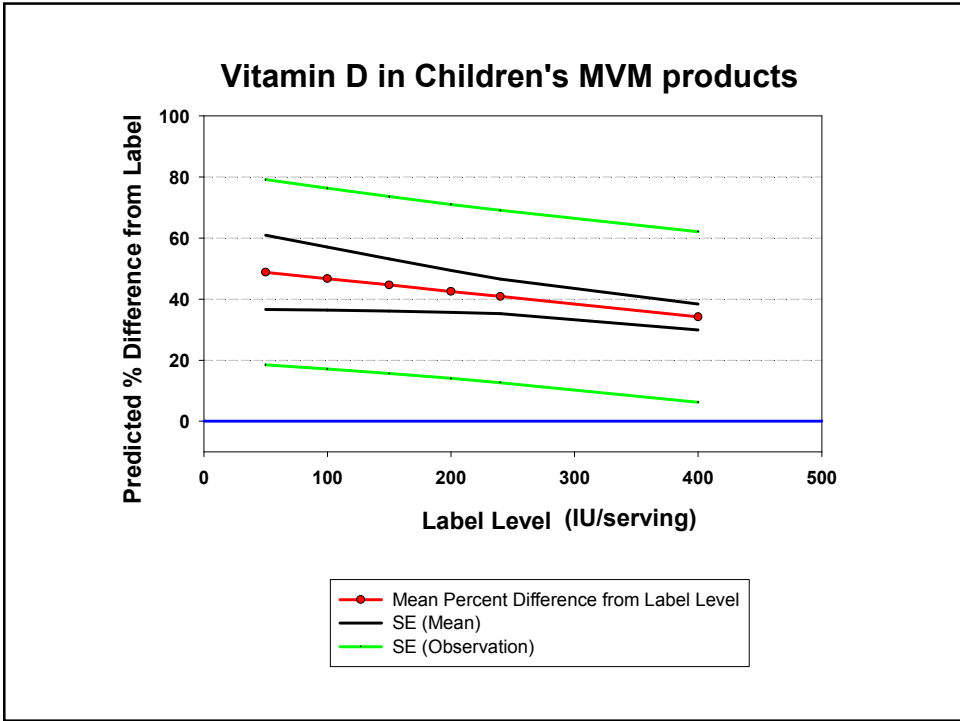
Pct Diff from Label



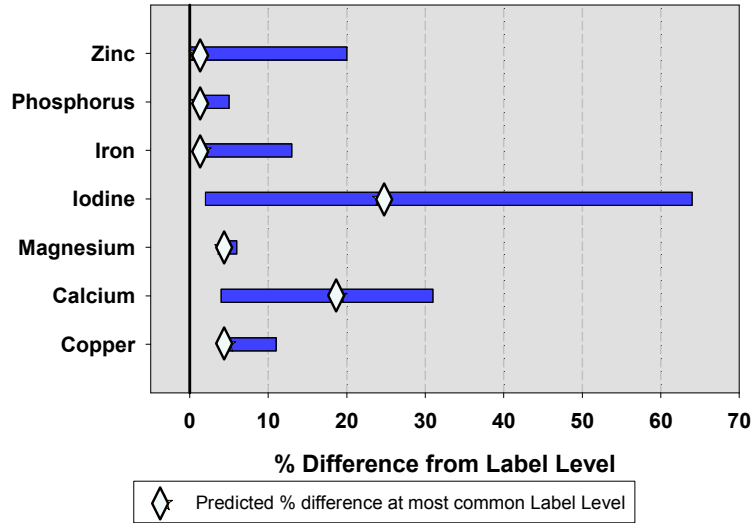
Vitamin A in Children's MVM products




● Mean Percent Difference from Label Level
— SE (Mean)
— SE (Observation)




Range of Predicted Percent Differences from Label for Minerals in Children's MVM Products





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RESEARCH SUMMARIES

Summary information about the research studies that support the DSID-2 release is reported in the three documents listed below. More detailed discussions of the adult and children's MVM studies are being prepared for publication in the scientific literature.

Summaries for specific areas of DSID research can be downloaded below:

- [Background Information and Pilot Study Research Summary \(PDF - 112KB\)](#)
- [Adult MVM Research Summary \(PDF - 130KB\)](#)
- [Children's MVM Research Summary \(PDF - 146KB\)](#)

Note: Documents in PDF format require the [Adobe Reader®](#). If you experience problems with PDF documents, please download the latest version of the Reader®.

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DSID-2 Data File Description

The second release of the Dietary Supplement Ingredient Database (DSID-2), reports national estimates for ingredient levels in children's and adult multivitamin/mineral (MVM) supplements. For a detailed explanation of each data file and the relationships between the files, see the document, [DSID-2 Data File Description \(PDF - 394 KB\)](#)

DSID-2 Data Files

Note: DSID-2 Data Files for adult MVMs replace DSID-1 files

A brief description of each file is listed below with individual links to the data files. A category column indicates whether the data record is for adult MVMs (01) or children's MVMs (02). Combined data files that include all tables are available for download in MS Excel 2003 and Access 2003 formats. Individual files are available for download in MS Excel 2003 and SAS formats.

DSID Data Files and NHANES Applications	Description and Download Links
DSID-2 Combined Data Files	Includes all tables below in one file. Formats: Excel (2.85 MB) Access (3.75 MB)
DSID-2, Table 1 - DSID Statistical	Parameter values derived from regression equations for specific ingredients in adult and children's MVM products. See Example Calculations for information about how to apply the equation data. SAS (1.7 KB) Excel (36 KB)

DSID Data Files and NHANES Applications	Description and Download Links
DSID-2 Combined Data Files	Includes all tables below in one file. Formats: Excel (2.85 MB) Access (3.75 MB)
DSID-2, Table 1 - DSID Statistical Results	Parameter values derived from regression equations for specific ingredients in adult and children's MVM products. See Example Calculations for information about how to apply the equation data. SAS (1.7 KB) Excel (56 KB)
DSID-2, Table 2 - Predicted Ingredient Amounts	Predicted ingredient amounts and standard errors based on regression analysis with linking codes applicable to NHANES dietary supplement label data. SAS (1.33 KB) Excel (281 KB)
DSID-2, Table 3 - DSID Applications to NHANES 2003-04	Application of data from Table 2 to ingredient levels in MVM supplements in NHANES 2003-04 files. SAS (401 KB) Excel (849 KB)
DSID-2 Table 4 - DSID Applications to NHANES 2005-06	Application of data from Table 2 to ingredient levels in MVM supplements in NHANES 2005-06 files. SAS (521 KB) Excel (985 KB)
DSID-2 Table 5 - DSID Applications to NHANES	Application of data from Table 2 to ingredient levels in MVM supplements in NHANES 2007-08 files. SAS (505 KB) Excel (948 KB)

Table 1 DSID Statistical Results

DSID-1 Table 1 - DSID Statistical Results

DSID Product Category Code	DSID Ingredient Name	DSID Unit	Minimum Label Value in Repetition Range	Maximum Label Value in Repetition Range	Parameters for the Predicted Mean Value			Parameters for the Predicted Standard Error					
					Predictor of the Mean Interval	Predictor of the Mean Linear	Predictor of the Mean Quadratic	SE of the Predicted Mean Interval	SE of the Predicted Mean Linear	SE of the Predicted Mean Quadratic	SE of the Predicted Mean Cubic	SE of the Predicted Mean Quartic	SE of the Predicted Mean Quintic
01	Vitamin B-12	mcg/Serving	1	100	8.8840798	-0.00112788	0	3.71889720	0.07150780	0.00100707	0.00220188	0	0
01	Vitamin B-6	mg/Serving	1	100	5.29593274	-0.46102098	0.06493371	2.04781124	0.14515810	0.01000729	-0.00078811	0.00792018	0.000
01	Vitamin C	mg/Serving	8	1000	8.01833378	0.00020281	0	1.30791087	0.02000827	0.02007018	0.01210188	0.0000112	0.000
01	Vitamin E	I.U./Serving	8	1000	6.17818088	-0.01171928	0	2.14814020	0.01417378	0.01770008	0.11200010	-0.00076167	1.000
01	Zinc	mg/Serving	0.629	80	0.00881150	-0.00025248	0	1.81078000	0.00000242	0.01000000	0.00000000	-1.00000000	0.000
02	Calcium	mg/Serving	20	300	34.1837779	-0.11000000	0	3.00000000	0.00000000	0.00000000	1.00000000	-1.00000000	0.000
02	Copper	mg/Serving	0.05	2	0.00000000	-0.00000000	0	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.000
02	Folic Acid	mg/Serving	200	400	20.00000000	-0.00000000	0	10.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.000
02	Iron	mg/Serving	10.5	100	30.00000000	-0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	-2.00000000	1.000
02	Iodine	mg/Serving	2	10	14.00000000	-0.00000000	0	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.000
02	Magnesium	mg/Serving	8	80	3.00000000	-0.00000000	0	2.71000000	0.00000000	0.00000000	-0.00000000	0.00000000	0.000
02	Manganese	mg/Serving	2.5	20	12.00000000	-0.00000000	0.00000000	1.00000000	-0.00000000	0.00000000	0.00000000	0.00000000	-0.000
02	Phosphorus	mg/Serving	90	100	7.00000000	-0.00000000	0	4.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.000
02	Selenium	mg/Serving	1	2.2	0.00000000	-0.00000000	0	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.000
02	Thiamin	mg/Serving	0.75	2	0.00000000	-0.00000000	0	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.000
02	Vitamin B-1	I.U./Serving	1500	5000	0.00000000	-0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.000
02	Vitamin B-12	mcg/Serving	1	8	0.00000000	-0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.000
02	Vitamin B-6	mg/Serving	0.5	5	0.00000000	-0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.000

Table 2. Predicted Ingredient Amounts

DSID Product Category Code	Ingredient	Label Amount per Serving	Unit	Predicted Mean Value per Serving	Predicted Mean Value per Serving SEM	Predicted Mean Value per Serving SE Individual	Predicted % Difference from Label for Predicted Mean	NHANES 2003-04 DSID Linking Code	NHANES 2005-06 DSID Linking Code	NHANES 2007-08 DSID Linking Code
01	ICDME	60	mg	75.6	3.6	12	26		3140600001000	
01	ICDME	63	mg	79.4	3.7	13	26	31406300001000		
01	ICDME	75	mg	94.6	3.8	15	26	31407500001000	3140750001000	33407500011000
01	ICDME	76	mg	95.8	3.8	16	26		3140760001000	
01	ICDME	90	mg	114	3.7	18	26	31409000001000		33409000011000
02	ICDME	67.5	mg	74.2	5.4	18	9.9		31406750001000	
02	ICDME	70	mg	76.1	5.8	18	8.7		31407000001000	33407000011000
02	ICDME	75	mg	79.9	6.5	20	6.3		31407500001000	33407500011000
02	ICDME	76	mg	80.7	6.6	20	6.1		31407600001000	

Table 3. NHANES 03-04 Applications

DSID Product Category Code	NHANES 2003-04 DSID Linking Code	Ingredient	NHANES Ingredient ID	Label Amount per Serving	Unit	NHANES Supplement ID
01	3140630001020	IODINE	10000191	63	mcg	1000135800
01	3140750001020	IODINE	10000191	75	mcg	1000515700
01	3140750001020	IODINE	10000191	75	mcg	1000527300
01	3140750001020	IODINE	10000191	75	mcg	1000529900
01	3140900001020	IODINE	10000191	90	mcg	1000378001
01	3141000001020	IODINE	10000191	100	mcg	1000510800
01	3141000001020	IODINE	10000191	100	mcg	1000490300
01	3141000001020	IODINE	10000191	100	mcg	1000525200
01	3141125001020	IODINE	10000191	112.5	mcg	1000556100
01	3141125001020	IODINE	10000191	112.5	mcg	1000172000

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Children MVM Calculator Home Page

The children's multivitamin/mineral (MVM) calculator is a web-based research tool that reports national estimates for 16 ingredients in children's MVMs. Labeled ingredient amounts for specific children's MVM products can be entered into the on-line calculator and the predicted values will be calculated. These values can be saved to build a small database or add to an existing database for national, regional or local dietary intake studies. The calculator uses data from the DSID-2.


The children's MVM calculator is available in 2 versions. The 'Ages 4 and Older' version is appropriate for most uses. The 'Ages 1 to < 4' version can be used for studies of supplement use in this age group.

NOTE: The predicted mean value per serving for each ingredient is calculated using a regression equation for that ingredient. For additional information on children's MVM research and the statistics supporting the calculator, use the website's Research Summaries and Data Files links on the left side of this page.

[Children's MVM Calculator Instructions](#)


[Start the Children MVM Calculator](#)

Children's MVM Calculator



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Children Multivitamin/mineral Calculator for Ages 4 and Older

[Switch to Children Age 1 to 4](#) | [Restore Default](#) | [Conversions](#) | [Save](#) | [View Saved](#) | [Help \(FAQ\)](#)

Select Values to Save	Ingredient in DSID (Common Synonyms)	Labeled Amount Per Serving (Valid Range for Prediction)	Predicted Mean Value Per Serving	Standard Error for Predicted Mean	Standard Error for Predicted Observation	% Difference From Label for Predicted Mean
<input type="checkbox"/>	TOTAL VITAMIN A	2500 IU (1500 - 5000)	3070 IU	90	610	23%
<input checked="" type="checkbox"/>	VITAMIN D	50 IU (50 - 400)	74.4 IU	6.1	15	49%
<input type="checkbox"/>	THIAMIN (vitamin B-1)	1.3 mg (0.75 - 2)	1.66 mg	0.041	0.23	11%
<input type="checkbox"/>	RBOFLAVIN (vitamin B-2)	1.7 mg (1.1 - 2.1)	1.85 mg	0.034	0.19	8.6%

Nutrient	Label	Predicted	SE Pred. Mean	SE Pred. Obs.	% Diff. From Label
Vitamin D	50 IU	74.4 IU	6.1	15	49%

DSID-2 Release Features

- Tables with parameter values for regression equations: Adult and Children's MVMs
- Application tables to NHANES DS products
- Excel spreadsheets of files
- Downloadable MS Access database
- Documentation of analytical studies, statistical approaches and research applications
- MVM Calculators

Current DSID Studies

- ❑ Omega-3 (n-3) Fatty Acid Supplements
- ❑ Over-the-counter Prenatal MVMs
- ❑ Adult MVM-2 (vit. D, vit. A, chromium, iodine)

[//dietarysupplementdatabase.usda.nih.gov](http://dietarysupplementdatabase.usda.nih.gov)



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Updates to Adult MVM results in DSID-2*

- ❑ Lower Thiamin and Vitamin B-6 levels in regression predictions due to conversion from HCL to the free form of the vitamins
- ❑ Optimized statistical calculations to separate lot and sample variance
- ❑ Added application table to NHANES 2007-08 data
- ❑ Modifications to the format for DSID linking codes in Tables 2-5

*Users of these data should update their data files using the DSID-2 files, because the DSID-2 data replace the DSID-1 data.