National Health and Nutrition Examination Survey

1999-2020 Data Documentation, Codebook, and Frequencies

Dietary Supplement Database - Ingredient Information (DSII)

Data File: DSII.xpt

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Component Description

The NHANES Dietary Supplement Database (NHANES-DSD) contains detailed information on the dietary supplements (DS) and non-prescription antacids containing calcium and/or magnesium (antacids) reported by survey participants since NHANES 1999. The NHANES-DSD release consists of three datasets containing information on the following: Dietary Supplement Product Information (DSPI), Dietary Supplement Ingredient Information (DSII), and Dietary Supplement Blend Information (DSBI).

Dietary supplement information from the in-house NCHS Product Label Database (PLD) is publicly released in three files that make up the NHANES-DSD. These files incorporate all products that have been reported by respondents since 1999 from the PLD. With subsequent releases, new products reported will be appended to the NHANES-DSD files.

The in-house PLD database is maintained by NCHS nutritionists. NCHS attempts to obtain a product label for all dietary supplements or antacids reported by participants from sources such as the manufacturer or retailer, the Internet, company catalogs, and the Physician's Desk Reference (PDR). Label information has also been obtained from the Dietary Supplement Label Database (DSLD), which is a joint project of the National Institutes of Health (NIH) Office of Dietary Supplements (ODS) and National Library of Medicine (NLM). The DSLD contains the full label contents from a sample of dietary supplement products marketed in the U.S. Selected label information is then entered into the PLD including, but not limited to: supplement name; manufacturer and/or distributor; serving size; form of serving size; and ingredients and amounts. The ingredient information entered into the database is taken directly from the supplement facts box on the label or carton. The PLD is used to assist with data editing and then publicly released in the data files (DSPI, DSII, and DSBI).

In addition to entering labels into the PLD database, NCHS created generic and default dietary supplements and antacids, which are also maintained in the database. Generics were created in the database when we had information about a reported supplement, such as the strength of all ingredients, but no brand name. These were generally single ingredient supplements, which included a strength (e.g., vitamin C 500 mg) or multiple vitamins and/or mineral supplements made by a private label manufacturer that was known to us and for which we had a label with identical ingredients and strengths (e.g., brand X all-purpose multivitamin was reported, and we had a label for brand Y, made by the same manufacturer). When all ingredient strengths were unknown, a default supplement was created in the database. Defaults were created for single ingredient and multiple ingredient supplements based on our own data of most frequently reported supplements of that type, based on the survey cycle in which the data was collected. Created default products and the actual products or strengths that were assigned to these defaults are listed in the documentation for the files associated with participants' use of dietary supplements, located on the NHANES website under the dietary data links.

In 2019, the application used to manage and access NHANES dietary supplement product database was updated to adapt to the .NET environment. This resulted in the new structure of dietary supplement identifiers. Variables DSDPID, DSDIID, DSDBID were added to indicate the updated supplement ID, ingredient ID, and blend component ID, respectively. The variables DSDSUPID, DSDINGID, and DSDBCID now indicate the old versions for supplement ID, ingredient ID, and blend component ID, respectively. In addition, six new variables were included to provide information on supplement reformulations: DSDPRDT,

DSDPREID, DSDORGID, DSDSGPF, DSDSEQF, DSDLINRF to indicate the product type, previous product ID, original product ID, sequential group formulation, sequential formulation, and linear formulation, respectively.

Data Processing and Editing

The in-house PLD was used for processing and editing of the dietary supplement data since 1999.

Variables pulled directly from the in-house PLD

DSDSUPP: Name of Supplement
This is the name from the front of the product label. The brand name is generally entered first (i.e., Nature's Way) and then the actual product name (i.e., lutein). Information such as the strength (i.e., 60 mg extract) of the product and other qualifiers that help distinguish a product from a similar product (i.e., mega, super, high potency, time release, chewable, extract) are also listed if they are on the front of the product label. Words like "dietary supplement" and "health claims" are not entered as part of the name.

DSDPID: Supplement ID Number
New Supplement ID is a unique number assigned to each product entered in the inhouse PLD.

DSDPRDT: Product Type
If the supplement was entered by NCHS as a regular product, it is equal to 1. If the supplement was created by NCHS as a generic product, it is equal to 2. Otherwise, if the supplement was created by NCHS as a default product, it is equal to 3. Previous Variable DSDGENRC was replaced by code "2" in DSDPRDT.

DSDSUPID: Supplement ID Number-Old version
Old Supplement ID is a 10-digit identifier assigned to each product entered into the in-house PLD. All identifiable products have a supplement ID beginning with the number "1". The next 3 digits (positions 2-4) are "888" or "881" if the supplement was created by NCHS as a generic or default product; otherwise the digits in positions 2-4 are coded "000" or "001". The next 4 digits (positions 5-8) are sequentially assigned by the system for each product. The last 2 digits (positions 9-10) indicate formulations of the same supplement: the first formulation entered into the database = 00, the first reformulation = 01, the next = 02, etc. Note that these are reformulations of the same product. Different versions of products (e.g., liquid vs. tablet, with iron vs. without iron, regular vs. high potency) are considered as different products thus have different 4-digit numbers in positions 5 to 8. When a product name was entered as "no product information available," "refused," or "don't know," its ID number starts with a string of 6s.

DSDSRCE: Supplement Information Source
The source of each product label is recorded into the PLD. Generic and default products do not have a source code.

DSDTYPE: Supplement Type
The type of supplements is recorded into the database. The supplement types are: infant/pediatric, prenatal, mature, or standard . Products are coded as infant/pediatric when the product name states "infant, children, child, or kid/s" or has an indication in the title, label, or the form (e.g., animal shapes) of the supplement that it is intended for children. If this is not the case, but the suggested dose or directions indicate dosage for children only, then the code is infant/pediatric, but if dosages for adults are also included, then the product is coded as standard. Products are coded as "Prenatal" when the product name states prenatal or a derivative of this name or has an indication in the title or label that it is intended for pregnant women. If this is not the case, but the suggested dosage or directions indicate dosage for pregnant women only, the product is coded as a prenatal, but if dosages for non-pregnant adults are also included, the product is coded as standard. Products are coded as "mature" when the product name or label includes words such as "mature, senior, geriatric, post-menopausal, or silver" or indicates with other words that it is intended for individuals 50 years and over. All other products are coded as "standard".

DSDSERVQ: Serving Size Quantity
This is the "serving size quantity," which is recorded from the product label's supplement facts panel for which the nutrient amounts are based on.

DSDSERVU: Serving Size Unit
This is the “serving size unit,” which is recorded from the product label’s supplement facts panel.

DSDPREID: Previous product ID
This represents the parent product from which this current product was derived.

DSDORGID: Original product ID
This represents the original or root product from which this formulation or product was derived.

DSDSGPF: Sequential group formulation
This represents the sequential order of creation from the original product within the group of identical product types.

DSDSEQF: Sequential formulation
This represents the sequential order of creation from the original product.

DSDLINRF: Linear formulation
This represents the direct line of descendancy order of creation from the original product. For example- original product being level 1, a product derived from original level 1 product being level 2 and a product derived from the level 2 product being level 3, and so on.

DSDIID: Ingredient ID
This is the new unique ingredient ID created by the PLD for each ingredient recorded from the product label’s supplement facts panel.

DSDINGID: Ingredient ID-Old version
This is the old unique ingredient ID created by the PLD for each ingredient recorded from the product label’s supplement facts panel.

DSDINGR: Ingredient Name
Ingredient names are recorded from the product label’s supplement facts panel.

DSDOPER: Ingredient Operator
This is a symbol =, <, or > that comes from the product label’s supplement facts panel.

DSDQTY: Ingredient Quantity
Ingredient quantity is recorded for each ingredient listed from the product label’s supplement facts panel. Some nutrient amounts are for a nutrient compound (generally a foreign-made product or an antacid) and these must be converted to an elemental nutrient amount (See Appendix 2 for recommended conversions).

DSDUNIT: Ingredient Unit
Ingredient unit is recorded for each ingredient listed from the product label’s supplement facts panel.

NHANES dietary supplement files have vitamin A and E expressed in different units based on what was reported on the product label’s supplement facts panel. Vitamin E may be reported in International Units (IU) or micrograms (µg). Vitamin A may be reported as International Units (IU) or as micrograms (µg) of retinol activity equivalents (RAE). Users should be aware of changes in dietary supplement labeling and are advised to use appropriate unit conversions, Unit Conversions.

DSDCAT: Ingredient Category
There are ingredient categories: Vitamin, Mineral, Botanical, Others, Amino Acid. These are assigned by NCHS staff. (Please see Appendix 1: Rules for Classifying Ingredients.)

DSDBCNAM: Blend Component Name
These are the ingredient names found within a blend. Blends in products will not give the actual breakdown of ingredient quantities in the blend. The ingredients will usually just be listed, and most of the time a total blend amount is given. The blend ingredients are released in file DSBI.

DSDBID: Blend Component ID
These are new unique ingredient ID numbers for blend ingredients created by the PLD.

DSDBCLID: Blend Component ID-Old version
These are old unique ingredient ID numbers for blend ingredients created by the PLD.

DSDBCCAT: Blend Component Category
There are blend ingredient categories: Vitamin, Mineral, Botanical, Others, Amino Acid. These are assigned by NCHS staff. (Please see Appendix 1: Rules for Classifying Ingredients.)

Variables created for the NHANES-DSD public release files

DSDBLFLG: Blend Flag
This indicator variable denotes whether an ingredient is a blend or not a blend. If the ingredient is a blend, then blend ingredients are contained in file DSBI.

DSDCNTV: Number of Vitamin(s) in Supplement
This variable indicates the number of vitamins in the supplement, including in blends. All ingredients categorized as “vitamins” in variables DSDCAT and DSDBCCAT are added up to get the number of vitamins in the product. If a product has the same vitamin listed as an ingredient as well as a blend, this vitamin was only counted once. Ingredients that are categorized as a blend (DSDBLFLG=1) in file DSII are not included in this count, but the ingredients within the blend are counted (blend ingredients in file DSBI).

DSDCNTM: Number of Mineral(s) in Supplement
This variable indicates the number of minerals in the supplement, including in blends. All ingredients categorized as “minerals” in variables DSDCAT and DSDBCCAT are added up to get the number of minerals in the product. If a product has the same mineral listed as an ingredient as well as a blend, this mineral was only counted once. Ingredients that are categorized as a blend (DSDBLFLG=1) in file DSII are not included in this count, but the ingredients within the blend are counted (blend ingredients in file DSBI).

DSDCNTA: Number of Amino Acid(s) in Supplement
This variable indicates the number of amino acids in the supplement, including in blends. All ingredients categorized as “amino acids” in variables DSDCAT and DSDBCCAT are added up to get the number of amino acids in the product. Ingredients that are categorized as a blend (DSDBLFLG=1) in file DSII are not included in this count, but the ingredients within the blend are counted (blend ingredients in file DSBI).

DSDCNTB: Number of Botanical(s) in Supplement
This variable indicates the number of botanicals in the supplement, including in blends. All ingredients categorized as “botanicals” in variables DSDCAT and DSDBCCAT are added up to get the number of botanicals in the product. Ingredients that are categorized as a blend (DSDBLFLG=1) in file DSII are not included in this count, but the ingredients within the blend are counted (blend ingredients in file DSBI).

DSDCNTO: Number of Other Ingredients in Supplement
This variable indicates the number of other ingredients in the supplement, including in blends. All ingredients categorized as “other” in variables DSDCAT and DSDBCCAT are added up to get the number of other ingredients in the product. Ingredients that are categorized as a blend (DSDBLFLG=1) in file DSII are not included in this count, but the ingredients within the blend are counted (blend ingredients in file DSBI).

The NCHS-DSD file may be linked to both the Household dietary supplement data use files and the 24-hour dietary recall interview dietary supplement files by the supplement ID number (DSDPID).

NCHS-DSD contains information on all DS and antacids reported from 1999-2020. New products will be appended as they are reported in future data releases. There are three files. The “Supplement Information”

file (DSPI) and the “Ingredient Information” file (DSII) can be linked by supplement ID number (DSDPID), which is a unique product identifier. The “Ingredient Information” file (DSII) and the “Supplement Blend” file (DSBI) can then be linked by the ingredient ID number (DSDIID).

Layout of DSQ_DSD

(DSPI): Supplement Product Information

Variable Name	Label
DSDPID	Supplement ID number
DSDPRDT	Product Type
DSDSUPP	Supplement Name
DSDSRCE	Supplement Information Source
DSDTYPE	Supplement Type
DSDSERVQ	Serving Size Quantity
DSDSERVU	Serving Size Unit
DSDPREID	Previous product ID
DSDORGID	Original product ID
DSDSGPF	Sequential group formulation
DSDSEQF	Sequential formulation
DSDLINRF	Linear formulation
DSDCNTV	Count of Vitamins in the Supplement
DSDCNTM	Count of Minerals in the Supplement
DSDCNTA	Count of Amino Acids in the Supplement
DSDCNTB	Count of Botanicals in the Supplement
DSDCNTO	Count of Other Ingredients in the Supplement
DSDSUPID	Supplement ID number-Old version

(DSII): Supplement Ingredient Information

Variable Name	Label
DSDPID	Supplement ID Number
DSDSUPP	Supplement Name
DSDIID	Ingredient ID Number
DSDINGR	Ingredient Name
DSDOPER	Ingredient Operator (<, =, >)
DSDQTY	Ingredient Quantity
DSDUNIT	Ingredient Unit
DSDCAT	Ingredient Category
DSDBLFLG	Blend Flag
DSDINGID	Ingredient ID Number- Old version

(DSBI): Supplement Blend Information

Variable Name	Label
DSDIID	Ingredient ID Number
DSDINGR	Ingredient Name
DSDBID	Blend Component ID Number
DSDBCNAM	Blend Component Name
DSDBCCAT	Blend Component Category
DSDBCID	Blend Component ID Number-Old version

Analytic Notes

Source of Product Information

The best source of product information is the label itself, but when this cannot be obtained, other sources are used. Information from other sources may not always be an accurate reflection of what is actually on the supplement label. This is true for the supplement's apparent name as well as for the ingredients. The apparent name on the container is most important, since interviewers see the supplement container and record the name as it appears to them. Differences from what appears on the label are particularly noted for information from the Internet (name and ingredients), the PDR (name), and supplement carton (name). In addition, supplement companies may change the appearance of a label and thus the apparent name without changing the content or may change content with minimal change to the label, or may change both. NCHS attempts to obtain updated labels as they come onto the market, but cannot guarantee complete success. The source of the supplement information is included in the data release.

Using Self-Reported Data

NHANES data are self-reported and recorded by interviewers, and thus may contain inconsistencies or errors. Some inconsistencies have been edited; however, users may notice situations that still need editing. Users are advised to assess the data and edit it as deemed appropriate for the analyses being undertaken.

Codebook and Frequencies

DSDPID - SUPPLEMENT ID NUMBER

Variable Name: DSDPID

SAS Label: SUPPLEMENT ID NUMBER

English Text: Supplement ID number

Target: Both males and females 0 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
1 to 20971	Range of Values	169377	169377	
.	Missing	0	169377	

DSDSUPP - SUPPLEMENT NAME

Variable Name: DSDSUPP

SAS Label: SUPPLEMENT NAME

English Text: Supplement name

Target: Both males and females 0 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
SUPPLEMENT NAME	Value was recorded	169377	169377	
< blank >	Missing	0	169377	

DSDIID - INGREDIENT ID NUMBER

Variable Name: DSDIID

SAS Label: INGREDIENT ID NUMBER

English Text: Ingredient ID number

Target: Both males and females 0 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
1 to 14309	Range of Values	169377	169377	
.	Missing	0	169377	

DSDINGR - INGREDIENT NAME

Variable Name: DSDINGR

SAS Label: INGREDIENT NAME

English Text: Ingredient Name

Target: Both males and females 0 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
INGREDIENT NAME	Value was recorded	169377	169377	
< blank >	Missing	0	169377	

DSDOPER - INGREDIENT OPERATOR

Variable Name: DSDOPER

SAS Label: INGREDIENT OPERATOR

English Text: Ingredient operator

Target: Both males and females 0 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
INGREDIENT OPERATOR	Value was recorded	169377	169377	
< blank >	Missing	0	169377	

DSDQTY - INGREDIENT QUANTITY

Variable Name: DSDQTY

SAS Label: INGREDIENT QUANTITY

English Text: Ingredient quantity

Target: Both males and females 0 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0 to 6000000	Range of Values	169377	169377	
.	Missing	0	169377	

DSDUNIT - INGREDIENT UNIT

Variable Name:	DSDUNIT
SAS Label:	INGREDIENT UNIT
English Text:	Ingredient unit
Target:	Both males and females 0 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
1	mg	99241	99241	
2	IU	14008	113249	
3	%	2533	115782	
4	mcg	32955	148737	
5	gm	11867	160604	
6	mL	82	160686	
7	kcal	5991	166677	
8	DU	115	166792	
9	HUT	151	166943	
10	LU	84	167027	
11	CU	112	167139	
12	endo-PGO	11	167150	
13	AGU	32	167182	
14	PPM	25	167207	
15	Million	203	167410	
16	Billion	526	167936	
17	LacU	32	167968	
18	X	0	167968	
19	PPB	0	167968	
20	Trace	57	168025	
21	Unknown	666	168691	
22	PU	46	168737	
23	SEU	4	168741	
24	InvU	8	168749	
25	°DP	25	168774	
26	HCU	21	168795	
27	CFU	8	168803	
28	GALU	22	168825	
29	ALU	35	168860	
30	FTU	5	168865	
31	NG	3	168868	
32	mcg DFE	347	169215	
33	mcg RAE	69	169284	
34	mg NE	39	169323	
35	SAPU	8	169331	
36	SU	5	169336	
37	FIP	8	169344	
38	GDU	4	169348	
39	SKB	1	169349	
40	UNIT	11	169360	

Code or Value	Value Description	Count	Cumulative	Skip to Item
41	ENDO-PG	1	169361	
42	BAU	1	169362	
43	HSU	1	169363	
44	BGU	3	169366	
45	AGSU	1	169367	
46	PC	1	169368	
47	SPU	2	169370	
48	XU	2	169372	
49	ENDO-PGU	1	169373	
50	DPPU	1	169374	
51	PGU	1	169375	
52	DPPIV	1	169376	
53	APU	1	169377	
.	Missing	0	169377	

DSDCAT - INGREDIENT CATEGORY

Variable Name: DSDCAT

SAS Label: INGREDIENT CATEGORY

English Text: Ingredient category

Target: Both males and females 0 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
1	Vitamin	60633	60633	
2	Mineral	39943	100576	
3	Botanical	12845	113421	
4	Other	47245	160666	
5	Amino acid	3730	164396	
.	Missing	4981	169377	

DSDBLFLG - BLEND FLAG

Variable Name: DSDBLFLG

SAS Label: BLEND FLAG

English Text: Blend flag

Target: Both males and females 0 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
1	Ingredient is a blend	4981	4981	
2	Ingredient is not a blend	164396	169377	
.	Missing	0	169377	

DSDINGID - INGREDIENT ID NUMBER - OLD VERSION

Variable Name: DSDINGID

SAS Label: INGREDIENT ID NUMBER - OLD VERSION

English Text: Ingredient ID number - old version

Target: Both males and females 0 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
INGREDIENT ID NUMBER - OLD VERSION	Value was recorded	142839	142839	
< blank >	Missing	26538	169377	

Appendix 1: Rules for Classifying Ingredients

VITAMINS

An ingredient is classified as a vitamin if it is:

- A single vitamin listed by its name (e.g., vitamin A)
- A standard chemical form of the vitamin (retinol, retinal, retinoic acid) in synthetic or natural form

A vitamin will be classified as "other" when it exists as:

- A precursor or provitamin to the active form of the vitamin (e.g., 7-dehydrocholesterol, a precursor to Vitamin D)
- A complex, since the ingredient content is unclear (e.g., B-complex)

The following appear in supplements as a source of vitamins and are therefore classified as a vitamin:

- Vitamin A: palmitate, vitamin A acetate, vitamin A palmitate
- Vitamin B-1/Thiamin: thiamin monophosphate or TMP, thiamin mononitrate, thiamin hydrochloride
- Vitamin B-2/Riboflavin: riboflavin mononitrate, riboflavin-5-phosphate sodium
- Vitamin B-3/Niacin
- Vitamin B-5/Pantothenic Acid: pantothenate, calcium pantothenate
- Vitamin B-6: pyridoxine hydrochloride, vitamin B6 hydrochloride
- Vitamin B-12/Cobalamin: cyanocobalamin
- Vitamin C/Ascorbic Acid: ascorbyl palmitate, sodium ascorbate
- Vitamin D/Calciferol: cholecalciferol, ergocalciferol, calcitriol
- Vitamin E/Tocopherol: d-alpha tocopheryl acid succinate, dl-alpha tocopheryl acetate, d-alpha tocopheryl acetate, d-alpha tocopherol, d-alpha tocopheryl, tocopherols, mixed tocopherols, vitamin E acetate, tocotrienol
- Vitamin K/Menadione: phytonadione
- Biotin: Choline, choline bitartrate
- Folic Acid/Folate

MINERALS

An ingredient is classified as a mineral if it is a macro or micromineral (trace element):

- in its elemental form (e.g., iron)
- is the source of the mineral in a supplement (e.g., ferrous gluconate, potassium iodide, nickel chloride)

An ingredient containing a mineral is classified as "other" when it is:

- an enzyme (e.g., boron protease)
- a complex, since the ingredient content is unclear (e.g., Trace Mineral Complex)
  used as an electrolyte (chloride, potassium, sodium)

The following are classified as minerals:

- Arsenic
- Copper
- Phosphorus

- Barium
- Fluoride
- Selenium
- Boron
- Iodine
- Silicon
- Bromine
- Iron
- Strontium
- Cadmium
- Magnesium
- Sulfur
- Calcium
- Manganese
- Tin
- Chromium
- Molybdenum
- Vanadium
- Cobalt
- Nickel
- Zinc

BOTANICALS

An ingredient is classified as a botanical if it is:

- part of a plant, tree, shrub, herb, etc.

Botanicals may include the following words:

- Extract, Powder
- Leaf, Root, Flower, Stem, Peel, Fruit
- Component of a botanical that specifically mentions it is from the plant (e.g., soy isoflavones, citrus bioflavonoids)

An ingredient containing a botanical is classified as "other" if it is:

- listed only as an unspecified blend
- a chemical structure derived originally from a botanical (e.g., bromelain, the enzyme found in pineapple; Alliin, a phytochemical in garlic; apple cider vinegar)

AMINO ACIDS

An ingredient is classified as an amino acid if it is an essential or nonessential amino acid. It can exist in:

- it’s free form (e.g., lycine, glutamine)
- its post-translational form with one or two added groups (e.g., Cystine, Hydroxylysine, Hydroxyproline, Dimethylglycine, and 3-methylhistidine)
- one of its isomeric forms (e.g., l-tyrosine)

- the source of an amino acid in a supplement (e.g., l-lysine monohydrochloride, glutamic acid hydrochloride)

An amino acid would be classified as "other" if it is:

- in its post-translational form with three or more added groups (Trimethylglycine, Tetramethylglycine, etc.)
- an alpha-keto acid (an amino acid with its amino group, NH3, replaced by a keto group) (e.g., -ketoglutarate)
- a residue of an amino acid (-carboxyglutamic acid also known as GLA)
- as a complex of amino acids (e.g., natural amino acid complex), since the ingredient content is unclear

The following are classified as amino acids:

- Alanine
- Glycine
- Proline
- Arginine
- Histidine
- Serine
- Asparagine
- Isoleucine
- Taurine
- Aspartic
- Acid
- Leucine
- Threonine
- Cysteine
- Lysine
- Tryptophan
- Glutamic
- Acid
- Methionine
- Tyrosine
- Glutamine
- Phenylalanine
- Valine

OTHER

The following are examples of ingredients that would be classified as "other":

- an electrolyte (e.g., chloride, potassium, sodium)
- a hormone (e.g., DHEA, cholesterol), unless if it is the active form of a vitamin (calcitriol)
- an enzyme (e.g., cellulase, glucoamylase)
- Complexes and blends (unless all components are of the same type ex. amino acid blend)
- Bioflavonoids and Isoflavones (if not associated with a plant, in which case it would be classified as a Botanical)
- Vinegars
- Phytochemicals (e.g., lutein, allin)

- Vitamin precursors (e.g., some carotenoids)

Appendix 2: Conversion Factors for Supplement Nutrient Units to Food Units and for Nutrient Compounds to Elemental Nutrients

INGREDIENT	INGREDIENT_ID	CONVERSION FACTOR
Vitamin A Conversion Factors		
ALPHA CAROTENE	587	1 IU alpha carotene = 7.2 mcg vitamin A
ALPHA CAROTENE	587	1 RAE = 24 mcg alpha carotene
BETA CAROTENE	392	1 IU beta carotene = 0.6 mcg vitamin A
BETA CAROTENE	392	1667 IU beta carotene = 1 mg beta carotene
BETA CAROTENE	392	1 RAE = 12 mcg beta carotene
VITAMIN A*	360	1 IU = 0.3 mcg vitamin A
VITAMIN A*	360	1 RAE = 1 mcg vitamin A
CRYPTOXANTHIN	614	1 RAE = 24 mcg cryptoxanthin
Vitamin D Conversion Factor		
VITAMIN D†	364	40 IU vitamin D = 1 mcg
Vitamin E Conversion Factor		
VITAMIN E‡	365	1 IU = 0.67 mg vitamin E
Calcium Conversion Factors		
CALCIUM CARBONATE	543	40% elemental calcium
CALCIUM L-THREONATE	4003	12.9 % elemental calcium
CALCIUM PANTOTHENATE	395	91.6% pantothenate
Iron Conversion Factors		
FERROUS FUMARATE	782	32.9% elemental iron
IRON FERROCHEL	13380	27.65% elemental iron
Glucosamine Conversion Factors		
GLUCOSAMINE HYDROCHLORIDE	410	83.0% glucosamine
GLUCOSAMINE SULFATE	143	65% glucosamine
GLUCOSAMINE SULFATE .2 KCL	850	29.6% glucosamine
D-GLUCOSAMINE SULFATE.2 NACL	1017	31.3% glucosamine
Magnesium Conversion Factors		
MAGNESIUM ASPARTATE	13643	8.42% elemental magnesium
MAGNESIUM CARBONATE	556	28.9% elemental magnesium
MAGNESIUM HYDROXIDE	544	41.7% elemental magnesium
MAGNESIUM PHOSPHATE TRIBASIC	616	27.7% elemental magnesium
MAGNESIUM TRISILICATE	2054	18.3 % elemental magnesium
Vitamin B-6 Conversion Factor		
PYRIDOXINE HYDROCHLORIDE	470	82% vitamin B-6
Other		
ALUMINUM HYDROXIDE GEL	14221	34.59% elemental aluminum
CHROMIUM NICOTINATE	14270	12.43% elemental chromium
CHROMIUM PICOLINATE	487	12.4% elemental chromium
CHOLINE BITARATE	82	41% choline
CHOLINE CITRATE	2248	41% choline
CREATINE MONOHYDRATE	480	88% creatine

INGREDIENT	INGREDIENT_ID	CONVERSION FACTOR
CYSTEINE HCL	776	76.9% cysteine
DOCUSATE SODIUM	109	5.1% sodium
GLUTAMIC ACID HYDROCLORIDE	653	80.1% glutamic acid
L-CYSTEINE HCL	488	69.0% cysteine
L-GLUTAMIC ACID HCL	611	80.1% glutamic acid
L-LYSINE HCL	743	80.03% lysine
LYSINE HYDROCHLORIDE	2088	80.03% lysine
POTASSIUM CHOLRIDE	287	52.5% elemental potassium
POTASSIUM PHOSPHATE	575	28.7% elemental potassium
POTASSIUM PHOSPHATE MONOBASIC	615	28.7% elemental potassium
THIAMIN MONONITRATE	468	92% thiamin
ZINC PICOLINATE	2629	21.1% elemental zinc
Basic Unit Conversion		
1 gm = 1000 mg		
1 mg = 1000 mcg		

* Conversion factor used for Vitamin A is Retinol, most common form

† Conversion factor for Calciferol

‡ Conversion factor for Alpha Tocopherol, most common form

Appendix 3: Proc Format

```
PROC FORMAT;
/********* variable DSD010 and DSD010AN ********/
VALUE DSD010F
1 = "Yes"
2 = "No"
7 = "Refused"
9 = "Don't Know"
. = "Missing"
;
/********* variable DSDCOUNT ********/
VALUE DSDCNTF
77 = "Refused"
99 = "Don't know"
;
/********* variable DSD070 ********/
VALUE DSD070F
1 = "Yes"
2 = "No"
;
/********* variable DSDDAY1 and DSDDAY2 ********/
VALUE DSDDAYF
1 = "Yes"
2 = "No"
;
/********* variable DSDMTCH ********/
VALUE DSDMTCHF
1 = "Exact or near exact match"
2 = "Probable match"
3 = "Generic match"
4 = "Reasonable match"
5 = "Default match"
6 = "No match"
7 = "Refused"
9 = "Don't know"
;
/********* variable DSD122U ********/
VALUE DSD122UF
1= "Tablets, capsules, pills, caplets, softgels, gelcaps, vegicaps"
2= "Droppers"
3= "Drops"
5= "Injections/Shots"
6= "Lozenges"
7= "Milliliters"
11= "Tablespoons"
12= "Teaspoons"
13= "Wafers"
15= "Cans"
16= "Grams"
17= "Dots"
18= "Cups"
19= "Spray/Squirts"
20= "Chews"
21= "Scoop"
22= "CC"
23= "Capful"
24= "MG"
25= "Units"
26= "Gulp"
27= "Ounces"
28= "Packages/Packets"
29= "Vial"
```

30= "Gumball"
31= "Strips"
32= “Bottle”
77= "Refused"
99= "Don't know"
;
/********* variable DSDANTA********/
VALUE DSDANTAF
0= "Non-antacid supplement"
1= "Antacid reported with dietary supplements(DSQ)"
2= "Antacid reported with medications(RXQ)"
;
/********* variable DSD124 ********/
VALUE DSD124F
1 = "Decided to take it for reasons of my own"
2 = "A doctor or other health provider told me to"
7 = "Refused"
9 = "Don't know"
;
/********* variable RXQ215A********/
VALUE RXQ215AF
1 = "Antacid"
2 = "Calcium Supplement"
3 = "Both"
4 = "Neither"
7 = "Refused"
9 = "Don't know"
;
/********* variable DSDSRCE ********/
VALUE DSDSRCEF
1 = "Directly from manufacturer"
2 = "Directly from distributor"
4 = "Inferred from supplement name"
5 = "Physician s Desk Reference (PDR)"
7 = "Product Catalog"
8 = "Internet Listing"
9 = "Supplement label or carton"
10 = "Supplement from same manufacturer"
11 = “Dietary Supplement Label Database”
7777 = "Refused"
9999 = "Don't know"
;
/********* variable DSDTYPE ********/
VALUE DSDTYPEF
1= "Infant/pediatric formulation"
2= "Prenatal formulation"
3= "Mature formulation"
4= "Standard formulation"
7777 = "Refused"
9999 = "Don't know"
;
/********* variable DSDSERVU ********/
VALUE DSDSRVF
1= "Caplet"
2= "Capsule"
3= "Dropper"
4= "Drop"
5= "Fluid Ounce"
6= "Gel Cap"
8= "Injection/Shot"
9= "Lozenge"
10= "Milliliter"
12= "Package/Packet"
13= "Pill"

14= "Tablespoon/Powder"
16= "Softgel"
17= "Tablespoon/Liquid"
18= "Tablet"
19= "Teaspoon/Liquid"
20= "Wafer"
21= "Ounce/Powder"
22= "Spray/Squirt"
24= "Scoop/Powder"
25= "Cup/Powder"
27= "Chew"
29= "Vegicap"
30= "Can/Liquid"
31= "Capful"
32= "Gumball"
33= "Gram/Powder"
34= "Teaspoon/Powder"
35= "Can/Powder"
36= "Scoop/Liquid"
37= "Cup/Liquid"
38= "Gram/Liquid"
39= "Drop/Lozenge"
42= "Strip"
43= “Bottle/Liquid”
99= "Unknown"
;
/********* variable DSDUNIT ********/
VALUE DSDUNTF
1= "mg"
2= "IU"
3= "%"
4= "mcg"
5= "gm"
6= "mL"
7= "kcal"
8= "DU"
9= "HUT"
10= "LU"
11= "CU"
12= "endo-PGO"
13= "AGU"
14= "PPM"
15= "Million"
16= "Billion"
17= "LacU"
18= "X"
19= "PPB"
20= "Trace"
21= "Unknown"
22= "PU"
23= "SEU"
24= "InvU"
25= "°DP"
26= "HCU"
27= "CFU"
28= "GALU"
29= "ALU"
30= "FTU"
31= "NG"
;
/********* variable DSDCAT ********/
VALUE DSDCATF
1 = "vitamin"
2 = "mineral"

3 = "botanical"
4 = "other"
5 = "amino acid"
7777 = "Refused"
9999 = "Don't know"
;
/********* variable DSDBLFLG ********/
VALUE DSDBLF
1 = "Ingredient is a blend"
2 = "Ingredient is not a blend"
;