

An Integrated Relational Database System and the Dietary Supplement Ingredient Database Release (DSID-1)

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Dietary Supplement Ingredient Database (DSID)

A database supported by chemical analysis for key DS ingredients of public health importance

Funded by:

**Office of Dietary Supplements, NIH
U.S. Department of Agriculture**

Collaborators:

**Office of Dietary Supplements, NIH
National Cancer Institute, NIH
National Center for Health Statistics, CDC
Food Composition and Methods Development Lab, BHNRC, ARS
National Institute of Standards and Technology
Food and Drug Administration**

Why Develop a DSID?

- ❑ **Over 50% of people surveyed in U.S. report taking a dietary supplement**
- ❑ **NHANES monitors U.S. diet and provides information for research on diet-health relationships**
- ❑ **Estimates of total nutrient intake from food plus dietary supplements can provide more accurate assessments of total intake**

Goals for DSID

- Develop reliable estimates of nutrients and other bioactive components in dietary supplement products**
- Release and maintain a publicly available on-line dietary supplement database**

DSID Studies

1. Laboratory Pilot Study

- ❑ **Investigate the status of methods of analysis and identify labs qualified to analyze nutrients in dietary supplements**

Roseland JM, Holden JM, Andrews KW, Zhao C, et al (2008). *Dietary supplement ingredient database (DSID): preliminary USDA studies on composition of adult multivitamin-mineral supplements*. J Food Comp Anal 21:S69-S77

2. Caffeine Study

- ❑ **Assess caffeine content of commonly purchased products containing caffeine ingredients**

Andrews KW, Schweitzer A, Zhao C, Holden JM, Roseland JM, et al (2007). *The caffeine contents of dietary supplements commonly purchased in the US: analysis of 53 products with caffeine-containing ingredients*. Anal Bioanal Chem 389:231-239

DSID Studies

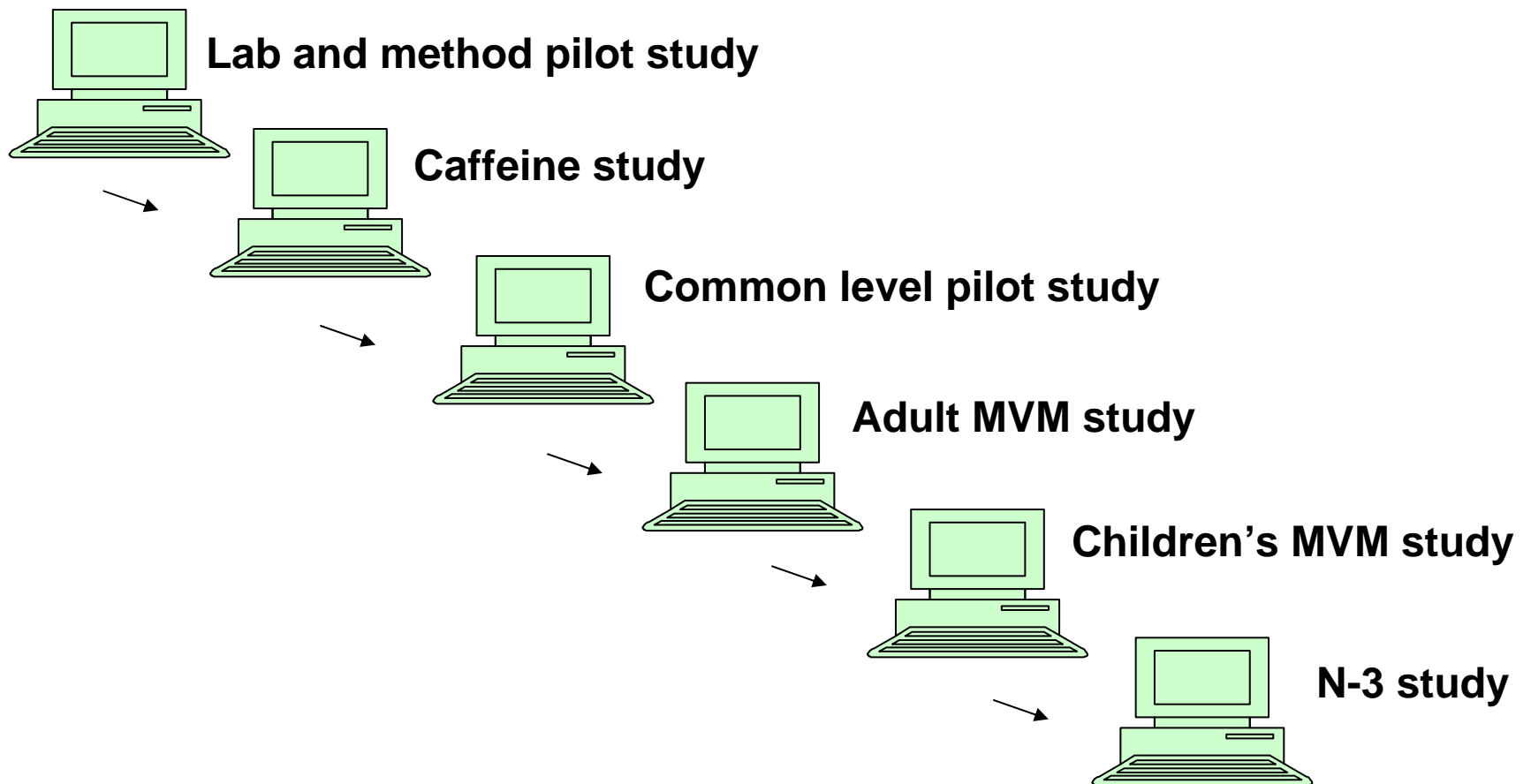
3. Common Level (CL) Pilot Study

- ❑ Assess content and variability per nutrient in adult MVMs chosen from most common labeled levels for 22 vitamins and minerals.

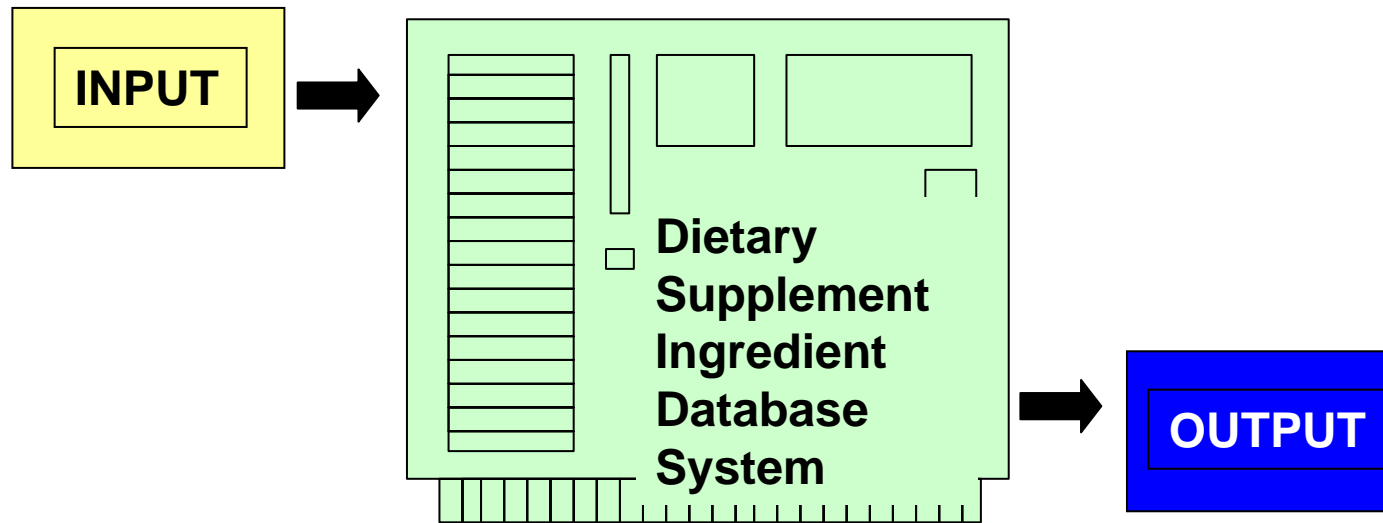
4. Adult MVM Study

- ❑ Assess content and variability in representative adult MVMs. Data for 18 nutrients released in DSID-1.

Current Configuration – Individual NDLDatabases for Dietary Supplements



Future Configuration – NDL Database for Dietary Supplements



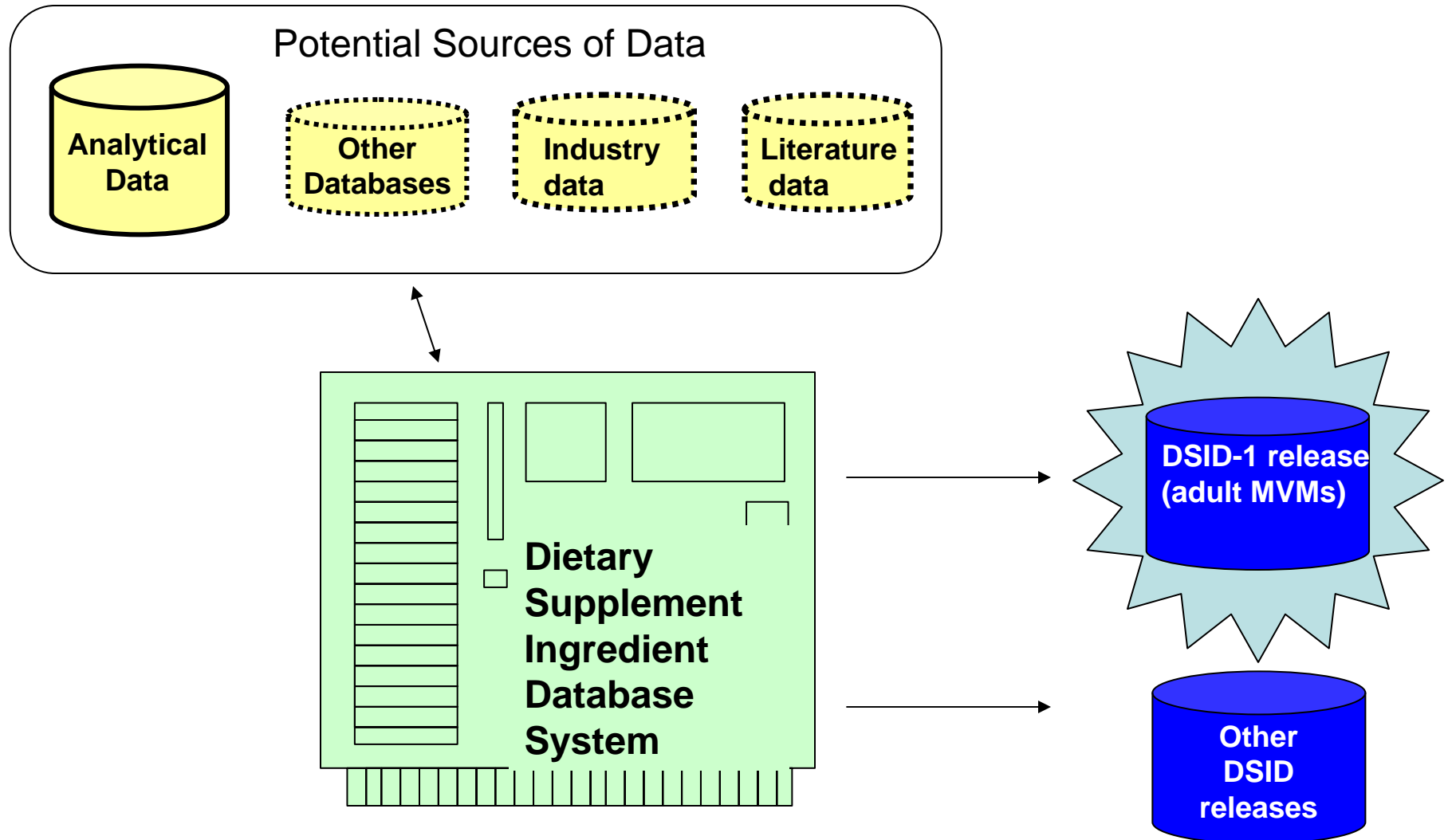
Dietary Supplement Ingredient System (DSIS)

Integrated system with a relational database structure:

- Data acquisition**
- Data evaluation**
- Statistical data analysis**
- Data compilation and storage**
- Both structured and flexible reports**
- Dissemination of information**

Dietary Supplement Ingredient Database

Flow of Information and products



DSIS Development

Progress to date:

- Identified and prioritized functional requirements**
- Developed database model (relational tables) draft**
- Migrated data from 2 studies**
- Reviewed and tested model**

DSIS Development

Next steps:

- Optimize data model**
- Complete data migration**
- Develop 'front-end' features, including forms, queries, and reports**
- Conduct QA and system tests**

First Product:

- DSID-1 Release – Adult MVMs**

Adult MVM* Study

Commonly Reported Products

- Multiple surveys used to identify 35 top products (55% of market share)
- Products purchased nationally from all market channels (n ≤ 6 lots)

Lower Market Share Products

- NHANES 2003-04 used to identify 80 lower market share products
- Products purchased nationally from all market channels (n ≤ 3 lots)

*Adult MVM defined as containing 3 or more vitamins

Adult MVM Sampling

Multiple channels sampled:

- Mass Merchandisers** (Wal-mart, grocery stores, drug stores, warehouse stores)
- Natural/Health Food Stores** (Whole Foods, Organic Markets)
- Nutrition Stores** (Vitamin Shoppe, GNC)
- Multi-level Marketers** (Amway, Herbalife)
- Direct Marketers** (Internet, catalogs, infomercials)
- Health Practitioners** (Doctors, Health clubs)

Vitamins and Minerals Analyzed in Adult MVMs

**Folic Acid
Alpha-tocopherol
Beta-carotene
Retinol
Riboflavin
Thiamin
Niacin
Vitamin B6
Vitamin B12
Vitamin C
Vitamin D**

**Calcium
Chromium
Copper
Iron
Magnesium
Manganese
Phosphorus
Potassium
Selenium
Iodine
Zinc**

Nutrient Data Evaluation for DSID-1

- Laboratory results reviewed for QC (NIST SRM 3280)
- Results analyzed by regression per nutrient (n=18)
- Data weighted by market share
- Mean % difference from label and SE calculated
- Data for 4 additional nutrients being evaluated for later release (vitamin D, chromium, beta carotene, retinol)

DSID First Release: DSID-1

- ❑ Provides analytically-based estimates of nutrient values in adult MVMs
- ❑ Data files include:
 - 1) Predicted values and SEs for 18 individual nutrients at a range of labeled levels for adult MVMs
 - 2) Links between nutrient estimates and NHANES files

Publicly accessible on National Library of Medicine website, April 20:

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

Preview of DSID Home Page


The screenshot shows a Microsoft Internet Explorer browser window displaying the Dietary Supplement Ingredient Database (DSID) home page. The browser's address bar shows the URL <http://sis4.nlm.nih.gov/dsid/>. The page header includes the logo for the Office of Dietary Supplements, National Institutes of Health, and the USDA logo. The main title is "Dietary Supplement Ingredient Database". A navigation menu at the top right contains links for Home, FAQ, Glossary, Contact, and Help. The page content is divided into two main sections. On the left is a navigation sidebar with the following links: **DSID Research and Data** (DSID-1, Research Summary, Data Files & Description), **Ingredient Calculator** (Adult MVM Calculator Basic Version, Professional Version), **Calculator Instructions**, **Calculator FAQs**, **General Information** (What Is New with DSID?, Publications & Presentations, History of DSID, NDL Web Site, ODS Web Site). The main content area features a welcome message: "Welcome to the Dietary Supplement Ingredient Database (DSID) home page!". It states that the Nutrient Data Laboratory (NDL), part of the USDA Agricultural Research Service, has developed the DSID to estimate levels of ingredients in dietary supplement products. It describes the first data release (DSID-1) as providing access to information on analyzed levels of nutrients in adult multivitamin/minerals (MVMs) used in the U.S. It notes that the data are intended primarily for research applications and are grouped by nutrient levels rather than by product names. The main features of DSID are listed as data files, a research summary, and an adult MVM calculator. The page concludes with a note that more information can be accessed via the left navigation bar. The browser's taskbar at the bottom shows the start button and several open applications, including an inbox, a message, a study on C..., a file named NNDB_09, Symantec AntiVirus, and the Dietary Supplement database. The system clock shows 12:55 PM.

Dietary Supplements Ingredient Database - Microsoft Internet Explorer


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Address <http://sis4.nlm.nih.gov/dsid/> Go Links

 **Office of Dietary Supplements**
National Institutes of Health

Dietary Supplement Ingredient Database



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DSID Research and Data

- DSID-1**
 - [Research Summary](#)
 - [Data Files & Description](#)
- Ingredient Calculator**
 - [Adult MVM Calculator Basic Version](#)
 - [Professional Version](#)
- [Calculator Instructions](#)
- [Calculator FAQs](#)
- General Information**
 - [What Is New with DSID?](#)
 - [Publications & Presentations](#)
 - [History of DSID](#)
 - [NDL Web Site](#)
 - [ODS Web Site](#)

Welcome to the Dietary Supplement Ingredient Database (DSID) home page!

The Nutrient Data Laboratory (NDL), Beltsville Human Nutrition Research Center (BHNRC), part of the USDA Agricultural Research Service, working with the Office of Dietary Supplements, NIH, and other federal agencies, has developed a Dietary Supplement Ingredient Databases (DSID) to estimate levels of ingredients in dietary supplement products.

This first data release of the DSID (DSID-1) provides access to information on analyzed levels of nutrients in adult multivitamin/minerals (MVMs) used in the U.S. These estimates were derived from analytical data generated for a representative set of adult MVM products collected from various U.S. locations.

At this time, the DSID is intended primarily for research applications. For each of eighteen nutrients, product data were grouped by nutrient levels rather than by product names. Statistical regression analyses were used to estimate mean percent differences from label and variability at specific nutrient levels for each of the eight vitamins and ten minerals analyzed. These data are appropriate for conducting population studies of nutrient intake, rather than for assessing individual products.

The main features of DSID include [data files](#), a [research summary](#), and an adult MVM [calculator](#). Regression equations are available for researchers with expertise to calculate multi-nutrient estimates of adult MVM supplement composition. A user-friendly calculator which uses the regression equations is also available as a research tool for those who want to obtain estimates of specific nutrient levels listed on the Supplement Facts labels of a limited number of adult MVMs. These estimates can be saved to build a small database for later use. Since over half of American report taking a dietary supplement, the estimates in the DSID will improve assessment of total nutrient intake from foods and supplements.

For more information, you can access DSID research manuscripts and presentations by using the left navigation bar

<http://ods.od.nih.gov/> Internet

start | Inbox - Microso... | NNDB - Message | RE: Study on C... | NNDB_09 | Symantec AntiV... | Dietary Supple... | 12:55 PM

DSID-1 Features

- Table of regression equations**
- Excel spreadsheets of database tables**
- Downloadable MS Access database**
- Documentation of analytical studies, statistical approaches and research applications**
- Adult MVM Calculator**

Monitoring Studies

- Planned for each product type**
- Ingredient monitoring based on analytical levels and variability from initial studies**
- Plans will be adjusted for regulatory and/or marketplace changes**

Current and Future Studies

- Children's MVMs**
- Omega-3 (n-3) Fatty Acid Products**
- Prenatal MVMs**
- Calcium and Vitamin D Supplements**

Summary

- ❑ **DSID information about supplement ingredients complements data in USDA food composition databases**
- ❑ **Total nutrient estimates using data from adult MVM dietary supplements plus food will be used for more accurate assessment of total intake**



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More about DSID-1 during EB

**Tuesday, April 21, Convention Center Room 343,
Minisymposium 10:30-12:30**

**11:15 a.m. “First release of the Dietary
Supplement Ingredient Database: Nutrient estimates
and methodology for 18 vitamins and minerals in
adult multivitamin/minerals”**



**Check out the DSID-1 web site at ODS
booth #1401, starting April 20**

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

OR [//dsid.usda.nih.gov](http://dsid.usda.nih.gov)