Dietary Supplement Ingredient Database (DSID): Adult Multivitamin/mineral Study Results and Implementation Strategies for First Data Release

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DSID
Dietary Supplement Ingredient Database
A U.S. Government Initiative

DSID: What is it?

A database, validated by analytical data, for
key ingredients of public health importance in dietary supplements

Funded by:

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

Collaborators with Nutrient Data Laboratory:

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?

- NHANES monitors U.S. diet and provides information for research on diet-health relationships

- Over 50% of those surveyed report taking at least one dietary supplement

- Need estimates of total nutrient intake from food plus dietary supplements for accurate assessments of total intake

Goals for DSID

- To develop reliable estimates of nutrients and other bioactive components in dietary supplements
- To assess the variability in ingredient levels for dietary supplements
- To release and maintain a publicly available on-line dietary supplement database

DSID Studies

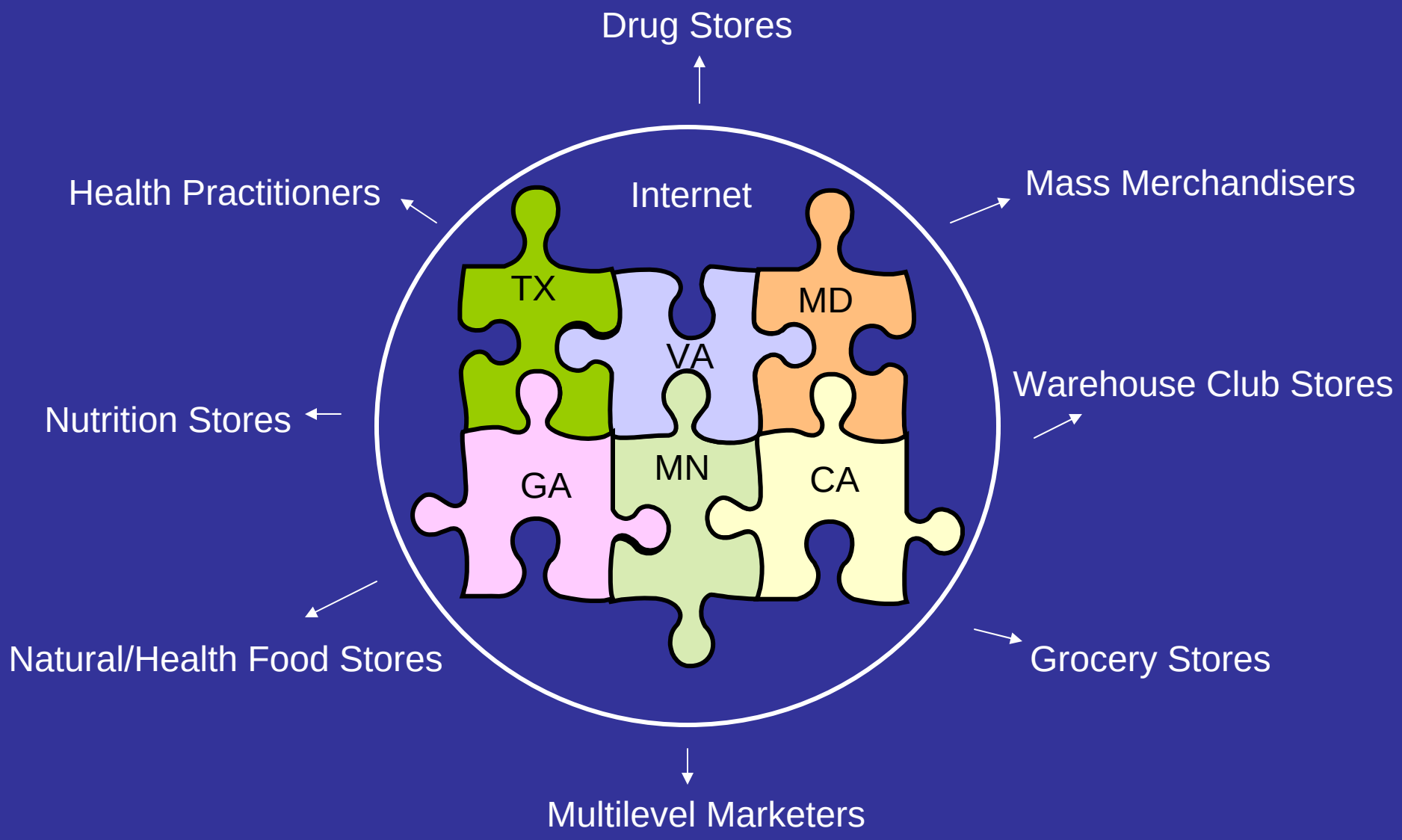
- Laboratory Pilot Study
  - Identify labs qualified to analyze nutrients in dietary supplements
- Percent Daily Value Pilot Study
  - Assess variability in adult MVMs randomly chosen from most common %DV levels for 23 nutrients
- Caffeine Study
  - Assess caffeine content of commonly purchased products containing caffeine ingredients
- Adult MVM Study
  - Assess nutrient content and variability in commonly reported and lower market share adult MVMs

Study Design Steps

1. Identify priority products and ingredients
2. Identify qualified labs and methods
3. Choose representative products using statistical sampling plans
4. Procure and process samples; evaluate QC
5. Assess ingredient content using statistical techniques
6. Release data

Adult MVM Sampling Structure

Top MVM Products (n = 35) and LMS Products (n = 80)



Adult MVM Study: ”Commonly Reported Products” Phase

Sampling Plan

- Multiple surveys used to identify products (35 products = 55% of the market share)
- Representative products purchased nationally across market channels (n= 6 lots)

Quality Control (QC)

- Samples repackaged and sent to qualified laboratories
- Products grouped for analysis with SRMs

Adult MVM Study: "Lower Market Share" Phase

Sampling Plan

- NHANES 01-02 used to identify LMS products
- Representative products purchased nationally across market channels ($n \leq 3$ lots)
- Some products chosen for specific nutrient levels where more data are needed in regression equations

Quality Control (QC) protocols followed

Results of Adult MVM Study: 35 Commonly Reported Products

Analytical results for individual nutrients fall into one of three categories:

1. Analytical values similar to label
2. Analytical values consistently higher than label
3. Analytical results variable

Summary of Data Evaluation

- Results from 3 Studies will be used to develop nutrient estimates for Adult MVM products:
  - DV study (18 or 24 products/nutrient, n=1)
  - Top 35 Adult study (35 products, n=6)
  - LMS Adult study (80 products, n=1-3)
- Regressions will be weighted and optimized

Application of Adult MVM Data

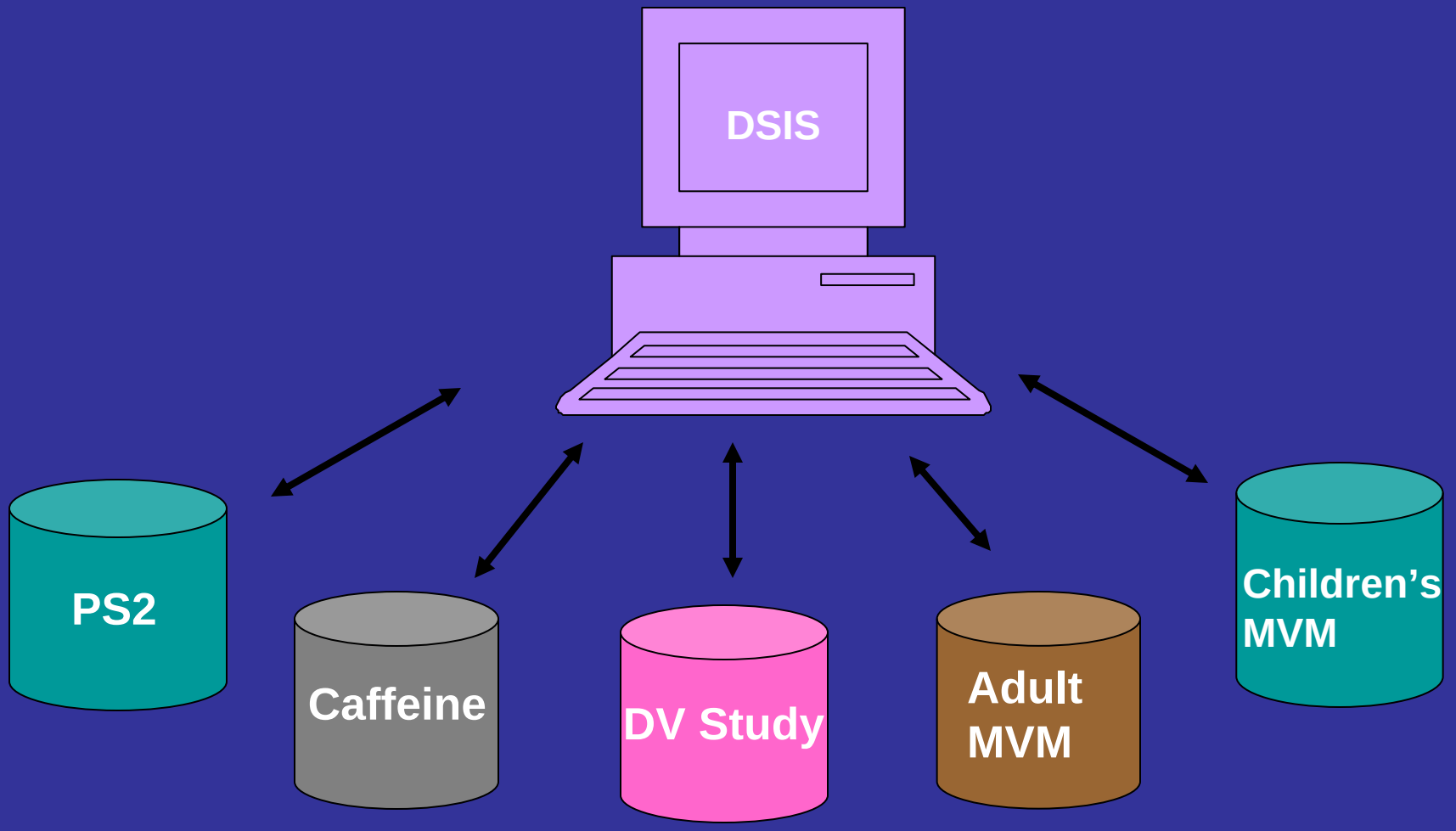
- Analyzing data with regression techniques to find patterns between label and analyzed values
- Planning to apply patterns for estimating values for database

What Will the Data Represent?

- Estimates of means or central tendency
- Nationally representative DS
- Based on analytical data
- Statistical analysis and estimation

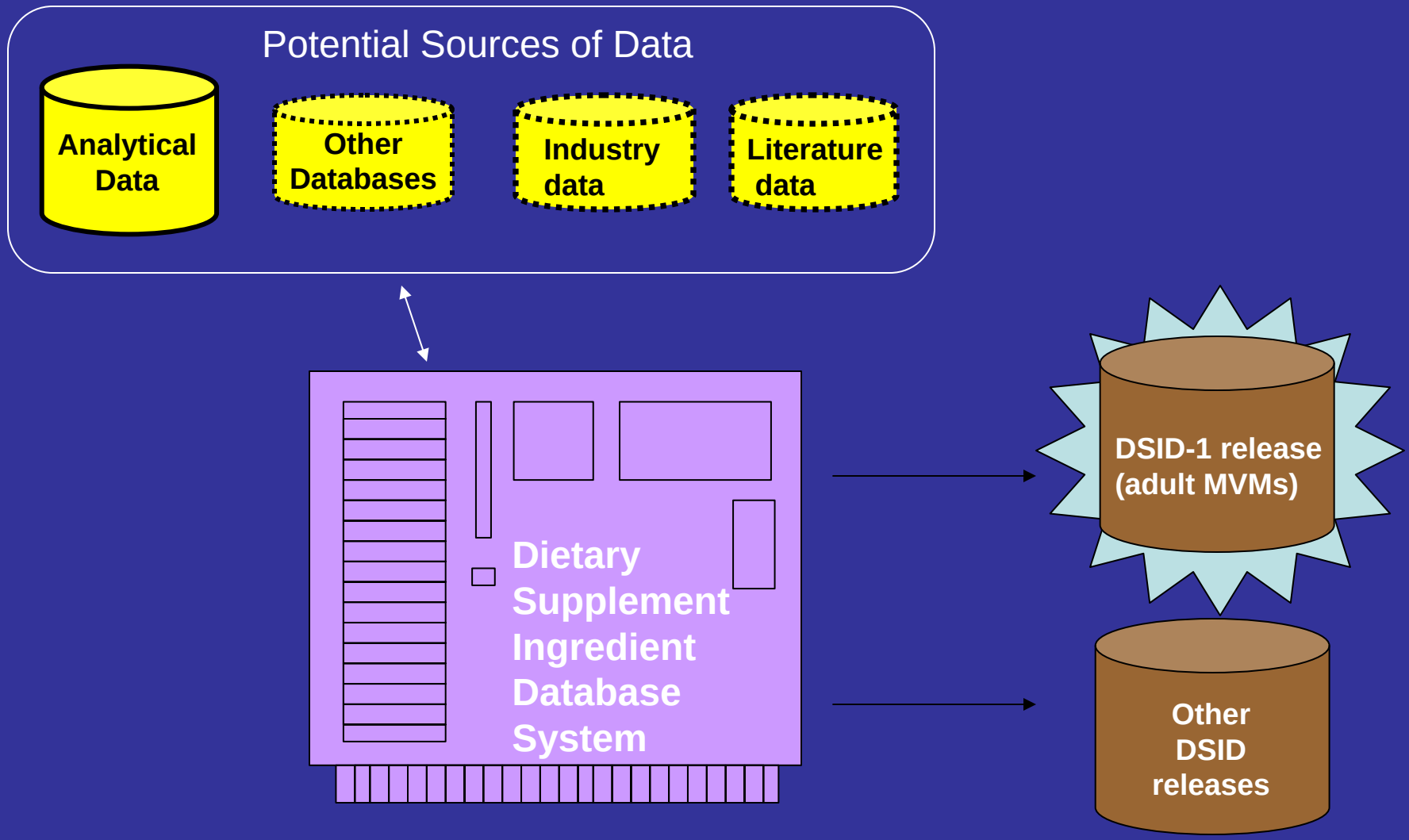
Dietary Supplement Databases:

Current Structure On ACCESS



Dietary Supplement Ingredient Database

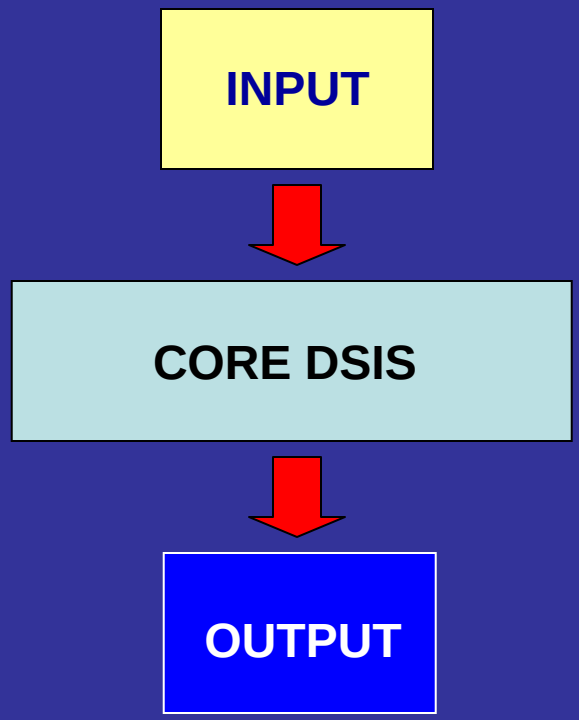
Flow of Information and products



Electronic Exchange Interfaces with:

- **Laboratories (product analyses)**
- **Companies: Label information/analyses**
- **Other research databases: NHANES , DSLD-USA, etc.**

DSIS Concept: Database as Central Repository



Universal data for researchers and the public:

- **Easy integration with research databases**
- **Diet intake analyses using SR and DSLD**
- **NLM database, etc.**

Stakeholder Meeting with Government Researchers

- Convened by DSID working group
- Summarized status of research findings
- Provided forum to discuss attendees' needs relative to content, format, and uses of DS composition data for the first data release

Database Format

- Estimates based on nutrient level mean values & indicators of variability
- Documented sources of data
- Values for 19 nutrients in DSID-1
- DSID-1 release of adult MVMs planned for late 2008

Potential Future Areas of Study

- Children's MVMs (in progress)
- Omega-3 fatty acids
- Prenatal MVMs
- Calcium and Vitamin D supplements

Summary

- DSID data will complement data in USDA food composition databases
- Total nutrient estimates using data from adult MVM dietary supplements plus food will be used for accurate assessment of total intake

For Further Information…

http://www.ars.usda.gov/dsid

- Dwyer JT, Picciano MF, Betz J, et al (2008). *Progress in developing analytical and label-based dietary supplement databases at NIH's Office of Dietary Supplements.* J Food Comp Anal 21: S83-S93.
- 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
- 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.
- Dwyer JT, Holden JM, Andrews KW, Roseland JM, Zhao C, et al (2007) *Measuring vitamins and minerals in dietary supplements for nutrition studies in the USA.* Anal Bioanal Chem 389:37-46.

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