USDA Dietary Supplement Ingredient Database (DSID): Adult Multivitamin/Mineral Study

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Why a Dietary Supplement Ingredient Database (DSID)?

Need for research on relationships between health and use of dietary supplements

Public health concerns:
- Excessive or deficient intakes of nutrients
- Exposure to other bioactive constituents
- Possible interaction with drugs
Goals for Dietary Supplement Ingredient Database

• To develop reliable estimates of nutrients and other bioactive components in Dietary Supplements
• To assess variability and/or possible bias in nutrient levels for DS
• To release and maintain publicly available on-line DS database
Vision for DSID

• Data for top-reported DS products based on lab analyses
• Probability-based sampling plan to obtain products to be analyzed
• Statistical applications to products in similar categories
Database Format

DSID vision:
• Nutrient estimates by product name
• Values for individual nutrients
• Values for nutrients for default and generic products
• Mean values & indicators of variability
• Documented sources of data
Key Challenges

- Categorization/Description
- Representative Sampling Plans
- Unique Matrix
- Methods and Reference Materials
- Identifying Priorities
- Sample Handling
- Qualified Labs

DSID
Pilot Study Results

Set priorities for nutrients and products:

• public health significance
• availability of valid methods & SRMs
• federal research projects

Identified experienced labs and methods

• assessed lab variability

Reviewed sample handling protocols

Developed quality control materials
Defining a MVM

Definition based upon

- Pills, capsules, tablets
- Number of vitamins and minerals
- “Specialty” MVM differentiation
- Functions or types of MVM
Adult MVM Study question: How do different products labeled at the same % Daily Value (DV) level compare?

What level of confidence exists with labeled nutrient values?
Adult MVM “% DV” Study
Objectives

• To determine if any systematic relationship exists among MVM.
• To assess variability across products
• To evaluate the % DV approach as aid in planning future studies
Adult MVM % DV Study Design

- Used NHANES ‘01-02 MVM records (n=541)
- Chose products at 3 most common DV levels for 23 nutrients.
- Analyzed 6 products from each DV level, total 219 products.
- Double Lot component: Analyzed 4 key nutrients for 3 products at 3 DV levels, total 36 products.
Adult MVM “% DV” Product Characteristics

• DV levels ranged from 2% to 6666%
• Most common DV level was 100% for 16 of the 23 nutrients
• 66% of the products were 1 pill per day, while 10% of products were 4 or more daily
Preliminary Key Findings from % DV Study
Calcium Label
Vs. Analyzed Value

• Labeled % DV ranged from 0 to 120%
• DV levels studied were 10, 16, 20, 40
• Analyzed values for 16 out of 24 products were within ±20% of labeled DV values
Folic Acid Label vs. Analyzed Value

- Labeled % DV ranged from 0 to 200%
- DV levels studied were 50, 100, 200
- Analyzed values for 14 out of 18 products were within ±20% of labeled DV values
%DV Pilot Study Results for Folic Acid

- Label Claim
- Analytical Value

PRELIMINARY
Key Findings of % DV Study
Percentage of Products Within +/- 20% of Label Claim
(n = 18 or 24)

- Phosphorus
- Manganese
- Iron
- Zinc
- Magnesium
- Potassium
- Calcium
Percentage of Products Within +/- 20% of Label Claim
(n = 18 or 24)

Nutrient
- Niacin
- Vitamin C
- Riboflavin
- Folic Acid

Percent
%DV Pilot Study Results for Vitamin D

Total Products Purchased for Study
Vitamin D Label vs. Analyzed Value

- Labeled % DV ranged from 0 to 250%
- DV levels studied were 50, 100, 150
- Analyzed values for 9 out of 18 products were within ±20% of labeled DV values
Key Findings of Double Lot Study: Preliminary summary

Lot-to-lot variability was generally $\leq$ lab variability for the 4 nutrients in the double lot study.
Comprehensive Adult MVM Study Objectives

• To provide nationally representative estimates for 22 nutrients in top products most commonly reported by the U.S. population

• To assess variability in specific products based upon geographic sampling plan
Overview of Comprehensive Adult MVM Study sampling frame

- Individual analysis (estimates) of 35 top products, basing each analysis on 6 samples distributed across marketing channels proportional to estimated product use.
- The top 35 products represent approximately 85% of adult MVM brands according to market share.
Market Channels for Adult MVMs obtained from May 2006 Market Survey

Percentage of Multivitamin Purchases by Channel

- Warehouse/Club: 14%
- Drug: 17%
- Mass: 36%
- Grocery: 16%
- Healthcare/Dr: 1%
- Internet/catalog: 7%
- Direct/Network: 2%
- Health Food Store: 2%
- Nutrition Store: 5%
DSID Future Plans

• Review and analyze nation-wide adult MVM study data.
• Release data as DSID 1.
• Future areas of study: childrens MVM, prenatal MVM, calcium- and Vitamin D-containing supplements, others
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