The Dietary Supplement Ingredient Database (DSID): Comparison of Adult and Children’s MVM Products

Karen Andrews1, Janet Roseland1, Angela Middleton1, Matthew Feinberg2, Cuilei Zhao3, Joanne Holden1, Johanna Dwyer2, Mary Frances Picciano2, Leila Saldanha2, Christopher Sempos2, Regan Bailey2, Larry Douglass3

1U. S. Department of Agriculture - ARS - Beltsville Human Nutrition Research Center - Nutrient Data Laboratory, Beltsville, MD
2National Institutes of Health - Office of Dietary Supplements, Bethesda, MD
3Consulting Statistician, Longmont, CO

Introduction

The Nutrient Data Laboratory, Beltsville Human Nutrition Research Center, Agricultural Research Service, U.S. Department of Agriculture, has been working with the Office of Dietary Supplements, National Institutes of Health and other federal agencies to plan and develop a Dietary Supplement Ingredient Database (DSID) to evaluate levels of ingredients in dietary supplement products.

The first major product of this research is a publicly available dietary supplement ingredient database, DSID, released in April, 2009 including data for 16 vitamins and minerals in adult MVMs (vitamins defined as containing >2 vitamins, with or without minerals). The DSID-1 release includes drug tables, data application tables, a research summary and an on-line adult MVM calculator. The web site is: (http://dietarysupplementdatabase.usda.gov).

Methods

For both the adult MVM and children’s MVM studies:

1. Representative Products were:
   A. Identified using multiple surveys
   B. Purchased:
       1. at retail outlets in 5 U.S. locations
       2. Through distributors or via the Internet (direct sales)
   C. Repackaged and sent to qualified laboratories in planned batches
   D. Analyzed for up to 21 vitamins and minerals

2. Laboratory precision and accuracy were evaluated using:
   A. Standard reference materials
   B. Blinded duplicates
   C. In-house reference materials

Comparison of Product Label Information

Table 1 lists:
• Percentage of purchased products containing each nutrient
• Minimum, maximum and most commonly labeled % Daily Value (% DV) for each nutrient

Note that for most of the children’s products evaluated, the primary age group was children’s. This is reflected in the % DV for this group being the same as for adults.

Comparison of Analytical Results

Product results for 12 nutrients analyzed to date are summarized in Figure 2. The overall mean % difference from label was calculated for each nutrient:

• Results for both studies are similar in mean % difference from label and among – product variability, identified here using error bars indicating one standard deviation (except for Vitamin E, manganese & selenium).
• For 3 of the 12 nutrients analyzed to date (copper, phosphorus & riboflavin), the mean % difference from label for the children’s products was less than the mean % difference from label for the adult MVM products.

Conclusions and Future Plans

1. The means of all 12 nutrients with analyzed values for both children’s and adult MVMs are above label, with some vitamins and minerals significantly higher than labeled levels.
2. Results for the remainder of the nutrients to be analyzed in MVM products, (vitamins C, D, vitamin A (both retinol and beta-caroten), potassium, folic acid, thiamin, niacin & chromium) will be finalized and reported in future publications and in the DSID-2 release in 2011.
3. Additional statistical analysis of children’s MVMs will include regression analysis of results across the range of labeled levels and variability estimates.