



A Review Of Multivitamin/Multimineral Supplement Products Reported in the National Health and Nutrition Examination Survey (NHANES) 1999-2000



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Abstract

Objective: NHANES 1999-2000 data indicate that 35% of U.S. adults took a multivitamin/multimineral supplement in the past month; most of them on a daily basis. NHANES supplement data were evaluated for patterns that may help characterize the types of multivitamin/multimineral supplements most commonly consumed in the U.S. **Methods and Materials:** The NHANES dietary supplement data files were imported into Microsoft Access. Queries were constructed in Structured Query Language (SQL) for searches of supplement name and counts of vitamins or minerals. Total vitamin and mineral count distributions were determined separately for adult products with three or more vitamins and for products with one or more minerals. In addition, products self-identified as multivitamins or multivitamin/minerals that contained at least one Dietary Reference Intake nutrient (vitamin or mineral for which there are identified daily values or adequate intake amounts) were examined. Distributions were determined for specific vitamins in products with both “multi” and “vitamin” in the product name and for specific vitamins and minerals with “multi”, “vitamin” and “mineral” in the product name. **Results:** The distribution of vitamin counts (>2) in adult supplement products indicates that the most commonly reported multivitamin products contain 13 vitamins. The distribution of mineral counts in adult supplement products shows that most of the products sold are either single or double mineral products (which may be in combination with vitamins or other supplement ingredients) or are multivitamin/multimineral products with 16 minerals and at least 13 vitamins. Dietary supplement products self-identified on the label as multivitamin products contain the same specific 11 vitamins 90% of the time; those self-identified as multivitamin/multimineral products also contained the same specific 11 vitamins and four specific minerals 90% of the time. **Significance:** The NHANES dietary supplement data files are useful for the evaluation of dietary supplement use in the U.S. Given the relatively high usage of multivitamin/multimineral supplements by Americans and the use of this category by researchers to describe supplement users, it is important to identify what specific vitamins and minerals are commonly contained in frequently reported multivitamin/multimineral products.

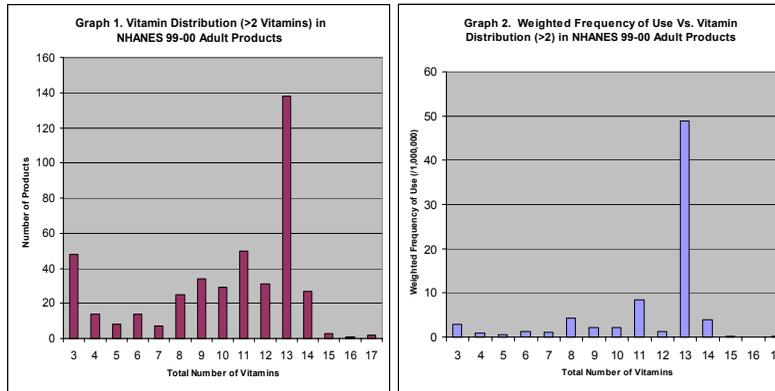
Introduction

As part of the Dietary Supplement Ingredient Database (DSID) working group, the Nutrient Data Laboratory at the United States Department of Agriculture is working with the Office of Dietary Supplements at the National Institutes of Health, the National Center for Health Statistics (NCHS), Center for Disease Control to develop an analytically validated dietary supplement database. This DSID database will identify and analyze representative dietary supplement products for their actual nutrient content. A logical system for categorizing dietary supplements provides a basis for designing a publicly available database useful to researchers, industry groups, nutrition professionals and consumers. In addition, categorization of dietary supplements is essential for selecting representative products for analysis and affects the estimation of values for related products. In a recent paper published by the NCHS, several categories for supplement products were identified (1). Multivitamin/multimineral products were defined as “three or more vitamins with or without minerals”. This definition of the category, multivitamin/multimineral, was used to evaluate the distribution of counts of vitamins and minerals in the NHANES supplement files. In addition, the ingredient composition of products sold specifically as multivitamins and multivitamin/multiminerals and reported in NHANES was summarized. Nutrient values were converted to % Daily Value (% DV) for this analysis. All vitamins and minerals with a Recommended Daily Allowance (RDA) or Adequate Intake (AI), also have a Daily Value (DV), which is the recommended daily amount based on a 2000 calorie diet. To calculate % DV, the label value was divided by the % DV for that nutrient and multiplied by 100.

Methods and Materials

In the NHANES 1999-2000 survey (2), respondents were asked about the amount and frequency of their dietary supplement use over the past 30 days. Over 1900 different supplement products (including generic and default groupings) were reported as taken at least once in the past month. The supplement data files were evaluated in two different ways. One method used NHANES 99-00 adult products (n=1725) to look at the distribution of vitamins and minerals. The other analysis focused on a subset of products (n=1417) containing only those nutrients for which there is a DV. Structured Query Language (SQL) queries searched nutrients commonly present in adult products and evaluated patterns in these products that may help define multivitamin/mineral supplements commonly sold on the market.

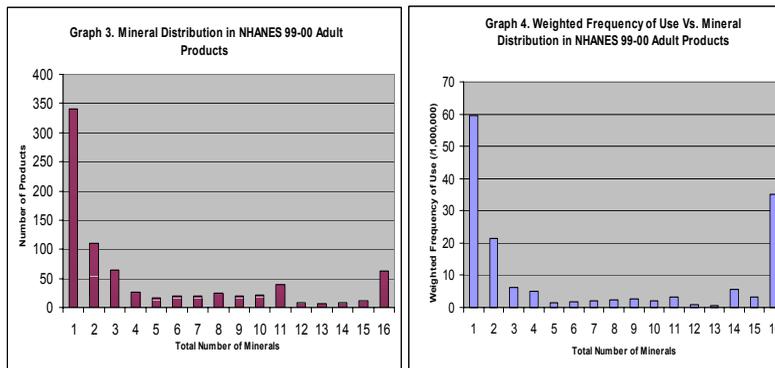
Results



Distribution of Vitamins in Supplement Products, Unweighted and Weighted

Graph 1 (n=918) represents the vitamin count distribution of the adult products with more than two vitamins that were reported in NHANES 99-00.

Graph 2 (n=918) represents the vitamin count of products vs. the weighted frequency of use of the products. These results indicate that an overwhelming number of people reporting use of a multivitamin product (almost 50 million people) take a supplement containing 13 vitamins.



Distribution of Minerals in Supplement Products, Unweighted and Weighted

Graph 3 (n=351) represents the mineral count distribution of all adult supplement products (1725) that were reported in NHANES 99-00.

Graph 4 (n=351) represents the mineral count of products vs. the weighted frequency of use of the products. These results indicate that almost 60 million people take a supplement with one mineral and 35 million take a supplement with 16 minerals.

Table 1. Adult products labeled “multi” and “vitamin”

Ingredient	n	% (n/158)	Median % DV
Riboflavin	158	100	100
Thiamin	156	99	100
Vitamin C	153	97	100
Vitamin E	153	97	100
Niacin	152	96	100
Vitamin A	151	96	100
Vitamin D	150	95	100
Pantothenic acid	149	94	100
Folic acid	148	94	100
Vitamin B 12	148	94	123
Vitamin B 6	148	94	100
Zinc	125	79	100
Calcium	120	76	16
Fe	120	76	100
Iodine	115	73	100
Magnesium	115	73	25
Copper	112	71	100
Manganese	110	70	175
Biotin	109	69	10
Selenium	109	69	30
Chromium	106	67	83

Table 2. Adult products labeled “multi” and “vitamin” and “mineral”

Ingredient	n	% (n/114)	Median %DV
Riboflavin	114	100	100
Vitamin E	114	100	100
Vitamin C	113	99	125
Thiamin	112	98	100
Niacin	111	97	100
Vitamin A	110	96	100
Zinc	110	96	100
Vitamin D	109	96	100
Folic acid	108	95	100
Pantothenic acid	108	95	100
Vitamin B 12	106	93	150
Vitamin B 6	106	93	150
Calcium	104	91	16
Iodine	104	91	100
Magnesium	103	90	25
Copper	100	88	100
Manganese	98	86	175
Selenium	97	85	29
Iron	95	83	100
Chromium	94	82	83
Biotin	92	81	10

In order to identify those products which manufacturers have self-identified as multivitamins or multivitamin/mineral products, product names from the labels of the products in NHANES 99-00 data files were searched. Of the 1900 products reported in NHANES, 1417 had at least one ingredient for which a %DV could be calculated. A search of this set of 1417 products identified 234 products with the terms “multi” and “vitamin”. Of these, 158 would be considered adult products. Table 1 indicates that 90% of the products (light blue area) that were self-identified as multivitamins contained the same 11 vitamins, usually at the 100% DV level.

When the terms, “multi” “vitamin” and “mineral” were all searched for in the product name, 114 products were found. Table 2 shows that 90 % of the products (light blue area) that were self-identified as multivitamin/mineral products contained the same 11 vitamins as the above group and included four minerals: zinc, calcium, iodine and magnesium. In addition, 80% of the products (dark blue area) contained biotin and 5 other minerals.

Conclusions

- The distribution of vitamin counts in adult supplement products indicates that the most commonly reported multivitamin products (>2 vitamins) contain 13 vitamins. The distribution of mineral counts in adult supplement products shows that most of the products reported are either single or double mineral products (which may be in combination with vitamins or other supplement ingredients) or are multivitamin/mineral products with 16 minerals. All of the products with 16 minerals also contain at least 13 vitamins.
- Dietary supplement products self identified on their label as multivitamins contain the same specific 11 vitamins 90% of the time. Dietary supplement products self identified as multivitamin/minerals contain the same specific 11 vitamins and four minerals 90% of the time. Additional minerals are present in many products.

References

- K. Radimer, et al. Dietary Supplement Use by US Adults: Data from the National Health and Nutrition Examination Survey, 1999-2000. Am. J. Epidemiol, August 15, 2004; 160(4): 339 - 349.
- http://www.cdc.gov/nchs/nhanes Accessed May 2004