

Dietary Supplement Use Improves Nutrient Adequacy in U.S. POINTER Participants, but Increases Risk of Excess Intake (A-8855)

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Widespread nutrient inadequacies were observed among non-supplement users. Supplement use improves adequacy for many, but users whose typical daily intakes exceed the Tolerable Upper Limit (UL) may be at adverse risk.



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Background

Energy needs decrease with advancing age. Diets insufficient in essential nutrients contribute to nutrient inadequacies, suboptimal cognitive and physical function, and overall unhealthy aging.

Our objective was to describe adequacy of key nutrients of both supplement users and non-users among a diverse sample of older adults at risk of cognitive decline and enrolled in the U.S. POINTER study (1). Nutrient adequacy was defined in reference to the Dietary Reference Intakes (sex- and age-specific Estimated Average Requirement (EAR) or Adequate Intake (AI), and Tolerable Upper Limit (UL)).

Methods

Adults aged 60 to 79 years at risk of memory loss (sedentary, suboptimal diet, other risk factors) were enrolled in the U.S. POINTER study (a phase III two-year randomized controlled trial) comparing the impact of two lifestyle interventions with respect to cognitive decline. The validated (2) Rush food frequency questionnaire (FFQ) was completed by participants prior to randomization. The 142-item FFQ captured usual food and beverage intakes along with usual dose, frequency, and duration of 10 vitamin and/or mineral supplements. Open-ended questions addressed additional items consumed at least weekly. Median daily nutrient intakes were computed using Nutrition Data System for Research (Nutrition Coordinating Center, 2023) and then expressed as a percentage of the EAR or AI cutoffs as well as those for the UL. Basic descriptive statistics included chi square and Fisher's exact tests where appropriate. Nutrient intakes were compared between non-users and users using Mann-Whitney tests.

Results

**Demographics**  
Of the 2111 enrolled participants, 2095 completed FFQs. During quality checks, potentially invalid questionnaires were excluded (<700 or > 4000 calories for men; <500 or > 3800 calories for women) with a final sample of 2041.

**Dietary Supplement Use**  
49% of participants reported taking a multivitamin-mineral (MVM) supplement

**Most commonly used:** Vitamin D (36%), Vitamin E (25%), Vitamin C (23%), Vitamin B12 (19%), Calcium (16%)  
**Less commonly used:** Folate (10.5%), Niacin (8%), Choline (6.1%), Omega-3 (2.3%), Vitamin K (0.8%)

Table 1: Total Sample and Analytic Sample at Baseline – the U.S. POINTER Study

| Characteristic                                        | Total U.S. POINTER Sample n=2111 | Current Analytic Sample n=2041 |
|-------------------------------------------------------|----------------------------------|--------------------------------|
| Sex, %                                                |                                  |                                |
| Male (n=656)                                          | 31.1                             | 30.8                           |
| Female (n=1455)                                       | 68.9                             | 69.2                           |
| Age Group, %                                          |                                  |                                |
| 60-70 y                                               | 64.4                             | 64.8                           |
| 71-79 y                                               | 35.6                             | 35.2                           |
| APOEε4 carriage, %                                    | 31.3                             | 31.3                           |
| College Graduate or more, %                           | 69.7                             | 69.8                           |
| Ever Smoked <sup>1</sup>                              | 45.4                             | 45.3                           |
| Body Mass Index <sup>1</sup> , ≥ 25 kg/m <sup>2</sup> | 81.3                             | 81.6                           |
| Area Deprivation Index <sup>1</sup> , > 31            | 50.0                             | 49.7                           |

<sup>1</sup>Variables were dichotomized. There were no remarkable differences in demographics of the two population samples.

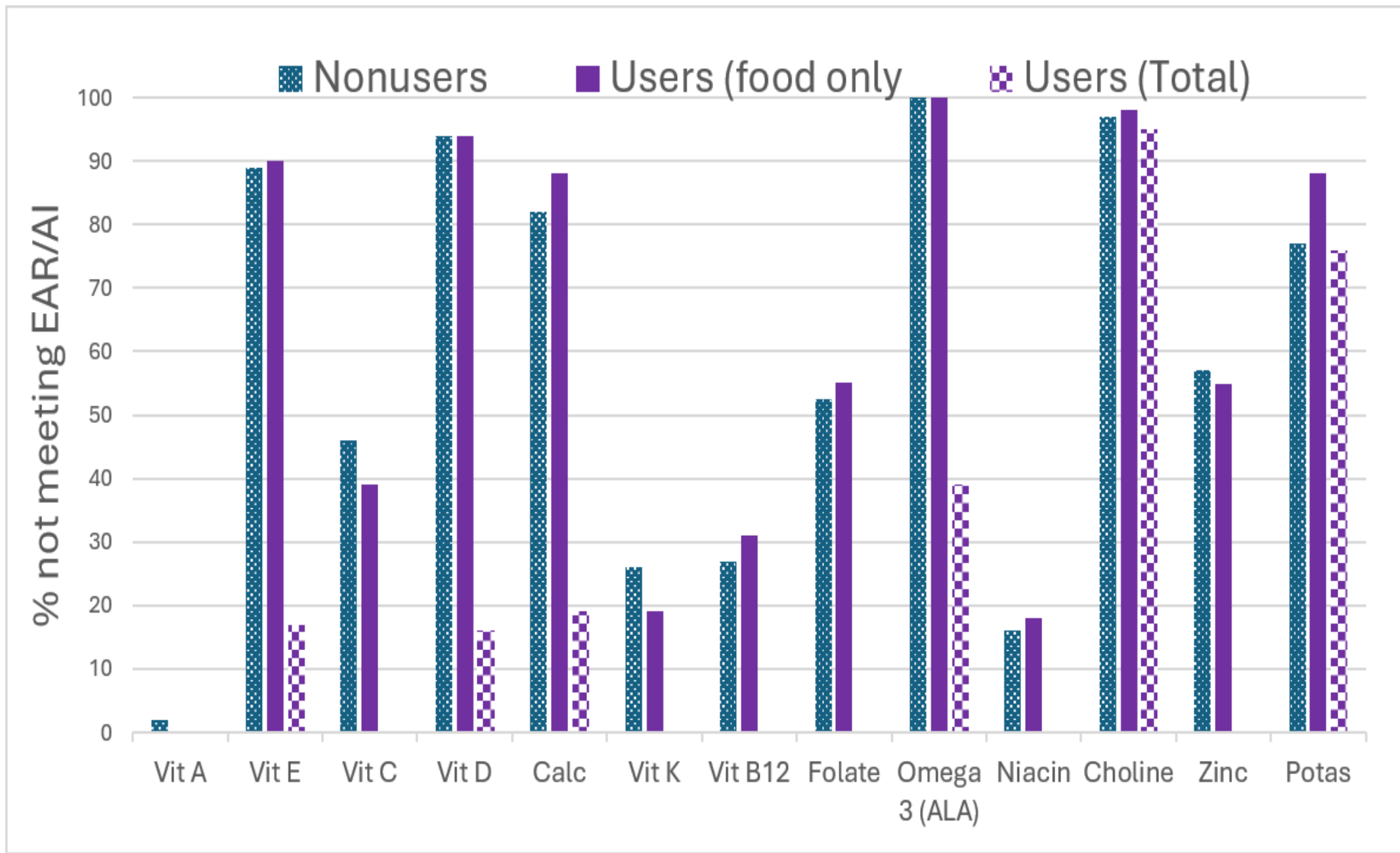


Figure 1. Proportion of all 2041 U.S. POINTER participants whose nutrient intakes were inadequate as assessed from usual daily intakes estimated by the Rush FFQ (FFQ).

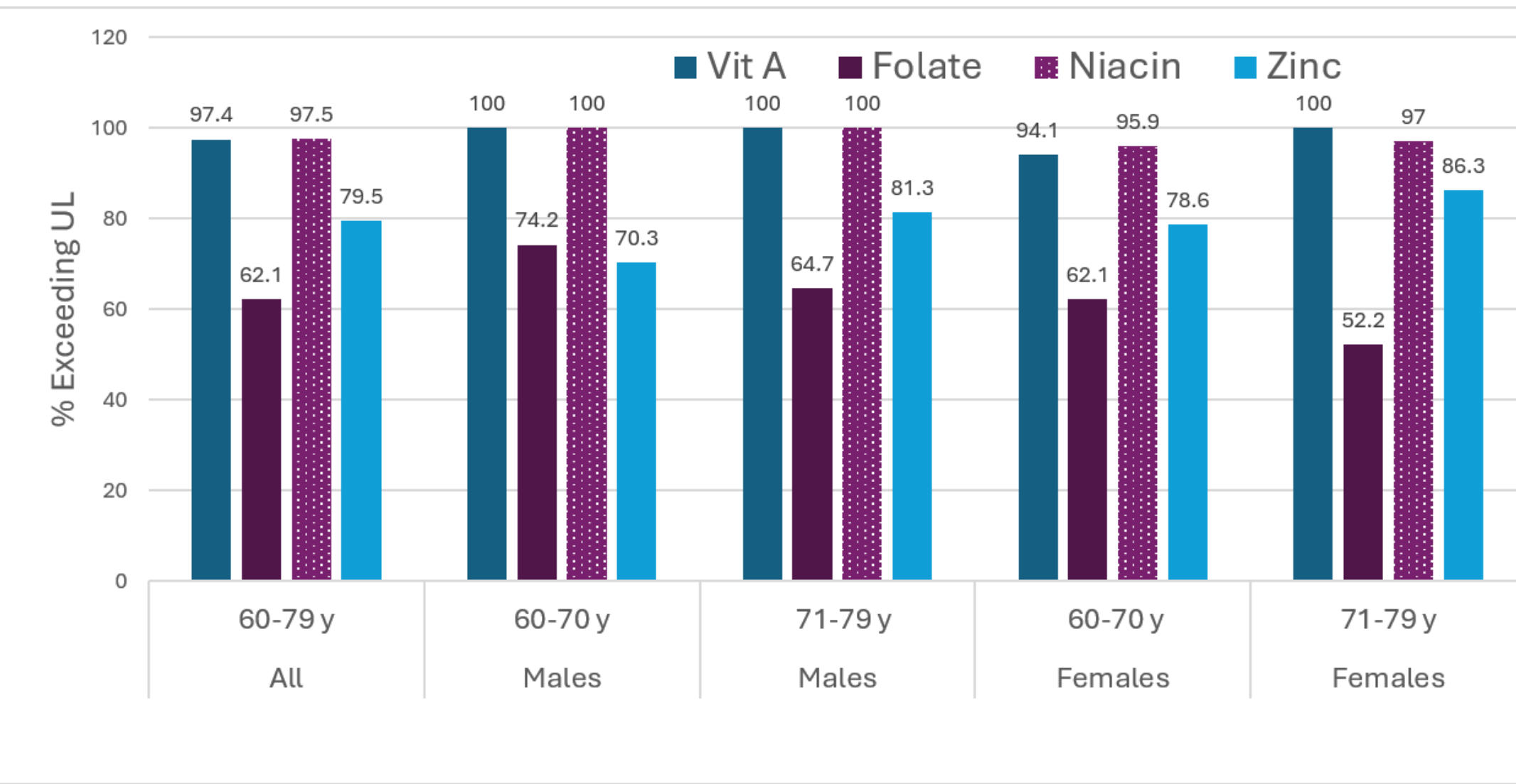


Figure 2. Proportion of U.S. POINTER supplement users whose intakes exceed the UL for safe and adequate intake. Tolerable ULs are as follows: Vitamin A, 3000 mcg; Folate, 1000 mcg; Niacin, 35 mg; and Zinc, 40mg.

References

1. Baker LD, Espeland MA, Whitmer RA, et al. Structured vs self-guided multidomain lifestyle interventions for global cognitive function. *JAMA*. 2025;334(8):681. doi:10.1001/jama.2025.12923

2. Tangney CC, Agarwal P, Ventrelle J, et al. Relative validity of the revised RUSH food frequency questionnaire and MIND diet screener: Capturing the Mediterranean-DASH Intervention for Neurodegenerative Delay (MIND) dietary pattern. *Alzheimer's Dementia* 2023; 19 (S23): e074843.

3. U.S. Department of Agriculture and US Department of Health and Human Services. *Dietary Guidelines for Americans, 2020-2025*, 9<sup>th</sup> edition (Internet). DietaryGuidelines.gov, 2020, p.139

Dietary Assessment: Nutrient Inadequacy

- As shown in Figure 1
- Most U.S. POINTER participants did not meet recommended intakes for several nutrients from food alone (e.g., vitamins E, C, D, calcium, niacin)
  - Dietary supplements improved nutrient adequacy (e.g., vitamins B<sub>12</sub>, folate, niacin, etc.)
  - Some nutrient gaps remained despite supplement use. (e.g., vitamins E, D, calcium)
  - Inadequate intakes of choline and potassium remained common. (Few reported foods or supplements rich in these nutrients.)

Dietary Assessment: Nutrient Excess

- As shown in Figure 2
- More is not always better
  - Some supplement users exceeded the Tolerable Upper Intake Level (UL) for nutrients (vitamin A, folate, niacin, and zinc). When such intakes are consumed, dry, cracked skin, bone loss, fatigue, and liver abnormalities are possible.
  - Individualized supplement use based on usual food choices is advisable compared with routine supplementation

Conclusion

Because energy needs decrease with advancing age (3), nutrient-dense food choices are essential. Our current findings of usual intakes for over 2,000 U.S. POINTER participants suggest that food alone was insufficient in meeting the recommendations for many nutrients older adults. Dietary supplements improved nutrient adequacy but also increased the risk of excessive intakes for some nutrients. Comprehensive, individualized assessment of both dietary and supplement intake is critical to address possible nutrient inadequacies and prevent potential excess intake among older adults.