

# EVALUATING THE U.S. FOLIC ACID FORTIFICATION POLICY: DID WE SUCCEED?

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**Purpose:** The 1998 mandate to fortify enriched grain products with folic acid in the US aimed to help prevent neural tube defects (NTDs) by increasing to 50% the proportion of women of childbearing age consuming greater than 400 micrograms (mcg) per day of folic acid. Limits on fortification levels are necessary because of concerns about masking of B-12 deficiency in older populations. Our analysis estimates the increase in folate intake after fortification.

**Methods:** We analyzed food, supplement, and total folate intake by gender, age (15-34, 35-64, and 65+), and race/ethnicity (non-Hispanic whites, non-Hispanic blacks, and Mexican-Americans) from two National Health and Nutrition Examination Surveys (NHANES): 16,794 subjects from NHANES III (1988-1994) and 4,831 from NHANES 1999-2000. We used a one-way analysis of variance on a two-measure subsample from NHANES III to adjust food folate intake distributions for measurement error. We compared pre- and post-fortification population-based distributions of total folate intake and proportions of the population consuming more than 400 and 1,000 mcg/day of total folate.

**Results:** Overall, daily food and total folate intake increased by approximately 100 mcg/day after fortification. The proportion of younger women consuming greater than 400 mcg/day of folate has increased since fortification, but has not yet reached the 50% target: 28% (pre-fortification) vs. 33% (post-fortification) of 15-34-year-old whites had intake >400 mcg/day; 19% vs. 23% of blacks; and 15% vs. 28% of Mexican-Americans. Among older populations (ages 65+) who may be at risk of B-12 deficiency masking, the percent who are consuming over 1,000 mcg/day (the tolerable upper limit) has increased after fortification for whites and black males, but has remained unchanged for black females and has decreased for Mexican-Americans: 2% vs. 4% (pre-vs.-post) for white males and females; 1% vs. 3% for black males; 1% (no change) for black females; 6% vs. 2% for Mexican-American males; and 3% vs. 0% for Mexican-American females.

**Conclusions:** Since fortification, folic acid intake among the U.S. population has increased, with substantial variations by age, gender, and race. Targeted supplement-use interventions among women of childbearing age may be needed to further increase the proportions of these women consuming greater than 400 mcg/day of folic acid.