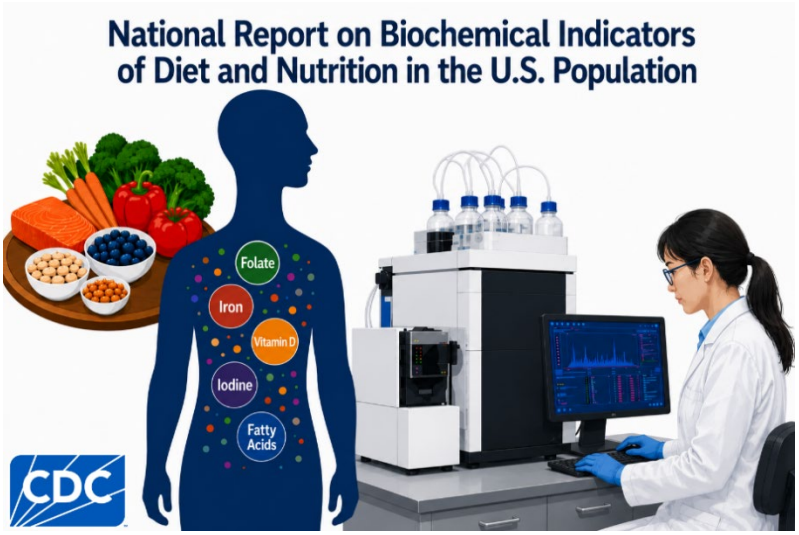
A COMPREHENSIVE BIOCHEMICAL STUDY OF THE NUTRITION STATUS OF THE U.S. POPULATION BASED ON 24 YEARS OF NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY (NHANES) DATA

2026 CDC Nutrition Report



The report includes 131 indicators of diet and nutrition

The 2026 CDC Nutrition Report provides reference data on biochemical indicators that are important to human health, for example fat- and water-soluble vitamins, iron-status indicators, and iodine. Biochemical refers to the nutrients or chemical components, like vitamins, in biological samples like blood, urine, or other bodily fluids.

New report uses NHANES results

The National Health and Nutrition Examination Survey (NHANES) is CDC's ongoing national survey to study the health and nutrition status of the U.S. population. NHANES uses a complex, nationally representative survey design. Estimates in the report are weighted to represent the U.S. civilian, noninstitutionalized population. The 2026 Nutrition Report includes results from people who participated in NHANES between 1999–2000 and August 2021–August 2023. The information is shown by age, sex, and race and Hispanic origin. Time periods vary by biomarker depending on data availability.

New information on biomarker differences between users and non-users of dietary supplements

The 2026 Nutrition Report presents new data comparing biomarker levels in users and nonusers of dietary supplements. Comparisons between supplement users and nonusers are descriptive and should not be interpreted as causal effects of dietary supplement use. Supplement users were defined as persons who reported taking at least one dietary supplement in the past 30 days. Understanding the differences between users and nonusers is important because nearly 35% of children and adolescents and 60% of adults reported taking at least one dietary supplement in the past 30 days (NHANES 2017–March 2020). The Report found that biomarker levels of important nutrients were typically higher in supplement users compared with non-users.

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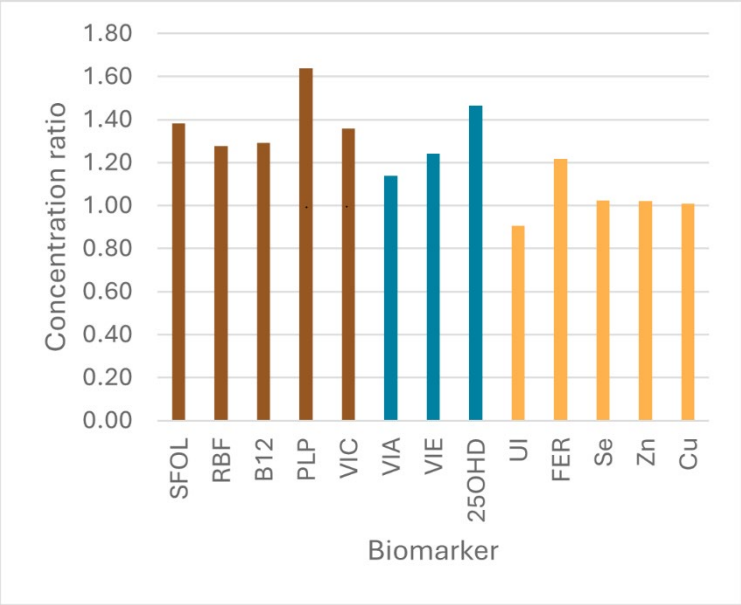
Comparison of biomarker concentrations between supplement users and nonusers



The graph compares levels of water-soluble vitamins (brown), fat-soluble vitamins (blue), and trace elements and minerals (gold) between users and nonusers of dietary supplements. The levels are shown as a ratio of weighed geometric or arithmetic mean concentrations in supplement users to nonusers. Levels of water- and fat-soluble vitamins were 10–60% higher in supplement users. The biggest differences between users and nonusers were for pyridoxal-5'-phosphate (PLP), a biomarker of vitamin B6 status, and 25-hydroxyvitamin D (25OHD), a biomarker of vitamin D status. Levels of trace elements and minerals were mostly comparable between users and nonusers.

Legend: SFOL, serum folate; RBF, red blood cell folate; B12, vitamin B12; PLP, pyridoxal-5'-phosphate; VIC, vitamin C; VIA, vitamin A; VIE, vitamin E; 25OHD, 25-hydroxyvitamin D; UI, urine iodine; FER, ferritin; Se, selenium; Zn, zinc; Cu, copper.

Source: National Health and Nutrition Examination Survey (NHANES) 1999-2000 to August 2021–August 2023.

What the report tells us

The 2026 Nutrition Report shows levels of different biochemical indicators of diet and nutrition in the general population and in selected groups such as children, women of reproductive age, and in groups defined by race and Hispanic origin.

The 2026 Nutrition Report provides:

- Nutritional biomarker information for dietary supplement users and non-users
- Reference information for physicians and scientists to detect high or low nutrient levels in people
- A look at nutrient levels over time to see trends in nutrition status
- Numbers that can be used to compare the effectiveness of nutrition interventions

U.S. women of reproductive age have borderline mild iodine deficiency

Background

Iodine is an essential part of thyroid hormones. Thyroid hormones control a person's growth and development. Across the world, iodized salt and seafood are generally the main source of this nutrient in the diet. In the United States, most people get their iodine from grains and dairy products like milk.

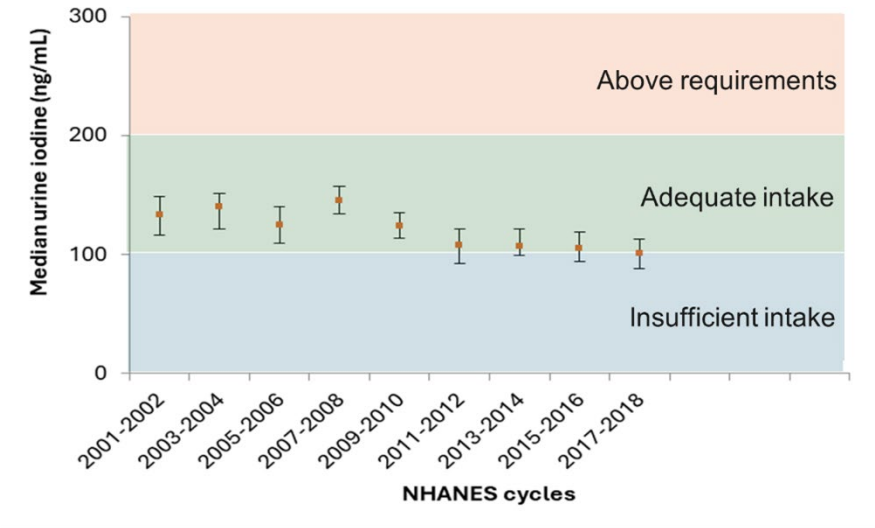
Iodine deficiency is the most preventable cause of intellectual disability in the world. Iodine deficiency can also cause hypothyroidism, goiter, cretinism, and other health problems.

Most dietary iodine absorbed by the body eventually shows up in the urine. So, the most common way to find out a person's iodine status is to measure the amount of iodine in his or her urine.

Intake recommendations

The American Thyroid Association recommends that all prenatal vitamins contain 150 micrograms of iodine and that North American women take daily dietary supplements with 150 micrograms of iodine during pregnancy and while nursing.

Urine iodine trends in American women



Source: National Health and Nutrition Examination Survey (NHANES) 2001-2002 to 2017–2018.

Women of reproductive age (females 12–49 years old) showed lower levels of iodine in their urine from 2001–2002 to 2017–2018. Women showed borderline mild iodine deficiency (i.e., insufficient intake) during the more recent NHANES cycles.

Over half of Americans have too-low omega-3 fatty acid levels

Background

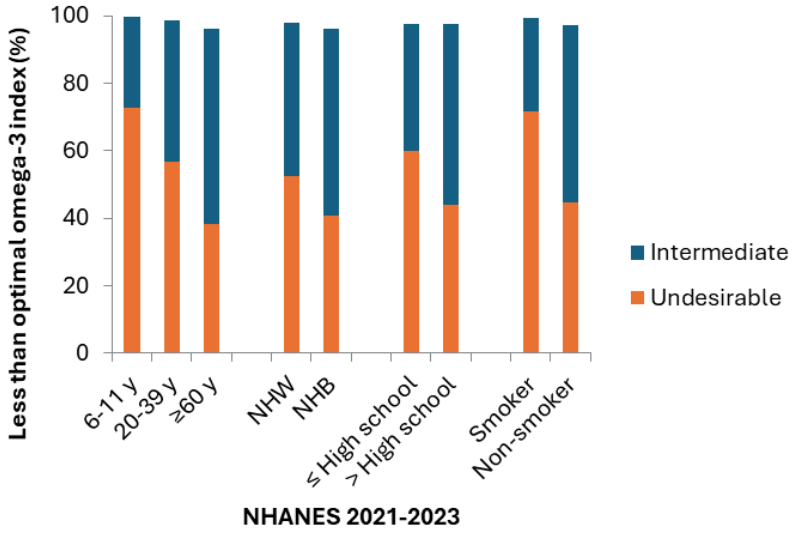
Fatty acids are the building blocks of fats. Among polyunsaturated fatty acids, omega-3's (n-3) are vital to good health. They can help protect the heart and the vascular system. Omega-3's can also help lower triglycerides and inflammation in the body. Previous studies have shown that the omega-3 index strongly relates to a person's risk of sudden death from heart problems.

The omega-3 index is the sum of eicosapentaenoic and docosahexaenoic acid levels in red blood cells. The omega-3 index uses the categories undesirable (<4%), intermediate (4–8%), and optimal (>8%).

Intake recommendations

The American Heart Association recommends that patients with no history of heart disease have at least two servings of fish per week (particularly fatty fish). Patients with coronary heart disease are encouraged to consume about 1 gram of omega-3 fatty acids per day, preferably from oily fish. In addition, the American Heart Association recommends the general population consume vegetable oils (for example, olive, soybean, walnut, and flaxseed) and foods that are high in alpha-linolenic acid, like walnuts and flaxseeds.

The U.S. population falls short of dietary recommendations to achieve optimal omega-3 index



Legend: NHW, non-Hispanic White (≥20 y); NHB, non-Hispanic Black (≥20 y); education level (≤high school and >high school) (≥20 y); recent tobacco use (past 5 days) (yes/no) (≥20 y).

Source: National Health and Nutrition Examination Survey (NHANES) August 2021–August 2023.

Over half of the U.S. population have an undesirably low omega-3 index (<4%) and 98% have values less than optimal (≤8%).

Folic acid fortification: A public health success

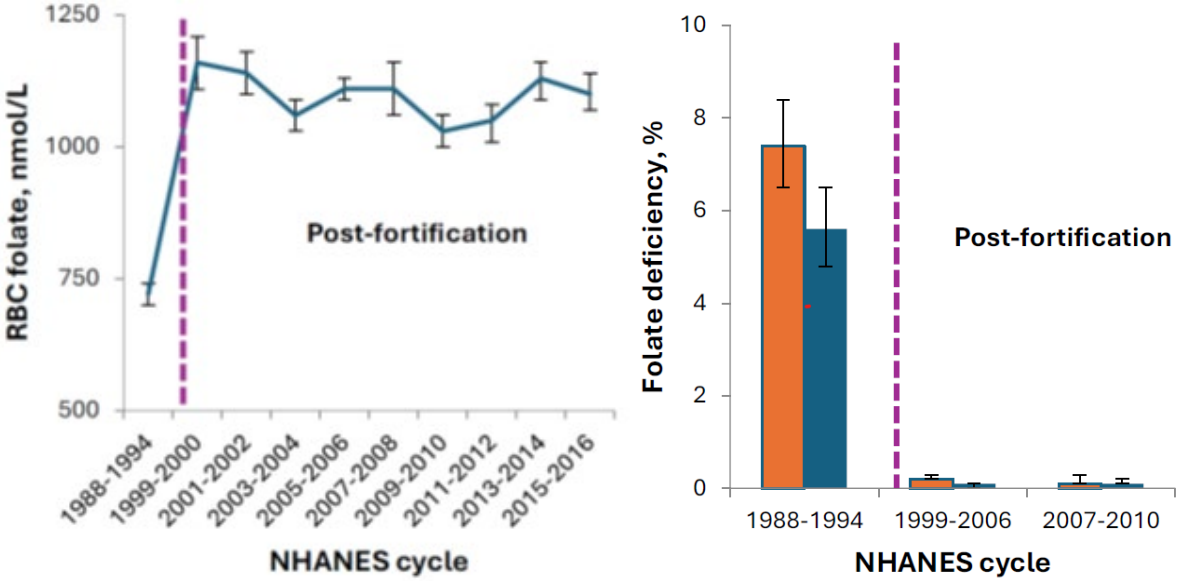
Background

It is important for people to have enough folate in their bodies during pregnancy, infancy, and other periods when cells rapidly divide and grow. To reduce the risk of neural tube defects in newborns, the U.S. Food and Drug Administration (FDA) requires folic acid to be added to all enriched cereal-grain products. Red blood cell folate reveals how much folate is stored in the body and is a good sign of long-term folate status.

Intake recommendations

The U.S. Preventive Services Task Force recommends that every woman who could become pregnant consume at least 400 micrograms of folic acid each day in addition to folate they receive from food in a varied diet.

U.S. blood folate levels increased post-fortification



Legend: Both graphs show data for the U.S. population 4 years and older for 1988-1994 and 3 years and older for other NHANES cycles. Orange bars represent red blood cell folate deficiency, whereas blue bars represent serum folate deficiency (right graph). RBC, red blood cell.

Source: National Health and Nutrition Examination Survey (NHANES) 1988-1994 to 2015-2016.

In 1998, the FDA began requiring folic acid to be added to enriched cereal grain products to reduce the risk of neural tube defects. After 1998, blood folate levels increased by about 50% in the overall U.S. population (left graph). Before 1998, about 6–8% of the overall population (right graph) and 10–12% of women of reproductive age (not shown) did not have enough folate. After 1998, that figure dropped to less than 1% both in the overall U.S. population (right graph) and in women of reproductive age (not shown) for all races and Hispanic origin groups.

Americans' vitamin D levels increased from 2001-2002 to 2021-2023

Background

Vitamin D is found naturally in only a few foods such as fish-liver oils, fatty fishes, mushrooms, egg yolks, and liver. In the United States, vitamin D commonly is added to milk and other foods.

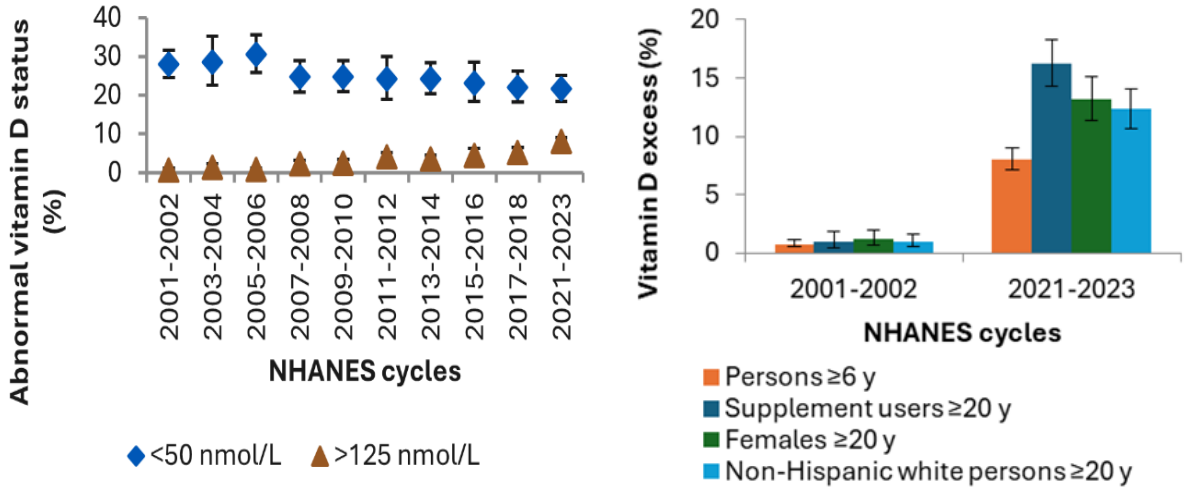
Vitamin D is essential for good bone health and is being studied for possible roles in muscle function and other health outcomes

Ultraviolet light from the sun helps people form vitamin D in the skin. It is transported to the liver and converted to 25-hydroxyvitamin D. Doctors use this form of vitamin D to determine whether a person has enough vitamin D because it is a good reflection of the vitamin D that people receive from food and exposure to sunlight.

Intake recommendations

The Institute of Medicine recommends 400 international units of vitamin D per day as an adequate level for infants from birth through 12 months of age. The *Dietary Guidelines for Americans* recommend vitamin D supplementation for breastfed infants and infants who have less than 32 ounces of infant formula per day.

Vitamin D insufficiency decreased, whereas vitamin D excess increased



Source: National Health and Nutrition Examination Survey (NHANES) 2001-2002 to August 2021–August 2023.

In U.S. persons 6 years and older, vitamin D insufficiency (25-hydroxyvitamin D <50 nmol/L) decreased from 28% to 22%, while excess (25-hydroxyvitamin D >125 nmol/L) increased from <1% to 8% between 2001-2002 and August 2021-August 2023 (left graph). Excess serum 25-hydroxyvitamin D concentrations increased most in adult supplement users, females, and non-Hispanic White persons (right graph).

The report found that differences in vitamin D deficiency by race and Hispanic origin observed in 2001-2002 still existed in August 2021-August 2023 (not shown). The greatest vitamin D deficiency—or vitamin D levels that were too low—were in non-Hispanic Black persons.

However, clinical data show greater bone density and fewer fractures in this group compared with other race and Hispanic origin groups. These findings should be interpreted in the context of prior evidence that bone-health outcomes do not always align with serum 25-hydroxyvitamin D concentrations across population groups. The race and Hispanic origin differences were less in August 2021–August 2023 compared to 2001–2002.

Additional information about vitamin D is available at https://www.cdc.gov/infant-toddler-nutrition/vitamins-minerals/vitamin-d.html.