

For a balanced diet and good health, pay particular attention to these essential vitamins and minerals

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These nutrients “have been linked to multiple positive health outcomes, are necessary for regulation of many systems in the body, and may help with reduced risk of some diseases,” said Cheryl Gilhooly. Credit: Ingimage

Most of us know that people require water, protein, carbohydrates, and fats to stay alive. But when it comes to essential vitamins and minerals, needed in smaller amounts but just as key in human functioning, things get hazy. Which ones do we have to be particularly careful about getting enough of? What happens if we don't? And what foods can we find them in?

The answers are complex, according to Cheryl Gilhooly, F02, manager of the Dietary Assessment Unit and Metabolic Research Unit at the [Jean Mayer USDA Human Nutrition Research Center on Aging \(HNRC\) at Tufts](#).

"Many factors influence nutrient needs and levels of adequate intakes," she said. "Investigators at the HNRC are especially interested in how various stages of aging or age-related disease may affect requirements, intake levels, and [health effects](#) associated with suboptimal intakes of certain nutrients."

Other factors that influence a person's nutrient needs and their ability to meet them include biological sex, genetics, weight status, pregnancy and lactation, activity levels, food security, eating patterns including restricted diets, and use of dietary supplements.

But across all categories, one thing is clear. The majority of Americans do not achieve recommended intakes of fruits, vegetables, dairy, and whole grains, foods that provide nutrients that are often under-consumed, said Gilhooly, citing the [National Health and Nutrition Examination Survey](#) and the [Dietary Guidelines for Americans](#).

According to national dietary intake reports, ten nutrients are commonly under-consumed by Americans. Four are of public health concern, meaning their underconsumption has been linked to adverse health outcomes: the minerals calcium and potassium; vitamin D; and fiber, a

type of carbohydrate.

The other six are the minerals magnesium and iron; vitamins A, C, E; and choline, a vitamin B-like nutrient.

"It is important to meet intake goals for these nutrients, since they have been linked to multiple positive health outcomes, are necessary for regulation of many systems in the body, and may help with reduced risk of some diseases," Gilhooly said.

To boost consumption of many of these needed nutrients, turn first to fruits and vegetables, she suggested. Keep fruit in sight in a bowl at home and work; toss vegetables and beans into soups, pastas, and stir fries—frozen veggies and canned beans are quick options; skip the fries and choose salads and vegetable sides at restaurants; and plan your meals.

"Scientists at the HNRCA continue to discover the benefits and function of other nutrients and food components such as vitamin K, carotenoids, and flavonoids, so when trying to improve intake of these ten under-consumed nutrients, you are most likely boosting your intake of other beneficial nutrients at the same time," Gilhooly said.

Here Gilhooly breaks down the details on nutrients to know, and gives more tips for boosting consumption.

Calcium and Vitamin D

- Important function: Boost bone health

Best sources

- Calcium: Dairy, fish with soft bones, dark green vegetables, and fortified foods such as dairy alternatives, juices, cereals, and tofu
- Vitamin D: Sunlight, fatty fish, and fortified foods such as milk, yogurt, dairy alternatives, juice, and cereals

Risks associated with deficiency

- Calcium: Lower bone mass
- Vitamin D: Rickets in children, osteomalacia in adults

Potassium

- Important functions: Muscle function, nerve function, balances fluids
- Best sources: Fruits such as dried fruits and bananas and vegetables such as acorn squash and sweet potatoes, milk and yogurt, beans, fish and seafood
- Risks associated with deficiency: Muscle weakness, fatigue, increased risk of high blood pressure and poor glucose regulation

Fiber

- Important functions: Promotes bowel health, helps control blood glucose levels
- Best sources: Fruits and vegetables, whole grains, and legumes
- Results of deficiency: Constipation, poor blood glucose control, higher risk for diseases such as diabetes and heart disease

Magnesium

- Important functions: Boosts bone health; regulates protein synthesis, blood glucose, blood pressure, heart rhythm, nerve and

[muscle function](#), energy production, and DNA synthesis

- Best sources: Beans, nuts, whole grains, and leafy greens
- Risks associated with deficiency: Rare, but symptoms include loss of appetite, muscle cramps, seizures, and abnormal cardiac symptoms

Iron

- Important functions: Aids in blood formation, oxygen transport, immune function, energy production
- Best sources: Beef, beef or chicken liver, shellfish, beans, and whole grains
- Risks associated with deficiency: Iron deficiency anemia, including fatigue, weakness, shortness of breath, lightheadedness, and cold hands and feet

Vitamins A, C, and E

Important functions

- All: Promote immune function
- Vitamin A: Supports vision, skin health, growth and development, reproduction, tissue lining
- Vitamin C: Skin health, growth and development, bone and teeth maintenance, wound healing
- Vitamin E: Has antioxidant and anti-inflammatory properties, aids in gene expression

Best sources

- Vitamin A: Fruits and vegetables, especially carrots and other orange- and yellow-colored ones; milk, yogurt, and fortified non-

dairy beverages

- Vitamin C: Fruits and vegetables, especially guavas, kiwis, strawberries, oranges, cantaloupes, grapefruits, and tomatoes
- Vitamin E: Fruits and vegetables, nuts, seeds, nut and seed butters, and vegetable oils (including salad dressing and mayonnaise made with oils)
- Risks associated with deficiency: Rare, but symptoms include vision impairment (vitamin A), impaired immune function and wound healing (all), and [muscle weakness](#) (vitamin E)

Choline

- Main functions: Strengthens cell membrane structure, memory, and muscle control
- Best sources: Meat, poultry, seafood and fish, eggs, and milk
- Risks associated with deficiency: Liver disease such as nonalcoholic fatty liver disease and muscle damage

Provided by Tufts University

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