

Underconsumed Vitamins and Minerals: Calcium, Potassium, Vitamin D, Vitamin B12

People need vitamins and minerals for the body to function and develop normally. The Dietary Guidelines for Americans (DGAs) state there is an underconsumption of calcium, potassium, and vitamin D in the general population, along with low intakes of vitamin B12 in older adults. Eating low amounts of these nutrients can lead to osteoporosis, fatigue, weakness, anemia, and more. It is important for individuals to receive enough vitamins and minerals to live a healthy life. It is recommended to obtain vitamins and minerals from whole, minimally processed foods rather than fortified or packaged products. Fortified foods and supplements are appropriate when whole food sources are unavailable, but they should be a secondary strategy. Listed below are menu tips, food sources, and nutrient requirements for common underconsumed nutrients that senior nutrition programs can incorporate into their meals and menus.

Menu Tips

- Increasing vegetables, fruit, beans, whole grains, and dairy within meals will help participants reach the recommended intakes of all vitamins and minerals.
- Use in-season produce to offer the highest nutrient content.
- Cook fruits and vegetables lightly or eat raw to preserve nutrients.
- Nutrient analysis software may misinterpret vitamin and mineral content of a meal. If using nutrient analysis, it's important to use standardized recipes and compare the database to your inventory's food labels.
- Whole, unprocessed foods should be the main source of vitamins and minerals, but fortified foods and dietary supplements can be included if necessary.

Nutrient Requirements, Menu Tips, and Food Sources

The following sections provide the Dietary Reference Intakes (DRIs) for the key nutrients listed above. DRIs is a general term for each nutrient recommended across the lifespan and provides the following information:

- How much you should aim for (recommended dietary allowance)
- A good target when a strict target is unknown (adequate intake)
- The maximum daily intake is likely to not cause negative health risks (tolerable upper intake level)

Calcium

Calcium is a mineral that helps form strong teeth and bones. Calcium deficiency can lead to thinning of bone tissues and loss of bone density over time.

Dietary Reference Intake: 1,000-1,200 mg/day (1,200 mg for women 51+; 1,200 mg for all adults 71 and older).

Calcium Menu Tips

- Pair high-calcium foods with high-protein and vitamin D foods (e.g., salmon or tuna) to increase calcium absorption.
- Prioritize milk, plain yogurt, and natural cheeses when feasible.
- Serve non-milk calcium sources for participants who are lactose intolerant or vegan (e.g., plain yogurt, fortified soy beverages, tofu prepared with calcium sulfate, sardines, leafy greens).
- Fortified orange juice may be high in added sugars; use cautiously to limit added sugar intake.

Food	Serving size	Calcium (mg)
Milk, whole, plain	1 cup	300
Milk, 1%-2%, plain	1 cup	305
Milk, skim, plain	1 cup	298
Cheese, natural (e.g., cheddar, Swiss)	1.5 oz	300-450
Cheese, reduced, low, or fat free (various)	1.5 oz	85-485
Yogurt, plain, whole milk (full fat)	8 oz	275
Yogurt, plain, nonfat	8 oz	488
Yogurt, plain, low fat	8 oz	448
Yogurt, Greek, plain, whole milk (full fat)	8 oz	250
Yogurt, Greek, plain, low fat	8 oz	261
Yogurt, Greek, plain, nonfat	8 oz	250
Tofu, raw, regular prepared with calcium sulfate	½ cup	434
Sardines, canned	3 oz	325

Kale, cooked	1 cup	177
White beans	½ cup	81
Bok choy, cooked	1 cup	185
Figs, dried	¼ cup	61
Orange juice, 100%, fortified	1 cup	34

See also the [Dairy Requirements in Senior Nutrition Programs Tip Sheet](#) for a comprehensive milk alternatives table.

Potassium

Potassium is a mineral and electrolyte that is prevalent in fruits, vegetables, and dairy products. This mineral is crucial for a healthy diet because irregular levels of potassium can lead to muscular paralysis and abnormal heart rhythms.

Dietary Reference Intake: Women: 2,600 mg/day and Men: 3,400 mg/day.

Potassium Menu Tips

- Add fresh fruit or dried fruit to plain yogurt.
- Use potatoes as the carbohydrate component of a meal – potatoes are one of the highest potassium food sources available.
- Add spinach and other leafy greens to sandwiches.
- Serve meals that contain beans and legumes, such as vegetarian chili.
- Milk and plain yogurt contribute significantly to potassium intake.

Fruit	Standard Size	Calories	Potassium (mg)
Kiwi fruit	1/2 cup	55	281
Orange Juice, 100%	1 cup	112	496
Cantaloupe, raw	1/2 cup	30	236
Honeydew, raw	1/2 cup	32	194
Watermelon, raw	1/2 cup	23	85
Banana	1 medium	112	451
Apricots, dried	1/4 cup	78	378

Vegetables & Legumes	Standard Size	Calories	Potassium (mg)
Potato, baked with skin	1 medium	161	926
Spinach, cooked	1 cup	41	839
Carrot juice, 100%	1 cup	94	689
Sweet potato, baked without skin	1/2 cup	103	542
Sweet potato, baked with skin	1 medium	142	717
Tomatoes, raw chopped	1/2 cup	33	264
White beans	1/2 cup	125	502
Avocado	1/2 cup	120	364

Dairy	Standard Size	Calories	Potassium (mg)
Yogurt, plain, whole milk (full fat)	1 cup	150	380
Yogurt, plain, nonfat	1 cup	137	625
Milk, whole	1 cup	150	322
Milk, fat free	1 cup	90.6	419
Milk, 1% low fat	1 cup	105	397
Milk, 2%	1 cup	125	397

Adapted from U.S. Department of Agriculture (USDA) [Food Data Central](#)

Vitamin D

Vitamin D is a fat-soluble vitamin found in some foods and produced through sun exposure. Vitamin D helps increase calcium absorption and aids in bone health. Deficiency can lead to osteoporosis and rickets. It may be difficult to provide the recommended intake of vitamin D through diet; the DGAs encourage prioritizing whole food sources of vitamin D first, with fortified foods and sunlight exposure as supplementary strategies.

Dietary Reference Intake: Ages 51-70: 600 IU/day. Ages 71 and older: 800 IU/day.

Vitamin D Menu Tips

- Prioritize whole food sources of vitamin D (e.g., salmon, tuna, sardines, eggs).
- Serve full fat dairy (e.g., whole milk, plain whole milk yogurt) as the primary source; choose fortified whole milk over fortified low-fat milk where available.
- Fortified juices, milk, and cereals are appropriate supplementary sources when whole food vitamin D is insufficient, but should not be the primary strategy.
- Ready-to-eat fortified cereals are preferred options, which discourages highly processed/packaged foods; oatmeal and other minimally processed grain choices are preferred.

Food	Standard Size	Vitamin D (IU)
Salmon, cooked	3 oz	570
Mushrooms, UV-exposed	½ cup	366
Tuna, canned	3 oz	40
Milk, whole, fortified	1 cup	120
Milk 2%, fortified	1 cup	120
Soy, almond, or oat milk, fortified	1 cup	120
Egg, whole	1 large	44
Fortified ready-to-eat cereals	1 cup	80

Adapted from NIH Office of Dietary Supplements — [Vitamin D Health Professional Fact Sheet](#)

Vitamin B12

Vitamin B12 is a water-soluble vitamin prevalent in animal-based protein sources. It is essential for diet because low intakes lead to anemia, fatigue, and low red and white blood cell counts. Older adults and vegans have an increased risk of vitamin B12 deficiency due to low animal-based protein intakes and decreased absorption with age.

Dietary Reference Intake: 2.4 mcg/day.

Vitamin B12 Menu Tips

- Prioritize whole food sources of vitamin B12 (e.g., unprocessed meats, chicken, turkey, fish, eggs, and dairy).
- Fortified products, such as nutritional yeast and cereals, are good sources for participants who are vegan or have very low animal protein intake.

- Because absorption of vitamin B12 decrease with age, older adults (especially those 71 and older) may benefit from discussing vitamin B12 supplementation with their healthcare provider even if dietary intake appears adequate.

Seafood	Serving Size	Vitamin B12 (mcg)
Clams, cooked	3 oz	17.0
Tuna, canned	3 oz	9.3
Salmon, cooked	3 oz	2.6

Meat & Eggs	Serving Size	Vitamin B12 (mcg)
Ground beef, cooked	3 oz	2.4
Egg	2 large	1.0
Turkey, cooked	3 oz	0.3
Chicken, cooked	3 oz	0.3-0.5
Chicken liver	3 oz	14.3

Dairy	Serving Size	Vitamin B12 (mcg)
Milk, whole	1 cup	1.3
Milk, 2%	1 cup	1.3
Skim milk	1 cup	1.2
Yogurt, plain	6 oz	1.0
Cheddar cheese	1 ½ oz	0.5

Non-Animal Products	Serving Size	Vitamin B12 (mcg)
Breakfast cereal, fortified	1 cup	0.6
Nutritional yeast, fortified	1 tbsp	~2.4

Adapted from NIH Office of Dietary Supplements — [Vitamin B12 Health Professional Fact Sheet](#)

Nutrition Education

Providing nutrition education to participants on the health benefits of essential vitamins and minerals can help them make better choices at home and away. Calcium, potassium, vitamin D, and vitamin B12 all play important roles for older adults. The nutrient recommendations in this tip sheet are based on general guidelines for older adults. Individual needs may vary depending on health conditions, medications, and other personal factors. Participants should consult with their doctor or a registered dietitian to determine the nutrient intake that is right for them. Visit the National Resource Center for Nutrition and Aging website for more resources on [Nutrition Education](#) and [Nutrition Guidelines](#).

Resources

- [Dietary Guidelines for Americans](#)
- [Vitamins and Minerals](#) (USDA)
- [Micronutrients](#) (National Agricultural Library)
- [Nutrition Needs for Older Adults: Calcium](#) (Nutrition and Aging Resource Center)
- [Potassium in Diet](#) (MedlinePlus)
- [Potassium Fact Sheet for Health Professionals](#) (Office of Dietary Supplements)
- [Nutrition Needs for Older Adults: Vitamin D](#) (Nutrition and Aging Resource Center)
- [Nutrition Needs for Older Adults: Vitamin B12](#) (Nutrition and Aging Resource Center)
- [Office of Dietary Supplements](#) (NIH)
- [Daily Value on the Nutrition and Supplement Facts Labels](#) (FDA)
- [Understanding Food Marketing Terms](#) (Academy of Nutrition and Dietetics)
- [Nutrition Recommendations: Dietary Reference Intakes](#) (Office of Dietary Supplements)

Last updated: September 2026