

How Much is Too Much?

Comparison of Dietary Reference Intake Values (for adult men and women) and Daily Values for Micronutrients with the Tolerable Upper Intake Levels (UL),^{a,c} Safe Upper Levels (SUL),^d and Guidance Levels^d
For Age 31 to 50

| Nutrient | RDA/AI ^b (men / women) ages 31-50 | Daily Value (Food Labels) | UL ^c | SUL or Guidance Level ^d | Selected Potential Effects of Excess Intake |
|-----------------------|--|------------------------------|------------------|---------------------------------------|---|
| Vitamin A (mcg) | 900 / 700 | 1500 (5000 IU) | 3000 | 1500** (5000 IU) | Liver damage, bone & joint pain, dry skin, loss of hair, headache, vomiting |
| beta-Carotene (mg) | | | | 7 (11,655 IU) | Increased risk of lung cancer in smokers and those heavily exposed to asbestos |
| Vitamin D (mcg) | 15 (600 IU) | 10 (400 IU) | 100 | 25 (1000 IU)** | Calcification of brain, arteries, increased blood calcium, loss of appetite, nausea |
| Vitamin E (mg) | 15 | 20 (30 IU) | 1000 | 540 (800 IU) | Deficient blood clotting |
| Vitamin K (mcg) | 120 / 90* | 80 | - | 1000** | Red blood cell damage/anemia; liver damage |
| Thiamin (B1) (mg) | 1.2 / 1.1 | 1.5 | - | 100** | Headache, nausea, irritability, insomnia, rapid pulse, weakness (7000+ mg dose) |
| Riboflavin (B2) (mg) | 1.3 / 1.1 | 1.7 | - | 40** | Generally considered harmless; yellow discoloration of urine |
| Niacin (mg) | 16 / 14 | 20 | 35 | 500** | Liver damage, flushing, nausea, gastrointestinal problems |
| Vitamin B6 (mg) | 1.3 | 2 | 100 | 10 | Neurological problems, numbness and pain in limbs |
| Vitamin B12 (mcg) | 2.4 | 6 | - | 2000** | No reports of toxicity from oral ingestion |
| Folic acid (mcg) | 400 | 400 | 1000 | 1000** | Masks B12 deficiency (which can cause neurological problems) |
| Pantothenic acid (mg) | 5* | 10 | - | 200** | Diarrhea & gastrointestinal disturbance (10,000+ mg/day) |
| Biotin (mcg) | 30* | 300 | - | 900** | No reports of toxicity from oral ingestion |
| Choline (mg) | 550 / 425* | | 3500 | | Fishy body odor (trimethylaminuria), hepatotoxicity |
| Vitamin C (mg) | 90 / 75 | 60 | 2000 | 1000** | Nausea, diarrhea, kidney stones |
| Boron (mg) | | | 20 | 9.6 | Adverse effects on male and female reproductive system |
| Calcium (mg) | 1000 | 1000 | 2500 | 1500** | Nausea, constipation, kidney stones |
| Chloride (mg) | 2300* | 3400 | 3600 | | Increased blood pressure in salt-sensitive individuals (when consumed as sodium chloride) |
| Chromium (mcg) | 35 / 25* | 120 | - | 10,000** | Potential adverse effects on liver and kidneys; picolinate form possibly mutagenic |
| Cobalt (mg) | | | | 1.4** | Cardiotoxic effects; not appropriate in a dietary supplement except as vitamin B-12 |
| Copper (mcg) | 900 | 2000 | 10000 | 10000 | Gastrointestinal distress, liver damage |
| Fluoride (mg) | 4 / 3* | | 10 | | Bone, kidney, muscle, and nerve damage; supplement with professional guidance |
| Germanium | | | | zero** | Kidney toxin; should not be in a dietary supplement |
| Iodine (mcg) | 150 | 150 | 1100 | 500** | Elevated thyroid hormone concentration |
| Iron (mg) | 8 / 18 | 18 | 45 | 17** | Gastrointestinal distress, oxidative stress |
| Magnesium (mg) | 420 / 320 | 400 | 350 ^e | 400** | Diarrhea |
| Manganese (mg) | 2.3 / 1.8* | 2 | 11 | 4** | Neurotoxicity |
| Molybdenum (mcg) | 45 | 75 | 2000 | zero** | Gout-like symptoms; joint pains; increased uric acid |
| Nickel (mcg) | | | 1000 | 260** | Increased sensitivity of skin reaction to nickel in jewelry |
| Phosphorus (mg) | 700 | 1000 | 4000 | 250** | Alteration of parathyroid hormone levels; reduced bone mineral density |
| Potassium (mg) | 4700* | 3500 | | 3700** | Gastrointestinal damage |
| Selenium (mcg) | 55 | 70 | 400 | 450 | Nausea, diarrhea, fatigue, hair and nail loss |
| Silicon (mg) | | | | 700 | Low toxicity; possibility of kidney stones |
| Sodium (mg) | 1500* | 2400 | 2300 | | Increased blood pressure in salt-sensitive individuals (when consumed as sodium chloride) |
| Vanadium (mg) | | | 1.8 | zero | Gastrointestinal irritation; fatigue |
| Zinc (mg) | 11 / 8 | 15 | 40 | 25 | Impaired immune function, low HDL-cholesterol |

^a Food and Nutrition Board, Institute of Medicine (U.S.). Dietary Reference Intakes Tables.

Available at <http://www4.nationalacademies.org/IOM/IOMHome.nsf/Pages/Food+and+Nutrition+Board>

^b RDA = Recommended Dietary Allowance, AI = Adequate Intake, indicated with *

^c UL = Tolerable Upper Intake Level (from food & supplements combined)

^d SUL = Safe Upper Levels; SULs and Guidance Levels (indicated by **) set by the Expert Group on Vitamins and Minerals of the Food Standards Agency, United Kingdom.

These are intended to be levels of daily intake of nutrients in dietary supplements that potentially susceptible individuals could take daily on a life-long basis without medical supervision in reasonable safety. When the evidence base was considered inadequate to set a SUL, Guidance Levels were set based on limited data. SULs and Guidance Levels tend to be conservative and it is possible that, for some vitamins and minerals, greater amounts could be consumed for short periods without risk to health. The values presented are for a 60 kg (132 lb) adult. Consult the full publication for values expressed per kg body weight.

This FSA publication, *Safe Upper Levels for Vitamins and Minerals*, is available at: <https://cot.food.gov.uk/cotreports/cotjointreps/evmreport>

^e The UL for magnesium represents intake specifically from pharmacological agents and/or dietary supplements in addition to dietary intake.

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