

## Consequences of nutrient depletions

### Beta-Carotene

This nutrient is converted to vitamin A by the body. Therefore deficiency symptoms are the same as those of vitamin A. The earliest symptom is reduced night vision. Prolonged deficiency leads to more advanced changes in eye tissue. Other potential signs of mild to moderate deficiency include rough, dry skin, loss of appetite, loss of hair luster, brittle nails, joint pain, and possibly increased susceptibility to infection.

### Biotin

Low levels of biotin are associated with changes in skin color, inflammation of the skin, hair loss, muscle pain, anemia, and loss of appetite, depression, insomnia, and elevated levels of cholesterol.

### Calcium

Osteoporosis (bone loss) is the primary disease associated with long-term calcium deficiency. It may be associated with bone pain and spinal deformity. Depleted levels can also cause muscle cramps, irregular heartbeat, and depression.

### Carnitine (L-Carnitine)

Deficiency is associated with anemia, fatigue, increased blood levels of ammonia, lethargy, unexplained stupor, and heart irregularities.

### Co-enzyme Q10

A deficiency of the antioxidant coenzyme Q10 may be associated with long-term conditions including heart disease and high blood pressure. Symptoms of deficiency include gingivitis, and weakened immune function.

### Copper

Signs and symptoms of long-term depletion of copper include anemia, changes in the structure and appearance of hair, heart damage, growth retardation, impaired bone formation, osteoporosis (bone loss), and emphysema (lung disease).

### Folic Acid

Low levels of folic acid have been linked to anemia, elevated homocysteine, heart disease, increased cancer risk, and birth defects.

### Iron

Depleted levels of iron may lead to anemia and weakened immune function. In the event of anemia, symptoms include dizziness, fatigue, shortness of breath, pale skin color, and possibly irregular heartbeat.

### Lactobacillus

Reducing the number of probiotic organisms in the gastrointestinal tract may decrease the body's ability to resist infections and diseases. Symptoms of deficiency include gas, abdominal distress, diarrhea, immune complaints, allergies, aggravation of auto-immune diseases, and yeast infections.

### Magnesium

Magnesium deficiency affects calcium and vitamin D levels in the body and may be associated with muscle cramps, heart irregularities, insomnia, high blood pressure, diabetes, and osteoporosis (bone loss).

### Melatonin

Reduced levels of melatonin in the body have been associated with sleep disturbances and accelerated brain ageing (through oxidative damage).

### Potassium

Symptoms of potassium deficiency include loss of appetite, nausea, drowsiness, feelings of apprehension, excessive thirst, irrational behavior, fatigue, muscle pain and weakness (usually of the lower limbs); severe cases may lead to irregular heartbeat.

### Protein

Protein deficiencies are characterized by weakened immune status, including increased susceptibility to infection, impaired wound healing, muscle and weight loss, growth retardation, and deterioration in skin and hair condition.

### Selenium

Selenium deficiency may be associated with muscular, digestive, and heart disorders; long-term deficiency may be associated with increased risk of developing certain chronic illnesses such as cancer, diabetes, or liver disease.

### Vitamin A (Retinol)

The earliest symptom of deficiency of this nutrient is reduced night vision. Prolonged deficiency leads to more advanced changes in eye tissue. Other potential signs of mild to moderate deficiency include rough, dry skin, loss of appetite, loss of hair luster, brittle nails, joint pain, and possibly increased susceptibility to infection.

### Vitamin B1 (Thiamine)

Symptoms of depleted levels of thiamine include weakness, fatigue, anorexia, constipation, memory loss, confusion, and depression. Deficiency may lead to beriberi, a condition characterized by inflammation of nerves, heart irregularities, and fluid retention.

### Vitamin B2 (Riboflavin)

Symptoms of vitamin B 2 deficiency may include cracks at the corners of the mouth, inflammation of the skin, growth retardation, and impaired wound healing.

### Vitamin B3 (Niacin or Niacinamide)

Because this nutrient plays a key role in many metabolic processes, low levels may impair the breakdown and use of starches, fats, and proteins. Symptoms of deficiency may occur within 1 to 2 months. Severely low levels of niacin or niacinamide cause pellagra, a condition characterized by inflammation of the skin, mental depression, abdominal pain, and diarrhea.

### Vitamin B6 (Pyridoxine)

Symptoms of vitamin B 6 deficiency may include weakness, nervousness, insomnia, mental confusion, irritability, and anemia. Long-term low levels of this nutrient may also increase the risk of heart disease as well as colon and prostate cancers.

### Vitamin B12

It can take years to develop complications associated with long-term depletion of this nutrient. Irritability, weakness, numbness, anemia, loss of appetite, headache, personality changes, and confusion are some of the signs and symptoms associated with vitamin B 12 depletion. Low levels of this vitamin may also be associated with an increased risk of colon cancer, heart disease, brain disorders, and birth defects.

### Vitamin C

Vitamin C deficiency may include bruising, fever, anemia, emotional changes, swollen and bleeding gums, fatigue, lethargy, jaundice (yellowing of the skin and eyes), increased susceptibility to infections, slow wound healing, and swelling of the lower limbs. Very rarely, severe deficiency leads to scurvy, a disorder that affects muscles and bones and is potentially fatal.

### Vitamin D

Vitamin D deficiency leads to abnormal bone formation (rickets) in children and softening of the bones (osteomalacia) in adults. Vitamin D deficiency interferes with calcium absorption, leading to deficiency of that nutrient with all of the associated symptoms (such as increased risk of fractures, osteoporosis (bone loss), and muscle weakness). Vitamin D deficiency is also associated with increased risk of cancer (especially breast cancer), depression and depression.

### Vitamin E

Vitamin E deficiency negatively affects muscle tissue, red blood cells, nervous, and the reproductive system. Over the long-term, depleted levels of this nutrient may also be associated with cancer, heart disease, and altered immune function.

### Vitamin K

The major symptom of vitamin K deficiency is an inability of the blood to clot properly, which may lead to excessive bleeding and a tendency to bruise easily. A deficiency of this vitamin can also accelerate hardening of the arteries.

### Zinc

Signs and symptoms of zinc deficiency include loss of appetite or sense of taste, impaired immunity, growth retardation, skin changes, reduced hormonal production, decreased sex drive and increased susceptibility to infection.