

# Vitamin Deficiency

Vitamin deficiency may result from a low intake of a particular vitamin or it may be that your body can no longer absorb or use the vitamins in your food. The latter could be a result of cancer; cancer treatment such as surgery, radiation, or chemotherapy; or another medical condition. The four most common vitamin deficiencies are vitamins D, B6, B12, and folate (B9). Chemotherapy may cause deficiencies of vitamins B1, B2, K, niacin (B3), folate (B9), and vitamin D. Liver disease may cause vitamin A deficiency, which can affect your immune system. Severe vitamin C deficiency causes scurvy (gum/teeth problems, dry hair and skin, anemia, and bruising).

Vitamins are either fat soluble or water soluble.

- **Fat-soluble** vitamins are stored in the body's liver, fatty tissue, and muscles. The four fat-soluble vitamins are vitamins A, D, E, and K. It is easier for your body to absorb these vitamins if they are taken with dietary fat. Because these are stored in the tissues, it is possible to have toxic levels of these vitamins.
- **Water-soluble** vitamins are not stored in the body's tissues. The nine water-soluble vitamins are vitamin C and all the B vitamins. If you have an excess of any of these vitamins in your body, they will be excreted (in the urine). Because they are not stored, you have to eat them on a regular basis. B12 is the exception to this rule as it can be stored in the liver for years. However, vitamin B12 deficiency can be serious and lead to a disruption in the nervous system and the circulatory system.

If you have a vitamin E deficiency, you may lose feeling in your arms and legs, lose control of body movements, have muscle weakness, and/or vision problems from the damage to nerves and muscles. Another sign of vitamin E deficiency is a weakened immune system.

Vitamin K plays a key role in blood clotting. If you are deficient in vitamin K, the most obvious symptom is unusual (unexpected) bruising or bleeding. Bleeding may be external (nosebleed) or internal (blood in your urine, vomit, or stool. Blood in vomit or stool may look red or black. Since bleeding causes you to lose red blood cells, you could eventually become anemic if the bleeding persists over time or is heavy.

Symptoms of other vitamin deficiencies are listed in the chart on the back of this page. Please note that deficiencies of vitamins B1, B2, and B3 are rare in the U.S. B1 and B2 are added to many foods, so deficiencies are usually only found in those who use alcohol heavily. If your B3 (niacin) gets very low, you may get *pellagra*. Symptoms include rough skin that turns red/brown in sun; bright red tongue; vomiting; constipation or diarrhea; fatigue; aggressive, paranoid, or suicidal behavior; and hallucinations.

Vitamin B9, also called folate, fosters the growth of red blood cells and reduces the risk of birth defects when taken by pregnant women. Folic acid is the name of the manmade (synthetic) version.

Evidence indicates that deficiencies of the vitamins B6, folate (B9), B12, and C (and deficiency of iron and zinc), can cause DNA damage and may lead to cancer. Zinc and iron are micronutrients that are absorbed as they pass through the intestines. However, they compete with each other. If there is an excess of iron,

then the absorption of zinc decreases. If there is excess zinc, then iron absorption decreases. If your doctor recommends these supplements, it is best to take them at least 30 minutes apart from each other.

**Vitamin deficiency anemia** develops when your body has a shortage of the vitamins needed to produce enough healthy red blood cells. Red blood cells carry oxygen from your lungs throughout your body. If your diet is lacking in certain vitamins, vitamin deficiency anemia can develop. Low B6 and C can cause anemia.

Symptom	A	B 1/ B2 + heavy alcohol	B3	B6	B7	B9	B12	C	D
Megaloblastic anemia						X	X		
Production of blood cells	X								
Susceptible to infection	X			X					X
Bruising								X	
Fatigue, weakness					X	X	X		X
Nausea		X	X	X					
Constipation				X			X		
Loss of appetite							X		
Belly pain			X						
Peripheral neuropathy							X		
Balance problems							X		
Confusion		X	X				X		
Memory problems							X		
Concentration problems						X			
Mouth sores						X	X		
Gum & teeth problems								X	
Cracks around mouth		X	X				X		
Brittle nails or hair					X			X	
Rash, skin changes	X			X		X		X	
Pellagra			X						
Depression				X					
Irritability						X			
Muscle ache				X	X				
Headache						X			
Heart palpitations						X			
Shortness of breath						X			
Vision changes	X								

Other common names for vitamins: A – retinol, B1 - thiamine, B2 - riboflavin, B3 – niacin, B6 – pyridoxine, B7- biotin, B9 – folate, B12 – cobalamin, C – ascorbic acid, D – cholecalciferol.

If you are found to have a vitamin deficiency, your doctor will advise you on diet, supplements, or other treatments. It can take 3-4 months to correct a deficiency.