HEALTH BASICS

Pantothenic acid and biotin

Pantothenic acid and biotin are B vitamins that help your body process nutrients.

WHAT IT IS
Two B vitamins involved in processing nutrients

WHERE IT COMES UP
Food labels, supplements, nutrition discussions, and laboratory tests

WHY IT MATTERS
Supports normal energy use and cell functions

WHAT IT IS NOT
Not a disease or diagnosis

WHO TO ASK
Primary care clinician, pharmacist, or registered dietitian

HOW IT IS CHECKED
Blood or urine tests when deficiency is suspected

Overview

Pantothenic acid and biotin are water-soluble B vitamins. Pantothenic acid is also called vitamin B5, while biotin is sometimes called vitamin B7.

Your body needs small amounts of both vitamins. They help enzymes carry out chemical reactions involving carbohydrates, fats, and proteins. They do not provide energy themselves. Instead, they help your cells use and process nutrients from food.

Both vitamins occur in many foods. This makes deficiency uncommon in people who eat a varied diet. They are also added to some multivitamins, B-complex products, and supplements marketed for hair, skin, or nails.

Pantothenic acid and biotin are nutrients, not diseases or diagnoses. A percentage on a food or supplement label shows how the amount compares with a reference daily value. It does not show whether you personally have a deficiency.

"Water-soluble" means that these vitamins dissolve in water and are not stored in the same way as many fat-soluble vitamins. It does not mean that any supplement amount is harmless. In particular, biotin supplements can interfere with some medical tests.

How it works

Pantothenic acid is part of coenzyme A. A coenzyme is a substance that helps an enzyme perform its job. Coenzyme A is involved in releasing energy from food and in making or breaking down fatty acids and other important compounds.

Biotin helps several enzymes called carboxylases. These enzymes take part in processing fats, amino acids-the building blocks of protein-and glucose, a form of sugar used by cells.

Because both vitamins assist enzymes, they are needed throughout the body. Taking more than your body needs does not necessarily make these reactions work faster.

Pantothenic acid is found in foods such as meat, eggs, milk, mushrooms, whole grains, potatoes, and some vegetables. Its name comes from a Greek word meaning "everywhere," reflecting its wide distribution in food.

Biotin is found in foods including eggs, meat, fish, nuts, seeds, and some vegetables. Food processing and preparation can affect vitamin content, but most people obtain biotin from a range of foods rather than one major source.

Gut bacteria can produce some biotin. It is not clear how much this contributes to the amount your body can use.

Why it matters for your health

Adequate pantothenic acid supports the chemical reactions that help your body use food and make substances needed by cells. True pantothenic acid deficiency is very rare and is usually considered alongside severe undernutrition or another condition affecting nutrition.

Adequate biotin supports enzymes involved in normal metabolism. Biotin deficiency is also uncommon, but it can occur in certain inherited or nutritional situations.

Biotin has a separate importance because it can affect laboratory technology. Some tests use biotin as part of the method that measures a substance in blood. A high intake from supplements can disrupt this process and produce a result that is falsely high or falsely low.

Tests that may be affected include some tests for thyroid hormones, reproductive hormones, vitamin D, and troponin. Troponin is measured when clinicians are checking for heart muscle damage. Not every test uses biotin, and different laboratories may use different equipment.

Biotin interference changes the test result, not necessarily the substance being measured in your body. This can make an otherwise accurate-looking result misleading.

What can go wrong

Problems related to pantothenic acid and biotin generally fall into a few named situations:

Raw egg white contains avidin, a protein that binds biotin and can prevent its absorption. Cooking changes avidin so that it does not bind biotin in the same way. Ordinary use of cooked eggs is not the concern.

Biotinidase deficiency is different from not eating enough biotin. It is an inherited metabolic condition, often included in newborn screening programs. An abnormal newborn screening result needs prompt follow-up with the child's healthcare team. A screening result alone does not confirm the diagnosis.

There is limited evidence that biotin supplements improve hair, skin, or nails in people who are not deficient. Hair or nail changes can have many causes, so a supplement response cannot identify the cause.

For routine concerns about your diet, supplements, hair, skin, or nails, arrange a non-urgent appointment with a primary care clinician or registered dietitian.

Seek emergency care for chest pain, severe breathing difficulty, fainting, or other possible medical emergencies. Do not delay care because you take biotin. Tell the emergency team about the product and amount because this information may affect how test results are interpreted.

- Pantothenic acid deficiency: exceptionally uncommon on its own and more likely to be considered with severe, broad undernutrition
- Biotin deficiency: uncommon, but possible with prolonged consumption of large amounts of raw egg white or in some medical and nutritional circumstances
- Biotinidase deficiency: an inherited disorder that prevents the body from recycling biotin properly
- Laboratory test interference: misleading results caused by supplemental biotin interacting with certain test methods
- Supplement effects: digestive upset can occur with large supplemental amounts of pantothenic acid

What you can do

Most people do not need to calculate their daily pantothenic acid or biotin intake. Eating a range of foods usually provides both vitamins.

Practical steps include:

Do not stop a prescribed product or delay a needed blood test on your own. There is no single waiting period before testing that applies to every biotin product and every laboratory method. The clinician or laboratory can advise based on the supplement amount, the test, and how urgently the result is needed.

Routine blood testing for pantothenic acid or biotin is not generally useful for people without a specific concern. When deficiency is suspected, specialist blood or urine measurements may be available. These results need to be interpreted with your diet, health history, and other findings.

If a label lists a large percentage of the daily value, that does not mean the product gives an extra health benefit. It also does not prove that the amount is appropriate for your reason for taking it.

- Check whether your multivitamin, B-complex product, or hair-and-nail supplement contains biotin
- Keep a current list of supplements, including amounts and how often you take them
- Share that list before blood tests, procedures, or emergency assessment
- Ask whether a supplement is likely to help the specific reason you are taking it
- Discuss a possible deficiency if you have severe dietary restriction, undernutrition, or a condition affecting nutrient absorption

Common questions

Are pantothenic acid and biotin the same vitamin?

No. They are separate B vitamins with different roles. They are often grouped together because both help enzymes process nutrients.

Does biotin make hair grow?

Evidence is limited for people who do not have biotin deficiency. Hair loss or thinning can relate to inherited patterns, hormones, illness, medications, nutrition, or hair-care practices. Biotin should not be used as a test for the cause.

Can biotin affect a thyroid test?

Yes. Supplemental biotin can interfere with some thyroid test methods, although not all laboratories use those methods. Tell the person ordering or collecting the test that you take biotin.

Do I need a vitamin test?

Usually not. Testing may be considered when there is severe undernutrition, a suspected absorption problem, an inherited disorder, or another specific clinical reason. A standard blood count or routine chemistry panel does not directly measure these vitamins.

Is biotin in food a laboratory-test concern?

The main concern is supplemental biotin, which can provide much more than an ordinary diet. Continue to tell your healthcare team about all supplements, even when the label describes them as natural.

Can I get too much from food?

Problems from ordinary food intake have not been a usual concern. Supplements are more likely to provide high amounts and, for biotin, create a risk of laboratory interference.

Sources

- National Institutes of Health Office of Dietary Supplements: Pantothenic Acid - Fact Sheet for Health Professionals
- National Institutes of Health Office of Dietary Supplements: Biotin - Fact Sheet for Health Professionals
- US Food and Drug Administration: Update-Biotin May Interfere with Lab Tests
- National Academies Press: Dietary Reference Intakes for Thiamin, Riboflavin, Niacin, Vitamin B6, Folate, Vitamin B12, Pantothenic Acid, Biotin, and Choline
- MedlinePlus Genetics: Biotinidase deficiency