Biotin

**INGREDIENTS**

Doctor’s Best Biotin is a highly potent source of biotin, a water-soluble B vitamin. Like other vitamins, biotin is vital to our life processes and occurs in all our cells. Unlike many vitamins, however, biotin is a coenzyme—it is actually part of the molecular structure of certain of our enzymes, and without it these enzymes cannot function. Biotin is essential for fetal development, for growth, and for health in adulthood. The body needs biotin in order to make energy and to efficiently utilize proteins, carbohydrates, and fats. Genetic research has established that biotin is profoundly important for the stability of our DNA and the healthy regulation of our gene functions. Clinical studies have found that biotin supplementation can improve the hair, skin, and nails. Yet the body cannot make biotin and therefore must obtain it from the diet.

Dietary biotin is known to be required for the health of the brain, eyes, ears, lungs, voluntary muscles, bone, and immune system. Pregnancy and lactation can deplete biotin as can malnutrition, smoking, excessive alcohol intake, certain medications, or habitual consumption of raw egg white. The body has protein transporters specialized to absorb biotin, to deliver it to the brain across the blood-brain barrier, and to ensure its uptake from the bloodstream into the cells.

**BENEFITS**

**Promotes Healthy Hair, Skin and Nails***

Considerable evidence links biotin status to the health of the hair, skin, and nails. One mutation is known that changes the structure of hair and makes it virtually impossible to comb. This is often accompanied by scaling of the scalp skin. Biotin supplementation was found to make such problem hair much easier to comb, while increasing the hair growth rate and eliminating scaling of the scalp.

Babies with inherited mutations of biotin enzymes, or simply with low blood biotin levels, can have totally bald scalps. Supplementation with biotin can restore hair growth in such bald babies, without adverse effects, and some researchers recommend that it be tried with any child having unexplained hair loss or skin changes.

---

**Biotin 5000**

**Supplement Facts**

<table>
<thead>
<tr>
<th>Serving Size</th>
<th>1 Veggie Capsule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Servings Per Container</td>
<td>120</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Amount Per Serving</th>
<th>% Daily Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biotin</td>
<td>5000 mcg</td>
</tr>
</tbody>
</table>

**Other Ingredients:** Microcrystalline cellulose, modified cellulose (vegetarian capsule), magnesium stearate (vegetable source), silicon dioxide.

**Suggested Adult Use:** Take 1 capsule daily, with or without food, or as recommended by a nutritionally-informed physician.

**Non-GMO / Gluten Free / Soy Free / Vegan**

Store in a cool dry place.

---

**Biotin 10000**

**Supplement Facts**

<table>
<thead>
<tr>
<th>Serving Size</th>
<th>1 Veggie Capsule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Servings Per Container</td>
<td>120</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Amount Per Serving</th>
<th>% Daily Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biotin</td>
<td>10,000 mcg</td>
</tr>
</tbody>
</table>

**Other Ingredients:** Microcrystalline cellulose, modified cellulose (vegetarian capsule), magnesium stearate (vegetable source), silicon dioxide.

**Suggested Adult Use:** Take 1 capsule daily, with or without food, or as recommended by a nutritionally-informed physician.

**Non-GMO / Gluten Free / Soy Free / Vegan**

Store in a cool dry place.

---

* These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.
Skin integrity is vulnerable to lack of biotin, whether due to its dietary insufficiency, poor absorption, or mutations in biotin enzymes. Biotin enzymes are involved in the metabolism of fatty acids, which are required for skin health, and this helps explain the link between biotin deficiency and skin changes. One indicator of biotin’s importance for the skin is that skin cells have transport proteins that are very efficient at importing biotin into the cell interior.

Clinical studies indicate biotin supplementation also can improve the nails. In a trial conducted with women, biotin (2.5 mg daily for 6-15 months) improved nail thickness by 25%, and also improved splitting of the nails. Microscopic examination revealed that the cell layer on the top of the nail also improved from an irregular to the more regular, normal orientation.

**Supports Energy Generation and Other Essential Enzyme Functions**

At least seven human enzymes require biotin in order to function. Five have biotin integrated within their structure as a coenzyme, and these all belong to the carboxylase category. Measuring the activities of these carboxylase enzymes gives a more accurate picture of the body’s biotin status than measuring blood biotin levels. The activity of each carboxylase enzyme can be conveniently assessed by measuring the level of its specific endproduct—a particular organic acid—in the urine.

Of the five known biotin carboxylases, three are located in the mitochondria, the microscopic energy generators within our cells. Carboxylases that reside in the mitochondria help make heme, a protein that contains iron and is essential for the mitochondria’s energy generation functions. Consequently, biotin deficiency can impair the functioning of heme proteins in the mitochondria, which in turn can create a free radical challenge for the cell.

The sixth biotin enzyme is biotinidase, which functions to release biotin from its linkages to proteins or other biomolecules and thereby make it available for utilization as the carboxylase coenzyme. Biotinidase also can remove biotin from used carboxylase molecules, for reuse in newly made carboxylase molecules. Mutations in biotinidase can markedly lower biotin absorption from the foods and contribute to depletion of the body’s biotin stores.

At least 165 biotinidase mutations are known to exist, and some countries routinely monitor newborns for the presence of such mutations. Supplementation with biotin (5-20 mg per day for 3-6 months) can correct some of the adverse effects associated with these mutations.

Biotinidase is also involved in the use of biotin to help stabilize the DNA and regulate gene activity.

The seventh biotin enzyme is holocarboxylase synthetase (HS), which functions to attach biotin into all five of the biotin carboxylase enzymes. HS also works together with biotinidase to insert biotin into the gene structure. Mutations in HS are associated with an array of genic and metabolic abnormalities, some of which respond favorably to biotin supplementation.

The seven biotin enzymes are so closely linked functionally, that a mutation which impairs any of them can potentially result in impairments of either biotin’s absorption from the intestinal tract, its incorporation into the carboxylases, its insertion into the genetic material, or its recycling from used biotin enzymes, and contribute to a functional biotin deficiency.

**Fundamental to Gene Regulation and DNA Integrity**

Besides its importance for energy generation and a broad variety of metabolic activities, biotin is crucial for DNA stability and overall healthy gene activity. This vitamin is involved in regulating at least 2000 genes, including genes for cell signaling, maintenance of chromosome structure, synthesis of biotin-dependent enzymes, and regulation of protein synthesis.

DNA is the genetic blueprint for our life processes, and its coding information is managed via its complex structural associations with a variety of proteins, mainly of the histone type. Histones help control how and when the DNA genetic coding will be read out or “translated.” The HS and biotinidase work together to attach or “tag” biotin onto selected histones. The biotin tags modify the histones functioning to help ensure that the patterns of DNA translation and other gene activity are appropriate for the particular cell.

**Helps Maintain Health and Wellbeing Across the Lifespan**

The importance of biotin for health begins at conception. The developing brain and other organs of the fetus have a high requirement for biotin. Yet biotin deficiency is common among pregnant women in the United States. Lactation also increases the requirement for dietary biotin intake. Therefore pregnant or lactating women are well advised to maintain healthy biotin status.

Since the requirement for biotin begins before a woman would likely know she is pregnant, and since biotin is very safe to consume, all women of reproductive age should be better prepared for pregnancy by having adequate biotin in their diet. The benefits of consuming adequate biotin actually extend to the entire population, including individuals who smoke, consume alcohol, or simply desire added “nutritional insurance” for good health. This B vitamin is increasingly being recognized for its diverse involvements in human energetics, genetic stability, and metabolic versatility.

**Scientific References**


* These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.

© Doctor’s Best, Inc.
Phone: 800-333-6977 • Fax: 949-498-3952 • www.drbvitamins.com