What is selenium and what does it do?
Selenium is a nutrient that the body needs to stay healthy. Selenium is important for reproduction, thyroid gland function, DNA production, and protecting the body from damage caused by free radicals and from infection.

How much selenium do I need?
The amount of selenium that you need each day depends on your age. Average daily recommended amounts are listed below in micrograms (mcg).

<table>
<thead>
<tr>
<th>Life Stage</th>
<th>Recommended Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth to 6 months</td>
<td>15 mcg</td>
</tr>
<tr>
<td>Infants 7–12 months</td>
<td>20 mcg</td>
</tr>
<tr>
<td>Children 1–3 years</td>
<td>20 mcg</td>
</tr>
<tr>
<td>Children 4–8 years</td>
<td>30 mcg</td>
</tr>
<tr>
<td>Children 9–13 years</td>
<td>40 mcg</td>
</tr>
<tr>
<td>Teens 14–18 years</td>
<td>55 mcg</td>
</tr>
<tr>
<td>Adults 19–50 years</td>
<td>55 mcg</td>
</tr>
<tr>
<td>Adults 51–70 years</td>
<td>55 mcg</td>
</tr>
<tr>
<td>Adults 71 years and older</td>
<td>55 mcg</td>
</tr>
<tr>
<td>Pregnant teens and women</td>
<td>60 mcg</td>
</tr>
<tr>
<td>Breastfeeding teens and women</td>
<td>70 mcg</td>
</tr>
</tbody>
</table>

What foods provide selenium?
Selenium is found naturally in many foods. The amount of selenium in plant foods depends on the amount of selenium in the soil where they were grown. The amount of selenium in animal products depends on the selenium content of the foods that the animals ate. You can get recommended amounts of selenium by eating a variety of foods, including the following:
- Seafood
- Meat, poultry, eggs, and dairy products
- Breads, cereals, and other grain products

What kinds of selenium dietary supplements are available?
Selenium is available in many multivitamin-mineral supplements and other dietary supplements. It can be present in several different forms, including selenomethionine and sodium selenate.

Am I getting enough selenium?
Most Americans get enough selenium from their diet because they eat food grown or raised in many different areas, including areas with soil that is rich in selenium.
Certain groups of people are more likely than others to have trouble getting enough selenium:

- People undergoing kidney dialysis
- People living with HIV
- People who eat only local foods grown in soils that are low in selenium

What happens if I don’t get enough selenium?
Selenium deficiency is very rare in the United States and Canada. Selenium deficiency can cause Keshan disease (a type of heart disease) and male infertility. It might also cause Kashin-Beck disease, a type of arthritis that produces pain, swelling, and loss of motion in your joints.

What are some effects of selenium on health?
Scientists are studying selenium to understand how it affects health. Here are some examples of what this research has shown.

Cancer
Studies suggest that people who consume lower amounts of selenium could have an increased risk of developing cancers of the colon and rectum, prostate, lung, bladder, skin, esophagus, and stomach. But whether selenium supplements reduce cancer risk is not clear. More research is needed to understand the effects of selenium from food and dietary supplements on cancer risk.

Cardiovascular disease
Scientists are studying whether selenium helps reduce the risk of cardiovascular disease. Some studies show that people with lower blood levels of selenium have a higher risk of heart disease, but other studies do not. More studies are needed to better understand how selenium in food and dietary supplements affects heart health.

Cognitive decline
Blood selenium levels decrease as people age, and scientists are studying whether low selenium levels contribute to a decline in brain function in the elderly. Some studies suggest that people with lower blood selenium levels are more likely to have poorer mental function. But a study of elderly people in the United States found no link between selenium levels and memory. More research is needed to find out whether selenium dietary supplements might help reduce the risk of or treat cognitive decline in elderly people.

Thyroid disease
The thyroid gland has high amounts of selenium that play an important role in thyroid function. Studies suggest that people—especially women—who have low blood levels of selenium (and iodine) might develop problems with their thyroid. But whether selenium dietary supplements can help treat or reduce the risk of thyroid disease is not clear. More research is needed to understand the effects of selenium on thyroid disease.

Can selenium be harmful?
Yes, if you get too much. Brazil nuts, for example, contain very high amounts of selenium (68–91 mcg per nut) and can cause you to go over the upper limit if you eat too many. Getting too much selenium over time can cause the following:

- Garlic breath
- Diarrhea
- Irritability
- Brittle hair or nails
- Discolored teeth
- Nausea
- Skin rashes
- Metallic taste in the mouth
- Loss of hair or nails
- Nervous system problems

Extremely high intakes of selenium can cause severe problems, including difficulty breathing, tremors, kidney failure, heart attacks, and heart failure.

The upper limits for selenium from foods and dietary supplements are listed below.

<table>
<thead>
<tr>
<th>Ages</th>
<th>Upper Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth to 6 months</td>
<td>45 mcg</td>
</tr>
<tr>
<td>Infants 7–12 months</td>
<td>60 mcg</td>
</tr>
<tr>
<td>Children 1–3 years</td>
<td>90 mcg</td>
</tr>
<tr>
<td>Children 4–8 years</td>
<td>150 mcg</td>
</tr>
<tr>
<td>Children 9–13 years</td>
<td>280 mcg</td>
</tr>
<tr>
<td>Teens 14–18 years</td>
<td>400 mcg</td>
</tr>
<tr>
<td>Adults</td>
<td>400 mcg</td>
</tr>
</tbody>
</table>

Are there any interactions with selenium that I should know about?
Yes, some of the medications you take may interact with selenium. For example, cisplatin, a chemotherapy drug used to treat cancer, can lower selenium levels, but the effect this has on the body is not clear.

Tell your doctor, pharmacist, and other health care providers about any dietary supplements and prescription or over-the-counter medicines you take. They can tell you if the dietary supplements might interact with your medicines or if the...
medicines might interfere with how your body absorbs, uses, or breaks down nutrients.

**Selenium and healthful eating**
People should get most of their nutrients from food, advises the federal government’s *Dietary Guidelines for Americans*. Foods contain vitamins, minerals, dietary fiber and other substances that benefit health. In some cases, fortified foods and dietary supplements may provide nutrients that otherwise may be consumed in less-than-recommended amounts. For more information about building a healthy diet, refer to the *Dietary Guidelines for Americans* and the U.S. Department of Agriculture’s MyPlate.

**Where can I find out more about selenium?**

**For general information on selenium:**
- Office of Dietary Supplements Health Professional Fact Sheet on Selenium
- Selenium and Selenium in diet, MedlinePlus®

**For more information on food sources of selenium:**
- U.S. Department of Agriculture’s (USDA) National Nutrient Database
- Nutrients List for selenium (listed by food or by selenium content), USDA

**For more advice on buying dietary supplements:**
- Office of Dietary Supplements Frequently Asked Questions: Which brand(s) of dietary supplements should I purchase?

**For information about building a healthy diet:**
- MyPlate
- *Dietary Guidelines for Americans*

**Disclaimer**
This fact sheet by the Office of Dietary Supplements provides information that should not take the place of medical advice. We encourage you to talk to your healthcare providers (doctor, registered dietitian, pharmacist, etc.) about your interest in, questions about, or use of dietary supplements and what may be best for your overall health. Any mention in this publication of a specific brand name is not an endorsement of the product.