

Selenium

This trace mineral has been implicated in both the primary and secondary prevention of prostate cancer.

While results are promising, supplementation is not necessary for most people. Food sources of selenium are plentiful and meeting dietary recommendations through food alone is preferable for overall health.

The body's first lines of defense against cell-damaging free radicals are antioxidant enzymes. Trace minerals (present in very small amounts in the body), such as selenium, are essential co-factors in these potent antioxidants.

Selenium and the enzyme it works with scavenge free radicals from dividing cells, which may explain selenium's potential as an anti-cancer agent. Without adequate amounts of selenium in the diet, these antioxidant enzymes may not function at peak levels, leaving the potential for cell damage that can lead to cancer.

Epidemiologic studies (those looking at large populations of people) have found an inverse relationship between selenium intake and cancers of the colon, breast and prostate, as well as heart disease. In fact, populations with the lowest risk of almost every type of cancer have an optimal intake of selenium, and vice versa.

Studies have found that higher levels of serum selenium were associated with a reduced risk of prostate cancer in comparison to men with poor selenium status. However, this result was only found in men who smoked. Other studies have found no association between selenium intake and risk of prostate cancer.

Experts are currently investigating the effectiveness of selenium in prostate cancer prevention. The **SELECT** (SELEnium and vitamin E Cancer prevention Trial) study is looking at selenium (and vitamin E) supplementation effects on the prevention of prostate cancer. The results of the SELECT trial are not expected until 2013.

The Recommended Daily Allowance (RDA) for selenium for adult men (18 years and older) is **55 micrograms (mcg) per day**. The average intake of selenium among North American men aged 60 years and older is approximately 112 micrograms per day⁴.

Meats, grains (wheat, barley, rye) and other plants (garlic and onions) provide the majority of selenium in the diet. The selenium content of the soil determines the selenium content of grains and vegetables, and varies considerably across North America.

In general, selenium supplements are not recommended unless a person has low serum (blood) levels. Taking unnecessary supplements may be harmful, and large amounts of selenium can

1. Peters U, Foster CB, Chatterjee N, *et al*. Serum selenium and risk of prostate cancer – a nested case-control study. *Amer J Clin Nut* 2007; 85:209-17.
2. Stratton MS, Reid ME, Schwartzberg G, *et al*. Selenium and prevention of prostate cancer in high-risk men...*Anticancer Drugs* 2003; 14:589-94.
3. Stratton MS, *et al*. Selenium and inhibition of disease progression in men diagnosed with prostate carcinoma. *Anticancer Drugs* 2003; 14:595-600.

lead to hair loss, brittle nails and other side effects. While the Upper Limit (UL) of safety for selenium is 400 micrograms per day, supplements containing *more than* 200 micrograms may be unsafe and are not recommended. Most multivitamins contain amounts that are both sufficient and safe, between 25 to 200 micrograms.

The following is a list of dietary sources of selenium that are not soil-dependant.

Food item	Serving	Selenium content (mcg)
Brazil nuts, dried, unblanched	¼ cup (60 ml)	680.6
Tuna, canned in water	~ ½ can (75 g)	60.3
Cod, baked or broiled	2.5 oz (75 g)	35.1
Turkey breast, oven roasted	2.5 oz (75 g)	23.1
Beef roast, lean, oven roasted	2.5 oz (75 g)	21.6
Chicken breast, roasted	2.5 oz (75 g)	20.7
Pasta, whole wheat, boiled	½ cup (125 ml)	19.2
Whole wheat flour	¼ cup (60 ml)	14.1
Cottage cheese, 1%	½ cup (125 ml)	12.2
Bread, whole grain/multigrain	1 slice	10.3
Barley, pearled, cooked	½ cup (125 ml)	7.1

Source: Health Canada, Canadian Nutrient File, 2007b version; www.healthcanada.ca/cnf

Research indicates that men with low levels of selenium show the most benefit from supplementation, whereas men with normal or greater than normal levels of selenium show no benefit. This may be because absorption of selenium in the intestine is more efficient when a person is selenium deficient. In fact, an increased intake of selenium frequently results in greater selenium loss in urine! Your selenium status can be measured by a blood test (assessing recent intake) or toenail analysis (measuring intake over the last year). If you are considering taking selenium supplements, talk to your doctor about having your status assessed to determine whether supplementation is necessary.

The Prostate Education & Research Centre



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