

Lycopene

Although some research studies have shown that this red colour pigment may provide protection against prostate cancer, there is no clear consensus.

Incorporating lycopene-rich foods, such as tomatoes, into your diet several times a week, however, shows more benefit than taking a lycopene supplement.

A member of the carotenoid family of pigments, lycopene is a potent antioxidant. Carotenoids are a group of vitamin A-like substances that give colour to fruits and vegetables and protect against various types of cancer, heart disease and blindness by destroying harmful free radicals in the body. Free radicals are unstable molecules produced during natural reactions in the body and in response to environmental triggers like smoking and sun exposure. They can be destructive and damage cells, contributing to the development of diseases such as cancer. Lycopene, as an antioxidant, counteracts these detrimental effects by either reducing the rate the damage occurs, or by preventing it from occurring completely.

Lycopene gives the red colour to tomatoes, papayas, pink grapefruits and watermelons. Leafy green vegetables (spinach and broccoli) as well as deep orange fruits (apricots, cantaloupes) and vegetables (squash, sweet potatoes) are excellent sources of *other* disease-fighting carotenoids such as beta-carotene and lutein.

The proposed benefits of lycopene for prostate cancer are two-fold – primary and secondary prevention. Lycopene has been proposed to compounds that can cause DNA damage. It may also inhibit the

growth of prostate cancer cells, reducing the risk of advanced disease and, potentially, recurrence of disease.

Despite supportive evidence in the mid 1990's and promising lab results, current human studies suggest, at best, a modest reduction in prostate cancer risk with increasing lycopene intake. In two recent studies, neither increasing lycopene intake ² nor increasing serum (blood) levels of lycopene ³ showed an association with decreased risk. There are, however, promising results for lycopene intake and secondary prevention, as several small scale studies have found benefits among men with recurrence or advanced disease.

Inconclusive study results should not deter you from including lycopene-rich foods in your diet, as they offer many additional nutrients important for overall health. For instance, ½ cup of tomato sauce provides 2 grams of fibre, 3 milligrams (mg) of vitamin E, 17 mg of vitamin C and 19.5 mg of lycopene at only 48 kilocalories per serving.

1. Giovannucci E, *et al.* Intake of carotenoids and retinol in relation to risk of prostate cancer. *Journal of the National Cancer Institute* 1995; 87: 1767-76.
2. Kirsh VA, *et al.* A prospective study of lycopene and tomato product intake and risk of prostate cancer. *Cancer Epidemiol Biomarkers Prev* 2006; 15: 92-8
3. Peters U, *et al.* Serum lycopene, other carotenoids, and prostate cancer risk: a nested case-control study in the PLCO Cancer Screening Trial. *Cancer Epidemiol Biomarkers Prev* 2007; 16: 962-8.

Nearly 80% of lycopene in the diet comes from processed tomatoes and tomato products, accounting for an average intake of about 7.5 milligrams (mg) per day of lycopene among Canadian men aged 50 – 65 years⁴. While raw tomatoes do contain some lycopene (~ 2.5 mg each), due to the plant structure, experts generally consider the availability of this lycopene to be zero. However, canning, cooking and using other heat-processing methods will break down tomato cell walls, releasing the lycopene, thereby increasing the lycopene availability. However, do not exclude raw tomatoes from your diet based solely on lycopene content - they are still loaded with other vitamins, minerals and phytochemicals that also benefit your health.

Lycopene-rich foods require *a little bit* of fat in order for the lycopene to be available for absorption. No need to douse your pasta dishes with cheese though; the little amount of fat that's needed can be provided by adding some olive oil, a modest amount of meat, poultry or fish, or a sprinkling of cheese to your favourite tomato recipes.

Food item	Serving	Lycopene content (mg)
Tomato sauce	½ cup (125 ml)	19.6
Tomato paste, canned	¼ cup (60 ml)	18.7
Tomato soup, canned, low sodium	1 cup (250 ml)	13.6
Tomato juice, low sodium	½ cup (125 ml)	11.6
Salsa, prepared (jarred)	¼ cup (60 ml)	7.0
Canned tomatoes, stewed	½ cup (125 ml)	5.4
Guava	1 medium	4.5
Watermelon	½ cup (125 ml)	3.6
Pink or red grapefruit	½ cup (125 ml)	1.7
Sardines, canned in tomato sauce	~ ½ tin (75 g)	1.1
Fresh tomato	1 medium	0 (2.5) [†]

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

[†] Due to the plant structure, experts generally consider the availability of this lycopene to be zero.

Although lycopene supplements have received considerable publicity, most scientific studies have found no connection to a reduced prostate cancer risk. A diet high in lycopene may be beneficial, but at this time there is no evidence to encourage taking lycopene in supplement form. While there are no adverse effects from including lycopene-rich foods as a part of a healthy balanced diet, large doses of lycopene in supplement form can cause uncomfortable gastrointestinal side effects, such as bloating and gas. Therefore, try to go for the food first before grabbing that supplement.

The Prostate Education & Research Centre



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www.prostatecentre.com

4. Johnson-Down L, Saady-Unterberger H, Gray-Donald K. Food habits of Canadians: Lutein and lycopene intake in the Canadian population. Journal of the American Dietetic Association 2004; 104(6): 980-3.