

LYCOPENE and MEN'S HEALTH

Lycopene is a naturally occurring antioxidant that is responsible for the red color of fruits such as tomatoes, guava, rosehip, watermelon, and pink grapefruit. Numerous scientific studies have linked **lycopene intake with the rate of occurrence of prostate cancer** - the second most commonly diagnosed cancer in American men. This link is of even more significance for African-American men, who, unfortunately, have the highest prostate cancer rate of any group in the world.

A landmark epidemiological study, conducted by the Harvard School of Public Health (Giovannucci E, et al. 1995) monitored the dietary habits of 48,000 men over a period of six years. The authors found that of the 46 fruits and vegetables evaluated it was only the tomato-based foods that were **beneficial in lowering the risk of prostate cancer, and lycopene was implicated as the active ingredient**. Those men who ate ten or more servings of tomato-based products per week had a 34 percent lower risk of contracting prostate cancer.

Men may have prostate cancer for many years before it becomes aggressive and life-threatening. The above Harvard study found that **the beneficial effects of tomato/lycopene were even more apparent when men who had late-stage cancers** were looked at in isolation from the overall group.

A team of researchers from the US National Cancer Institute in Bethesda, Maryland, published a study in 2002 that was designed to test conclusively if it was indeed lycopene that provided the prostate protection implied by the various epidemiological studies that had previously been conducted (Am J Epidemiol 2002;155:1023-1032). About half of the 437 men studied had prostate cancer. **A correlation was found between blood serum lycopene level and cancer**: the men with the highest levels had a significantly reduced risk of prostate cancer compared to those with the lowest lycopene levels.

Lycopene owes its prostate cancer-fighting ability to two separate factors. First, it is a powerful antioxidant. This means that it is able to effectively neutralize free radicals that are constantly introduced into our bodies via the food we eat and the air we breathe. The cellular damage caused by these unstable molecules is one of the causes of cancer. Secondly, **lycopene is readily absorbed and stored in several discrete places, two of which are the prostate gland and testes**, which makes lycopene a particularly useful antioxidant for men.

Lycopene level has also been correlated with male fertility. Several preliminary studies, including that of Dr. Armand Zini of McGill University, Montreal, have shown that men with lower semen lycopene levels have poorer quality sperm. Furthermore, **sperm function improves after lycopene supplementation**. This phenomenon has, again, been attributed to lycopene's antioxidative ability.

The principal cause of death for men, heart disease, has also been linked to cellular damage caused by free radicals. Thus, for several reasons, **the health of all men can be enhanced by a regular intake of lycopene-rich foods or a good quality dietary supplement** .

LYCOPENE and WOMEN'S HEALTH

A summary of research studies on the Health Benefits of Lycopene.

From the media, we have already heard about the impressive benefits of Lycopene for men's prostate health. But did you know the impressive benefits of Lycopene for women's health? The following is a summary of research studies on the benefits of lycopene for women's health and longevity. (Men, you can still benefit from reading this too.) There is evidence that the intake of lycopene can positively impact chronic health concerns that are important to women. These include breast cancer, ovarian cancer, cervical cancer, cardiovascular disease, vision and longevity.

Lycopene and Breast Health

In the United States, women who live to be 90 have a 1 in 8 chance of being diagnosed with breast cancer, with 205,000 cases expected in 2002 (1). While some studies have found no significant association between dietary lycopene intake and breast cancer, others have found **a positive relationship between lycopene in breast tissue and breast cancer risk (2)**. **In cell cultures, lycopene has been found to inhibit breast cancer tumors more efficiently, when compared to alpha and beta-carotene (3)**. In a case-control study conducted between 1993 and 1999 which examined the relationship between 17 micronutrients and breast cancer risk, lycopene was significantly inversely associated with breast cancer risk. The study reviewed the diets of 289 Swiss women with confirmed breast cancer and 442 controls. Median intake of lycopene in the "high intake" group was 6229 µg/day (4). In a study published in 1998, samples taken from The Breast Cancer Serum Bank in Columbia, Missouri were analyzed to evaluate the relationship of levels of carotenoids (including lycopene), selenium and retinol with breast cancer. **Only lycopene was found to be associated with a reduced risk for developing breast cancer (5)**.

Lycopene and Ovarian and Cervical Health

Intake of dietary lycopene may also play a role in the prevention of ovarian and cervical cancers. An estimated 23,300 cases of ovarian cancer and 13,000 cases of cervical cancer are expected in the U.S. in 2002 (1). From a population-based study of 549 cases of ovarian cancer and 516 controls, researchers estimated consumption of several antioxidant vitamins and carotenoids including lycopene. Intake of lycopene was significantly and inversely associated with risk for ovarian cancer, predominately in postmenopausal women. **The foods most strongly associated with a decreased risk for ovarian cancer were raw carrots and tomato sauce (6)**. In a study involving 147 confirmed cervical cancer patients and 191 non-cancerous subjects (7), only lycopene was found to be significantly lower in cancerous patients. In another study of non-Hispanic, black women, **those women with higher levels of lycopene in the blood were found to have a decreased risk (by 33%) of developing cervical cancer (8)**.

Lycopene and Cardiovascular Health

Cardiovascular disease is the number one killer of women in the United States. According to the American Heart Association (9), over 32 million American women have one or more types of cardiovascular disease. **Studies have indicated that consuming tomatoes and tomato products containing lycopene reduce the risk for cardiovascular disease. Lycopene intake has also been found to be associated with a lower risk of myocardial infarction (10)**. In a study of participants from 10 European countries, **it was found that consumption of lycopene in fruits and vegetables**

might reduce the likelihood of developing heart disease (11). In a recent report from the 2002 American College of Cardiology annual meeting, blood samples from nearly 500 women participating in the Women's Health Study were analyzed. Researchers found that **women with the highest levels of plasma lycopene had a 33 percent lower risk of developing cardiovascular disease than those with the lowest blood levels** (12).

Lycopene and Vision Health

Maintaining healthy vision as people age is an important factor in maintaining their independence. According to the National Eye Institute, over half of all Americans age 65 and older are afflicted with cataracts (13). In one cross-sectional survey of 372 women and women aged 66 to 75 years in Sheffield, England, **the risk of cortical cataract was lowest in participants with the highest plasma concentrations of lycopene. The researchers noted the findings suggest that a diet rich in carotenoids may protect against cataract development.** This conclusion was based on observational data. Human, randomized controlled trials should be conducted to verify the results (14).

Lycopene and Pregnancy

Antioxidants have been suggested to play a role in preeclampsia. In one study, placental tissue, maternal serum, and umbilical cord venous blood levels of four dietary carotenoids (including lycopene) were compared in 22 normal pregnant women and 19 women with preeclampsia. Levels of beta-carotene, canthaxanthin, and lycopene in placentas in preeclamptic women were lower than from those with a normal pregnancy, as were beta-carotene and lycopene levels of maternal serum. These findings suggest that oxidative stress or dietary antioxidants may affect preeclampsia (15).

Lycopene and Longevity

Lycopene may also improve longevity in women. In a study examining plasma lycopene and longevity in nuns, lycopene and other carotenoids were measured in 94 participants, ages 77 to 99 years, living in the same convent. After six years of follow-up, only 13% of those with low plasma lycopene were still alive, while 48% of those with moderate lycopene and 70% of those with high lycopene were living ($P=0.0001$). Life table analyses indicated an 11-year difference in life expectancy between those with low and high plasma lycopene (16).

Lycopene Conclusion

In conclusion, lycopene, as an antioxidant, reduces oxidative stress. It may play an important role in many health concerns for women. These include breast cancer, cervical cancer, cardiovascular disease, and preeclampsia. As stated above, serum lycopene levels in women also appear to be positively correlated with longevity. It is therefore advisable for women to regularly include a food source of lycopene in their diets.

References:

1. American Cancer Society. Cancer Facts & Figures 2002, 4
2. Zhang S, Tang G, Russell RM, Mayzel KA, Stampfer MJ, Willett WC, Hunter DJ. Measurement of retinoids and carotenoids in breast adipose tissue and a comparison of concentrations in breast cancer cases and control subjects. *Am J Clin Nutr* 1997; 66:626-632
3. Levy J, Bosin E, Feldman B, Giat Y, Miinster, Danilenko M, Sharoni Y. Lycopene is more potent inhibitor of human cancer cell proliferation than either A-carotene or beta-carotene. *Nutr Cancer* 1995; 24:257-266
4. Levi F, Pasche C, Lucchini F, La Vecchia C. Dietary intake of selected micronutrients and breast-cancer risk. *Int'l J. of Cancer* 2001; 91:260-263
5. Dorgan JF, Sowell A, Swanson CA, Potischman N, Miller R, Schussler N, Stephenson HE Jr. Relationships of serum carotenoids, retinal, a-tocopherol and selenium with breast cancer risk: results from a prospective study in Columbia, Missouri. *Cancer Causes Control* 1998; 9:89-97.
6. Cramer DW, Kuper H, Harlow BL, Titus-Ernstoff L. Carotenoids, antioxidants and ovarian cancer risk in pre- and postmenopausal women. *Int'l J. of Cancer* 2001; 94:128-134
7. Goodman MT, Kiviat N, McDuffie K, Hankin JH, Hernandez B, Wilkens LR, Franke A, Kuypers J, Kolonel LN, Nakamura J, Ing G, Branch B, Bertram CC, Kamemoto L, Sharma S, Killeen J. The association of plasma micronutrients with the risk of cervical dysplasia in Hawaii. *Cancer Epidemiol Biomark Prev* 7:537-544, 1998
8. Kanetsky PA, Gammon MD, Mandelblatt J, Zhang ZF, Ramsey E, Dnistrian A, Norkus EP, Wright TC Jr. Dietary intake and blood levels of lycopene: association with cervical dysplasia among non-hispanic, black women. *Nutr Cancer* 31:31-40, 1998.
9. American Heart Association. 2002 Heart and Stroke Statistical Update, 4
10. Sanjiv A, Rao AV. Tomato lycopene and its role in human health and chronic diseases. *Can Med Assoc J* 2000; 163:739-744
11. Kohlmeir L, Kark JD, Gomez-Garcia E, Martin BC, Steck SE, Kardinaal AFM, Ringstad J, Thamm M, Masaev V, Riemersma R, Martin-Moreno JM, Huttunen JK, Kok FJ. Lycopene and myocardial infarction risk in the EURAMIC study. *Am J Epidemiol* 1997; 146:618-626
12. PRNewswire: Study suggests lycopene may contribute to women's heart health. www.prnewswire.com. April 4, 2002.
13. National Eye Institute. Facts about cataract. <http://www.nei.nih.gov>, accessed 4/20/02.
14. Gale CR, Hall NF, Phillips DIW, Martyn CN. Plasma antioxidant vitamins and carotenoids and age-related cataract. *Ophthalmology* 2001; 108:1992-1998
15. Palan PR, Mikhail MS, Romney SL. Placental and serum levels of carotenoids in preeclampsia. *Obstetrics & Gynecology* 2001; 98:459-462
16. Gross MD, Snowdon DA. Plasma lycopene and longevity: findings from the Nun Study. *FASEB Journal* 2001; A400 (abstract)

The statements contained in this article have not been evaluated by the Food and Drug Administration. The information contained here is not intended to diagnose, treat, cure, or prevent any disease. Suggestions and ideas presented in this article are for information only and should not be interpreted as medical advice, meant for diagnosing illness, or for prescriptive purposes. Readers are encouraged to consult their health care provider before beginning any cleanse, diet, detoxification program, or any supplement regimen. The information in this article is not to be used to replace the services or instructions of a physician or qualified health care practitioner.