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SUPER FOODS

Sesame Seeds

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More than just the nutty topping on a hamburger bun, sesame seeds are full of powerful disease-fighting phytonutrients. These versatile seeds have long been used by different cultures throughout the world, yet many people are unaware of their healthful qualities. Recent research has focused on the unique sesame lignans found in abundance in the seeds, which have shown great potential in reducing blood lipid levels and blood pressure, fighting inflammation and cancer, boosting the body's antioxidant capacity, and enhancing vitamin E bioavailability. A wealth of evidence reveals the power contained within these tiny seeds in helping manage some of today's prevalent health disorders, and gives us plenty of reasons to

add them to our daily diet.

ACHIEVING HEALTHY LIPID PROFILES

Reducing cholesterol is a well-known strategy to favorably alter one's risk-factor profile for heart disease. Sesame seeds are packed with two unique sesame seed lignans, called sesamin and sesamol, which are inducers of cholesterol reduction as revealed by a number of studies.

In an early study, hypercholesterolemic subjects treated with 32 mg/day of sesamin reduced their levels of total cholesterol and low-density lipoprotein (LDL) after eight weeks, compared with control subjects in whom these levels remained unchanged.¹

In another study, 21 subjects with hypercholesterolemia showed reductions in total cholesterol and LDL by 6.4% and 9.5% respectively, after consuming 40 grams of sesame seeds for four weeks. The beneficial drop in cholesterol disappeared, however, when the subjects resumed their normal diet for a further four weeks. Sesame ingestion also exerted an antioxidant effect by prolonging the lag phase of LDL oxidation (the stage where oxidation proceeds very slowly).²

Recent studies have confirmed these findings. Similar persistent reductions in total cholesterol, LDL, triglycerides, and the LDL:HDL ratio have been seen when sesame extracts were given to patients with high blood pressure³ and to postmenopausal women.⁴ Furthermore, in the study of hypertensive patients, which compared the cholesterol-lowering ability of sesame oil with sunflower and groundnut oils, sesame oil demonstrated superior antioxidant activity and better protection against lipid peroxidation than the comparators.³

Lipid peroxidation is a harmful free radical-generating process that often precedes the build up of plaque in the arteries (atherosclerosis). Sesame oil has recently been shown to directly inhibit atherosclerosis lesion formation, while beneficially altering the lipid profile.⁵

It is believed that one possible mechanism by which sesame lignans exert their beneficial effects may be by working synergistically with vitamin E in the body to increase blood and tissue levels of this biologically important antioxidant.

THE VITAMIN E CONNECTION

Vitamin E is a potent fat-soluble antioxidant that reduces blood clotting and lipid peroxidation. It is also vital in protecting cell membranes from oxidative damage, which lessens the potential for inflammation and chronic aging-related diseases.



Vitamin E exists in the body in a number of forms of which alpha tocopherol is most well known. As a result, the alpha form has attracted a lot of attention in the past. Research is emerging, however, that the lesser-known gamma tocopherol may be more effective than alpha tocopherol in quenching a dangerous form of nitrogen-based free radical (peroxynitrite) in the body. This free radical is associated with many inflammatory processes.



Researchers have also shown that gamma tocopherol, unlike the alpha form, inhibits the formation of pro-inflammatory prostaglandins, which are major contributors to disorders ranging from heart disease to cancer.⁶⁻⁸ In fact, several studies have shown that higher plasma concentrations of gamma tocopherol are associated with reduced incidence of these diseases.^{7,9,10}

The good news is that sesame seeds work by increasing both the alpha and gamma forms of tocopherol in the body. They have been shown to raise alpha tocopherol levels in rat brain and have even been found to be more useful than taking alpha tocopherol itself at maintaining high levels of this nutrient and inhibiting lipid peroxidation in various regions of the rat brain.¹¹

Several studies have also investigated the effects of sesame seed lignans on increasing tissue concentrations of the protective gamma tocopherol. One such study discovered that the consumption of as little as 5 mg of sesame lignans over a three-day period significantly increased serum levels of gamma tocopherol by 19%. This study also examined the effects of walnuts and soy oil, which were shown not to be as beneficial.¹²



Furthermore, another study revealed that sesamin prevents the breakdown of gamma tocopherol in the body, resulting in higher bioavailability of this critical nutrient. In this study, a single dose of sesame oil, containing 136 mg of sesame lignans coadministered with gamma tocopherol reduced the urinary excretion of gamma tocopherol metabolites compared with control subjects who did not receive the sesame oil.¹³

Japanese researchers even compared sesame seed lignans with flax seed lignans and found that sesame seeds elicited higher gamma tocopherol levels and lower TBARS scores (a measure of oxidative stress).¹⁴

The evidence for improved vitamin E (gamma tocopherol) status is therefore pretty clear. This is welcome news, but for the fact that some dietary supplement sources contain high doses of the alpha form, which can deplete plasma and tissue levels of the gamma form. In contrast, supplementation with gamma tocopherol increases both alpha and gamma forms in the body.⁷

FIGHTING CANCER

Given the potent anti-inflammatory effect of gamma tocopherol, sesame seeds and their lignans have been studied, both directly and indirectly, for possible anticancer effects.

Research has shown that the sesamin lignan can be converted by intestinal microflora in humans to the mammalian lignans, enterolactone and enterodiols, which may have protective effects against hormone-related diseases such as breast cancer.^{15,16} Both sesame and flax seeds are rich sources of mammalian lignan precursors.¹⁵

In one study, the sesamol lignan was found to stop the growth and induce apoptosis (programmed cell death) of cancer cells.¹⁷ A further study in 220 premenopausal women reported that the risk of breast cancer fell with increasing enterolactone concentrations.¹⁸



A possible mechanism by which sesame lignans may arrest cancer growth came to light in a recent study. It was shown that sesamin arrested cell growth in the early phase of the cell cycle called G1, by down-regulating a protein called cyclin D1, which promotes cancer cell growth.¹⁹

LOWERING BLOOD PRESSURE

Regularly enjoying sesame seeds may also lower blood pressure. Sesame lignans have been shown to favorably affect antihypertensive pathways, which could have profound implications for the millions of people battling hypertension.

A recent human study into the effects of different edible oils in hypertensive patients being treated with nifedipine, an antihypertensive therapy, showed that sesame oil offered better protection over blood pressure, lipid profiles, and lipid

peroxidation than either sunflower or groundnut oils. Sesame oil also favorably increased both enzymatic and non-enzymatic antioxidants compared with the other oils.³

Other research has shown that the sesame lignans also have a beneficial effect on nitric oxide, a powerful vasodilator with anti-atherosclerotic and antithrombotic properties. Dilation of blood vessels makes it easier for blood to flow through, thereby lowering the pressure within the vessels. In one study, sesamol increased the release of nitric oxide from umbilical vein endothelial cells,²⁰ while another study found that sesamin metabolites enhanced vasorelaxation as well.²¹ The authors concluded that sesamin's antihypertensive effects were directly related to this vessel relaxation.

Taken together, these studies are very encouraging. Because sesame seeds are part of our normal diet, future research should further elucidate the mechanisms of action of this food in fighting chronic aging-related diseases.

A HEALTHY ADDITION

Sesame seeds can be added to almost anything including salads, stir fries, soups, and baked goods. You could also try sesame butter as a substitute for peanut butter or eat sesame seeds in the form of tahini or as an addition to hummus. It should be noted that sesame-containing foods have been reported to cause allergy, although the FDA does not include sesame in its list of allergy-causing foods for labeling purposes. Nevertheless, the nutty flavor of sesame seeds can really add that "something" to even the most basic dishes. •

If you have any questions on the scientific content of this article, please call a Life Extension Health Advisor at 1-800-226-2370.

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