Flaxseed and Breast Cancer Prevention
James Meschino DC, MS, ROHP

.

Flaxseeds are a rich source of omega-3 fats, which have been shown to be important in the prevention of cardiovascular disease. Ground flaxseed powder has also been shown to lower LDL-cholesterol (bad cholesterol), further supporting its use in cardiovascular health.

In addition, animal and human studies are providing the first evidence that consumption of flaxseed may play a role in cancer prevention.

Flax is a potent source of lignan precursors, which are among the many plant compounds that yield phytoestrogens with estrogen-like qualities. These phytoestrogens are under investigation for their potential ability to prevent the development of breast, prostate, colon and other tumors in humans.

Flaxseed contains high levels of SLD (secoiso-lariciresinol diglycoside) and matairesinol, compounds that are converted by gut bacteria into the mammalian lignans, enterolactone and enterodial. (phytoestrogens).

Both enterolactone and enterodiol have demonstrated anticancer properties and flaxseeds contain 75 to 800 times more of these lignan precursors than any other food.

Studies have demonstrated that rats fed flaxseeds have greater than a 50% reduction in carcinogen-induced abnormal colon growths. There was also a slowing of cell division of normal cells (epithelial) in the colon and the breast. Slowing of cell division is associated with a lower risk of cancer. Other animal studies have confirmed the anti-tumor effects of flaxseed lignans.

Human studies have demonstrated that SLD, enterolactone and enterodiol are absorbed by humans and that they have the power to influence female hormone function.

In a study conducted at the Universities of Minnesota and Rochester, women who added flaxseed to their diet experienced changes in their menstrual cycles. Researchers observed that the women had increased progesterone-estradiol ratios during the luteal phase, fewer anovulatory cycles (cycles with no ovulation) and a decreased tendency to ovarian dysfunction. All of these adaptations are linked to a lower risk of breast cancer.

In another study at the University of Minnesota and the University of Helsinki, lignans and other phytoestrogens known as flavonoids inhibited enzyme activity necessary for estrogen production from fat tissue. This form of estrogen (estrone) is thought to contribute to breast cancer and other reproductive organ cancer. The understanding that flaxseeds can block the formation of this cancer-permissive estrogen (estrone) is an important clinical finding.

In summary, flaxseed lignans may defend against cancer through a number of mechanisms. Lingans have been shown to compete with more dangerous estrogens for binding to receptors on reproductive organs. This would reduce the impact of these more dangerous estrogens on these tissues.

Lignans have been shown to inhibit the growth of estrogen-sensitive breast cancer cell lines. They inhibit the enzyme that produces estrone hormone; one of the more dangerous estrogens made in fat tissue. Lignans slow down cell division and reduce colon cancer tumors in animal studies. Finally, lignans have been shown to inhibit the formation of blood vessels around cancer cells (anti-angiogenesis); a vital step in blocking the spread of cancer. All of this experimental evidence suggests that flaxseed is potentially important in protecting against cancer.

My advice is to consume at least two tablespoons of flaxseed powder per day. It can be added to juice, sprinkled on to cereal, blended into a protein shake etc.

If you purchase whole flaxseeds be sure to crush them in a grinder before you ingest them. This will permit a greater entry of lignan precursors into the bloodstream. Most health food stores sell flaxseed powder, which is pre-ground.

Be aware that "flaxseed oil" is not a potent source of flaxseed lignans. Flaxseed oil is an excellent source of omega-3 fats, but to derive the lignans from flaxseeds, you must consume the flaxseeds themselves in a ground-up form.

References:

1. Ziegler J. Just the flax, Ma'am: Researchers testing linseed. J Natl Cancer Inst 1994; 86; 23: 1746-48

2. Cunnane SC. et al. Nutritional attributes of traditional flaxseed in healthy young adults. Am J Clin Nutr. 1995; 61; 62-8

3. Thompson LU, Robb P, Serraino M, Cheung F, Mammalian lignan production from various foods. Nutr Cancer 1991; 16:43-52

4. Chan JK, McDonald BE, Gerrard JM, Bruce VM, Weaver BJ, Holub BJ. Effect of dietary a-linolenic acid and its ratio to linoleic acid on platelet and plasma fatty acids and thrombogenesis. Lipids 1993;28:811-7

5. Cunnane SC, Ganguli S, Menard C, et al. High alpha-linolenic acid flaxseed (Linum usitatissimum): some nutritional properties in humans. Br J Nutr 1993;69:443-53

6. Setchell KDR, Adlercreutz H. Mammalian lignans and phytoestrogens; recent studies in the formation, metabolism and biological role in health and disease. In: Rowland I, ed. Role of the gut flora in toxicity and cancer. London: Academic Press, 1988:315-45.

7. Adlecreutz H, Mousavi Y, Hockerstedt K. Diet and breast cancer. Acta Oncologia 1992;31:175-81

8. Serraino M. Thompson LU. The effect of flaxseed supplementation on the initiation and promotional stages of mammary tumorigenesis. Nutr Cancer 1991;17:153-9

9. Serraino M, Thompson LU. The effect of flaxseed supplementation on early risk markers for mammary carciogenesis. Cancer Lett 1991;60:135-42

10. Serraino M, Thompson LU. Flaxseed supplementation and early markers of colon carcinogenesis. Cancer Lett 1992;63:159-65

11. Axelson M, Sjovall J, Gustafsson BE, Setchell KDR. Origin of lignans in mammals and identification of a precursor from plants. Nature 1982;2298:659-60

12. Shultz TD, Bonorden WR, Seaman WR. Effect of short term flaxseed consumption on lignan and sex hormone metabolism in men. Nutr Res 1991;11:1089-100

13. Lampe JW, Martini MC, Kurzer MS, Adlercreutz H, Slavin Jl. Urinary lignan and isoflavonoid in premenopausal women consuming flaxseed powder. Am J Clin Nutr 1994;60:122-8

14. Thompson LU, Potential health benefits and problems associated with antinutrients in foods. Food Res Int 1993;26:131-49

15. Adlercreutz H, Mousavi Y, Clark H, et al. Dietary phytoestrogens and cancer: in vitro and in vivo studies. J Steroid Biochem Mol Biol 1992;41:331-7

16. Mousavi Y, Adlecreutz H. Enterolactone and estradiol inhibit each others proliferative effect on MCF-7 breast cancer cells in culture. J Steroid Mol Biol 1992;41:615-9

17. Fotsis T, Pepper M, Adlercreutz H, et al. Genistein, a dietary-derived inhibitor of in vitro angiogenesis. Proc Natl Acad Sci USA 1993;90:22690-4