against breast cancer, soy must be consumed early in life. For example, one Chinese study found women who consumed about 1½ servings of soy during adolescence (13 to 15 years of age) were 50% less likely to have breast cancer as were women who consumed little soy during the teenage years. Similarly, a study by researchers from the National Cancer Institute found that Asian women who consumed the most soy during the ages of 5 to 11 were 58% less likely to develop breast cancer in comparison to women consuming little soy during childhood. Other evidence indicates the isoflavones in soy are responsible for these observed benefits. Clearly, young girls should definite consume soy and of the various soy products available, calcium and vitamin D fortified soymilk may be an especially good choice since some evidence suggests vitamin D early in life may also protect against breast cancer.

As is the case of breast cancer, rates of prostate cancer are also very low in Japan compared to the United States. Animal studies show that when soy is added to the diet, in general, the development of prostate tumors is inhibited. Importantly, a recent animal study found that the main isoflavone in soybeans inhibited the metastasis of prostate tumors by 96%. In general, mortality from cancer results from cancer cells metastasizing from the tissue of origin to vital organs. Several studies have also found that in prostate cancer patients soy slows the rise in prostate specific antigen (PSA) levels. PSA is an indicator of prostate cancer. Since prostate tumors are typically very slow growing if soy even modestly delays the onset of tumors and/or slows their growth this will allow men to die with their tumor rather than of their tumor.

Recommended intake

On the basis of Asian soy consumption, the results from clinical and epidemiologic studies examining the health effects of soyfoods, and the principles of dietetic practice, it is recommended that two to three servings of soyfoods be consumed daily. One serving is for example, 1 cup soymilk or 3 to 4 ounces of tofu. Emphasis should be placed on consuming less processed soyfoods but even the more processed forms of soy, such as the many meat analogues on the market, can make healthy contributions to the diet.

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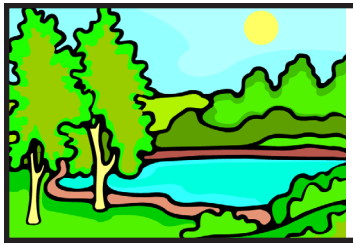

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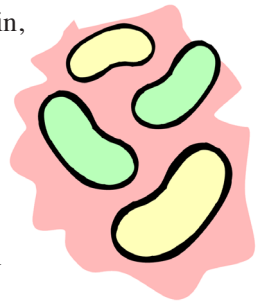
Surprising Benefits of Soy

Traditional soyfoods, such as tofu and miso, have played important roles in Southeast Asian diets for centuries and have been consumed by health-conscious individuals in Western countries for decades. They have been prized for providing ample amounts of high-quality protein. Recently however, these foods have increased in popularity because of research suggesting they may have health benefits independent of their nutrient content. For example, soyfoods have been postulated to reduce the risk of coronary heart disease, osteoporosis, and some forms of cancer. There is also evidence indicating soy alleviates hot flashes in postmenopausal women and more speculative data suggesting possible benefits in areas ranging from cognitive function to asthma. The two components of the soybean that have attracted most research attention are the protein and isoflavones. Of course, in addition to providing protein, soyfoods are low in saturated fat and cholesterol-free and are also good sources of many essential nutrients such as potassium and folate and the soybean is one of the few plant sources of omega-3 fatty acids.



The purpose of this article is to review evidence related to the potential health benefits of soyfoods and to provide intake recommendations.

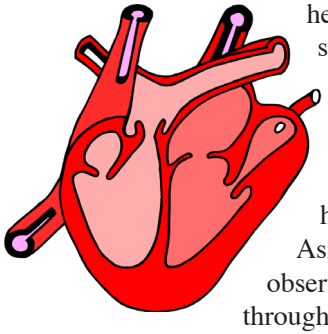
Background on Isoflavones

Unquestionably, much of the excitement of soyfoods is because they are essentially unique sources of a group of plant chemicals called isoflavones. If your diet includes soy your diet is high in isoflavones and if not, your diet is nearly devoid of these soybean constituents unless exposure occurs through the many supplements that are on the market. Isoflavones have a chemical structure that is similar to the female hormone estrogen so not surprisingly, they exert estrogen-like effects under certain experimental conditions. This is why isoflavones and soyfoods have been posited as natural alternatives to conventional hormone therapy for menopausal women. However, it is extremely important to recognize that isoflavones

are very different from the hormone estrogen. There are many biological processes affected by the hormone estrogen that are not affected by isoflavones or soyfoods. Therefore, no conclusions about the effects of isoflavones can be made on the basis of what is known about estrogen.

Coronary Heart Disease

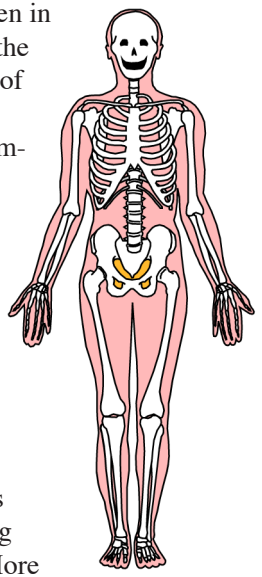
In 1999, the U.S. Food and Drug Administration awarded a health claim for soyfoods and coronary heart disease based on the cholesterol-lowering effects of soy protein. Extensive evidence indicates soy protein directly lowers LDL-cholesterol (bad cholesterol) about 4 percent. Although modest, even this degree of reduction can reduce risk of coronary heart disease by about 10%. Furthermore, blood cholesterol is further lowered when soyfoods replace most animal products which tend to be high in saturated fat. Also, there is very intriguing evidence that aside from any effects on cholesterol levels, soyfoods reduce risk of coronary heart disease through multiple mechanisms such as by directly improving the health of the arteries. Several large epidemiologic studies have found Japanese and Chinese subjects who consume about two to three servings of soyfoods daily are much less likely to have heart attacks and coronary heart disease than Asians who consume little soy. The protection observed in these studies is far beyond that possible through cholesterol reduction. Clearly, soyfoods are very heart-healthy.



Osteoporosis

The first clinical study to examine the effects of an isoflavone-rich soy protein on bone mineral density was published in 1998. Since that time more than 20 trials have been published; these trials have generally used soy protein or isoflavone supplements. Initial interest in the skeletal benefits of soyfoods can be attributed to the estrogen-like effects of isoflavones. Estrogen therapy is known to reduce bone loss and fracture risk in postmenopausal women. As women enter the menopause, the decline in estrogen levels can cause significant bone loss over the next 5 years, which places these women at an elevated risk of developing fractures.

Overall, the results from the clinical studies examining the effects of soy on bone loss are inconsistent but encouraging however; no definitive conclusions can be made because many of the trials were short in duration and small in size. This having been said, a recent statistical analysis of 10 studies concluded that the isoflavones in soybeans reduce bone loss in postmenopausal women. Furthermore, in the only epidemiologic study to include fractures as an end point, risk was reduced by approximately one-third when comparing Chinese postmenopausal women in the highest intake group with those in the lowest. In the highest intake, women consumed about two servings of soy daily. For women concerned about bone health, soyfoods should definitely be part of the diet. Calcium-fortified soymilk is an especially good choice in this regard because it is a good source of calcium and protein – nutrients that are important for bone health – as well as isoflavones.



Alleviation of Hot Flashes

Menopausal women in Japan tend not to suffer from hot flashes like North American and European women do. There has been considerable speculation that one reason for the lower incidence of hot flashes is Japan is that the estrogen-like effects of isoflavones mitigate the drop in estrogen levels in women entering the menopause which is the trigger for hot flashes. More than 50 studies have examined the effects of isoflavones, either from supplements or soyfoods, on hot flashes. These studies have produced very inconsistent results; many have shown very significant reductions in hot flash frequency or severity whereas others have shown minimal or no effects. Several reasons for the inconsistent data have been proposed. For example, it may be that only certain types of supplements are beneficial or that only certain women benefit depending upon who they metabolize isoflavones, which varies markedly among individuals. In any event, the evidence is certainly sufficiently strong for health professionals to recommend soyfoods and isoflavone supplements for relief. Any benefits will be apparent within just a few weeks.

Cancer

Of all the potential health benefits of soyfoods, it was the potential for these foods to reduce cancer risk that first attracted the attention of the research community. Despite being a very economically-developed country, Japanese rates of breast and prostate cancer are very low in comparison to the United States.

Extensive research has focused on the possibility that soyfoods reduce breast cancer risk. This research has included animal, epidemiologic, and clinical studies. A recent statistical analysis of the epidemiologic data found that Asian women who consume the most soy are about one-third less likely to develop breast cancer as Asian women who consume little soy. Interestingly, women in the high-soy group only consumed about 1½ servings daily.

However, very exciting evidence suggests that to derive protection