

# having Our Soy

by Adriane Fugh-Berman, M.D.

**A**lthough tofu, miso, and green soybeans have been an integral part of the traditional diet in many Asian countries, soy products have been slower to catch on in the U.S.

But a flurry of scientific interest in the health benefits of soy has been generated by recent research suggesting that a high-soy diet may account for lower rates of cancer and heart disease in Asian women. (Benefits are seen in those who consume an average of 20 to 40 grams of soy protein per day.) In addition to being high in protein, calcium, and fiber, soybeans and the products derived from them contain plant estrogens, also called phytoestrogens, which may lower the risk of developing breast cancer and reduce menopausal symptoms such as hot flashes. Soy may also help lower cholesterol levels and protect against cardiovascular disease.

Chinese and Japanese women have a significantly lower incidence of, and mortality from, breast cancer than Western women, and several studies show that Asian women who eat a traditional diet have lower breast cancer rates than those who have converted to a Western diet. While there are several crucial differences in the diets—Asians eat less fat and protein and more carbohydrates than Westerners—any researchers feel that the high consumption of phytoestrogens by Asian women is the key to their lower breast cancer rates.

The health potential of soy rests on the premise that even though plant estrogens are very weak estrogens (the strongest among them is only 1/200th as strong as human estrogens), they may perform functions similar to some of our own, stronger estrogens. And they are quite versatile—much of the potential of phytoestrogens (as well as some of the confusion about them) stems from the fact that they appear to have different effects in pre- and postmenopausal women.

For premenopausal women, whose bodies generate a significant amount of estrogen, researchers think phytoestrogens have what is known as an antiestrogenic effect: they bind to the estrogen receptors in our bodies, competing for space with our own estrogens. This surplus of estrogen then seems to send a chemical message to our hormone factories to take a break. One theory is that women who eat plant estrogens every day have a constantly lower rate of production of homegrown estrogen and thus a lower risk for hormone-related cancers (higher levels of bodily estrogen have been linked to increased

risk for breast cancer).

In addition, a number of animal studies suggest that phytoestrogens may attach to estrogen receptors of tumors, and actually inhibit the growth of cancer cells. Researchers at the University of Alabama at Birmingham's Department of Pharmacology and Toxicology found that baby rats exposed to a substance known to cause breast cancer had a cancer rate 40 percent lower when they also received genistein, a phytoestrogen found in soybeans.

There is yet no conclusive evidence that phytoestrogens help prevent breast cancer in postmenopausal women. Breast cancer rates rise with age, and Asian women have lower breast cancer rates at all ages than Westerners. However, one study of Chinese women in Singapore found that soy intake seemed to have a preventative effect only for premenopausal women.

In fact, in postmenopausal women, phytoestrogens are thought to have an *estrogenic* effect: because there is less estrogen produced during and after menopause, phytoestrogens supplement women's natural estrogen, giving our bodies a mild boost. One study showed that the vaginal cells of postmenopausal women who ate a soy-supplemented diet looked more like those of premenopausal women.

And soy may account for the fact that Asian women rarely complain of hot flashes. Researchers hypothesize that phytoestrogen intake may make the menopausal drop in estrogen an easier descent for Asian women—lowering estrogen levels enough before menopause and buoying their bodies after menopause. Westerners, on the other hand, start at a higher level and fall to a lower level. Of course, societal factors may also come into play: it's difficult to determine the importance of the fact that Asians respect age while Westerners worship youth.

Perhaps one of the most exciting breakthroughs with soy is its potential as an alternative to hormone replacement therapy (HRT). Researchers at Wake Forest University are now comparing the effects of soy versus conventional forms of HRT, in the hope that soybeans will offer the same benefits without the same risks. Soybeans appear to lower cho-

### Soy as a Source of Calcium

The recommended daily allowance of calcium for women is 1,200 milligrams.

	Mgs Calcium
Tofu, firm*	553
1/4 block (81 g)	
Tofu, regular*	406
1/4 block (116 g)	
Soymilk, fortified, 1 cup	80-300
Take Care Nutritious Beverage, 25 g	300
Soybeans, roasted, 1/2 cup	119
Soybeans, boiled, 1/2 cup	88
Tempeh, 1/2 cup	77
Soymilk, 1 cup	7

\*Tofu processed with calcium sulfate.  
Chart source: USDA.

lesterol levels and the risk for cardiovascular disease. While soybeans are proportionally high in fat, they are low in calories and do not add many fat grams to the diet, particularly if soybeans replace high-fat meats. A metaanalysis of 38 controlled trials found that heavy consumption of soy protein reduced total cholesterol by an average of 9.3 percent, low-density lipoprotein cholesterol by 12.9 percent, and triglycerides by 10.5 percent.

Of course, soy products are not all created equal: a recent study compared tofu, a commercial soy drink, and soy-based nutritional formulas. Tofu had 10 times the amount of phytoestrogens as the soy drink, and formula had only trace amounts of phytoestrogens (though other studies have found phytoestrogens in soy-based formulas). The way that soybeans are processed affects nutrients; for example, calcium is added to bean curd in the process of making tofu (see box).

There is now a range of soy products being produced and they are becoming increasingly available—in supermarkets instead of just in health food stores. And while the idea of eating eight ounces a day of tofu may still be a hard sell in some quarters, the health benefits may make it well worth the try.

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Source: *Ms.*, January-February 1996