

## NUTRITION

## Soy food intake and breast cancer

Consumption of soy foods is safe for patients with breast cancer and may have beneficial effects on recurrence of breast cancer and mortality rates, according to a new study published in *JAMA*.

Soy foods are the main dietary source of isoflavones, a major group of phytoestrogens with both estrogen-like and antiestrogenic effects. Although estrogen has been associated with the development and progression of breast cancer, the effects of soy food consumption on breast cancer were unknown.

The Shanghai Breast Cancer Survival Study was a large, population-based cohort study of 5,033 women with breast cancer, aged 20–75 years, who were diagnosed between March 2002 and April 2006. The patients were followed up for breast cancer recurrence and survival, and soy food consumption was assessed and updated by a food frequency questionnaire, to determine the association of soy food intake after breast cancer diagnosis with total mortality and cancer recurrence.

After a median follow-up of 3.9 years, a total of 444 deaths and 534 recurrences of breast cancer had occurred in the study cohort. The researchers found that the consumption of soy foods, determined by either soy protein or soy isoflavone intake, was inversely associated with mortality and breast cancer recurrence. This association was present irrespective of estrogen-receptor expression or tamoxifen treatment.

The investigators found that the associations of soy food intake with mortality and recurrence seemed to follow a linear dose-response pattern until soy protein intake reached 11 g per day or soy isoflavone intake reached 40 mg per day. A further increase in soy food consumption seemed to have no further beneficial effect on breast cancer outcomes. “In other words, you only need to consume a moderate amount of soy food to achieve the benefits,” states Xiao Ou Shu from the Vanderbilt Epidemiology Center of the Vanderbilt University in Nashville, USA.

Soy isoflavones could compete with endogenous estrogens in the binding of estrogen receptors, which would lower the biological availability of estrogen. Soy isoflavones also reduce the body’s production of estrogen and increase its clearance from the circulation, thereby reducing the overall amount of estrogen in the body. The most frequent types of breast cancer are dependent on estrogen for growth; in other words, a reduction of whole-body estrogen levels in most cases equates to less cancer growth. Notably, Shu points out that “other constituents of soy foods, such as folate, protein, protease inhibitor, calcium or fiber, individually or in combination, could also be responsible for the survival benefits of soy food consumption.”

“We have published previously that soy intake before cancer diagnosis was



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unrelated to breast cancer outcomes,” says Shu. When taken together with the findings of the current study, these results indicate that current soy food consumption, rather than previous intake of soy foods, mediates the effects on breast cancer outcomes.

Virtually all Chinese women eat some soy foods, such as tofu, soy milk or soy beans, whereas only a small proportion of American women consume soy foods regularly. Previous research has found that prognostic factors for breast cancer are similar for Chinese and American women, which is why the researchers believe that their findings have similar implications for US women with breast cancer.

Shu and colleagues plan to continue their follow up of the Chinese cohort to investigate the effects of the consumption of soy foods on long-term health, including BMD, fracture risk, and coronary heart disease.

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