The Jury’s still out on soy’s benefits

By David Schardt

Soy What?

Scientists have long suspected that the soy foods in Asian diets may help explain why people in places like Japan, China, and Singapore have lower rates of breast cancer, prostate cancer, osteoporosis, and heart disease. And thousands of studies over the past two decades—most of them carried out in the West—have tried to figure out whether soybeans are beneficial and, if so, which parts of the soybean are responsible.

“But reviews of these studies have found the effects of soy to be weak and not very consistent,” says Stephen Barnes, a soy expert at the University of Alabama at Birmingham.

Why the disconnect? Maybe it’s because people in Asia eat different soy foods than people in North America. Or perhaps genetics or other differences in lifestyle matter more. And there’s always the possibility that eating soy just doesn’t help.

Here’s the latest on what scientists are discovering about soy and health.

Bones

“There’s no question that the recent studies examining the effects of soy on bones have been very disappointing,” says D. Lee Alekel. “But it is what it is. That’s why we do clinical trials.” Alekel researches osteoporosis and bone health at Iowa State University.

“The epidemiological research in Asia suggests that consuming soy foods protects the bones, but we don’t know if that’s true only if you grow up in a culture where one consumes these foods regularly all through life,” notes Alekel. “When you look at the shorter-term intervention trials in Western countries, the results are very inconsistent.”

In Alekel’s 2000 study of 69 women at or around the age of menopause, for example, those who ate soy protein rich in isoflavones for six months had less bone loss in the lower spine than those who ate isoflavone-poor soy protein.1 (Isoflavones are weak estrogen-like compounds in soy.)

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In a study of 59 men with early stage prostate cancer, for example, PSA levels dropped or stayed the same in 69 percent of those who consumed 60 mg of soy isoflavones every day for three months, compared with 55 percent of those who received a placebo.4 That was a statistical tie. (Rising PSA, or prostate-specific antigen, may signal the growth of prostate tumors.)

What about men who start out cancer free? Five studies have asked men how often they eat soy foods and then waited to see who later was diagnosed with prostate cancer and who wasn’t. In two of the five (one in Japan and one in the United States), soy eaters had a lower risk. In the other three, they didn’t.5-9 It’s not clear why the results are inconsistent.

The Bottom Line: “The idea that soy can stop prostate cancer is a wonderful hypothesis that hasn’t yet been adequately tested in men,” says researcher Steven Clinton.

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Prostate Cancer

In 1999, Clinton and his colleagues showed that prostate tumors grew more slowly in mice when soy protein and isoflavones were added to their diet.3 But so far, results in humans are less encouraging.

Researchers at the University of Connecticut Health Center in Farmington assigned roughly 100 women aged 60 and older to take one of four protein supplements every day: 18 grams of soy protein, the soy protein with 105 mg of isoflavones, 18 grams of milk and egg protein, or the milk-egg protein with 105 mg of isoflavones. After one year, there was no difference in bone mineral density among the four groups.2

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**BREAST CANCER**

“The idea that eating soy foods may reduce the risk of breast cancer has been around for years,” says researcher Regina Ziegler of the National Cancer Institute in Bethesda, Maryland. “It was originally inspired by the fact that breast cancer rates are low in Asia and high in Western countries, and was later supported by test tube and animal research.”

In some studies of Asian women, those who consume traditional soy foods every day as adults have a lower risk of breast cancer. For example, Anna Wu of the University of Southern California in Los Angeles and colleagues asked roughly 35,000 middle-aged and older Chinese women in Singapore how often they ate soy foods. Over the next 7 to 12 years, those who ate the equivalent of one or more servings of tofu a day were 18 percent less likely to be diagnosed with postmenopausal (but not premenopausal) breast cancer than those who ate less than one serving a day.10

But the evidence is mixed. For example, one study in Asia found a link in premenopausal women, another found a link only with isoflavones and miso soup (but not other soy foods), and two Asian studies found no link with anything.11-14

The evidence is weaker in studies of women in the West. Among California teachers and European women, soy eaters or isoflavone takers had no lower breast cancer risk.15 That may be because women in the West eat few traditional soy foods, says Wu. Or soy may not matter, East or West.

“Eating soy may be closely tied with other lifestyle factors—such as increased physical activity or reduced body weight—that we may not be able to adequately take into account but that affect the chances of being diagnosed with breast cancer,” Ziegler points out.

It’s also possible that soy’s protective effect is triggered early in life, when breast tissue is growing. That seemed to be the case in four retrospective studies of early soy intake. Asian women living in the United States, Canada, and China who had breast cancer recalled eating (or their mothers recalled feeding them) fewer soy foods during their childhood or adolescence than similar women without breast cancer.16-19

But retrospective studies can be less reliable than prospective studies because of what scientists call “recall bias.” People who have been diagnosed with a disease may subconsciously remember their past differently. (For example, they may think, “If I have breast cancer, maybe it’s because I didn’t eat enough soy when I was young.” So they may “remember” eating less soy than women who don’t have breast cancer.) What about women who already have breast cancer? “We don’t know if there’s any benefit from eating soy foods,” says Wu. “But there also doesn’t appear to be any risk.”

Two studies from the 1990s had raised red flags. Women who were given soy protein with isoflavones had signs of increased cell proliferation in their breast tissue or in breast fluid.20 Any time cells multiply, there’s a greater risk of cancer.

“More recent studies using larger doses of soy for longer periods of time have not confirmed these earlier findings,” says Wu. “Most scientists looking at these studies would conclude that soy foods are probably safe for women with breast cancer.”

**The Bottom Line:** It’s unclear if soy foods reduce breast cancer risk.

**COGNITION**

Does eating tofu rot your brain?

In a prospective study published in 2000, men in Hawaii who reported eating the most tofu during middle age were the most likely to suffer cognitive impairment and brain atrophy later in life.21 And last year, when British researchers interviewed some 700 elderly men and women in Singapore, the more tofu the seniors reported eating, the worse their memories. But the more tempeh (fermented soybeans) and fruit they ate, the better their memories.22

“Most scientists have dismissed these associations as spurious,” says University of Wisconsin researcher Carey Gleason. Instead, she notes, a tofu-rich diet may simply signal habits that affect the brain. “For example, it could indicate the degree of acculturation,” says Gleason. “If so, those who followed a more traditional Japanese-Hawaiian diet with tofu may have been less likely to use Western medicine. Or maybe they had less education or were less engaged in society, which are risk factors for dementia.”

Researchers have tested soy isoflavones on memory and other mental abilities in short-term studies. So far, results on women under 65 have been inconsistent. (Research hasn’t focused on men.) In some studies, isoflavones boost memory. In others, they don’t.23-26

As for planning and mental flexibility, “the jury is still out,” says Pauline Maki of the Center for Cognitive Medicine at the University of Illinois at Chicago. In contrast, studies testing isoflavones on women over 65 have consis-
tently come up empty. “Estrogen receptors may not respond as well in older women,” says Maki.

In fact, in the Women’s Health Initiative Memory Study, women 65 and older who took estrogen or estrogen plus progestin were twice as likely to be diagnosed with dementia, including Alzheimer’s disease, as similar women who took no hormones.27 (Soy isoflavones are weak estrogen-like compounds.)

The Bottom Line: “Women over 65 should consume no more than two servings of soy foods a day and not start taking soy isoflavone supplements,” says researcher Pauline Maki.

HOT FLASHES

“In good studies, soy reduces the frequency of hot flashes 20 to 30 percent more than a placebo does,” says Mindy Kurzer, director of the Healthy Foods, Healthy Lives Institute at the University of Minnesota.

Estrogen pills cut hot flashes by 90 percent, but “a lot of women don’t want to take estrogen,” says Kurzer. “And since they don’t have any other alternatives, soy is an option to give them some relief.”

Kurzer is working with soy expert Mark Messina of Loma Linda University in California on a new meta-analysis of the research. (A meta-analysis combines the data from similar studies and can sometimes detect effects that the individual studies can’t.)

In the first meta-analysis, published three years ago, studies that used at least 15 milligrams a day of the isoflavone genistein seemed to be successful against hot flashes, while those that used less than 15 mg didn’t seem to be.28

The second meta-analysis—several new studies have been published since the first—is consistent with that, says Messina. “It looks like eight of the nine studies using high amounts of genistein were effective against hot flashes, while only four of the eight using small amounts were.”

But he cautions that some studies in the meta-analysis were poorly done. “In some, we couldn’t figure out how the researchers measured hot flashes, how many subjects dropped out, or what the statistical analysis was based on.”

Most of the successful studies used at least 50 mg of isoflavones that contained at least 15 mg of genistein, notes Messina, adding that “any benefits were apparent within six weeks.” (Messina consults for Archer Daniels Midland, which makes the Novasoy brand of isoflavone supplement.)

The Bottom Line: “I don’t see any downside to trying isoflavones for 5 or 6 weeks,” says researcher Mark Messina. Just keep in mind that hot flashes often improve even when women take a placebo.

HEART DISEASE

Ten years ago, the U.S. Food and Drug Administration allowed food labels to make a health claim that 25 grams a day of soy protein may reduce the risk of heart disease. You can see the claim today on some soy burgers and other soy foods.

But since 1999, it has become clear that soy protein has just a small impact on LDL (“bad”) cholesterol. In 2006, the American Heart Association declared that while soy foods “may confer benefits to cardiovascular health” by replacing animal foods, “the direct cardiovascular health benefit of soy protein or of isoflavone supplements is minimal at best.”29

In late 2007, the FDA announced that it would re-evaluate four previously approved health claims, including the one for soy and heart disease, but it has yet to publish any conclusions.

“The current estimate is that eating soy protein lowers LDL cholesterol by 3 percent,” says Loma Linda University’s Mark Messina. (Earlier studies estimated a 6 to 13 percent drop.) And that’s if you eat 25 grams of soy protein every day.

“Twenty-five grams is a lot,” admits Messina. “But with the wide availability of soy foods, you can easily do it.”

Other researchers aren’t convinced.

“In the U.S., few people eat 25 grams of soy protein every day,” says Alice Lichtenstein of Tufts University in Boston, who served on the Heart Association committee that reviewed the soy research.

The heart disease claim that the FDA approved has led to some unanticipated consequences, says Lichtenstein.

“For example, adding the minimum amount of soy protein to snack foods or energy bars allows them to make a heart disease claim even though the foods may pack a few hundred calories per serving, and someone would have to eat four servings to reach 25 grams of soy protein.”

Nonetheless, notes Lichtenstein, “eating soy burgers or soy milk instead of foods with animal fats like hamburgers or full-fat milk is a great strategy to cut saturated fat intake. It could also help people lower their blood cholesterol and, if they eat foods made with whole soybeans, it could increase their fiber intake.”

The Bottom Line: Eating large amounts of soy protein (25 grams a day) can lower LDL (“bad”) cholesterol by a modest 3 percent.

What’s in a Serving?

A 3½ oz. serving of firm tofu has roughly 6 grams of protein and 20 milligrams of isoflavones (including 10 mg of genistein).

References: