**Update on the SOY controversy**



**A Harvard trained surgeon, Dr. Mills has specialized in breast health and breast cancer care since 1989.**

**She is the co-founder of “Women to Women”**

We’ve used soy at the clinic for 10 years to help relieve menopausal symptoms, and we’ve reviewed all of the myths about it —

* that soy causes breast cancer
* interferes with tamoxifen or the digestion of protein
* causes developmental delays in infants fed soy formula
* and many others.

In our experience, and in countless studies we’ve looked at, we’ve found nothing to support these myths … which only makes sense, since soy has been an important part of Asian diets for thousands of years and continues to be a popular food choice. Yet, I keep hearing from women that they, their friends, or their partners are worried about the safety of soy. It’s absolutely true that soy products are not for everyone —

* there are some women who are allergic or sensitive to soy.
* Other women have digestive or thyroid problems that need to be addressed before eating soy is a good idea. But I decided to research why soy has been fingered as a “dangerous” food, and why some of these anti-soy voices are so angry, if not downright frightened, about a little green bean.

So I decided to research why soy has been fingered as a “dangerous” food, and why some of these anti-soy voices are so angry, if not downright frightened, about a little green bean. Given that soy is eaten by millions of people around the world every day, it’s puzzling that some people regard soy so negatively. While I’m not sure that we’ve found all the answers, we here at Women to Women have looked into whether there is any scientific merit to the claims of those who demonize soy, and what we’ve found only confirms our understanding that soy is a healthy food with many benefits for women.

**So let’s talk about WHO is campaigning so aggressively against soy, and take a look at the science behind this issue.** Who is the voice against soy?

There is just a huge amount of information and misinformation floating around on the internet about the supposed dangers of soy.

* The loudest anti-soy voices are coming mostly from a close-knit group associated with promoting the nutritional agenda of the Weston A. Price Foundation (WAPF). Sally Fallon, Kaayla T. Daniel, Mary Enig, Julia Ross and Joseph Mercola are all members of the board at WAPF, or honorary members.The WAPF was founded by the early 20th century dentist Dr. Weston Price, who traveled around the world to research the diets of populations who enjoyed the greatest longevity. Today the foundation promotes a nutrition agenda based solely on “nutrient-dense whole foods and the vital fat-soluble activators found exclusively in animal fats.”
* The WAPF agrees with many of the same ideas we have about the benefits of whole, organic foods produced without harmful chemicals and additives.
* But their main principles disregard the fact that some of the longest-lived peoples in the world enjoy a diet that is rich in plant proteins — not the least of which includes soy. And it is puzzling that they single out the soybean as harmful when it is a staple in so many healthful foods from around the world and has been shown to have health benefits from many years of ongoing research.

**What are their claims about soy?**

The internet is a marvelous invention, but just because anyone’s voice can be heard nowadays doesn’t mean that what’s being said is true — or worse, that it hasn’t been taken out of context. And some of the claims the shrillest voices are making against soy really are outrageous and frightening. Here are just a few:

* Soy phytoestrogens disrupt endocrine function and have the potential to cause infertility and to promote breast cancer in adult women.
* Megadoses of phytoestrogens in soy formula have been implicated in the current trend toward increasingly premature sexual development in girls and delayed or retarded sexual development in boys.
* Women with the highest levels of estrogen in their blood [have] the lowest levels of cognitive function.

This kind of “medicalese” is a problem because it almost sounds like real science — enough so that others on the internet site this website as a source for publishing some truly strange and ridiculous headlines of their own:

* Soy reduces penis size;
* or Tofu shrinks brains;
* or Soy is making kids “gay.”

It gets almost comical as the list goes on. It’s no wonder so many women are uncertain about the safety of soy — but the good news is that there is just no real evidence behind these extreme claims. At Women to Women, we have examined hundreds of studies and reviews on soy from the leading peer-reviewed research journals around the world. Everything we know so far about soy points to the many positive health benefits of soy products, or demonstrates inconclusive results. So I was interested to learn where these detractors were getting their information from, and what I found was quite surprising.

**Faulty science and the campaign against soy**

1. One of the most important lessons in science and statistics for us to understand is that just because two factors seem related, does not mean one caused the other.
2. Another is that we have to carefully examine how someone reaches their conclusions, because faulty reasoning leads to incorrect answers.

So let’s look at the reasoning of the people who consider soy unhealthy and see how it stacks up.

Many of the most strident anti-soy groups list page after page of resources in support of their claims. To the untrained eye, it might appear as though there is scientific substantiation against soy. But more often than not, they are misrepresenting the research findings.

* For example, I found that the WAPF listed articles or reports (not necessarily scientific studies) by year, out of context, without listing any other articles that came out that year, making it seem as though that one study was “the truth” for that year.
* Also, many of the studies on soy showing ambiguous results have been conducted on non-human subjects — usually rats or other rodents. In much the same way dogs can’t tolerate chocolate, rodents and humans can’t always digest the same foods or substances in the same ways. There are enough similarities that we can learn a lot by experiments in rats, but enough differences that it’s important to know up front when rats, not humans, are the test subjects. Sometimes studies in animals give us the only information we have, but we need to be cautious about drawing conclusions from studies based on animal models. From there, the next step is to design a study to see whether the findings apply to humans as well. The WAPF doesn’t say that the studies were actually done on rats when they discuss the findings — perhaps because doing so might make their claims seem less believable, without the same results being seen in people.
* Here’s another kind of “sleight of hand” explanation the WAPF gives on their website. A study published in 1997 in the journal Pediatrics suggested that girls in the US are entering puberty at an earlier age than in the past, and here’s what the WAPF concluded: (WAPF) Our Comment: *The widespread use of soy-based formula, beginning in the 1970’s, is a likely explanation for the increase in early maturation in girls.* The study indeed came from Pediatrics, published in 1997 — but nowhere in the article’s content or summary do the researchers ever link their findings to soy products. Here is how the authors themselves worded their conclusion:

Conclusions. These data suggest that girls seen in a sample of pediatric practices from across the United States are developing pubertal characteristics at younger ages than currently used norms. Practitioners may need to revise their criteria for referral of girls with precocious puberty, with attention to racial differences.

The fact that more African-American girls were maturing earlier than in the past was one of the researchers’ points, in the context that precocious puberty creates social and psychological concerns. But because African-Americans in general have been shown to be more lactose-intolerant, the WAPF leapt to the conclusion that soy must be the culprit without looking at the facts. In statistics, this is called a fallacy, and I could not find any literature to date that supports this idea. In fact, nearly all infant formulas, both cow milk and soy-based, contain corn syrup or sucrose, providing calories that might contribute to obesity — which in girls can lead to early puberty. Unfortunately, this kind of “magical” guesswork can be found all over the internet when it comes to soy — and without good science, many are resorting unnecessarily to scare tactics.

The best thing we all can do is adopt a considered approach to the shouting match about soy. For whatever personal, political or economic reasons, there are people out to make misleading, confusing, and downright scary statements about soy — but a wild guess is just not the same thing as a sound conclusion. **We can counterbalance the loud, alarmist, but scientifically thin voices against soy with a mass of positive research data that speaks volumes about soy’s safety — not to mention the fact that thousands, if not millions, of people consume soy all the time with no ill effects!**

**So let’s take the science at face value.**

While we know that science doesn’t always get it right, there is a wealth of research that shows that when eaten in small amounts every day, soy can be an extremely healthy, low-fat, body-beneficial food that gives you lots of protein without a lot of harmful side effects. In other words, the good far outweighs the remote possibility of bad.

But just so you can enjoy soy without worry, there are things you may want to know about how best to include soy in your diet, considering both health benefits and concerns.

**The heart of the soy controversy — soy isoflavones**

Soybeans and many other legumes contain compounds called “isoflavones”, and it is these compounds that many in the anti-soy camp point to as the main “danger” of soy. They argue that because isoflavones are phytoestrogens — that is, their molecules share similarities with the estradiol molecule, the major estrogen hormone in human beings — consuming soy products could promote the growth of estrogen-sensitive cancers in women.

**Faults in the argument against soy:**

* BIAS: Using only research that supports one point of view while ignoring studies that contradict it.
* OVERGENERALIZATION: Assuming that the results of a small number of limited studies is directly applicable to all human beings.
* LEAPS OF LOGIC: Drawing conclusions unrelated to the goals or methods of particular research studies.
* FALLACY: Making assumptions about the relationship between two pieces of information without testing that relationship (correlation does not equal causation).

Phytoestrogens do have the ability to interact with estrogen receptors in our bodies, where they can evoke similar types of responses that the hormone causes or alternatively, block those effects. But many people don’t realize that **the intensity of an estrogen receptor’s bond with isoflavones is much, much weaker (a thousand times or so) than estradiol’s.** The duration of the response may also be different and, unlike synthetic estrogens, **phytoestrogens do not accumulate in the body but pass through in a matter of hours. Isoflavones also function as antioxidants, counteracting free radicals in our tissues, which may be why some research shows they can protect against cancer.**

We explain this in much more detail in our article on phytotherapy  but the bottom line is that:

* soy isoflavones are not the same as our own estrogen, **so eating soy does not cause us to have more estrogen in our bodies**.
* Even more good news is that in many of the studies on soy isoflavones that look at soy isoflavone intake and cancers, cardiovascular risks, brain dysfunction, osteoporosis, or menopausal symptoms, researchers found either favorable, promising, or else inconclusive effects. In other words, at minimum, soy isoflavones show no harmful effect.

And there are many possible explanations for why results can be “inconclusive,” including study design and limitations. Every woman’s body is unique; therefore, how bioavailable phytoestrogens become in our bodies after we eat them depends on many variables:

* our individual genetic make-up,
* our digestion
* our metabolism
* what else we eat
* even our native gut flora.
* All of these influence our ability to reap health benefits from soy isoflavones. Also, it’s important to remember that these studies do not take into account what else is going on in a subject’s life, and what other lifestyle changes she might be experiencing (or may need to address).

At the clinic, we recommend soy as a natural, therapeutic treatment to help women with many aspects of their health, including hormonal balance, because so many of our patients find it helpful. We’ve seen years of case studies and research that suggests that adding soy to the diet — or appropriate dosages of isoflavones — can sometimes help menopausal symptoms, although not everyone experiences uniform relief.

While there are no one-size-fits-all treatments for any problem, what I can say about the safety of soy is that **scientists from several countries recently examined more than 200 isoflavone studies and concluded that “the current literature supports the safety of isoflavones as typically consumed in diets based on soy or containing soy products.”**

I think the key piece that women can walk away with is the word “typically.” Because how much soy isoflavones we eat — and in what form — matters when thinking about how to best include soy into our diets.

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| **Source:** US Department of Agriculture, Agricultural Research Service. 1999. USDA–Iowa State University database on the isoflavone content of foods. URL: <http://www.nal.usda.gov/fnic/foodcomp/Data/isoflav/isfl_tbl.pdf> (accessed 04.23.2008). |

Of the many isoflavones that occur naturally in plants, genistein, daidzein, and glycitein are the primary ones found in soybeans. As you can see above, soybeans typically include at about 50% genistein, 40% daidzein, and up to 10% glycitein forms. In contrast, soy germ isoflavone products typically contain only 20% genistein, 40% daidzein, and 40% glycitein.

What do all of these numbers mean?

Well, if a product lists 100 milligrams of isoflavones, you don’t really know what the ratio of those isoflavones is unless the manufacturer lists the ratios for you. Since genistein has the most noted beneficial effects in humans, and whole soybean is much higher in genistein than the soy germ, eating soy products or supplements that are made from the whole bean gives you more of the therapeutic effects that we see in the clinic.

**How much soy is healthy?**

We don’t really know yet whether any particular soy isolates taken by themselves are as safe as or effective as whole soy foods, but what we do know is that we can get the most benefits when we consume small amounts of isoflavone-rich foods throughout the day, as part of a regular, lifelong eating habit.

Another key to separating the facts from the misleading information is to look at isoflavone dosage. Studies often cited by soy critics use isolated compounds containing amounts of isoflavones that far exceed what a person would normally eat. Soy experts analyzing populations in major soy-consuming countries report isoflavones intakes varying between approximately 25–80 milligrams of isoflavones per day. Studies also show intake at the upper end of that range to be both safe and highest in therapeutic value. Again, let’s not forget that Asian cultures have not only been enjoying soybeans in their diet for thousands of years, but likewise they enjoy longer lifespans, less heart disease, and lower rates of obesity and cancer.

But just as with any other food, it’s best to make soy one of a variety of healthy choices rather than making it the major focus of your diet — especially if you’re concerned about your breast health or your thyroid.

Addressing your **health concerns and soy**

* **Breast health**

**As a breast surgeon**, I’m frequently asked about soy’s estrogenic qualities, and whether phytoestrogens are helpful or detrimental for prevention or treatment of breast cancer. Patients also want to use alternatives to hormone replacement and are curious about soy products, foods, supplements, isolates and phytoestrogens, but are deeply concerned about the safety of soy and breast health.

After years of research, we know that the soy isoflavones genistein and daidzein have a very weak estrogen-like effect, but unlike real estrogens, they do not allow cells to proliferate. As mentioned above, soy isoflavones can weakly bond with estrogen receptors on a cell, making the cell resistant to the more reactive hormonal form of estrogen. For women, this blockade may prevent certain cell processes from turning on, which can stimulate it to grow or possibly mutate.
* **Soy and tamoxifen**

Some doctors and healthcare practitioners have long recommended that women with breast cancer and anyone at high risk for it avoid soy, because of genistein’s weak estrogenic effects on breast cells. Studies in mice show that genistein may actually help override cancer cells’ resistance to tamoxifen, which suggests it might be useful in combination with this drug or other types of chemotherapy to prevent recurrence. But researchers also recognize that the links between genistein and tamoxifen therapy warrant further examination in humans.

**Thyroid concerns**

It is true that if someone has a hidden thyroid problem, eating soy regularly can uncover it. That doesn’t mean soy caused the problem, only that certain properties of soy made the problem more obvious — and that’s a good thing, because it helps you to address the problem!

When soy exposes a thyroid deficiency, one possibility is that **you have not been getting enough iodine.** For a healthy, iodine-replete individual, soy is very beneficial, but if you do have a thyroid problem and you consume large quantities of soy without first looking into your iodine status, there is a remote risk of developing a goiter. Ensuring that your iodine levels are adequate, and learning how to balance your body’s needs adequately, will eliminate this risk.

We feel very excited about what we’ve uncovered. **Soy is good for us!** This is great news! While soy itself is innocent, however, there’s no question that it has become a political issue.

Some will probably continue to revile it as “poison,” while others will continue to sing its praises as the “miracle food.”

* Try to include soy regularly in your diet, averaging 25–50 mg soy isoflavones per day will give you the basic benefits.
* If you are using soy for menopausal symptoms, target a higher initial therapeutic dose of 80–100 mg soy isoflavones per day for best results.
* Make sure your soybeans are from a reliable, quality source — choose soy products that contain no GMO’s (genetically modified organisms) and look for organic foods whenever possible.

At Women to Women, we believe that knowledge is power, and where that knowledge comes from is just as important as the source of the foods we eat. Finding reliable sources that aren’t one-sided is the best way to get the big picture, especially when it comes to issues that are so politicized. So after reading the above bullet points, speak with your healthcare practitioner if you’re still concerned about including soy in your diet. Otherwise, rest assured that for most women, these wondrous green beans are part of a diet that is healthy, flavorful, and above all — safe.