Where do we STAND on soya?

By Jacqueline Howard, CNN

Soya has become a big component of a plant-based diet, but debates have raged for decades over whether soya really produces certain health benefits. Here is a look at the controversial history of soya—and what science currently says about it.

1940s: The root of the soya dispute
Soya contains a naturally occurring oestrogenic compound called isoflavone, which seems to have stirred a storm of confusion around how soya impacts public health.

“Isoflavones are considered phytoestrogens. In other words, plant oestrogens,” says Dr Omer Kucuk, a medical oncologist at Emory University’s Winship Cancer Institute, who has studied the benefits of soya isoflavones.

“Isoflavones are part of a larger group of compounds called flavonoids, and there are many, many flavonoids in nature.”

Yet evidence of isoflavones possibly having harmful effects appeared in the 1940s, spurring one of soya’s first controversies. A 1946 study in The Australian Veterinary Journal indicated that sheep that grazed on a subterranean, isoflavone-rich clover in Western Australia experienced fertility issues and breeding problems.

“The breeding problem appears to be of purely nutritional origin,” the authors of the study wrote. “A further possibility is the presence in the clover of some substance which potentiates the animal’s natural oestrogen, or abnormally stimulates its production.”

The infertility may have resulted from a hormone imbalance, triggered by the herbage the sheep ate, according to the study. Still, this was found only in sheep and not in humans. Soon enough, researchers would conduct more studies on these oestrogenic effects in various farm animals, and the animal feed industry would develop an interest in soya.

1950s: Soya used in animal feed
Approximately 80% of the soya currently produced in the United States (US) is used as animal feed, Kucuk says. Soya is a billion-dollar industry that spans continents and feeds millions of livestock worldwide, according to the World Wide Fund for Nature, but it was not always that way.

In the 1950s, the soya industry was just beginning to explore how soya could be used in animal feed and how isoflavones could affect animals. By 1959, soya bean oil meal was described as an excellent source of growth promoters for young farm animals, such as turkeys.

In the decades to come, soya studies would shift away from soya’s role in farm animal diets and towards its role in human diets.

1960s: Soya bean industry grows in the US
“Soya consumption is not an uncommon thing. More than two billion people consume soya every day,” Kucuk says.

“If you put China, Japan, Korea and southeast Asia together, you have more than two billion people, and these people consume 20 to 30 times more soya than the average American every single day of their lives. It’s part of their diet. This has been going on for not just hundreds of years, but for thousands of years.”

With a long history in Asia, soya slowly emerged as a common food source in the US in the 1960s. During this time, states formed soya bean industry groups affiliated with the American Soybean Association, which was funding research to find uses for soya beans and ways to reduce production costs.

1970s: The rise of soya in the American diet
By the early 1970s, more studies shed light on the use of soya proteins in baked foods and the functional properties of these proteins.

The American Soybean Association established its headquarters in St Louis in 1978. Around that time and later, contradicting studies concerning the potential health benefits of soya arose, creating confusion.

1980s: Setting the record straight
Two animal studies—one on monkeys published in 1986 and another on rats published in 1987—suggested that soya diets caused an enlarged pancreas and were associated with the growth of pancreatic cancer in those animals.

In response to those studies and others, the National Cancer Institute’s Division of Cancer Etiology organised a workshop to discuss the state of research on soya in relation to cancer risks. After the workshop, participants published a report in the journal Cancer Research in 1989.

They wrote that there was no evidence that soya bean-derived foods had adverse effects on the human pancreas. Rather, it
was observed that human populations with high levels of soya in their diets had decreased rates of pancreatic cancer. In the years to come, cancer researchers would tout the potential cancer prevention benefits of soya foods.

**1990s: Breast cancer, soya connection explained**

Among the first of many studies to suggest that soya beans contain potentially anti-carcinogenic benefits, providing something of a protective effect against cancer, was a 1991 study published in the journal of the American Dietetic Association.

Things changed in 1996. That was the year a pilot study, published in the journal *Cancer Epidemiology, Biomarkers and Prevention*, suggested that consuming soya protein might actually stimulate the growth of breast cancer cells.

This confusion regarding whether soya is good or bad for cancer risk, stems from the fact that soya isoflavones can mimic oestrogen in the body and can bind to oestrogen receptors, says Kucuk.

“Some people naively thought, ‘Well, since they’re oestrogenic, they must be bad, because oestrogen causes breast cancer.’ We all know that in women, oestrogen levels are associated with a higher risk of breast cancer. There are two oestrogen receptors in the human body: alpha and beta.

“Alpha is the bad one. That’s the one where, if something binds to alpha, it may increase the risk of breast cancer, because it makes breast cells grow. But beta, on the other hand, causes the opposite effect. Soya isoflavones bind preferentially to oestrogen receptor beta. Even though soya isoflavones bind to both oestrogen receptors, they preferentially bind to the good oestrogen receptor.”

More studies would indicate that women in regions where soya is primarily consumed, such as Japan and China, tend to experience lower cancer rates than women who consume Western diets, Kucuk says.

However, those studies would not end the soya and cancer debate – which continued into the 2000s.

**2000s: More studies on soya and health**

Another study, published in the journal *Cancer Research* in 2001, suggested that soya isoflavones stimulated the growth of oestrogen-dependent human breast cancer cells.

Then, a 2007 review paper published in the journal *Cancer* suggested an apparent lack of association between soya and breast cancer. Rather, the paper suggested that avoiding weight gain and limiting the consumption of alcohol reduces the risk of breast cancer.

But there were other benefits too, including that replacing junk food in your diet with soya can aid in avoiding weight gain, according to research published in 2004 and 2009. Around that time, soya protein and isoflavones also gained attention for having a potential role in improving cardiovascular health.

An American Heart Association (AHA) paper published in the journal *Circulation* in 2006 found that “soya products should be beneficial to cardiovascular and overall health, because of their high levels of polyunsaturated fats, fibre, vitamins and minerals and low levels of saturated fat.” In 2008, the AHA then stated that there was not enough evidence to claim a strong link between soya and reduced risk of coronary heart disease.

**The cholesterol link**

“Soya has the antioxidant properties that can lower our LDL, so basically the bad cholesterol,” says Jenna Stangland, a registered dietitian at Twin Cities Orthopedics in the Minneapolis area.

“It doesn’t necessarily increase our HDL, or our good cholesterol,” she says. “But we know it is able to lower bad cholesterol, and it prevents the bad cholesterol from being oxidised. When bad cholesterol gets oxidised, it ends up clogging our arteries.”

In the mid-2000s, research offered more information on how soya intake may impact thyroid function. The evidence suggested that soya can interfere with the body’s ability to absorb a synthetic thyroid hormone often used to treat hypothyroidism. Generally, it is recommended to wait four hours before consuming any soya products after taking thyroid medication, according to the Mayo Clinic.

Additionally, some studies have suggested that eating soya foods can help reduce certain menopause symptoms such as hot flashes. But others have suggested otherwise. A review paper in the journal *Menopause*, released in October 2010, called for more clinical studies to evaluate the role of soya isoflavones in menopausal health. “There are mixed results of the effects on midlife women,” the authors write about soya.

Meanwhile, as the types of soya foods consumed by Americans continued to expand and diversify, experts noticed that the way soya was eaten impacted on its health benefits.

**2010s: Natural, processed and fermented soya**

“From where we stand, it is a beneficial protein and healthy fat source, with more research showing the benefits of a plant-based diet,” Stangland says of soya.
getting more of those nutrients in massive quantities than the non-fermented product.”

Now, as Americans are gaining a better understanding of soya, uncertainty over the cancer and soya connection finally seems to have been settled in new research.

2017: Soya consumption is beneficial
Soya may not pose a risk for women with breast cancer after all, according to a study published in the journal Cancer.

On the contrary, it might be associated with a reduced risk of death over a nine-year period in some women, says Dr Fang Zhang, a cancer epidemiologist and assistant professor at Tufts University’s Friedman School of Nutrition Science and Policy. “Results from our study and those from others are consistent that soya food consumption in women with breast cancer does not have a detrimental effect on prognosis or survival.”

The study involved data on 6,235 American and Canadian women with breast cancer, including their diets, and cancer survival and death rates, between 1995 and 2015. The data came from the Breast Cancer Family Registry, an international database funded by the National Cancer Institute.

Zhang and her colleagues analysed the data, taking a close look at each woman’s diet and survival outcome, which were tracked over 113-month (or roughly 9.4 year) follow-up periods in the data. The researchers controlled other factors that might influence death rates, such as socio-economic status, exercise, weight, and habits such as smoking or drinking alcohol.

The researchers then sorted the women into four groups based on the amount of isoflavones they consumed through soya foods. The researchers found that the women in the highest quartile – who consumed the most isoflavones, approximately half to one serving a week – were 21% less likely to die compared to the lowest quartile over the nine-year period in which mortality data was measured.

This study puts that argument to rest
“I would say this study is probably the strongest one that we have right now in North American women, showing that soya consumption in breast cancer patients is not only safe but also beneficial,” Kucuk says. He wrote an editorial on the new study in the journal Cancer.

“Previous studies were in Asian women in China, Japan and Korea,” Kucuk says. “One of the things that people criticizing soya will say is that, ‘Oh, well, soya may prevent breast cancer in China and Japan because they eat it all their lives, but in the US, it may not prevent it because US women don’t start eating it as a child, they may start it later, and this may not be beneficial.’ Well, this study puts that argument to rest.”

Kucuk adds that more research is needed to investigate the impact of soya foods on public health. “Where there is a great need is more clinical studies looking at prevention of cancer, not just breast cancer but other cancers as well. One area where soya isoflavones can be beneficial is in preventing the side effects of the cancer treatments we use, like chemotherapy, radiation therapy and hormone therapy.”

In his editorial, Kucuk notes that most Americans do not consume appreciable levels of soya foods, even though the US is the top soya producer in the world, producing nearly 40% of the global soya supply.

“Imagine in areas of low socio-economic status where a lot of women have a high risk of breast cancer, especially African-American women; there could, for example, be some large public health type of studies where people can be given vouchers to obtain soya milk or have soya products given to them at a discount,” Kucuk says. “This could result in huge healthcare savings. So far, we know that soya foods are good, they are safe, and they prevent breast cancer. They also improve treatment results and decrease mortality in breast cancer patients.”

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