

## **New Insights About Soy and Prostate**

**Author :** Dr. Mark Messina

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Men who regularly consume soy are less likely to develop prostate cancer than men who don't. New research from Ohio State University provides one reason why that might be the case.

When the scientific community first began exploring in earnest the role of soy in cancer prevention, most of the focus was on breast cancer. However, prostate cancer wasn't too far behind. That shouldn't be too surprising given that prostate cancer mortality rates in soyfood-consuming countries are just as low relative to the West as are breast cancer rates. Most of the interest in the role of soyfoods in cancer prevention is because these foods are uniquely-rich sources of isoflavones. However, in recent years, interest in the possible preventive effects of soy against prostate cancer appear to have waned. The above referenced research from Ohio State University may end up reversing that trend.

Prostate cancer rates in soyfood-consuming countries are quite low. For example, the age-adjusted incidence rates per 100,000 people in Japan, Korea and China, are 26.6, 22.4, and 12.0, respectively.<sup>1</sup> Compare those rates to the U.S. rate for blacks and non-Hispanic whites of 178.8 and 112.3, respectively. The Japanese-American rate is 115.0, which clearly indicates the low rates in soyfood-consuming countries aren't a result of genetic differences.

Differences in cancer rates among countries are a solid basis for generating hypotheses but not for drawing meaningful conclusions about etiology. More informative are studies that identify differences in lifestyle between cancer patients and healthy individuals within the same country.

So, are men who regularly consume soy less likely to develop prostate cancer than men who don't? This question was addressed by Applegate and colleagues<sup>2</sup> in research published last year. Based on their review of the epidemiologic data, these authors concluded that "... evidence from observational studies shows a statistically significant association between soy consumption and decreased PCa [prostate cancer] risk." Although supportive of the protective effects of soy, one caveat is that reduction in risk was much stronger for case-control studies than for cohort studies; the former are more subject to bias and therefore carry less weight within the epidemiologic community.

Presumably, for soy to reduce risk of developing prostate cancer and/or to control the progression of this disease, isoflavones must accumulate in the prostate tissue. Insight about isoflavone prostate tissue concentrations is provided by a recently published study by Grainger and colleagues<sup>3</sup> from Ohio State University. For this study, men scheduled for prostatectomy were recruited to consume 0, 1, or 2 cans of tomato-soy juice per day before surgery. The juice provided

20.6 mg lycopene and 66 mg isoflavone aglycone equivalents per can.

Genistein concentrations in the prostate in the 0, 1 and 2 cans/day groups were 0.54, 0.60 and 0.75 nmol/g, respectively and daidzein concentrations for these three groups were 0.22, 0.28 and 0.33 nmol/g, respectively. Tissue concentration increased with increasing isoflavone intake although the dose-response was not statistically significant. This is not the first study to show isoflavones are found in the prostate.<sup>4-6</sup> Interestingly, in the 0-can group, urinary isoflavone levels were below the limits of detection and yet, isoflavones were present in the prostate. This finding provides strong evidence that isoflavones accumulate in the prostate. This conclusion agrees with previously published research.<sup>6</sup>

That the prostate appears to have the ability to concentrate soy isoflavones provides a basis for speculating isoflavones could affect carcinogenesis in that tissue. It is, however, interesting to note that the difference in isoflavone concentrations (especially for genistein) between the 0 and 2 cans/day groups wasn't that striking. This finding suggests that it may take some time for isoflavone concentrations to reflect intake. Men consumed the tomato-soy juice for on average only 24 days.

Finally, although changes in PSA were not the focus of the study by Grainger et al.,<sup>3</sup> they did find the 2-cans/day group experienced a nonsignificant decrease in prostate-specific antigen slope compared with 0 cans/day. Whether this decrease was due to the carotenoids (or some other component of tomatoes) or the isoflavones or both can't be determined from the study design.

## References

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