

## How Much "Hidden" Soy is in the American Food Supply?

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A recent paper in *Food Chemistry* suggested that isoflavone intake in Western countries might be greatly underestimated because dietary intake assessments don't capture the "hidden" soy protein in many foods.<sup>1</sup> This soy protein isn't exactly "hidden." Soy protein appears on the ingredient lists of commercial food product labels and is specifically noted on the federally-mandated list of potential allergens in the United States. Soy protein is also identified on food labels in European countries.

It's true, though, that in many of these foods, soy is not an obvious ingredient since it's often there for functional purposes only, such as for moisture retention.<sup>2</sup> This means that most people are likely to consume some soy protein even if they don't regularly eat soyfoods. For example, in a review of isoflavones, soy researcher Stephen Barnes provided a number of examples of the use of soy protein.<sup>3</sup> He wrote: "When roasting the Christmas turkey, the expectation is that cooking will produce profuse gravy—to ensure that will happen, producers pump a solution of SPI [soy protein isolate] into the turkey before it is sold."

The concept of hidden soy is not a new one. In 1999, researchers commented that "urinary isoflavone excretion was associated positively with intake of soyfoods, even in a population that does not regularly consume soy; however, 'hidden sources' of isoflavones appeared to contribute significantly to isoflavone exposure in this United States population."<sup>4</sup> This finding was based on their observation that isoflavone excretion correlated with intake of high-fat and processed meats. The impact of high-fat and processed meats was particularly evident in men who didn't consume soyfoods.

This finding is not surprising. Soy intake among these subjects averaged about 1/20<sup>th</sup> of a serving per day. As a result, isoflavone intake in this group was so low that even small amounts from the addition of soy protein to processed foods would make a significant proportional contribution to isoflavone intake.

It's important to put these amounts into perspective, though. South Dakota State University researchers estimated that American adults consume only about 2.35 mg isoflavones per day, which is the amount found in about 1/10<sup>th</sup> of a serving of a traditional soyfood like tofu or soymilk.<sup>5</sup> They based their estimate on NHANES III intake data and the USDA isoflavone database, which includes 557 foods. Most of these foods aren't soyfoods; they are non-soy foods that naturally contain trace amounts of isoflavones and foods to which small amounts of soy protein have been added.

Using dietary instruments is the most common approach to assessing isoflavone exposure. But as already noted, quantifying urinary isoflavone levels is another. Research has shown that urinary levels reflect dietary isoflavone intake.<sup>6-8</sup>

When urinary levels of Chinese and Americans are compared they show huge differences, just as one would expect from dietary intake data. More specifically, urinary levels of isoflavones among 1,081 women participating in the NHANES (1999-2004) were compared with urinary levels of 2,165 women participating in the Shanghai Women's Health Study.<sup>9</sup> This comparison shows that total urinary isoflavone levels among the Chinese women were about 40-fold greater than levels among the American women. Therefore, the consumption of non-soyfoods that contain soy protein as a functional ingredient doesn't contribute nearly the isoflavone content of traditional soyfoods. While many commonly-consumed foods in Western diets contain soy protein, "hidden" soy doesn't provide significant amounts of isoflavones.

### *References*

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