



# Soy & the Thyroid

## **MISCONCEPTION**

Soyfoods should be avoided because they contain compounds that are harmful to the thyroid.

## **REALITY**

There is no reason for people to be concerned about the effect of soyfoods on thyroid function. Even hypothyroid patients can safely consume soyfoods

The impact of soyfoods on thyroid function has been studied for more than 70 years so a lot is known about this relationship [1]. But before discussing this information it is important to have some understanding of the function of the thyroid.

The thyroid is one of the largest endocrine glands (a gland that secretes a substance such as a hormone into the bloodstream) in the body. This gland is found in the neck below where the Adam's apple is located in men. The thyroid controls how quickly the body burns energy (metabolic rate) and affects every organ in the body. It accomplishes these tasks by synthesizing two hormones called thyroxine (T4) and triiodothyronine (T3). Iodine, which is an essential mineral, is needed for thyroid hormone synthesis. The production of thyroid hormones is controlled by another hormone called thyroid stimulating hormone which is produced by the pituitary gland.

Symptoms of hypothyroidism, which occur when too little thyroid hormone is produced, include weight gain and lethargy whereas symptoms of hyperthyroidism, which occur when too much thyroid hormone is produced, often include weight loss and trouble sleeping [2, 3].

Research in rodents (rats are extremely sensitive to factors affecting the thyroid) conducted in the 1930s and 1940s showed that diets containing large amounts of soy produced goiter (enlarged thyroid). And in the 1960s, several cases of goiter were identified in infants fed soy formula [4-6]. However, increasing the iodine content of the diet of the experimental animals and fortifying soy infant formula with iodine (which is the current practice) eliminated these problems.

In humans with a normal-functioning thyroid consuming sufficient iodine, the evidence overwhelmingly shows that soyfoods don't cause thyroid problems – more than 25 clinical (human) studies show this to be the case [7]. Some of these studies have been quite long in duration – two to three years, and exposed study participants to very



large amounts of soy [8]. Thus, for the vast majority of people soyfoods are nutritious additions to the diet whose consumption should be encouraged.

Soyfoods may somewhat inhibit the absorption of thyroid medication such as levothyroxine (thyroid hormone), which is taken by hypothyroid patients [9]. However, foods in general have this effect, as do foods enriched with fiber, calcium supplements, and many herbs and drugs [10]. This is why thyroid hormone is taken on an empty stomach and why hypothyroid patients can still consume soyfoods [11, 12]. If there is any small effect on absorption, the medication dose can easily be adjusted accordingly.

It was noted above that iodine intake is essential for the production of thyroid hormones. Some scientists have suggested that soy might cause thyroid problems in those whose iodine intake is inadequate [13]. In the United States, iodine intake is generally more than adequate [14] although this is not true for all population groups [15] and is not the case in all countries [16]. Of course, the key dietary advice is not to avoid soy but to make sure iodine intake is adequate since it is an essential nutrient. Furthermore, and very importantly, recent clinical research suggests that even in those whose iodine intake is inadequate, soyfood consumption is unlikely to adversely affect thyroid function [17].

Finally, there is a condition called subclinical hypothyroidism that affects anywhere from 5 to 10 percent of older individuals [18]. These individuals have normal thyroid function but are at an increased risk of developing hypothyroidism. One study found that in a very tiny percentage of subclinical hypothyroid patients soy adversely affected thyroid function [19]. However, in all of the patients, soy markedly reduced blood pressure and inflammation and increased the ability to use the hormone insulin. So overall, soyfoods were quite beneficial in this group of patients. Additional research in this area is underway.

In summary, the clinical evidence shows that for the overwhelming majority of the population consuming soyfoods will not in any way impair thyroid function.

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