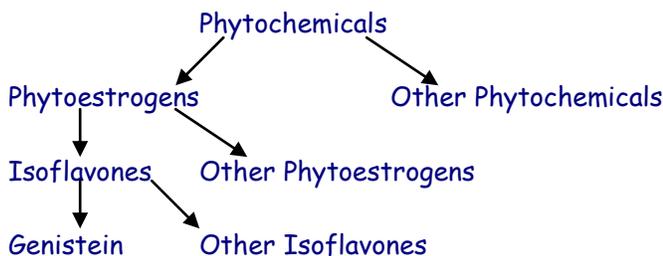


## Phytoestrogens and LAM

### What are phytoestrogens?

Phytoestrogens (fy-toe-s-tro-jens) or plant estrogens are one type of a group of natural compounds called phytochemicals (fy-toe-chem-eh-cals). Phytochemicals are plant chemicals that work to protect the body against disease. Phytoestrogens have been associated with many health benefits. In particular, they have been linked to reduced risk for heart disease, osteoporosis, and cancer. Although phytoestrogens have many desirable benefits, people with LAM need to avoid foods that contain phytoestrogens. Read on for more information.

Diagram 1: Phytochemical Tree



### How do phytoestrogens affect patients with LAM?

The cause of LAM is still unknown but researchers believe that estrogen may be involved in the progression of the disease. Since phytoestrogens work like the hormone estrogen, it has been recommended that LAM patients avoid foods that are good sources of phytoestrogens.

### What are the types of phytoestrogens?

There are 3 major types of phytoestrogens: isoflavones, lignans, and coumestans. *Isoflavones* (eye-so-flay-vones) are the most potent of the plant estrogens. That is to say they produce the most estrogen-like activity of the three major categories of phytoestrogens. *Genistein* (jen-eh-steen), one type of isoflavone, is the most potent isoflavone (see diagram 1).

### What Foods Contain Phytoestrogens?

Phytoestrogens are found in a variety of foods such as fruits, vegetables, grains, nuts, seeds, and herbs. The best food sources are soybeans and products made from soybeans.

But....

Soy foods vary in the amount and types of isoflavones they contain. This variability depends on the variety of the soybean plant, where the soybean was grown and how the soybean was processed. High temperatures used in processing foods can destroy phytoestrogens. The part of the soybean used to make the food is also important. Phytoestrogens are not found in the fatty portion of the soybean plant. This is why soybean oil does not contain phytoestrogens.

### What Foods Should I Avoid?

It is recommended that LAM patients avoid soy and soy-containing foods such as soybeans, soybean sprouts, soybean nuts, soy milk, tofu, soy flour, textured soy protein, tempeh, and miso. Soy protein isolates and soy protein concentrates can vary in the amount and types of isoflavones they contain. Because their content is not always known, it may be best to avoid foods containing these ingredients.

### **Soy Foods to Avoid**

- Soybeans
- Soybean sprouts
- Soybean nuts
- Tofu
- Soy milk
- Soy cheese
- Tempeh
- Miso
- Natto

### **Soy Ingredients to Avoid**

- Soy flour
- Soy protein isolate
- Soy protein concentrate

### **Soy Foods Allowed**

- Soy sauce
- Soybean oil
- Meat substitutes made with soybeans such as soy burgers or soy hotdogs (most of the active phytoestrogen content is destroyed in processing)
- Soy lecithin