

Food For Thought *Phytosterols & Health*

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Nutrition scientists are discovering even more components of plant-based foods that may provide health benefits. One of these is phytosterols, which are natural chemicals found in plants. Phytosterols are found in high concentrations in some plant oils, seeds and legumes, such as peanuts. They are also found in lower concentrations in fruits and vegetables. Recent research has shown that phytosterols:

- inhibit cancer growth,
- protect against heart disease, and
- may offer protection from colon, prostate and breast cancer.

Phytonutrients are Plentiful in Peanuts

Phytosterols (PS) are literally plant (phyto) chemicals. They include both plant sterols and plant stanols, which differ in their chemical structures. The three most common forms of phytosterols in foods are beta-sitosterol, campesterol, and stigmasterol.

Phytosterols are the equivalent of animal cholesterol in the body, but they act very differently. One difference is that phytosterols are absorbed at a much lower rate than cholesterol. Phytosterols are absorbed from the blood into the body at a rate of 5-10%, whereas cholesterol is absorbed at a rate of 50%.¹


Recent research has identified the amount of beta-sitosterol (SIT) in peanuts and peanut products. SIT is the most widely found phytosterol in foods and new research shows it may help protect against colon, breast and prostate cancer.

Researchers at the State University of New York at Buffalo examined the SIT content of several peanut products. They found that snack peanuts contain about 65 mg SIT/100 gm and regular peanut butter contains 135 mg SIT/100 gm.²

Peanut flour, which results from partial removal of the oil from peanuts, contains about 46 mg SIT/100 gm. Peanut oil contains approximately 190 mg SIT/100 gm, making it a good source of SIT as well. In fact, refined, or pure, peanut oil contains 38% more protective SIT than refined olive oil.²

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Easy Ways to Add 50 mg B-sitosterol to Your Diet

	Amount	Product	Idea
	1 oz.	Peanut Oil	Saute vegetables! Combine with balsamic vinegar and herbs for a marinade for chicken breasts!
	1.2 oz	Peanuts	Grab a small handful!
	1.3 oz	Peanut Butter	Just over 2 Tbsp. - perfect for a sandwich!
	4 oz.	Peanut Flour	Substitute for half the white flour in bread or cookie recipes!

Phytosterols and the Cancer Connection

As plant components, phytosterols (PS) may offer protection against cancer by several different means. These include inhibiting cell division, stimulating tumor cell death and modifying some of the hormones that are essential to tumor growth.³

Epidemiological and experimental evidence suggests phytosterols have a protective effect. Long-term studies show an association between the amount of plant sterol consumed in the diet and developing cancer. For example, there is a much higher incidence of colon, prostate, and breast cancers in Western societies as compared to Asian societies, where they consume more than 3-4 times the amount of phytosterols. The Western diet contains approximately 80 mg PS/day, whereas vegetarian diets contain 345 mg PS/day and Japanese diets contain 400 mg PS/day.³

In an experimental study recently published in *Anticancer Research*, mice with human cancer tumors were fed either a phytosterol diet or a cholesterol diet. Tumor size in animals fed the phytosterols was 33% smaller and had 20% fewer shifts of cancer cells to lymph nodes and lungs than in the cholesterol diet group.¹ The article concludes, "Phytosterols, which can be easily incorporated into our diet, may offer a relatively simple and practical means for retarding growth and metastases of breast cancer cells."

Peanuts are also one of the few foods that contain the plant chemical resveratrol. This sterol has been associated with reduced cardiovascular disease and reduced cancer risk. Resveratrol is most widely known for its presence in grape skins and red wine, and may be one of the compounds responsible for the health benefits of red wine consumption. Dr. Tim Sanders and his team of researchers at the US Department of Agriculture found that peanuts have a significant amount of resveratrol. The average amount of resveratrol in one ounce of commonly eaten peanuts without the skin (15 whole peanut kernels) is 73 ug.^{4,5} Ounce for ounce, peanuts contain almost 30 times as much resveratrol as grapes.

Phytosterols and the Heart Disease Connection

Traditionally, scientists have looked at plant sterols for their benefits in preventing heart disease. Phytosterols were first recognized in the 1970's for their ability to absorb dietary cholesterol in the blood, thereby protecting against cardiovascular disease.

Phytosterols lower cholesterol in two ways. First, they block the absorption of dietary cholesterol that is circulating in the blood. Secondly, they reduce the re-absorption of cholesterol from the liver, which your body naturally produces. So whether your cholesterol is high because of dietary habits, genetics, or both, eating foods with phytosterols can help lower blood cholesterol levels.

Food companies have started adding different plant sterols and plant stanols to foods, such as margarines and salad dressings, to provide this blood cholesterol lowering benefit. Advertisements encourage consumers to eat three servings per day of these fortified foods to lower cholesterol by 10-15%.

Peanuts and peanut products are unique whole foods that naturally contain phytochemicals. They also contain heart-healthy monounsaturated fat, which has been linked to lowering blood cholesterol levels.

“Peanuts and peanut products are unique whole foods that naturally contain phytochemicals.”

A recent study from Penn State University shows that diets that include 2-3 servings daily of peanuts or peanut butter lowered cholesterol by 11-14%.⁶

The researchers compared three higher fat diets—one with peanuts and peanut butter, the second with peanut oil, and the third with olive oil—to the average American diet and a low-fat diet. They found that the three diets rich in monounsaturated fat all lowered total cholesterol, LDL (bad) cholesterol, and triglyceride levels, and did not lower beneficial HDL cholesterol levels.

One factor that might contribute to these results, in addition to other essential nutrients and healthy fatty acids, are the many plant chemicals found in peanut products. Overall, the peanut diets reduced the risk of cardiovascular disease by 21%, whereas a low-fat diet reduced the risk by only 12%.



Dr. Atif Awad, co-investigator of the study and professor of nutrition at the State University of New York at Buffalo said, *"Studies from our laboratory and others suggest that plant sterol consumption offers protection from colon, breast and prostate cancer. Therefore, identifying popular foods such as peanuts, peanut oil, peanut butter and peanut flour as good sources of SIT may provide major health benefits for many people."*

High Nutrient Value in Complex Plant Foods

Nutrition scientists have long known about the health benefits of plant-based diets. Besides phytochemicals, some plant foods also contain healthy unsaturated fat. Replacing even a small amount of the saturated fat in your diet with monounsaturated fat can have a big effect on health. Try new dishes with peanuts, beans or seeds instead of cheese and meat or spread peanut butter on your morning bagel instead of cream cheese or butter.

The finding that peanuts contain phytosterols that are thought to provide health benefits is consistent with epidemiological studies. Researchers at Loma Linda University, the Harvard School of Public Health, and the Iowa Women's Study found that in the populations studied, frequently eating small amounts of peanuts, peanut butter, and nuts helped to reduce the risk of heart disease by as much as 50%.⁷⁻⁹

Many other nutrients thought to contribute to heart-healthfulness are found in peanut products. For example, peanuts and peanut butter are an excellent food source of vitamin E. They also provide approximately 2 grams of fiber per ounce, and, compared to many other foods, have relatively high amounts of folic acid, thiamin, niacin, copper, manganese, phosphorus, magnesium, and zinc.

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The Peanut Institute is a non-profit organization that supports nutrition research and develops educational programs to encourage healthful lifestyles.



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