

Nutrition and Health Info Sheet

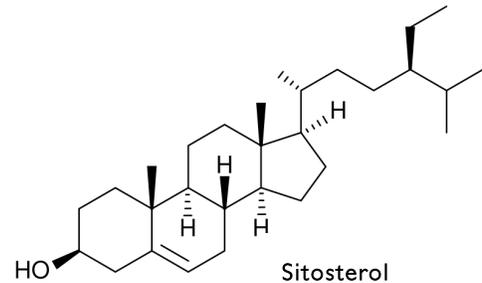
For Health Professionals

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Phytosterols

What are phytosterols?

Phytosterols are the plant version of cholesterol. Animals primarily make cholesterol, and plants make a variety of phytosterols and stanols. While humans can make cholesterol or obtain it from the diet, we are unable to make any kind of phytosterol, and thus only get those from dietary sources. There are two main classes: sterols and stanols. Sterols have a double bond in their sterol ring, while stanols do not.



What is the evidence that phytosterols protect against disease?

Studies have found that consuming 1-2 grams each day of phytosterols can lower low-density lipoprotein (LDL) cholesterol by 6 to 10 percent, which may reduce risk for coronary heart disease (1-3). They are also effective when combined with cholesterol-lowering medication; adding phytosterols to statin medications can lower LDL more than doubling the statin dose (4, 5).

How do phytosterols work?

Phytosterols work by reducing the amount of cholesterol that is absorbed in the small intestine. This includes cholesterol from dietary sources, as well as cholesterol from bile that would normally be reabsorbed and reused (2, 3).

The decrease in absorbed cholesterol upregulates LDL receptors, which in turn removes more LDL from circulation. It also causes an increase in endogenous production of cholesterol, although not enough to compensate for the increased blood clearance. The end result is lower LDL cholesterol (2, 3).



What is the recommended intake?

The National Cholesterol Education Program recommends 2 grams of sterol or stanol esters a day as a therapeutic option to enhance cholesterol lowering (6). It is recommended that pregnant and breast-feeding women avoid foods with added phytosterols, as the safety of these compounds has not been studied in these groups (6).

Can too much be harmful?

High intake of phytosterols may reduce the absorption of beta-carotene (7). Those with the rare disorder known as sitosterolemia or phytosterolemia, which increases absorption and decreases excretion of phytosterols, should avoid foods with added phytosterols (6).



What are some foods that have phytosterols?

Phytosterols are found in small amounts naturally in many vegetable oils and nuts. Over the last decade, products enriched with phytosterols, such as margarine, and orange juice have become widely available (Table 1).

Table 1. Foods containing plant sterols

Food or Supplement	Serving size	Phytosterols per serving (g)	Calories per serving
Brussels sprouts	½ cup, cooked	0.035	28
Almonds	1 ounce	0.039	163
Wheat bran	½ cup	0.058	63
Peanuts	1 ounce	0.062	166
Canola oil	1 tablespoon	0.092	120
Corn oil	1 tablespoon	0.102	120
Sesame oil	1 tablespoon	0.118	120
Wheat germ	½ cup	0.197	207
Centrum Cardio	1 tablet	0.4	N/A
Giant Eagle Fat Free Milk with Corowise Plant Sterols	8 fl oz (1 cup)	0.4 g	90
Kroger Active Lifestyle Milk	8 fl oz (1 cup)	0.4	90
Smart Balance Heart Right Fat Free Milk	8 fl oz (1 cup)	0.4	110
VitaFusion HeartOne Gummy Vitamins	2 gummy vitamins	0.4	15
Lifetime Low Fat Cheese (Cheddar, Extra Sharp Cheddar, Jalapeno Jack, Mozzarella and Swiss)	1 oz	0.65	47
Rice Dream Heart Wise – Original Flavor	8 fl oz (1 cup)	0.65	130
Rice Dream Heart Wise – Vanilla Flavor	8 fl oz (1 cup)	0.65	140
Silk Heart Health	8 fl oz (1 cup)	0.65	80
Benecol Smart Chews	1 chew	0.7	20
Cardio Chews (Cherry and Chocolate flavors)	2 chews	0.8	30
Kroger Active Lifestyle Bread 5 Seed Whole Grain	2 slices	0.8	160
Kroger Active Lifestyle Bread Honey Oat	2 slices	0.8	150
Benecol Light Spread	1 tablespoon	0.85	50
Benecol Spread	1 tablespoon	0.85	70
Minute Maid Premium Heartwise Orange Juice	8 fl oz (1 cup)	1	110
Promise activ Light Spread	1 tablespoon	1	45
Smart Balance Heart Right Light Spread	1 tablespoon	1.7	45
Smart Balance Heart Right Spread	1 tablespoon	1.7	80

Information for this table was obtained from: USDA Nutrient Database for Standard Reference; manufacturer's published data; Oregon State University Linus Pauling Institute Micronutrient Research Center (<http://lpi.oregonstate.edu/infocenter/phytochemicals/sterols/>).

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