Stanols/Sterols

En Español (Spanish Version)

Requirements/Sources | Therapeutic Dosages | Therapeutic Uses | What Is the Scientific Evidence for Stanols? | Safety Issues | References

**Supplement Forms/Alternate Names**
- Phytostanols; Sitostanol; Campestanol; Stigmasterol; 5-Alpha-Stanols; Stanol esters; Sterols; Sterol esters; Phytosterols

**Principal Proposed Uses**
- Lowering Cholesterol

Stanols are substances that occur naturally in various plants. Their cholesterol-lowering effects were first observed in animals in the 1950s. Since then, a substantial amount of research suggests that plant stanols (usually modified into stanol esters) can help to lower cholesterol in individuals with normal or mildly to moderately elevated levels. Stanols are available in margarine spreads, salad dressings, and dietary supplement tablets.

Related substances called sterols or phytosterols (such as beta-sitosterol) and sterol esters appear to lower cholesterol in much the same manner as stanols. 3,4

( Note: Use of beta-sitosterol for conditions other than high cholesterol is discussed in the beta-sitosterol article.)

**Requirements/Sources**

Sterols are found in most plant foods. Stanols occur naturally in wood pulp, tall oil (a by-product of paper manufacturing), and soybean oil, and can also be manufactured from the sterols found in many foods. Stanol and sterol esters are manufactured by processing stanols or sterols with fatty acids from vegetable oils. 1,2 Stanol/sterols and their esters are added to margarine spreads and salad dressings and are also available as dietary supplement tablets.

**Therapeutic Dosages**

Typical dosages of stanol/sterols and their esters to improve cholesterol profile range from 2.7 to 5.1 g per day. 1-4

One study suggests that using stanol products once a day may be as effective as dividing up your intake throughout the day. 1,2,5 It may take up to 3 months to show a substantial decrease in total cholesterol values. 1,6

**Therapeutic Uses**

Strong evidence tells us that stanol/sterols and their ester forms can significantly improve cholesterol profile 7-20,22,54,55,57-60.
What Is the Scientific Evidence for Stanols/Sterols?

Because they are structurally similar to cholesterol, stanols (and sterols) can displace cholesterol from the "packages" that deliver cholesterol for absorption from the intestines to the bloodstream. This displaced cholesterol is then excreted from the body. This action not only interferes with the absorption of cholesterol from food, it has the additional (and probably more important) effect of removing cholesterol from substances made in the liver that are recycled through the digestive tract.

Numerous double-blind, placebo-controlled studies, ranging in length from 30 days to 12 months and involving a total of more than 1,000 people, have found that sterol/stanols and their esters are effective for improving cholesterol profile. The combined results suggest that these substances can reduce total cholesterol and LDL ("bad") cholesterol by about 10% to 15%. They do not, however, have much of an effect on HDL ("good") cholesterol, nor on triglycerides.

For example, in a double-blind, placebo-controlled study, 153 people with mildly elevated cholesterol were given sitostanol esters in margarine (at 1.8 or 2.6 g of sitostanol per day), or margarine without sitostanol ester, for a total of one year. The results in the treated group receiving 2.6 g per day showed improvements in total cholesterol by 10.2% and LDL cholesterol by 14.1%—significantly better than the results in the control group. Neither triglycerides nor HDL cholesterol levels were affected.

Fish oil too has been shown to have a favorable effect on fats in the blood, in particular triglycerides. A study investigating the possible benefit of combining sterols with fish oil found that together they significantly lowered total cholesterol, LDL-cholesterol, and triglycerides, and raised HDL-cholesterol in subjects with undesirable cholesterol profiles.

Even people already taking standard medications to improve cholesterol profile (specifically, drugs in the statin family) appear to benefit when they additionally use stanols/sterols. According to one study, if you are on statins and start taking sterol ester margarine as well, your cholesterol will improve to the same effect as if you doubled the statin dose.

Stanols or sterols also appear to be safe and effective for improving cholesterol profile in people with type 2 (adult-onset) diabetes.

Safety Issues

Sterols are presumed safe because they are found in many foods. Stanols are also considered safe, but for a different reason: they are not absorbed. No adverse effects have been reported in any of the studies on lowering cholesterol, with the exception of one study that reported mild gastrointestinal complaints in a few preschool children. In addition, no toxic signs were observed in rats given stanol esters for 13 weeks at levels comparable to or exceeding those recommended for lowering cholesterol.

Although concerns have been expressed that stanol esters might impair absorption of the fat-soluble vitamins A, D, and E, this does not seem to occur at the dosages required to lower cholesterol. Stanol esters might interfere with absorption of alpha- and beta-carotene, although some studies have found no such effect. Evidence is also conflicting whether sterols or sterol esters impair nutrient absorption. Until more is learned, it may be reasonable for people using stanol or sterol products to take a multivitamin/multimineral tablet.


