

Vitamin E Helps Decrease Your Cancer Risk

Analysis by [Dr. Joseph Mercola](#)

March 12, 2024

STORY AT-A-GLANCE

- › Vitamin E is an important fat-soluble vitamin and antioxidant that combats inflammation, makes red blood cells, supports healthy immune function and helps your body use vitamin K, which is important for heart health
- › Vitamin E deficiency increases your risk for immune dysfunction, cognitive deterioration, cardiovascular disease and certain cancers, including prostate, breast, colon and lung cancers
- › A meta-analysis of 11 studies concluded that patients with lower concentrations of serum vitamin E (the vitamin E level in your blood) had a higher risk for colorectal cancer. Other studies have shown natural vitamin E may reduce your risk of lung cancer by more than 60%, and gamma-tocotrienol, a cofactor, may decrease prostate tumor formation by 75% and inhibit growth in human breast cancer cells
- › Vitamin E also prevents linoleic acid (LA) stored in your tissues from being oxidized into toxic byproducts. Since most people have LA stores that are 10 times higher than normal, and since excess LA likely is one of the primary contributors to chronic disease, it can be a good idea to take vitamin E regularly until you get your LA down to healthy levels
- › When supplementing, make sure it's made with natural (not synthetic) vitamin E and has a balance of all eight vitamin E compounds that is free of genetically engineered ingredients and soy

Vitamin E is a fat-soluble vitamin with potent antioxidant activity that helps combat damaging free radicals. It also plays a role in the making of red blood cells, helps your

body use vitamin K (which is important for heart health¹) and is involved in your immune function and cell signaling. As with many other nutrients, many do not get enough of this basic micronutrient from their diet.

In the U.S. alone, 75% to 90% of the population fails to reach the recommended dietary allowance (RDA) of vitamin E.^{2,3} The RDA for people over the age of 14 is 15 milligrams of vitamin E per day, but most Americans get only half that amount.⁴ Insufficient vitamin E can increase your risk for a wide variety of diseases, including immune dysfunction, cognitive deterioration, cardiovascular disease and certain cancers,⁵ especially prostate, colon and lung cancers.^{6,7}

Obesity heightens your risk of vitamin E deficiency further, in part because the increased oxidative stress in fat cells increases your body's need for vitamin E to begin with.

Obesity also impairs your body's utilization of vitamin E.^{8,9} Food is your best source of vitamin E, since food contain a combination of the eight types of vitamin E. If you're using a supplement, there are key considerations that need to be heeded, which I'll review below.

Low Vitamin E Level Linked to Higher Risk of Cancer

A number of studies have looked at vitamin E's influence on diseases like cancer. It's important to realize that while some studies have linked vitamin E supplementation to an increased risk for cancer,¹⁰ most of those studies were looking at synthetic vitamin E, which I do not recommend using.

For example, there was a study published in 2015 that analyzed the effects of vitamin E intake on lung cancer risk among female nonsmokers. This was a study that looked at diet versus supplemental vitamin E in 72,000 subjects. After 12 years of follow-up, 481 women had been diagnosed with lung cancer.

Interestingly, dietary vitamin E strongly correlated with a lower risk of lung cancer, while supplemental vitamin E was associated with an increased risk. Not surprisingly, the supplemental vitamin E used was synthetic.

Overall, this makes a strong case for making sure you're either getting your vitamin E from food, or from a natural vitamin E supplement, as natural vitamin E is the only kind that has a protective effect. Case in point: studies assessing the anti-cancer potential of natural vitamin E have found that:

- 300 IUs¹¹ of natural vitamin E per day may reduce lung cancer risk by 61%¹²
- Gamma-tocotrienol, a cofactor found in natural vitamin E preparations, may decrease prostate tumor formation by 75%¹³
- Gamma-tocotrienol also fights existing prostate cancer tumors and may inhibit growth in human breast cancer cells¹⁴

A 2017 meta-analysis¹⁵ of 11 studies concluded that patients with lower concentrations of serum vitamin E (the vitamin E level in your blood) had a higher risk for colorectal cancer. An earlier study,¹⁶ published in 1993, also found that high intake of vitamin E helped decrease the risk of colorectal cancer – especially in those under the age of 65. As explained in the study:

“Vitamin E is the major lipid-soluble antioxidant found in cell membranes, where it protects against lipid peroxidation. In addition, like carotenoids and water-soluble vitamin C, it can also stimulate the immune system and may protect against the development of cancer by enhancing immune surveillance. Vitamins E and C reduce nitrite, compounds that induce tumors ...”

Other Health Benefits of Natural Vitamin E

Aside from its cancer-preventive potential, natural vitamin E may also:

- Lower your risk of heart disease and stroke.¹⁷
- Help relieve symptoms associated with nonalcoholic steatohepatitis, a common obesity-related fatty liver disease.

- Lower your risk of age-related macular degeneration, a leading cause of vision loss in the elderly.¹⁸
- Boost improvements in blood vessel function that occur when a smoker quits smoking.¹⁹
- Delay loss of cognitive function in Alzheimer's patients.²⁰ Results showed that clinical progression of Alzheimer's slowed by 19% per year in the group receiving 2,000 IUs per day of vitamin E, compared with placebo. This delay translated into just over six months of delayed progression over the two-year follow-up period. Caregiver time also increased the least in the group receiving vitamin E.

This study actually used synthetic alpha-tocopherol that was not balanced with tocotrienols or any of the other tocopherols – beta, gamma and delta. Chances are the benefits would have been even greater if the natural form was used.

Vitamin E Protects Against Damage Caused by Linoleic Acid and Estrogen

Another important benefit of vitamin E is that it prevents linoleic acid (LA) stored in your tissues from being oxidized into toxic byproducts. Since most people are walking around with LA stores that are 10 times higher than normal.

Since excess LA is likely one of the primary contributors to chronic disease, it can be a good idea to take vitamin E regularly until you [get your LA down to healthy levels](#), which may take up to six years for most people. Vitamin E can almost miraculously prevent most of the damage done by LA.

“Vitamin E also prevents LA stored in your tissues from being oxidized into dangerous toxic byproducts.”

Vitamin E can also reverse or prevent many of the issues associated with excess estrogen. This is important because excess estrogen has remarkable parallels to LA in terms of its metabolic and anti-health effects. When you eat excess polyunsaturated fat (PUFA) or LA, you increase your body's production of estrogen. So, when you increase LA, estrogen levels go up – and that's not a good thing.

Both LA and estrogen increase the influx of calcium into the cell, which causes nitric oxide and superoxide to increase inside the cell. Nitric oxide and superoxide combine almost instantaneously to form a very pernicious reactive nitrogen species called peroxynitrite, which causes pervasive damage to tissues in your body.

LA and estrogen also increase a potentially dangerous process in your body called lipolysis, which is simply the liberation of fatty acids from your fat cells into your bloodstream where they are mobilized. This then increases the oxidation of LA, which is precisely what you want to avoid as ideally you want to keep LA in your fat cells until they metabolize it with peroxisomes. Fortunately, vitamin E can also help neutralize this damaging effect of LA.

Vitamin E also directly inhibits the activity of an enzyme called aromatase. This is an enzyme that converts the male hormones like testosterone and DHEA into estrogens. Even better, it serves as an estrogen antagonist, meaning it binds to the estrogen receptor to block it from binding to estrogen. This dramatically lowers the damage from excess estrogen.

Vitamin E works very similarly to the drug tamoxifen, which is used to treat estrogen receptor-positive breast cancers. For these reasons, I firmly believe nearly everyone needs to be getting vitamin E in their diet. However, due to the high LA burden, very few people can get enough vitamin E to suppress this oxidative destruction unless they're taking a supplement.

The good news is that since the supplementation is short term (provided you're actively reducing your LA intake), you're not going to need it the rest of your life. If you can keep your LA intake to below 5 grams a day for three years, it's likely you may not even need it at all, or at most, only a few times a month.

However, if you go out and binge on a meal that's very high in LA, I would strongly recommend taking a vitamin E capsule to protect yourself from this exposure.

Once your LA levels get low, you only need about 2 mg of vitamin E per gram of LA. If your LA intake is at or below 5 grams a day, as recommended, you only need about 10 mg of vitamin E, which is a very low dose. Since vitamin E is fat soluble, it stays in your fat tissues for some time.

Vitamin E Reverses Mitochondrial Oxidation Inhibition

Two studies that highlight the destructive influences of estrogen and cortisol were published all the way back in 1963²¹ and 1960.²² As explained by bioenergetic researcher Georgi Dinkov,²³ these studies show that estrogen and cortisol inhibit NADH oxidation in the mitochondria, thereby shifting the ratio between NAD⁺ and NADH in the mitochondria in favor of reduction.

Reduction, in turn, causes a reverse in the flow of electrons in the electron transport chain, which causes damaging reactive oxygen species (ROS) to be generated. The end result is poor mitochondrial function and chronic inflammation, which are at the root of most chronic conditions, including diabetes, cardiovascular disease and cancer.

On top of that, estrogen also inhibits pyruvate dehydrogenase, which increases NADH accumulation and skews the NAD⁺/NADH ratio even more, and “induces a multi-fold rise in ceruloplasmin – a reliable biomarker of both acute and chronic inflammation, as well as some cancers (e.g. lymphomas),” Dinkov warns.²⁴ The good news is that since vitamin E is such a potent inhibitor of both estrogen and cortisol, it can reverse these adverse effects.

How Much Vitamin E Do You Need for Optimal Health?

According to one scientific review,^{25,26} a mere 21% of the people studied had a protective level of serum vitamin E, which is thought to be 30 micromole per liter ($\mu\text{mol/L}$). This appears to be the threshold above which “definable effects on human health in multiple

areas” are obtained.²⁷ Human studies have also found that achieving a level of 30 µmol/L requires a daily intake of at least 50 IUs of vitamin E.²⁸

A primary reason for such widespread deficiency is that most people eat a primarily processed food diet, which tends to be lacking in vitamin E and other important nutrients.

Deficiency during pregnancy can be particularly problematic. Worldwide, about 13% of people have vitamin E levels below the “functional deficiency” threshold of 12 µmol/L, and most of these are newborns and young children. Babies deficient in vitamin E are at increased risk for immune and vision problems. Being deficient in vitamin E during pregnancy also raises your risk for miscarriage.²⁹

Since vitamin E is fat-soluble, taking it with some healthy fat, such as coconut oil or avocado, can help increase its bioavailability. In fact, studies have shown your body will absorb only about 10% of the vitamin E from a supplement when you take it without fat.³⁰

Signs and Symptoms of Vitamin E Deficiency

Signs and symptoms of serious vitamin E deficiency include:^{31,32}

Muscle weakness and unsteady gait	Loss of muscle mass
Cardiac arrhythmia	Vision problems, including constriction of your visual field; abnormal eye movements; blindness
Dementia	Liver and kidney problems

How to Pick a Good Vitamin E Supplement

Most vitamin E supplements are synthetic, and you want to steer clear of those. Studies have demonstrated that synthetic vitamin E has the opposite effect of natural vitamin E, such as increasing the risk of certain cancers rather than lowering it,^{33,34,35} for example. So, it's important to make sure you're getting a natural version.

Synthetic vitamin E is called alpha tocopherol acetate. The acetate indicates that it's synthetic. Next, you need to pay attention to the orientation of the optical isomer. Most vitamin supplements are racemic, or they have left- and right-hand isomers. This is a problem as most biological molecules have optical isomers that are right-handed.

They're usually called D and L isomers, which stands for right and left. When you have both left and right isomers present, it's called racemic. Biologically, there's usually only one optical isomer that works well, and with vitamin E it is the D isomer that works in your body, while the L isomer is useless.

Yet in synthetic supplements, 50% of the vitamin E is the useless L isomer. To make matters even worse, many synthetic versions use an ester of vitamin E, which only has about 50% of the activity of the natural product. So, the total activity of many vitamin E supplements is reduced by 75%.

So, the first step in identifying healthy good vitamin E supplements is to make sure you're getting real vitamin E and not synthetic. What you're looking for is "d alpha tocopherol." This is the pure D isomer, which is what your body can use. Synthetic alpha-tocopherol is listed with a "dl" (i.e., dl-alpha-tocopherol).

There are also other vitamin E isomers, and you want the complete spectrum of tocotrienols, specifically the beta, gamma, and delta types of vitamin E, in the effective D isomer.

Another potential problem is that if you take high amounts of alpha-tocopherol in isolation, it could potentially deplete the other tocopherols and tocotrienols from your body. This is true whether you're taking a natural or a synthetic one, so I recommend looking for a food-based supplement that has a balance of all eight types of vitamin E (four tocopherols and four tocotrienols).

Also look for a supplement that is free of soy, soybean oil derivatives and genetically engineered (GE) ingredients (some of the most common GE ingredients found in supplements are derivatives of corn, soy and cotton seed).

Your Best Source of Vitamin E

Supplements are best taken in addition to, not in place of, a healthy diet, and only if you actually need them. One way to evaluate your need for a vitamin E or other supplements is to use a nutrient tracker, such as [Cronometer.com/Mercola](https://www.cronometer.com/Mercola), which is the most accurate one on the market because of their decision to eliminate inaccurate crowd sourced data. It's available free of charge.

Vitamin E can easily be obtained from a healthy diet, so before considering a supplement, consider including more vitamin E-rich foods^{36,37} in your diet. Vitamin E is synthesized by plants, and the highest amounts are found in plant oils.

However, while some health authorities recommend canola oil as a good source,³⁸ this is actually a terrible source due to its high LA content. Beans – another good source of vitamin E – may also be problematic for many due to their high lectin content.

One of the best healthy natural sources of vitamin E would be grass fed ruminants like beef or bison. A normal serving can provide enough vitamin E to protect against the oxidative stress from LA in a low LA diet. If you have a high LA diet and have had one for quite some time, like most people, then you will want to consider a supplement with around 100 units of vitamin E that meets the criteria in the section above.

Avoid supplements that don't meet these criteria or much higher doses of vitamin E as more is not necessarily better and can be highly counterproductive.

Sources and References

- ^{1, 5, 31} [University of Maryland Medical Center, Vitamin E \(Archived\)](#)
- ² [British Journal of Nutrition 2012 Aug;108\(4\):692-8](#)
- ^{3, 6, 25} [Prevent Disease July 26, 2016 \(Archived\)](#)

- ^{4, 17} National Institutes of Health, Vitamin E Fact Sheet
- ^{7, 38} PCRM.org, How Vitamin E Helps Protect Against Cancer (Archived)
- ⁸ Science Daily November 2, 2015
- ^{9, 30} Science Daily October 7, 2015
- ¹⁰ Science Daily May 19, 2016
- ¹¹ Calculator Site, How to Convert IUs to Mcg or Mg
- ¹² Int J Cancer. 2008 Sep 1;123(5):1173-80
- ¹³ International Journal of Cancer 2011: 128/(9); 2182-2191
- ¹⁴ European Journal of Lipid Science and Technology January 18, 2008
- ¹⁵ Medicine 2017 Jul; 96(27): e7470
- ¹⁶ Cancer Research September 15, 1993; 53: 4230-4237 (PDF)
- ¹⁸ Ophthalmology. 2009 May;116(5):939-46
- ¹⁹ Time Magazine April 25, 2013
- ²⁰ JAMA January 1, 2014: 311(1); 33-44
- ²¹ Journal of the American Geriatrics Society April 1963, 11(4)
- ²² The Journal of Biological Chemistry 1960; 235(12): 3413-3416
- ^{23, 24} Haidut.me March 4, 2024 (Archived)
- ²⁶ Nutraingredients-USA.com July 19, 2016
- ^{27, 28} International Journal for Vitamin and Nutrition Research, ISSN 0300-9831
- ²⁹ Johns Hopkins December 3, 2014
- ³² Medscape Vitamin E December 21, 2021
- ³³ Cancer Prevention Research May 2012, DOI: 10.1158/1940-6207.CAPR-12-0045
- ³⁴ Science Daily April 23, 2012
- ³⁵ Sci Transl Med 29 January 2014: Vol. 6, Issue 221, p. 221ra15
- ³⁶ The World's Healthiest Foods Vitamin E (Archived)
- ³⁷ MyFoodData.com, Top 10 Foods Highest in Vitamin E