

Broccoli Compound May Boost Cognitive Function

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✓ Fact Checked

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STORY AT-A-GLANCE

- › After just 12 weeks of supplementing with sulforaphane, which is just one of broccoli's claims to fame, older adults experienced better cognitive function
- › Sulforaphane also helps protect the heart, catalyzes a healthy balance of gut bacteria, and may be a weight management tool
- › A superior choice to supplements is broccoli sprouts; they contain up to 50 times the amount of chemoprotective compounds and are easily grown indoors

Food has a profound effect on your health – whether to prevent disease or reverse the negative effects of disease and illness. For example, decades of research have revealed the powerful effect that broccoli and other cruciferous vegetables have on several common health issues. Research¹ has found that sulforaphane, one of broccoli's claims to fame, is responsible for improving cognitive function and mood in older adults.

Other cruciferous vegetables include Brussels sprouts, cauliflower, cabbage, collards, kale and Bok choy. Broccoli has decades of research behind it that show it's a valuable health-promoting food. While several compounds have demonstrated positive effects on health, one of the most widely studied is sulforaphane. The compound may be best known for its cancer-fighting properties.

For example, studies have shown that sulforaphane supports normal cell function and division while triggering apoptosis in colon,² liver,³ prostate,⁴ breast⁵ and tobacco-

induced lung cancer.⁶ While it is helpful in the prevention of cancer, data⁷ also shows it may also help in the treatment of breast cancer.

Sulforaphane also increases enzymes in your liver⁸ that help destroy cancer-causing chemicals you may consume or be exposed to in your environment. This compound has even been called “one of the most powerful anticarcinogens found in food.”⁹

Research has also shown it boosts detoxification of environmental toxins,¹⁰ helps prevent or treat high blood pressure,¹¹ heart disease, Alzheimer's disease,¹² autism¹³ and even schizophrenia.¹⁴

Older Adults Experience Better Cognitive Function and Mood

The featured Japanese study¹⁵ was published in *Frontiers in Aging Neuroscience*. The researchers used 12 weeks of supplementation and found that the participants experienced greater processing speed and a reduction in negative mood as compared to the group who received the placebo.

Researchers began with the premise from past studies showing sulforaphane with cognitive training had a positive effect on cognitive function. They sought to investigate whether consuming sulforaphane could improve cognitive performance and mood in older adults.

They used a 12-week, double-blind, randomized controlled trial in which 144 adults – 73 men and 71 women – with an average age of 66.82 years were assigned to either a placebo group or a group that received sulforaphane supplementation.

The intervention group took 30 mg of glucoraphanin daily, which is converted to sulforaphane in the body. The researchers measured cognitive function, mood states, and serum and urine biomarkers at baseline and the conclusion of the intervention.

The group that took the sulforaphane supplementation exhibited an improvement in cognitive processing speed and a reduction in negative mood. Additionally, the intervention group had a higher sulforaphane N-acetyl L-cysteine (SFN-NAC) urine level,

indicating they had consumed the glucoraphanin capsules. There were no other significant biomarkers of oxidative stress, neuroplasticity or inflammation.

The health benefits from eating cruciferous vegetables are linked to glucosinolates,¹⁶ which are plant chemicals that are metabolized into isothiocyanates, including sulforaphane. Broccoli contains an enzyme called myrosinase that helps to break down glucosinolates into erucin or sulforaphane. The researchers concluded:¹⁷

“Although we did not find any significant changes in antioxidant response, neural plasticity, or the neuroinflammation blood parameter, these results indicate that nutrition interventions using SFN can have positive effects on cognitive functioning and mood in healthy older adults.”

Sulforaphane’s Effect on the Heart, Leaky Gut and Obesity

Research data have shown that sulforaphane can help lower the risk of cardiovascular disease¹⁸ and reduce high blood pressure in an animal model.¹⁹ In one animal study,²⁰ researchers sought to evaluate the efficacy of sulforaphane in the lab. Past data using exogenous antioxidants were not conclusive, which led the researchers to theorize that inducing endogenous antioxidant activities could have a promising cardioprotective effect.

Their theory was confirmed in the lab by demonstrating a reduction in intracellular reactive oxygen species production, which has a pathogenic response on the myocardium²¹ triggering damage and dysfunction. The antioxidant and anti-inflammatory properties of sulforaphane may be related to the activation of the Nrf2 pathway that acts as a defense mechanism against oxidative stress.

Another animal study^{22,23} identified yet another benefit from broccoli – a healthy gut. Researchers from Penn State demonstrated that broccoli may help in the treatment of colitis and leaky gut syndrome when they discovered broccoli contains a compound called indolocarbazole (ICZ). This compound helps catalyze a healthy balance of bacteria and supports your immune system.

Researchers swapped out 15% of the animal's diet for raw broccoli,²⁴ which is equal to about 3.5 cups of broccoli each day for a human. While that is quite a bit of broccoli, researchers say you can get an equivalent amount from one cup of Brussel sprouts as these vegetables contain three times the amount of ICZ as broccoli.

Animal research^{25,26} has also suggested that sulforaphane can be used as a weight management tool. Mice that were fed a high fat diet with sulforaphane gained weight 15% slower than those getting the same diet without sulforaphane supplementation.

They also gain 20% less visceral fat. This fat collects around your internal organs and is particularly hazardous to your health. The researchers believe two different mechanisms were behind the results:²⁷

- Sulforaphane was found to speed up tissue browning. Brown fat is a beneficial type of body fat that helps you stay slim. It's a heat-generating type of fat that burns energy rather than storing it.
- Sulforaphane also decreased gut bacteria in the Desulfobivriaceae family. These bacteria are known to produce toxins that contribute to metabolic endotoxemia and obesity.

Easy to Grow Sprouts Are a Concentrated Form of Nutrients

It has been my experience that it's always better to get your nutrients from food as opposed to supplements when it's possible. However, there are times when it's impractical or nearly impossible to achieve a therapeutic dose from food alone. You can get meaningful amounts of sulforaphane and DIM from eating broccoli, but it could be difficult to consistently eat enough to reach a therapeutic dose.

A superior choice to a supplement is broccoli sprouts, which are far more potent than whole broccoli and allow you to eat less in terms of quantity. According to the late Dr. Paul Talalay,²⁸ then professor of pharmacology at Johns Hopkins and researcher who launched the field of chemoprotection:²⁹

“Three-day-old broccoli sprouts consistently contain 20 to 50 times the amount of chemoprotective compounds found in mature broccoli heads, and may offer a simple, dietary means of chemically reducing cancer risk.”

You can have a ready supply of cancer-fighting nutrients by growing sprouts at home. It's quite easy, it can be done indoors, and you don't need a lot of space. Although sprouts are small, they are packed with enzymes, vitamins, minerals and antioxidants that protect against free radical damage. When I first started sprouting seeds I used Ball jars, but I've since switched to growing them in potting soil.

Sprouts grown in Ball jars need to be rinsed several times a day to prevent mold growth and it's a hassle to keep them draining in the sink and taking up space. You would also need dozens of jars to get the same amount as in just one flat tray. When sprouts are grown in soil they can be harvested in about a week and one pound of seeds will produce over 10 pounds of sprouts.

Sprouts can be added to salads, sandwiches or vegetable juice or smoothies. You can also boost the benefits of sulforaphane in broccoli and other cruciferous vegetables by pairing them with a myrosinase-containing food.³⁰ This is the enzyme that converts the precursor glucoraphanin to sulforaphane. Foods that contain myrosinase include Dakin radishes, arugula, and mustard seed.³¹

Ideally, broccoli should be steamed for no more than four minutes to increase the available sulforaphane content. This eliminates a heat-sensitive sulfur-grabbing protein that inactivates sulforaphane,³² while retaining the myrosinase in the broccoli. Without myrosinase, your body cannot absorb sulforaphane.

If you opt for boiling, blanch the broccoli for no more than 30 seconds and then immerse it immediately in cold water to stop the cooking process. If you prefer raw food, you'll get the most sulforaphane and nutrients from broccoli sprouts rather than mature broccoli.

Sources and References

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