

Costly Spice Surprisingly Effective for Alzheimer's

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✓ Fact Checked

STORY AT-A-GLANCE

- › Animal and laboratory studies demonstrate saffron is neuroprotective; data also show it is as effective as memantine to treat moderate to severe Alzheimer's disease
- › The bioactive compound crocin inhibits the formation and aggregation of tangles and amyloid plaques, hallmark signs of Alzheimer's disease
- › Saffron also reduces blood sugar and improves insulin sensitivity, one of the triggers of Alzheimer's disease, also called Type 3 diabetes
- › Consider using other protective strategies to reduce your risk of Alzheimer's disease, including eating a cyclical ketogenic diet with intermittent fasting, avoiding all processed foods and sugar, consuming cruciferous vegetables in your daily diet and taking care of your gut health

Saffron is one of the most expensive spices in the world, and for good reason. Evidence suggests this unique and costly spice may have a significant impact on the development and progression of Alzheimer's disease.¹

Saffron is harvested from the stigma of *Crocus sativus*, a perennial plant belonging to the iris family. The flower has three stigmas of saffron that must be harvested while the flowers are still closed, during the one week every year when the plant flowers.²

It is believed that saffron is native to Greece, but today most of the spice is grown in Iran, Greece, Morocco and India.³ The spice has a complex flavor profile that is difficult

to describe. On its own, saffron smells woody with an earthy scent.⁴

To buy the real deal, saffron can cost up to \$13 per gram, or about \$365 per ounce.⁵ To produce 1 ounce of saffron takes 3,000 stigmas, or 1,000 flowers. When you're buying saffron, look for a dark red or red orange color in which you should be able to see individual threads.

If you found a cheaper saffron, it's likely fake.⁶ The stigmas from safflower plants are sometimes substituted and sold less expensively. They do not add the same color or flavor profile to foods, although they smell a little like saffron. Real saffron is sometimes adulterated by grinding up and mixing safflower stigmas to stretch the product.

Saffron as Effective as Drug Against Severe Alzheimer's

Saffron has historically been used in Persian traditional medicine for the treatment of memory problems. Multiple animal studies have looked at the antioxidant protection [saffron](#) may offer along with its protection against cognitive decline and memory deficits.⁷

In one animal study, researchers used morphine to induce memory loss and found the administration of saffron attenuated the impairment.⁸ In another study,⁹ researchers found that animals injected with saffron extract, including the active ingredient crocin, and subsequently subjected to stress, exhibited:¹⁰

"... significantly higher activities of antioxidant enzymes including glutathione peroxidase, glutathione reductase and superoxide dismutase and significantly lower total antioxidant reactivity capacity. Finally, crocin significantly decreased plasma levels of corticosterone, as measured after the end of stress.

These observations indicate that saffron and its active constituent crocin can prevent the impairment of learning and memory as well as the oxidative stress damage to the hippocampus induced by chronic stress."

The main compound, crocin, is a water-soluble carotenoid that has demonstrated potential to protect brain cells in animal and lab studies.¹¹ Saffron extract was tested¹² against memantine, a commonly prescribed medication for the symptoms of moderate to severe **Alzheimer's disease**. Memantine is an NMDA receptor antagonist that has demonstrated the ability to slow the loss of cognitive abilities.¹³

Like most medications, memantine has a list of side effects, including vomiting, loss of appetite, unusual weakness, anxiety and aggression.¹⁴ Some of these side effects are also common symptoms of moderate-to-severe Alzheimer's disease, including anxiety and aggression.¹⁵

Researchers engaged 68 people with a diagnosis of moderate-to-severe Alzheimer's disease.¹⁶ The group was split into a treatment group and a control group. The control group received memantine at a dose of 20 milligrams (mg) per day while the intervention group received 30 mg per day of saffron capsules for 12 months.

Adverse events related to the intervention or medication were recorded and the participants' cognitive skills were evaluated every month. The researchers found no statistically significant difference between the two groups. They concluded the saffron extract capsules were "comparable with memantine in reducing cognitive decline in patients with moderate to severe AD."¹⁷

Researchers have been looking at the mechanism of action crocin may take in the brain. During the development and progression of Alzheimer's disease, tangles and amyloid plaques aggregate in the brain and destroy brain nerve cell function. One lab study¹⁸ demonstrated crocin has a protective effect on the development of amyloid plaque commonly found with Alzheimer's disease.

It not only inhibits the formation but disrupts current aggregates of amyloid in the brain. Other hallmarks of the disease are the fibril tangles made of tau protein. Another lab study¹⁹ demonstrated crocin had an inhibitory effect on the formation and aggregation of tau protein filaments.

Alzheimer's Disease Linked to Insulin Resistance

The Alzheimer's Association²⁰ estimates there are more than 6 million people living in the U.S. who currently have a diagnosis of Alzheimer's disease. The number is projected to more than double to nearly 13 million by 2050. During 2020, the association estimated Alzheimer's and dementia deaths increased by 16%, with 1 in 3 seniors dying with Alzheimer's or another form of dementia.

This is estimated to cost the U.S. \$355 billion in 2021 and may rise as high as \$1.1 trillion by 2050. Besides Alzheimer's disease, diseases such as cardiovascular disease, obesity and **Type 2 diabetes** have also been growing significantly in the past several decades.

The interaction between aging and insulin resistance may increase the risk of Alzheimer's disease.²¹ Scientists began calling the form of diabetes that selectively involves the brain Type 3 diabetes and concluded that the features of this condition raise the risk of Alzheimer's disease.²²

By 2015, researchers from Iowa State University²³ found a strong association between an individual's **memory** function decline and insulin resistance, which added to the growing body of evidence that preventing insulin resistance is an important means of preventing Alzheimer's disease. A study scientist from the department of food science and human nutrition at Iowa State commented in a press release:²⁴

"We are terrible at adjusting our behavior based on what might happen in the future. That's why people need to know that insulin resistance or related problems with metabolism can have an effect in the here and now on how they think, and it's important to treat."

"For Alzheimer's, it's not just people with Type 2 diabetes. Even people with mild or moderate insulin resistance who don't have Type 2 diabetes might have an increased risk for Alzheimer's disease because they're showing many of the same sorts of brain and memory relationships."

In the following years, more evidence was found to link insulin resistance with Alzheimer's disease. Type 2 diabetes substantially increases the risk of neurodegenerative dementia and especially Alzheimer's disease.²⁵

Scientists continue to analyze the way insulin affects the brain and find it increases the turnover of neurotransmitters and influences the clearance of the hallmarks of Alzheimer's disease – amyloid beta peptide and phosphorylation of tau.²⁶ Insulin is thought to have an effect on multiple pathways that contribute to neurodegeneration.

Saffron Aids Insulin Sensitivity and Lowers Blood Glucose

Saffron contributes to reducing the development and progression of Alzheimer's disease through reducing insulin resistance. In one review of the literature,²⁷ researchers identified animal studies in which the bioactive compound crocin helps reduce insulin resistance. This happened when the animals were administered dexamethasone or a high fructose diet to induce high blood sugar.

One laboratory study²⁸ suggested saffron may help glucose uptake into the muscle, but when administered with insulin, improved **insulin sensitivity**. Evidence from the cell study suggested that AMP-activated protein kinase (AMPK) is a mechanism that plays a major role in the effect saffron has on insulin sensitivity in skeletal muscle cells.

Animal studies²⁹ have also demonstrated that saffron extract can lower blood glucose levels and have a positive effect on complications that result from hyperglycemia. Finally, a paper published in 2018 discussed how it exerted a hypoglycemic effect by “improving insulin signaling and preventing beta-cell failure.”³⁰

Saffron Works as Well as a Drug to Treat ADHD

Attention deficit hyperactivity disorder (ADHD) is a commonly diagnosed neuropsychiatric disorder that affects 5% to 10% of school-age children.³¹ The children experience a mix of symptoms, from difficulty concentrating and hyperactivity to mood swings and short attention span.

The standard medical approach is a central nervous system stimulant drug such as methylphenidate (Ritalin). However, as with many medications, it causes significant side

effects that impact the child's ability to function, including difficulty sleeping, loss of appetite and nausea.³²

Some children and adults are not responsive to central nervous system stimulants to treat their symptoms of ADHD.³³ In a six-week, randomized double-blind study,³⁴ researchers engaged 50 children from age 6 to 17 years who completed the study. They were randomly assigned to receive methylphenidate or saffron capsules to treat their symptoms of ADHD.

The children's behavior was monitored using the Teacher & Parent ADHD Rating Scale, and the researchers found that methylphenidate and saffron had the same effect on ADHD symptoms. They noted that “short-term therapy with saffron showed the same efficacy compared with methylphenidate,”³⁵ adding that the frequency of the adverse effects was also similar. They continued:³⁶

“Taken together, since saffron is a ‘putative’ antidepressant and antidepressant agents are acceptable for treatment of ADHD, we hypothesized that saffron intake would be of benefit in these patients. In addition, having the ability to affect both monoaminergic and glutamatergic systems also qualify saffron as a possible candidate for the treatment of ADHD due to malfunction of these circuits in this disorder.”

Protective Strategies Against Alzheimer’s Disease

Research evidence has demonstrated there are several factors that impact the development and progression of Alzheimer's disease. This means there are several different strategies you can use to help protect your brain health and reduce your risk. I have written about many of these strategies, and many of them involve your nutritional habits.

As discussed earlier, there is a significant link between insulin resistance in the brain, also called Type 3 diabetes, and the development of Alzheimer's disease. You can reduce your risk by avoiding net carbohydrates, processed foods and sugars that spike your blood glucose and negatively impact your mitochondrial function. Following a

cyclical ketogenic diet with **intermittent fasting** also has a powerful effect on your metabolism.

Research studies have looked at the effect a singular dietary change has on the development of Alzheimer's disease. One of those is the neuroprotective effect that long-term coffee drinkers experience. As I discuss in "**Can Coffee Reduce Your Risk of Alzheimer's Disease?**" evidence suggests that drinking coffee can lower your risk and reduce your overall cognitive decline.

Sulforaphane has a significantly beneficial effect on the brain as demonstrated in an initial study in patients with schizophrenia³⁷ and an Alzheimer animal study.³⁸ Evidence from animal models³⁹ demonstrates that sulforaphane clears the accumulation of amyloid-beta and tau and improves memory deficits.

Cruciferous vegetables, and especially broccoli and broccoli sprouts, are high in sulforaphane as I discuss in "**Sulforaphane for Your Heart and Brain.**" Evidence also links **your gut health and Alzheimer's disease**, finding proteins produced by gut bacteria may trigger the development of the disease.

While scientists still have a lot to learn about the central nervous system and neurodegenerative diseases, it is apparent from recent evidence that the decisions you make today can have a significant effect on your potential risk for developing diseases. I encourage you to take simple steps that can have long-term results and to share the information you learn here with your friends and family.

Sources and References

- ^{1, 12, 16, 17} [Human Psychopharmacology, 2014;29\(4\)](#)
- ² [Healthyish, February 5, 2018, Why is it so expensive?](#)
- ³ [Healthyish, February 5, 2018, Where does saffron come from?](#)
- ^{4, 6} [In Search of Yummy-ness, March 19, 2018](#)
- ⁵ [Healthyish, February 5, 2018](#)
- ⁷ [Behavioral Brain Research, 2011;219](#)
- ⁸ [Advances in Pharmacological and Pharmaceutical Sciences, 2012; doi.org/10.1155/2012/494367](#)
- ^{9, 10} [European Journal of Pharmacology, 2011;667:222](#)
- ¹¹ [Journal of Agricultural and Food Chemistry, 2017;65\(5\)](#)
- ¹³ [Medline Plus, Memantine](#)

- ¹⁴ RxList, What are the Side Effects of Namenda?
- ¹⁵ National Institute on Aging, What are the symptoms of Alzheimer's Disease?
- ¹⁸ Cellular and Molecular Biology Letters, 2013;18(3)
- ¹⁹ Iranian Journal of Basic Medical Sciences, 2015;18(5)
- ²⁰ Alzheimer's Association, Facts and Figures, Quick facts
- ²¹ CNS Drugs, 2003;17(1)
- ²² Journal of Diabetes Science and Technology, 2008;2(6)
- ²³ JAMA Neurology, 2015;72(9)
- ²⁴ Science Daily, July 27, 2015
- ²⁵ Nature Reviews in Neurology, 2018;14:168
- ²⁶ The Lancet Neurology, 2020;19(9)
- ²⁷ Food Research International, 2010;43:1981
- ²⁸ Food Chemistry, 2012;135
- ²⁹ European Journal of Biological Sciences 2013;5(1)
- ³⁰ Journal of Cellular Physiology, 2018; doi.org/10.1002/jcp.27843
- ³¹ Child and Adolescent Psychiatric Clinics of North America, 2000;9(3)
- ³² Cochrane Database Systematic Review, 2018; doi.org/10.1002/14651858. CD012069.pub2
- ³³ National Institute for Health and Care Excellence, Guidelines
- ^{34, 35} Journal of Child and Adolescent Psychopharmacology, 2019;29(3)
- ³⁶ Journal of Child and Adolescent Psychopharmacology, 2019;29(3), Intro 2nd to last para
- ³⁷ Clinical Psychopharmacology and Neuroscience 2015;13(1):62
- ³⁸ Journal of Alzheimer's Disease, 2018;62(4):1803
- ³⁹ Molecular Nutrition and Food Research 2018;62(12)