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## Berries on the Brain: Why They're Actually Good For Your Brain Health

*From the Environmental Nutrition Newsletter*

Americans are eating more berries, and that's a good idea. Besides being packed with vitamins, minerals and fiber, berries are rich in flavonoids like anthocyanins and flavanols. "Berries are colorful because of bioactive compounds like these," says Navindra P. Seeram, Ph.D., an associate professor in the Department of Biomedical and Pharmaceutical Sciences at the University of Rhode Island College of Pharmacy. "They protect the berry, and those beneficial effects are imparted when we eat berries."



Both oxidative stress and inflammatory mediators in the blood can cause damage to brain cells. Berries contain flavonoids, which have antioxidant and anti-inflammatory effects that counteract, reduce, and repair this damage. The blood-brain barrier protects the brain from harmful circulating agents in our bodies, but "compounds like anthocyanins can cross the blood-brain barrier," says Seeram. "So they bring their powerful properties right to the site of action." According to Barbara Shukitt-Hale, Ph.D., a USDA research psychologist, we don't fully understand yet why berries are so good for the brain, but it is most likely due to the antioxidant and anti-inflammatory potential of these compounds.

Most of the evidence for berries and brain health comes from animal studies, but that is changing says Shukitt-Hale. "In the last five to six years we've started studies in humans, and the data coming in from those studies are very promising." Here's what we know so far about what berries may do for the brain:

### **Improve memory.**

A new study found that both younger and older adults who ate flavonoid-rich blueberries showed improvements in memory and attention-based tasks, as well as increased blood flow to key areas of the brain. "In other studies, older adults given blueberries or strawberries for three months did better on memory tests than those who got a placebo," says Shukitt-Hale. A pilot study that gave children (8-10 years old) a flavonoid-rich blueberry drink showed a boost to memory in that age group as well.

## **Slow brain aging.**

Berries may help fight the natural decline in brain function that comes with aging. "At least in animals, eating blueberries and strawberries has been shown to increase the number of new neurons made in the brain, and how many branches neurons have," says Shukitt-Hale. "We've also seen improvement in brain signaling and the potential of neurotransmitters. We need to study this in humans to know for sure."

## **Ward off dementia.**

Clogged veins and arteries can slow blood flow to the brain, causing vascular dementia. A diet high in vegetables and fruits like berries protects vascular health, but berries also protect against dementia in other ways. Anthocyanins in fruits, like blackberries, blueberries, raspberries and strawberries, protect the brain from oxidative stress, which has been shown to be a major contributor to neurodegenerative disorders like Alzheimer's disease. Additionally, emerging evidence shows that the compounds found in berries can counteract advanced glycation end-products (AGEs), which have been linked to various age-related changes including Alzheimer's. AGEs are formed as a result of natural processes in the body and are found in animal products, especially those cooked at high temperatures. The key is to eat berries regularly, as recent investigations with blueberries show significant reduction in dementia risk when the berries are eaten before dementia begins.

## **And more.**

In an animal model of post-traumatic stress disorder, blueberries reduced oxidative stress and inflammation and restored neurotransmitter imbalances. Another animal study showed blueberries and raspberries may help protect against the negative effects a high fat diet can have on the brain. The flavonoids in berries have even been shown to boost your mood and decrease risk of developing depression.

There's an impressive body of science demonstrating benefits of berries for cognitive performance and brain function, and the number of controlled human trials is increasing. While the bulk of research has been done on blueberries, other berries (like blackberries, raspberries and strawberries) have many of the same bioactive compounds. "Berries are very nutrient dense, and they have diversity of natural compounds that make them extra powerful," says Seeram.

Experts advise including a variety of colorful berries in your diet on a regular basis. "Eating berries regularly will ensure the beneficial compounds will be in your circulatory system to dampen any harm that comes along," says Seeram.

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