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1-1-2015

### Cherry on top: summer fruits are also good for the brain

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#### Recommended Citation

Charlton, Karen E. and Caldwell, Katherine, "Cherry on top: summer fruits are also good for the brain" (2015). *Faculty of Science, Medicine and Health - Papers: part A*. 3394.  
<https://ro.uow.edu.au/smhpapers/3394>

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## Cherry on top: summer fruits are also good for the brain

### Abstract

Summer fruits are back on Australian tables. We've long known cherries and other stone fruits provide a range of essential vitamins and minerals. But here's another reason to make sure they're on the shopping list: they're good for the brain.

### Disciplines

Medicine and Health Sciences | Social and Behavioral Sciences

### Publication Details

Charlton, K. & Caldwell, K. (2015). Cherry on top: summer fruits are also good for the brain. *The Conversation*, 24 November 1-3.

# THE CONVERSATION



## Cherry on top: summer fruits are also good for the brain

November 24, 2015 3.13pm AEDT

Anthocyanins, which provide the red, blue and purple pigments, may help protect against cognitive decline. Tom Ipri/Flickr, CC BY-NC

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Summer fruits are back on Australian tables. We've long known cherries and other stone fruits provide a range of essential vitamins and minerals. But here's another reason to make sure they're on the shopping list: they're good for the brain.

### **Flavonoids**

Flavonoids are nutrients that contain more than 6,000 unique compounds. They're widespread in plants, and are grouped into five subclasses: flavonols, flavan-3-ols, flavones, flavonones and anthocyanins.

The major sources of flavonoids in the diets of older Australians are black tea (89%), oranges and orange juice (2.7%), green tea (1.3%) and bananas (0.9%).

Flavonoids protect plants from microbe and insect damage, which may explain some of their observed health benefits in humans. They contribute to the sensory characteristics of foods such as flavour, astringency and colour.

Anthocyanins, for example, provide the red, blue and purple pigments in fruits such as strawberries, cherries, blueberries and plums. They're also found in red wine, tea, coffee, and some vegetables such as red onion and cabbage.

### **How do berries improve brain health?**

Anthocyanin-rich fruits have been shown to affect the brain in several ways. It is thought that a number of pathways work together to improve cognition and prevent degeneration of the brain.

First, the high antioxidant content of these fruits may scavenge free-radicals and reduce

inflammation in the brain.

Additionally, flavonoids in the fruit have the potential to inhibit cell death of nerve cells (neurons), and improve connections between the neurons, especially in the areas of the brain associated with learning and memory (hippocampus).

Flavonoids may also disrupt the aggregation of amyloid beta (A $\beta$ ) in the brain and thereby prevent formation of amyloid plaques. Amyloid plaques are sticky buildups of these proteins which accumulate outside neurons, and are implicated in Alzheimer's disease development.

Consuming a large serve of anthocyanin-rich fruits may boost learning ability, memory and motor skills.

Research suggests that people who regularly consume berries (two to three times per week) have better brain function and are less likely to develop dementia than others their own age.

## Diet and dementia

Dementia is the single greatest cause of disability in older adults aged over 65 years and is the second leading cause of death in this age group. Even small delays in the onset of dementia and its subsequent progression will have the potential to significantly alleviate the burden of this disease on society.

Our research team has shown the potential for anthocyanin-rich cherry juice to improve memory in older adults with mild to moderate Alzheimer's type dementia. A feasible serving of 200ml a day of juice was provided to participants in order to overcome the issue of seasonality.

After 12 weeks, people who regularly consumed the cherry juice had significantly improved scores of tests related to memory and word-recall compared to those who were provided with an alternative fruit juice that contained minimal anthocyanins.

## The purple fruit frontier

As more is discovered about the health effects of anthocyanin-rich fruits, the demand for fruits with superior health benefits is growing. An Australian-bred plum developed by Queensland government scientists, the Queen Garnet, has up to five times the levels of anthocyanins present than in normal plums.

Animal studies show impressive results so far for its potential to improve health. Obese rats fed with the Queen Garnet plum juice showed that their high blood pressure, fatty livers, poor heart function and arthritis returned to normal in just eight weeks.

We are now investigating the role of the Queen Garnet plums on cognitive function in people with early signs of memory loss.

## How can you be sure it's the fruit?

Food-based studies are complex. First, we need to understand how the body metabolises the bioactive compounds.

Anthocyanins are quickly broken down in the digestive tract to a range of different digestive substances (called metabolites), many of which are excreted in the urine within about six hours. It may be the intact anthocyanin compound itself that exerts physiological effects. Or it could be one of its many metabolites.

The "dose" of anthocyanin required for health benefits, and how this can be achieved from

foods remains unclear. An acute cross-over study, for instance, found the blood pressure lowering effects of cherry juice over six hours were only seen if 300ml was consumed as a single serving, rather than as three 100ml servings over three hours.

Lastly, it is likely that anthocyanins in food may interact with other nutrients, and combinations of foods may show synergistic effects. In other words, they may have a greater combined effect than if consumed in isolation.

While the role of diet for improving cognitive health looks bright (purple), a bowl of cherries won't counteract other lifestyle factors implicated in cognitive decline. Quitting smoking, cutting down on saturated fat and being physically active are also crucial for keeping ageing brains healthy.

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Food and nutrition

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