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- Ferulic Acid, Pterostilbene & Cognitive Health –

Summary:

Ferulic Acid

- Flavonoid found in plant cell walls
- Strong antioxidant effects
- Anti-inflammatory abilities
- Neuroprotective effects

Food Sources:
Ferulic acid is found in small amounts in rice, wheat, oats, tomatoes, carrots, pineapples and oranges. In grains, it is found in the bran (hard-outer shells) – a part commonly removed in processing.

Antioxidant:
Ferulic acid is an effective antioxidant. Ferulic acid is more bioavailable than other dietary flavonoids so far studied, staying in the blood for longer than other antioxidants such as vitamin C.

Anti-inflammatory Effect:
Ferulic acid inhibits the overproduction of messengers and mediators that promote inflammation (prostaglandin E2, tumor necrosis factor-alpha, nitric oxide synthase, cyclooxygenase-2). It is so effective at reducing inflammation researchers suggest ferulic acid may have potential as an anti-inflammatory drug. (*J Clin Biochem 2007 Mar;40(2):92-100*)

Neuroprotection:
Oxidative stress plays a role in aging in the brain, and the development of neurodegenerative diseases such as Alzheimer's disease. Ferulic acid is a potent scavenger of free radicals and up-regulates protective enzymes in the brain. In studies, ferulic acid prevents amyloid beta-peptide plaques from damaging the brain. (*Nutrients 2015 Jul 15:7(7):5764-82*) Amyloid beta-peptide plaque is currently the target of pharmaceutical companies' attempting to find a treatment for Alzheimer's disease.

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Summary:

Pterostilbene

- Primary antioxidant component of blueberries
- Highly bioavailable
- Neuroprotective
- Anti-inflammatory
- Cancer preventive actions

Food Sources:
Found in blueberries, or *Pterocarpus marsupium* heartwood. The amount of pterostilbene content varies from 99ng to 520ng/gram among blueberry varieties. As such, to eat 100mg of pterostilbene need to eat between 200,000 and 50 million blueberries depending on the variety.

Antioxidant:
Pterostilbene is similar to resveratrol, a compound found in red wine, with comparable antioxidant, anti-inflammatory and anti-carcinogenic properties. However, pterostilbene has more bioavailability (more lipophilic, better oral absorption): shown to be 80% bioavailable compared to 20% for resveratrol. Pterostilbene reduces oxidative stress and production of free radials, as well as increases production of antioxidants. It is being extensively researched for its potential anti-carcinogenic abilities. (*Oxid Med Cell Longev 2013;2013:575482*)

Neurological Benefits:
Increasing levels of oxidative stress in the brain are a proposed mechanism of age-related cognitive decline. Many studies show eating berries may effectively stop neurological decline with age. Studies show blueberries improvement GABA levels, memory capability and beneficially change metabolic pathways in the brain. Pterostilbene has been identified as the nutrient in blueberries responsible. Pterostilbene improved markers of Alzheimer's disease in supplementation studies. Human clinical trials show ferulic acid is effective at protecting the brain from free radicals. (*Pharmacol Biochem Bev 135,199-209*)

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COGNITIVE HEALTH

Cognitive Nutrition
Two of the major triggers of aging in the brain are oxidative stress (free radical damage) and chornic, low-grade inflammation (neuroinflammaging). "Accumulated data strongly suggest that phytochemicals from fruits, vegetables, herbs and spices may exert relevant immunomodulatory and anti-inflammatory activities in the context of brain aging." (*Front Pharma* 2016 Oct;7(364))

Green Tea
Population studies show lower rates of dementia and Parkinson's disease in those who drink green tea. Green tea is a source of the antioxidant ECGC. ECGC can penetrate the blood brain barrier. EGCG has neuroprotective effects and prevents the production and clumping of amyloid beta-peptides (associated with Alzheimer's disease progression). (*PLoSOne* 2014;9(5)) ECGC in green tea appears to protect dopamine-producing cells; changes affecting dopamine release in the brain is thought to be an underlying problem in Parkinson's disease. (*Biol Psychiatry.* 2007 Dec 15;62(12):1353-62)

Ginkgo Biloba
A handful of large, long term human clinical trials in older adults have shown taking ginkgo biloba daily is an effective and safe treatment of dementia. It does this by modulating inflammation in the brain, and increasing blood flow in the brain. (*J Pharm Health Care Sci* 2015;1:14;)

Fish Oil
Extensive research shows the presence of omega-3 fatty acids (most bioavailable in fish oil) play a vital role in brain cell integrity and function. Over twenty studies have shown that consumption of fish and polyunsaturated fatty acids (EPA, DHA) are associated with a lower risk of cognitive decline, dementia and Alzheimer's disease. (*Am J Clin Nutr* 2016 Feb;103(2):330-40)

Chlorella
Oxidative stress is linked to neurological decline with age. Studies show prolonged consumption of chlorella may prevent progression of cognitive impairment (*Neurosci Lett* 2009 Oct 30;464(3):193-8).

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Ferulic Acid – see detailed Ferulic Acid page.

Pterostilbene – see detailed Pterostilbene page.