

The Brain Makers

The dry weight of your brain is 60 per cent fat. The trillions of brain cells are largely made out of essential fats, bound to phospholipids. The binding together of these essential brain components, depends on methylation nutrients, mainly B vitamins. These three families of nutrients – essential fats, phospholipids and methylation nutrients – are the brain makers.

Achieving an optimal supply is central, not only to intelligence and memory, but also your mood. As the speed of life and pace of change accelerates, and our lifespan extends, the brain, more than any other organ, feels the strain reflected in an ever-increasing incidence of depression, dementia and ADHD.

To what extent can these problems be avoided by an optimal supply of the brain makers? A lot. When B vitamins were given to people with pre-dementia with raised homocysteine levels, the indicator of faulty methylation they were remarkably protective against brain shrinkage in people with enough omega-3s, illustrating that brain makers work together. In fact, there was a 73% reduction in the rate of brain shrinkage¹ which brought the rate of brain shrinkage down to that seen in normal. Healthy people of similar age with no cognitive decline.

Brainmaker No.1 - Essential brain fats

As far as essential fats are concerned the most abundant in the brain is DHA – it makes up a quarter of the brain's cerebral cortex. Oily fish contain roughly equal amounts of EPA and DHA. Only 'DHA, alone or combined with EPA, contributes to improved memory function in older adults (45+) with mild memory complaints', concludes a meta-analysis published last month in the Public Library of Services journal². The benefit, they say, is apparently driven by DHA, at a daily level between 500 and 1,000mg. There is also evidence of benefit for schoolchildren.³

On the other hand, EPA has strong anti-depressant effects. A study of studies – a meta-analysis - concluded that 'the use of omega-3 is effective in patients with diagnosis of depression'⁴. A similar dose is needed for an effect.

To achieve at least 500mg of both EPA and DHA does mean supplementing them, as well as eating fish. Having a twice daily capsule of omega-3 fish oil, providing 250mg of each, and eat oily fish three times a week, plus a tub of taramasalata – fish roe is a great source. Also eat chia seeds, flax seeds or walnuts, the highest vegetarian source of omega 3.

Brainmaker No.2 - Phospholipids

All fish, not just oily fish, are an excellent source of the next brain maker – phospholipids, as are eggs. They are the backbone of brain cells – the essential fats literally hang off them creating the intelligent membrane the not only holds neurons together but contains the receptor sites for neurotransmitters, the brain's communication molecules. They are semi-essential, meaning that the body can make them but growing evidence shows that we just don't make enough and need to get a direct source from diet or supplements.

The most abundant phospholipid in the brain is phosphatidyl choline. Also important is phosphatidyl serine and phosphatidyl dimethylethanolamine – abbreviated to PC, PS and DMAE accordingly.

Both PC and PS⁵ have been shown to improve memory, concentration, speed of thinking and protect those with mental illness⁶. One study gave students a large dose of PC and reported memory improvement within 90 minutes.⁷

Lecithin granules or capsules are a direct source of PC. These are also included in some ‘brain food’ supplements. Or/and eat six eggs a week, plus five servings of fish.

Brainmaker No.3 - Methylation nutrients

There are a billion ‘methylation’ reactions every few seconds in your brain. Methylation turns genes on and off, repairs DNA, makes neurotransmitters and phospholipids and is also needed to attach them to essential omegas. It is the builder, while omegas and phospholipids are the building material. If your homocysteine level is high you’ve got a methylation problem.

The three most important methylation nutrients are vitamins B12, folate and B6. But you also need methyl groups. Greens contain the natural ‘methyl’-folate vitamin, but it is an unstable form. That’s why most supplements contain the stable form called folic acid - but it has to be converted back into methylfolate to work properly and not everyone is good at doing this. Recently, stable forms of methylfolate have become available and are preferable in lowering high homocysteine levels, thus improving methylation. Lentils, beans, nuts and seeds are also an important source of folates. Later in life B12 absorption can become impaired so B12 is especially important to supplement in relatively high doses – from a base of 10mcg to 500mcg if homocysteine level is high. TMG and zinc also help lower homocysteine. You’ll find out more about this in the B VITAMIN domain.

So, for a healthy brain, you want to eat fish, eggs, greens, beans, walnuts and chia seeds and supplement extra omega 3 fish oil, high in DHA and EPA, plus phospholipids and methylation nutrients – B6, B12 and folate, plus zinc and TMG. It is especially important for vegans to supplement these nutrients, including a seaweed derived source of DHA.

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1. Jernerén F, Elshorbagy AK, Oulhaj A, Smith SM, Refsum H, Smith AD. Brain atrophy in cognitively impaired elderly: the importance of long-chain ω -3 fatty acids and B vitamin status in a randomized controlled trial. *American Journal of Clinical Nutrition*. 2015;102:215-21.

² K Yurko-Mauro et al, [PLoS ONE](#) 2015

³ W Stonehouse, [Nutrients](#) 2014

⁴ G Grosso et al, [PLoS One](#) 2014

⁵ MJ Glade and K Smith, [Nutrition 2015](#) 2015

⁶ V Knott et al, [Pharmacol Biochem Behav](#) 2015

⁷ SL Ladd et al, [Clin Neuropharmacol](#) 1993