why fat is essential for a healthy mind

FAT MAY NOT be always good for your waistline, but the right sort of fat is vital to boost your brain power. Omega-3 and omega-6 essential fatty acids are found in ordinary foods such as meat, dairy, oily fish, nuts, seeds and oils, yet people who don't eat enough in their diet are at risk of depression, insomnia and behavioural problems. It is an irony of modern life that what we now consider to be a 'healthy' diet – low in meat, fat and dairy and high in vegetable oils – could be contributing to these problems, while a more old-fashioned 'balanced' diet could be what we need to keep brains healthy.

For Jane Hammonds, 33, essential fatty acids helped her beat chronic fatigue syndrome (CFS). Jane, a geography teacher from North London, was off work for nine months battling extreme tiredness and exhaustion associated with the debilitating illness. "I didn't have the energy to walk upstairs to lie on the bed, let alone go to the corner shop," she remembers. "I couldn't watch a film because it was too taxing to concentrate for that amount of time. My brain felt fuzzy and vacant, as though I were detached from everything." By the time she came across omega-3, she had already tried antidepressants, nutritional therapy, lymphatic drainage massage and herbs. "Within a month of taking the supplements of essential fatty acids, my brain felt sharper, I had more energy and my sleep improved," she says. She was back at work within four months.

The key to Jane's recovery is that 60 per cent of the brain is made up purely of fat, says Basant Puri, medical professor at Hammersmith Hospital and Imperial College, London, and one of the country's leading authorities on essential fatty acids and the brain. "The most important fats in the brain are omega-3 and omega-6," he explains. "Feeding the brain with a regular intake of essential fatty acids helps keep the brain nourished."

These necessary fats cannot be manufactured from scratch by the body, but must be provided by the diet. When we eat a food containing omega-3 or omega-6, it is converted in the body by special enzymes into even more crucial types of fat. One of these – and one we are deficient in – is the long-chain polyunsaturated fatty acid EPA, converted from omega-3 and found in foods like oily fish and linseed. Some experts, including Professor Puri, believe that we are also deficient in the fatty acids DGLA and AA, both of which are converted from omega-6, and which are found in vegetable oils and evening primrose oil.

> COMMUNITIES THAT ATE THE MOST FISH WERE LEAST LIKELY TO SUFFER FROM DEPRESSION

Put simply, the work of these converted fats is to ensure that the cell membranes of the body, including those of the brain, are kept fluid. Most fatty acids in the brain link up with other molecules to form phospholipids – important membrane nutrients whose responsibility it is to ensure that vital messages are transmitted smoothly between the neurons in the brain.

A deficiency means the phospholipids become sluggish. This in turn translates into a slowing down of the transfer of vital brain chemicals such as serotonin and dopamine, that keep emotions, behaviour and thought on track. Low levels of serotonin are characteristic of depression.

A study by Dr Joseph Hibbeln of the US National Institutes of Health, published in 1998, showed that communities who consumed the most fish were least likely to suffer from depression. He found that countries with the lowest fish consumption, like New Zealand, had rates of depression 60 times higher than in Japan.

Essential fatty acids are also vital during pregnancy, both for the foetus's brain and to prevent postnatal depression. Professor Puri's own studies show that if a pregnant woman's diet is lacking in fatty acids, her baby's brain will scavenge them from her own body. Women's brains shrink during pregnancy as a result. "They will return to normal afterwards if essential fatty acids are plentiful in her diet," he says.

Experts suspect that this scavenging could be a cause of postnatal depression. "Although we don't know enough causes for certain, there is a strong suspicion that by giving her own essential fatty acids to the baby, a new mother is left short," says Dr Alex Richardson, senior research fellow at the Oxford University Laboratory of Physiology and co-director of the charity Food and Behaviour Research (www.fabresearch.org).

Dr Richardson recently published a study of children with developmental co-ordination disorders, like dyspraxia, in ▷

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WHICH VITAMINS AND MINERALS WILL HELP?

The following will help the body utilise fatty acids efficiently:

- Niacin – found in breakfast cereals, poultry, fish, meat, wholemeal bread
- Folic acid – green leafy vegetables, offal, chickpeas, nuts
- Vitamin B6 – walnuts, soya, avocado, fish
- Vitamin B12 – offal, fish, eggs, cheese
- Vitamin C – citrus fruit, vegetables
- Selenium – Brazil nuts, lentils, wholemeal bread, eggs
- Zinc – oysters, red meat, poultry, beans
- Magnesium – nuts, wholemeal bread, seeds, green leafy vegetables

LIFESTYLE CHANGES

- Keep junk food to a minimum to reduce harmful trans fats
- Cut back on coffee and tea, opting instead for herbal brews
- Quit smoking
- Try to relax
- Eat a healthy Mediterranean diet with lots of fish, green leafy vegetables, nuts and seeds

DO I NEED SUPPLEMENTS?

Both Professor Puri and Dr Richardson take supplements to ensure they get enough EPA. Rather than taking fish-oil supplements, which contain saturated fat and put you at risk of ingesting too many PCBs, as well as potentially toxic doses of vitamin A, Puri chooses VegEPA capsules (www.vegepa.com). Each capsule provides 280mg of pure EPA with virgin evening primrose oil, and no DHA. "Too much DHA inhibits the conversion into EPA, and there is also the risk that it will turn into free radicals, which can be carcinogenic," says Puri. Dr Richardson takes MorEPA (www.healthyandessential.com), containing about 600mg of EPA per capsule.

which they were given a mix of omega-3 and omega-6 for three months. "Their reading showed three times the normal progress, and their spelling twice the normal progress compared to the placebo group," she says. "Their behaviour and concentration also improved considerably."

But depression and behavioural illnesses aren't the only problems. As we get older, the brain stops growing and gradually deteriorates and shrinks, leading to memory loss and dementia. A deficiency of omega-3 and omega-6 aggravates this effect, but according to Professor Puri, co-author of *The Natural Way to Beat Depression* (Hodder Mobius, £7.99), it can be reversed with a sufficient shot of essential fatty acids. "When patients take high doses of omega-3 and omega-6, no matter what their illness, you see a regrowth of the brain," he says. "I have seen it in depression, schizophrenia, chronic fatigue syndrome and dementia."

Work has also been done on patients with Huntington's disease, a genetic degenerative brain disorder. Symptoms include loss of motor control, involuntary spasms and diminished memory. There was thought to be no cure, but a 2002 study by Puri and his team revealed that Huntington's sufferers treated with high doses of EPA showed an improvement in motor co-ordination and brain scans.

This is just one of many studies pointing to EPA as the most useful of all the omega-3 and omega-6 fats. "We used to think DHA [also from omega-3] was the most valuable because it is found in the brain structure," explains Dr Richardson. "But 10 years ago, scientists started to find that EPA had an effect on schizophrenia and depression, and in each case, EPA worked better than a placebo."

Richardson thinks we should concentrate on increasing our intake of foods that are high in omega-3, as she reckons the average Western diet is already rich in omega-6. "The original hunter-gatherer diet had a ratio of four to one omega 6 to omega-3. But the modern Western diet, which is low in fish and high in processed food, has a ratio that is closer to 12 to one or even 15 to one in favour of omega-6. Too much omega-6 will lead to problems such as blood clotting too easily."

> SCIENTISTS STARTED TO FIND THAT EPA HAD AN EFFECT ON SCHIZOPHRENIA

Other scientists also suspect that omega 6 competes with omega-3 for conversion to other essential fatty acids, increasing the rate of deficiency. It is thought that a surfeit of omega-6 foods may be one factor feeding the potential for cancer. And Dr Joseph Hibbeln claims that the escalating depression rates in the Western world could be linked to our vastly increased use of vegetable oils – leading to a shortage of omega-3 in the body.

The good news is that it is possible to get enough essential fatty acids from diet alone. Tucking into a Mediterranean diet with lots of fish would be ideal: three portions of oily fish a week provide the recommended amount of EPA, while certain types of meat and dairy such as cereals, eggs, poultry, most vegetable oils, and wholegrain breads provide high-quality AA on the omega-6 side.

In theory, the conversions by the enzymes from the parent essential fatty acid to something the brain can use should happen inside our bodies, but some lifestyle factors conspire to make the enzymes less efficient. Stress, for example, causes the release of the hormone cortisol, which stops conversions. Other obstructions are low levels of certain vitamins and minerals, or a high intake of caffeine or nicotine. Enzymes will also perform poorly if a diet is rich in hydrogenated and trans fats, found in highly processed foods, such as margarine and crisps.

So, if you are serious about increasing your intake of essential fatty acids, your efforts will be wasted unless you ditch that caffeine dependency and fast-food lunch addiction, too. □

WHAT SHOULD I BE EATING?

Recommended minimum of essential fatty acids a week is 3g, and no more than 3g a day.

- About three portions of oily fish a week provides the minimum weekly requirement. Good sources are mackerel, kippers, salmon, trout, tuna and herring. Women and girls should eat slightly less because of the risk of taking in too many pollutants, known as polychlorinated biphenyls (PCBs), which could cause problems in unborn children. Choosing wild varieties of fish over farmed, as well as organic farmed, should help keep PCBs low.
- Linseed oil – also known as flaxseed – taken alone or mixed into dressings, or crushed linseeds. A tablespoon of ground seeds contains around 3.8g of ALA, the parent type of omega-3 fat. "The ALA in linseeds and linseed oil still needs conversion to EPA and DHA, another fatty acid. Whereas fish oil doesn't," says Dr Richardson. "Some knowledgeable vegetarians, therefore, choose an algal-source DHA supplement, in addition to plenty of linseeds and green leafy vegetables to provide ALA."
- Eat your greens several times a week. Most of the little fat in leafy green vegetables, like broccoli or cabbage, is ALA (around 0.13g of ALA per 100g of broccoli).
- Omega-3-enriched eggs from hens fed on fish oil. Each egg gives 0.01g of DHA and 0.02g of EPA.
- Walnuts – a 30g serving contains 2.6g of ALA.

OMEGA-3 FOODS

- Oily fish such as salmon, trout, mackerel, herring, tuna, sardines and kippers
- Seeds, and oils derived from them, such as hemp, linseed and pumpkin seeds
- Walnuts and walnut oil
- Eggs enriched by omega-3
- Green leafy veg like broccoli and cabbage
- Venison

OMEGA-6 FOODS

- Vegetable oils such as olive and sunflower
- Eggs
- Meat and dairy from animals fed on grass