



HEALTH MATTERS!



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Diet And The Nervous System

The health and performance of the nervous system is essential to that of the body. Neurotransmitters – brain chemicals, which help to transmit messages in the Central Nervous System (CNS), make the connections between the networks of neurons that make up the brain. These chemicals influence the way we think, feel and behave and increasingly, research is showing that there are links between the type of foods we eat and the availability of certain neurotransmitters in the brain.

The daily intake of vitamins, minerals and other nutrients affect the ability of the nervous system to perform its many necessary functions. There are several macronutrients (particularly protein) and micronutrients (vitamins and minerals) that directly influence the correct functioning and health of the nervous system, and it is important that these are consumed at adequate levels.

The following nutrients are essential for normal Brain and Nervous System functioning.

A well-balanced nutritious diet should provide sufficient amounts of the following nutrients. If you believe that you may struggle to eat the following foods then a good quality vitamin and mineral supplement – especially through the winter months – may be beneficial.

Proteins (Amino Acids) – These play an important role in normal brain function, particularly before birth when the concentrations in the blood of the developing foetus can be three times greater than found in the mother.

Most of the essential chemical substances in the brain and CNS – the neurotransmitters, such as dopamine and serotonin – are produced in our bodies from **amino acids**. The following **amino acids** and their related neurotransmitters therefore are vital for a healthy nervous system:

- **Glutamate** – is a precursor to gamma-amino-butyrate (GABA – a calming neurotransmitter), whilst **glycine, aspartate** are also important for healthy brain chemistry.
- **Tyrosine** – the antidepressant produces dopamine, adrenaline and noradrenaline.
- **Tryptophan** – The sleep promoter produces serotonin (for elevated moods).
- **Phenylalanine** – The pain reliever – involved with the nervous system – is used to elevate moods and can also help with memory.
- **Amino acids** – can help to produce Adenosine, ADP, ATP and AMP, which in turn produce energy that is essential for all bodily (including brain) functions.
- **Arginine** – helps to produce nitric oxide, which is vital for neurotransmission.

Protein foods that provide all of these abovementioned **amino acids** are: **Meat, Fish, Eggs, Quorn, Dairy Products, Pulses, Soy, Tofu, Nuts, Seeds and grains like Quinoa (small amounts).**

Care must be taken, however, with very low energy, vegan or macrobiotic diets, alcoholism and anorexia, and in situations that increases the requirement for protein (when intakes may be inadequate), such as in pregnancy, lactation and periods of growth, as this can lead to an imbalance in the supply of amino acids to the brain and CNS.

Omega Fats – The structural components of cell membranes in the brain, including the myelin sheath – the protective coating around nerve fibres that increase the speed at which impulses are conducted – contain high proportions of the omega 3 fat, docosahexaenoic Acid (DHA) and the omega-6 fat, arachidonic acid (AA).

- **Sources of omega 3 (DHA)** – salmon, herring, mackerel, sardines, anchovies, fresh tuna, walnuts, (flax provides some, but not in significant quantities as the conversion to DHA is costly).
- **Sources of omega 6 (AA)** – dairy foods, meat, fish and eggs.

The B vitamins, all play a role in healthy nerve and brain function, namely:

Thiamine (vitamin B1) – A deficiency can interfere with the production of certain neurotransmitter amino acids, such as glutamate and aspartate, as well as glucose metabolism, which the brain is highly sensitive to. Foods that are rich in thiamine include: **Wholegrains (Oats, Brown Rice, Wholewheat or Wholegrain Breads, Quinoa, Amaranth), Organ Meats (Liver, Kidneys), Pork, Nuts and Legumes (Dry Beans, Peas and Lentils).**

Niacin (vitamin B3) – A deficiency may be linked to neurological damage. Mild niacin deficiency is associated with weakness, tremor, anxiety, depression and irritability. The human body is capable of manufacturing niacin from the amino acid tryptophan. A niacin deficiency therefore could benefit from adequate intakes of high-quality protein foods, as well as direct sources found in: **Meat - a good source of niacin and tryptophan, Wholegrains (Oats, Brown Rice, Wholewheat or Wholegrain Breads, Quinoa and Amaranth).**

Pyridoxine (vitamin B6) – is essential for the synthesis or metabolism of practically all the neurotransmitters and adequate levels can break down high levels of homocysteine that is responsible for mental deterioration. Moreover, deficiency of B6 causes symptoms such as tiredness, nervousness, irritability, depression, insomnia, and difficulty with walking. Rich dietary sources of pyridoxine include: **Meat, Fish, Potatoes, Bananas and Legumes (Dry Beans, Peas, Lentils and Soy Products).**

Folic acid (folate / vitamin B9) – has a role in the upkeep of the adult nervous system is also involved in the production of neurotransmitters. Deficiency of folic acid is associated with anaemia and neuropathy in adults. The following foods are good sources of folate: **Green Leafy Vegetables, Liver, Oranges, Avocados, Bananas, Peanuts and Potatoes.**

Vitamin B12 – is essential for the maintenance of myelin. Inadequate synthesis of myelin can lead to neurological damage. It also has a highly significant role in both the formation of the nervous system (nerve cells) as well as in the maintenance of its proper functions. Vitamin B12 is exclusively found in animal sources, like: **Liver, Red Meat, Poultry, Fish, Eggs, Milk and Dairy.**

Minerals. The minerals that serve to help enhance the functioning of the nervous system are:

Calcium – In addition to its other equally important health benefits, **calcium** also has a role in keeping the nerves healthy as well as to ensure their ability to communicate effectively. Rich **calcium** foods are: **Dairy Products, Bony Fish, Beans, Green Vegetables and Oranges.**

Magnesium – is the mineral, which can help the body make use of calcium most efficiently, meaning it has a very important role in the upkeep of the nervous system. The lack of **magnesium** in the body can actually contribute to nervousness and confusion. **Magnesium** rich foods are: **Green Vegetables, Wholegrains, Nuts, Seeds, Meat and Beans.**

Potassium – A diet lacking in potassium can lead to nervous disorders. Potassium rich foods are: **Fruits and Vegetables, Seeds and Meat.**

Copper – Like vitamin B6, this mineral is essential for the production of neurotransmitters and myelin. A severe lack of copper in your diet can lead to spinal cord degeneration and a progressive failure of nerve function. **Copper** rich foods are: **Organ meats, seafood, mushrooms, beans, nuts, wholegrains, prunes, beetroot, spinach and eggs.**

Lecithin – is rich in **choline**, which is necessary for the proper transmission of nerve impulses from the brain through the central nervous system. Lecithin also protects and repairs nerves. Good sources are: **eggs, pulses, nuts, seeds & cruciferous vegetables.**

Please Note: This handout should only be used as a guide to help inform you as to the foods that **may** support a healthy nervous system. It **should not** be used as definitive guide to nervous system support.