

Nutritional considerations for veggie/vegan diets



Plenty of research shows benefits of diets rich in plant-based whole foods, such as vegetables, fruits and whole grains high in fibre and rich in nutrients. There are, however, **some key nutritional factors to consider when following a diet completely lacking in animal-derived foods** - as these are the richest natural sources of some essential brain nutrients. These considerations are **especially important during pregnancy & childhood**.

Long-chain Omega-3s are absent

Long-chain omega 3 fatty acids (DHA & EPA) are critical for brain health, but direct dietary sources are missing from vegetarian diets. Short-chain omega-3 are found in some plant oils - notably flax and chia seeds. But converting these into long-chain in the body is inefficient and unreliable - especially for DHA (and varies with genetics, omega 6 intake, and other factors). Compared with omnivores, EPA and DHA levels are typically 30% lower in vegetarians and more than 50% lower in vegans. Oily fish is the richest source of EPA & DHA, and adequate amounts of these vital long-chain omega 3s often can't be obtained from a 'fish-free' diet, without special supplements derived from algae or fortified foods.



Fewer brain-vital B Vitamins

Vegan diets contain virtually no B12 (meat is the main source) - and B12 is absolutely **essential for normal brain and nerve structure and function**, and for making red blood cells. Vegans therefore **must get their B12 from supplements or fortified foods**, because **deficiency can cause serious problems with mood, memory or behaviour (including psychosis) even without 'classic' B12 deficiency signs** like sensory & motor symptoms, or anaemia. Other B vitamins B1, B2, B3, B6 & B9 (folate) are also vital for brain health. (B2 can be low in vegans, as milk & dairy are a rich source). All of them work best together, and good regular supplies are needed, as they are water-soluble and not stored in body fat.



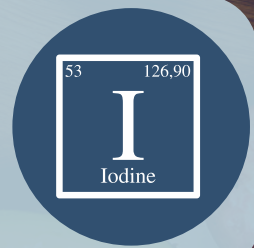
Raised risk of Choline deficiency

Choline (which works with B vits and omega-3 DHA) is crucial for normal brain development and function, and **deficiencies in pregnancy & infancy can lead to lifelong impairments of cognition and behaviour**. Animal foods (meat, eggs and fish) are the main dietary sources, but inadequate intake is common even in omnivores, and vegans / vegetarians are at particular risk. Sunflower or soy lecithin supplements are a good source, and some plant foods (cruciferous vegetables and certain beans) can provide around 10% of daily needs.



Lower levels of Iodine

Iodine deficiency is the largest preventable cause of brain disorders worldwide, as iodine is needed to make thyroid hormones, vital for brain development and function. Milk & dairy are the main dietary sources (but fish & seafood the richest). **Most vegans get only 20-30% of adequate iodine intake, so usually need to supplement** - especially before & during pregnancy. Seaweeds (notably kelp) are a rich plant-based source, but supplements containing these are NOT recommended (see BDA Iodine Factsheet), as their content is highly variable, and **excessive iodine can be harmful**. Similarly, eating these seaweeds more than once a week is not recommended.



Less bioavailable Iron

Iron is essential for brain development and function, as well as for red blood cells. Early life deficiency (pregnancy and infancy) is a major cause of poor brain health worldwide, and lack of iron at any age can impair mood, behaviour, energy & sleep. To get enough iron, vegans/vegetarians need to consume more, and include varied plant sources (e.g. peas, raisins, spinach, kale) and/or supplement if recommended by a GP. Plant-based iron is not as easily absorbed as animal-based sources, but consuming vitamin C at the same time can help increase absorption e.g. combining with lemon or orange juice.





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There is plenty of research showing the benefits of **increasing** our intake of plant-based whole foods, such as vegetables and fruits high in fibre and rich in nutrients. There are, however, some key nutritional factors to consider when following a diet completely absent of animal-derived foods as these are the richest natural sources of some key brain nutrients. These considerations are especially important during pregnancy & childhood.

Zinc in lower quantities in plants

Lack of dietary zinc can contribute to difficulties in behaviour, learning, attention and mood, as well as many physical health problems; and fish, seafood and red meat are the best sources. Zinc is found in legumes (e.g chickpeas, lentils & beans) but the phytates they contain reduce absorption of zinc (and other minerals). Zinc and copper compete with each other, so balanced intakes of both are needed. Many plant foods contain both (e.g. lentils, peas, cashews and dark chocolate), so zinc supplementation is not necessarily required for vegans or vegetarians - provided that requirements are met through a well-balanced, varied plant-based diet that includes plenty of whole foods.



UK recommend Vitamin D supplementation

Classic Vitamin D deficiency symptoms include soft or weak bones and teeth, and/or bone pain, and impaired immunity. But **Vitamin D is also essential to brain health**. Deficiencies in early life may raise risks for ADHD, autism, schizophrenia; and at any age may contribute to mental health problems like depression or dementia. The main source of Vitamin D is skin exposure to bright sunlight, and in the UK, most people need to supplement in autumn and winter if not all year round. Individuals with darker skin, babies & the elderly have higher deficiency risks. Vitamin D3 (animal-derived) is more effective than vitamin D2 (plant-derived) in raising vitamin D levels for longer, so higher doses of the plant-based form are needed for vegans and vegetarians.



Vitamin A

Vitamin A is vital for normal growth and development, eye and brain health and immune function. Diets that exclude animal products increased risks for vitamin A deficiency, as **preformed vitamin A** is not found in plant foods. Carotenoids in many plant foods (which our bodies turn into vitamin A) can **usually** meet intake needs (but conversion efficiency can vary between individuals). It's therefore important for vegans & vegetarians to eat a variety of fruit and vegetables, and a well-planned vegan diet should include rich sources daily, such as orange sweet potato, butternut squash, carrot or spinach, kale, cantaloupe melon and spring greens.



Vitamin K2 usually lacking

Vitamin K2 has a wide range of underappreciated health benefits, as (with Vitamin D and magnesium) it is needed to regulate calcium within the body. Vitamin K2 is needed, for example, to ensure calcium is used to build & maintain strong bones and teeth, and for normal cell signalling - rather than being deposited into blood vessels or kidneys, where 'calcification' raises risks for heart disease, vascular dementia, or kidney stones. Meat and dairy products (notably cheese & yogurt) are the best direct dietary sources of Vitamin K2, although some is made from Vitamin K1 (plentiful in plant foods) - and natto (a traditional Japanese food made from fermented soy, and available in supplements).



Taurine & Creatine

Taurine and creatine are both important amino acids (building blocks of protein for body tissues and enzymes), which play key roles in both brain and body health. Both are plentiful in animal derived foods (most notably meat), but not plant-based foods - so supplies may be relatively lacking - i.e. available only at lower levels - in many people who follow vegan or vegetarian diets. More research is still needed into the effects of these amino acids on mood, behaviour and learning - but if needed (and recommended by a qualified health practitioner) supplements can provide these.

