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How can vegetarian and vegan diets promote good health?

PERSPECTIVES

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Well-planned vegetarian and vegan diets, with the addition of some supplements, can cover all of the body's nutritional needs and promote good health and disease prevention.

Illustration: Hilde Thomsen

In recent years, plant-based diets have attracted increasing attention, and the number of people following a vegetarian and vegan diet has grown, especially young people (1). There are various reasons why someone might choose a vegetarian or vegan diet, including considerations related to the climate, environment and animal welfare, as well as personal preferences, religion and ethics. Vegetarianism and veganism are a lifestyle for most adherents, and veganism is recognised as a life philosophy (2). Such choices should be respected, and healthcare personnel should be able to provide good, tailored advice.

Vegetarian and vegan diets

A vegetarian diet is normally defined as a diet in which dairy products and eggs may be eaten, while a vegan diet consists solely of plant-based foods. Diets can generally be on a spectrum from purely plant-based/vegan to animal-dominated, with many choosing somewhere in between.

Current knowledge suggests that a well-balanced plant-based diet promotes good health and can be suitable at all life stages, including for pregnant women, breastfeeding mothers, and older people, as well as for children (3–6). Several recent meta-analyses have studied the relationship between the intake of various foodstuffs and the risk of the most common lifestyle diseases, such as cardiovascular disease, type 2 diabetes, obesity, and cancer, as well as life expectancy (7–13). Overall, the studies show that following a mainly plant-based diet with limited amounts of red meat, processed meat and sugar has beneficial effects. This is in line with the Norwegian Dietary Guidelines (14).

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A healthy and balanced vegetarian or vegan diet can consist of nutritious plant-based foods and by-products of these. Food groups that should be included in the daily diet are legumes (beans, lentils, peas), whole grains, vegetables, fruits, berries, nuts, seeds and plant oils, low-fat dairy products or plant-based drinks and eggs, if included in the diet (1). Meanwhile, the intake of sweet and fatty foods should be limited because these can displace nutritious foods and contribute to obesity.

The diet planner (*Kostholdsplanleggeren*) (15) and the Norwegian food composition table (*Matvaretabellen*) (16) are online tools that can be used to calculate the intake of various nutrients.

Are we getting enough nutrients?

A diet as described above contains ample amounts of dietary fibres and sufficient protein. Several plant-based proteins, such as soy protein, have a dietary protein quality that is equal to that of protein from animal sources (17). Amino acids from legumes and cereal products complement each other, which means that protein quality is rarely a problem in a diet that contains protein from different plant sources. However, legumes and cereal products do not need to be consumed in the same meal, as was previously thought (17).

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People who follow a vegetarian or vegan diet often have a higher intake of unsaturated fat and a lower intake of saturated fat than others (18). However, special attention must be paid to the intake of long-chain polyunsaturated omega-3 fatty acids. The long-chain omega-3 fatty acid docosahexaenoic acid (DHA) is necessary for, inter alia, the growth and development of the brain and nervous system in foetuses and infants. An adequate DHA intake is therefore particularly important for pregnant women, breastfeeding mothers, and young children. In a traditional diet, common sources of this fatty acid are fish, seafood, cod liver oil and eggs. In a vegetarian or vegan diet, long-chain omega-3 fatty acids can be added in the form of algae oil capsules or liquid oil (1). The

short-chain omega-3 fatty acid alpha-linolenic acid, which is found in plants, can be converted to DHA in the body to some extent. Good sources of alpha-linolenic acid include flaxseed and flaxseed oil, walnuts, and pumpkin seeds. However, the conversion rate varies considerably and can be influenced by genetic factors, gender, health, age, and diet (6, 19).

Without supplements or fortified products, it can also be difficult to achieve a sufficient intake of certain vitamins and minerals, such as vitamin B_{12}, iodine and vitamin D (5, 19). An adequate intake of vitamin B_{12} and iodine during pregnancy and while breastfeeding is essential for normal development of the brain and nervous system in the foetus and breastfed infant. In adults, long-term subclinical vitamin B_{12} deficiency is associated with, inter alia, dementia (5). A supplement containing various vitamins and minerals, including vitamin B_{12}, vitamin D and iodine, is therefore recommended for vegetarians and vegans (1). The different supplements have slightly different content of nutrients.

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In some supplements, the vitamin B_{12} content is higher than the recommended intake. The usual mechanism of uptake for this vitamin, via intrinsic factor, is normally saturated at about half the recommended intake of a meal. To increase the uptake, supplements or fortified products can therefore be consumed in two different meals. Another uptake mechanism is via passive diffusion, with approximately a 1 % uptake of higher doses (20). This is the reason why some supplements have a much higher vitamin B_{12} content than the daily requirement (4). This vitamin has low toxicity, and taking more than the recommended dose is not considered a risk.

Marine plants such as seaweed and kelp have a high iodine content, and some types have dangerously high amounts of iodine. It is therefore important to know the iodine content and adjust the intake accordingly if marine plants are to be used to meet a person's iodine requirement. Dietary supplements are often a safer alternative in terms of iodine (1, 21). Many plant-based drinks are fortified with calcium and various vitamins, including vitamin B_{12}, and those fortified with calcium contain as much calcium as cows' milk. About a half-litre of plant-based drinks fortified with calcium per day, together with calcium-rich foods such as green vegetables and almonds, will provide a sufficient intake. It should be noted that organic plant-based drinks do not contain added vitamins or minerals.

Follow-up and relevant blood tests

When monitoring those following a vegetarian or vegan diet, certain essential nutrients can be measured in blood samples. Because vitamin B_{12} deficiency can have significant negative consequences, and because not everyone knows

which supplements and fortified products they should take, vitamin B_{12} should be given special attention (19). When assessing vitamin B_{12} status, vitamin B_{12} and methylmalonic acid (MMA) levels should be measured, possibly also homocysteine. Haemoglobin and the size of the blood cells can also be measured, but anomalies here are not a specific indicator of vitamin B_{12} deficiency. An annual assessment of vitamin B_{12} status is recommended, and because the body's B_{12} reserves can last for several years before falling below the reference range, status checks are particularly important in the first few years following the introduction of a vegetarian or vegan diet.

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The incidence of iron deficiency anaemia is roughly the same in vegans as in the rest of the population (5, 22). Women of childbearing age lose iron through menstruation, and the monitoring of iron stores (ferritin) can be well advised. Vitamin D status should be assessed by the measurement of 25-hydroxy vitamin D concentration in serum. There are few sources of this vitamin in a vegetarian and vegan diet and serum levels will often be low if adequate supplements are not taken. In contrast, iodine status cannot be measured from a blood sample. In research projects, iodine in urine is used as a biomarker, but in clinical practice the intake is often estimated, e.g. by asking if patients use a dietary supplement, or consume dairy products (cows' milk, yogurt, brown cheese) or plant-based drinks that contain iodine.

With good advice and follow-up from doctors and other healthcare personnel, a well-balanced vegetarian and vegan diet, along with the necessary supplements or fortified products, can contribute to a good nutritional status and good health. Practical advice is available at Helsenorge.no.

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