
Vegetarian and vegan eating

Summary

- Vegetarians don't eat meat for a range of health, environmental, ethical, religious or economic reasons.
 - There are many different types of vegetarianism.
 - A well-planned vegetarian diet can meet nutritional needs during all stages of life.
 - Some nutrients, such as protein, iron, calcium, zinc, vitamin B12 and vitamin D can be harder to obtain from some types of vegetarian diets.
 - Special care needs to be taken during pregnancy, breastfeeding and with children on vegetarian and, especially, vegan diets.
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A vegetarian diet is one that does not include any meat or seafood. However, there are many variations to this – some people following a vegetarian diet may eat eggs and dairy foods, while others may avoid one or both.

A vegan diet is another form of vegetarianism where only plant foods are eaten and all foods from animal sources are avoided (meat, seafood, dairy, eggs and sometimes honey and gelatine).

Vegetarian diets can have many health benefits. They can offer all the essential vitamins and minerals necessary for a long and healthy life provided they are well-planned.

Breastfeeding mothers and children who have a vegetarian diet need to take particular care to make sure they get all the essential nutrients they need for healthy growth and development.

Types of vegetarian diets

Although 'vegetarian' usually means 'plant-based' there are a few different types of vegetarian diets. What version of vegetarian diet a person follows depends on many things including health, environmental, ethical, religious or economic reasons.

The main types of vegetarianism are:

- **Lacto-ovo-vegetarian** – people who do not eat any meat and seafood, but include dairy foods (such as milk), eggs and plant foods
- **Lacto-vegetarian** – people who do not eat meat, seafood and eggs, but include dairy foods and plant foods
- **Ovo-vegetarian** – people who do not eat meat, seafood and dairy foods, but include eggs and plant foods
- **Vegan** – people who avoid all animal foods and only eat plant foods.

Two other diets that are not strictly vegetarian but still focus on reducing or limiting the amount of animal products eaten are:

- **Pescetarian** – people who do not eat any meat, but include seafood, dairy foods, eggs and plant foods
- **Flexitarian** – people who mainly have a plant-based diet but that sometimes includes small portions of meat and seafood; sometimes also called 'semi-vegetarian'.

People following pescetarian or flexitarian diets often do so to get the health benefits of eating a largely vegetarian diet without giving up meat entirely.

Health benefits of a vegetarian diet

A well-balanced vegetarian or vegan diet can provide many health benefits, such as a reduced risk of chronic diseases, including:

- **obesity**
 - coronary **heart disease**
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- **hypertension (high blood pressure)**
- **diabetes**
- some types of **cancer**.

Vegetarians and vegans also have lower rates of illness and death from some degenerative diseases.

Meeting nutritional needs on a vegetarian diet

If you choose to be vegetarian or vegan, plan your diet to make sure it includes all the essential nutrients. This is even more important if you are **pregnant**, planning a pregnancy, breastfeeding or have young children following a vegetarian diet. **Eating a wide variety of foods** will make it easier to meet your nutritional requirements.

Essential nutrients that are harder to obtain in a vegetarian diet, if not carefully planned – include protein, some minerals (especially iron, calcium and zinc), vitamin B12 and vitamin D.

Protein sources for vegetarians

Protein is essential for many bodily processes, including tissue building and repair. Protein is made up of smaller building blocks called amino acids. These amino acids are classed as non-essential (can be made by the body) and essential (must be obtained through the diet).

A 'complete' protein has all the nine essential amino acids necessary for dietary needs. Most plant foods, however, are not complete proteins – they only have some of the nine essential amino acids. **Soy products**, quinoa and amaranth seeds are some of the few exceptions of a complete vegetable protein.

It was once thought that vegetarians and vegans needed to combine plant foods at each meal to ensure they consumed complete proteins (for example, baked beans on toast). Recent research has found this is not the case.

Consuming various sources of amino acids throughout the day should provide the complete complement of protein. Generally, if **energy (kilojoules or calorie)** intake is sufficient, vegetarian diets can meet or exceed their protein requirements, but some vegan diets may be low in protein.

Some good vegetarian sources of protein include:

- legumes (such as beans, peas and lentils)
- **nuts and seeds**
- soy products (including soy beverages, tempeh and tofu)
- **whole (cereal) grains** (such as oats and barley)
- pseudo-cereals (such as quinoa and amaranth)

It's recommended that vegetarians and vegans eat legumes and nuts daily, along with wholegrain cereals and pseudo-cereals, to ensure adequate nutrient intakes.

Minerals for vegetarians

If you're following a vegetarian or vegan diet, you need to make sure you get the right amount of essential dietary minerals.

Some of these minerals and their suggested food sources include:

Iron

Iron is an important mineral that is involved in various bodily functions, including the transport of oxygen in the blood.

Although vegetarian and vegan diets are generally high in iron from plant foods, this type of iron, called non-haem iron, is not absorbed as well as the iron in meat (haem iron). Combining non-haem iron-containing foods with foods high in vitamin C and food acids (such as **fruit and vegetables**) helps your body absorb the iron.

Good vegetarian food sources of iron include:

- cereal products fortified with iron (such as breakfast cereals and bread)
- wholegrains
- legumes
- tofu
- green leafy vegetables
- dried fruits.

Zinc

Zinc performs numerous essential functions in the body, including the development of **immune system** cells.

Good vegetarian food sources of zinc include:

- nuts
- tofu
- miso
- legumes
- wheatgerm
- wholegrain foods.

Calcium

Calcium is vital for strong bones and teeth. It also plays a crucial role in other systems of the body, such as the health and functioning of nerves and muscle tissue.

Good vegetarian food sources of calcium include:

- **dairy products**
- plant-based milk drinks fortified with calcium (check the label)
- cereals and fruit juices fortified with calcium (check the label)
- tahini (sesame seed paste)
- some brands of tofu (check the label)
- leafy dark green vegetables (especially Asian greens)
- legumes
- some nuts (such as almonds and Brazil nuts)

Iodine

Dietary **iodine** is needed to make essential thyroid hormones involved in metabolic processes. This includes growth and energy use, as well as brain and bone development during pregnancy and in early childhood.

Good vegetarian food sources of iodine include:

- bread (except those marked as 'organic' or 'no added salt')
- dairy products
- **eggs**
- seaweed
- some plant-based milk drinks that include seaweed extracts (check the label)
- iodised **salt**.

Vitamin B12 sources for vegetarians

Vitamin B12 is important for red blood cell production – it helps to maintain healthy nerves and a healthy brain. People following a vegan diet are at risk of developing vitamin B12 deficiency because it is only found in animal products.

Vegetarian sources of vitamin B12 include:

- dairy products
- eggs
- some soy beverages (check the label)
- some vegetarian sausages and burgers (check the label).

(Although it's often believed that mushrooms, tempeh, miso and sea vegetables are a source of B12, this is not true. These foods contain a compound with a similar structure to B12, but it doesn't work like B12 in the body.)

If people following a vegan diet don't get their B12 requirement from these foods, they are advised to take B12 supplements to avoid vitamin B12 deficiency – including **anaemia**. This is particularly important for breastfeeding mothers where vitamin B12 deficient breastmilk can interfere with normal brain development of the baby.

Vitamin B12 absorption becomes less efficient as we age, so supplements may also be needed by older people following a vegetarian diet.

Check with your doctor before starting on any **vitamin and mineral supplements**.

Vitamin D sources for vegetarians

Vitamin D is important for strong bones, muscles and overall health. Although small amounts of vitamin D are present in food, it is not a true 'vitamin' because it can also be produced by the body after exposure to UV radiation in sunlight.

The main source of vitamin D for most Australians is sunlight. There are few foods that contain significant amounts of vitamin D. There is very little vitamin D in most people's diets, unless they eat fatty **fish**, eggs, liver or foods fortified with vitamin D (such as margarine). Fortified low-fat and skim milk is another source of vitamin D, but it is present in low amounts.

Vegetarian sources of vitamin D include:

- eggs
- some margarines (check the label)
- some cereals (check the label)
- some dairy and plant-based milk drinks (check the label).

As the sun is also a major source of vitamin D, dietary intake is only important when exposure to UV light from the sun is inadequate – such as people who are housebound or whose clothing covers almost all of their skin.

Vegetarian and vegan eating throughout life

Well-planned vegan and vegetarian diets can be appropriate for all stages of a person's life. However, special care needs to be taken for vegetarian diets during pregnancy and breastfeeding, and infancy and childhood. This especially applies to those who follow a vegan diet.

Strict vegan diets are not recommended for very young children.

Vegetarian and vegan eating during pregnancy

A **vegetarian diet can be safely followed during pregnancy** provided you eat regularly to ensure you have enough energy. Include a variety of foods from the five food groups each day to meet your nutrient needs.

Most women will need supplements of nutrients that are difficult to obtain just from food (such as **follic acid** and iodine). Vitamin B12 supplements will also be needed for women following vegan diets for optimal brain development in their baby.

Vegetarian and vegan eating while breastfeeding

If you are **breastfeeding** and on a vegetarian diet, you can obtain all the nutrients and energy you need as long as you **include a wide range of foods from the five food groups each day**. Depending on your individual circumstances, supplements may be recommended by your health professional.

If you are breastfeeding and on a vegan diet, a **vitamin or mineral supplement** may be required. This is particularly the case with vitamin B12. A severe lack of vitamin B12 in breastmilk can interfere with a baby's brain development and can also cause anaemia in the mother.

Breastfeeding mothers on vegan diets are recommended to continue to breastfeed – ideally for two years or longer.

Check with a dietitian to make sure your diet contains the right amount of energy and nutrients to support your health and wellbeing and the optimal development of your infant, especially if you are exclusively breastfeeding or following a vegan diet.

Vegetarian and vegan eating for babies and young children

Up to the age of six months, babies only need breastmilk or infant formula.

From around six months, most babies are ready to be introduced to solids – although breastmilk or infant formula are still their main source of nutrition until 12 months.

Vegetarian and vegan foods can be safely introduced to babies and young children, provided all their energy and nutrient needs are met. This requires careful planning.

For some babies – especially those being introduced to vegan eating, supplements may be recommended to ensure some essential nutrients typically provided by animal-based foods are supplied in adequate amounts (such as iron and vitamin B12).

As children grow, they need loads of nutrients – a vegetarian diet should include:

- Protein alternatives (such as nuts, eggs, legumes and tofu).
- Energy for growth and development.
- Iron to prevent anaemia.
- Vitamin B12.
- Vitamin D and calcium to prevent bone disease.
- Suitable fats from non-meat sources.
- Food in the correct form and combination to make sure nutrients can be digested and absorbed (such as foods high in vitamin C alongside iron-rich plant foods).

If you wish to introduce your child to vegetarian or vegan eating, seek advice from a dietitian, doctor or your maternal and child health nurse to ensure they are getting essential nutrients for optimal growth and development.

From around six months, solids **from all five food groups** should be introduced gradually, with first foods being rich in iron, protein and energy for growth.

Iron is important for babies and children

Iron is an important nutrient for growth and is vital for babies and young children. By six months of age, the stores of iron a baby has built up during pregnancy are usually depleted, which is why their first foods need to be iron-rich.

This is important for babies following vegetarian and vegan diets because vegetarian sources of iron ('non-haem' iron) tend not to be as easily absorbed by the body as animal sources of iron ('haem' iron).

Combine foods containing vitamin C with foods that are high in iron – such as offer an orange with baked beans on toast. Vitamin C enhances the absorption of iron.

Non-animal sources of iron include:

- plain cooked tofu, pulses and legumes (such as baked beans, lentils, chickpeas, red kidney beans, butter beans, cannellini beans, borlotti beans)
- dark green vegetables (such as spinach, broccoli, green peas and kale)

- ground seeds and nuts (such as almond meal or smooth nut butters to reduce the risk of choking)
- dried fruits (such as figs, apricots and prunes) – offer with meals rather than on their own as they can stick to budding teeth and promote tooth decay)
- baby cereals fortified with iron

Cook pulses thoroughly to destroy toxins and to help digestion. Undercooked pulses can cause vomiting and diarrhoea in young children.

Babies and children on vegetarian and vegan diets have high-energy needs

If your child’s diet is high in fibre, their little tummy can easily feel full before they’ve consumed enough energy or nutrients to meet their needs. High fibre foods can also lead to poorer absorption of some nutrients (such as iron, zinc and calcium).

Babies and children on vegetarian or vegan diets can get enough energy and boost their absorption of nutrients by eating a wide variety of foods and including lower fibre foods (such as white bread and rice), in addition to wholegrain and wholemeal varieties.

Another way to ensure vegetarian children meet their energy needs is to give them frequent meals and snacks.

Feed and sleep patterns vary from baby-to-baby, as well as with age. A 7–9-month-old baby’s feed and sleep pattern might look something like this table:

On waking	On waking Breastmilk or formula feed
Breakfast	Iron-fortified baby cereal or similar
	Finger food (e.g. soft fruit)
Sleep	
Lunch	Savoury meal (e.g. spinach and lentil dahl)
	Finger food (e.g. cooked pasta pieces)
	Breastmilk or formula feed
Sleep	
	Dinner Savoury meal (e.g. chickpea and vegetable stew)
	Finger food (e.g. cooked vegetables)
	Breastmilk or formula feed
Before bed	Breastmilk or formula feed

This is an example only – your child’s eating and **sleep and settling routine** may be different.

Try to include a mixture of refined and unrefined (wholegrain) cereals and a variety of energy-giving foods in your child’s diet:

- hummus and other bean/pulse dishes
- full-fat dairy (such as yoghurt, cottage cheese and custard)
- well-cooked egg
- smooth nut and seed butters (such as peanut, almond and tahini)

- avocado
- starchy foods (such as pasta, flour, white rice, white bread and potatoes)
- **vegetable oils** (such as extra virgin olive oil and canola oil) or vegan spreads in cooking.

Milk, infant formula and plant-based milks

Up to the age of six months, breastmilk or infant formula is the only food your baby needs.

Until 12 months, breastmilk or infant formula should still be the main drink, although small amounts of full-fat cow's milk can be used in cooking. Goat's or sheep's milk is not recommended. Do not give your child **unpasteurised milk (raw milk)** – it can cause **gastrointestinal illnesses**.

Plant-based milks such as soymilk (except soy follow-on formula) and other nutritionally incomplete plant-based milks (such as rice, oat, coconut or almond milk) are not suitable alternatives to breastmilk or infant formula for babies under 12 months.

After 12 months, under the guidance of your nurse, doctor or dietitian, full-fat fortified soy drink or calcium-enriched rice and oat beverages (at least 100mg of calcium per 100mL) can be used. Your child's diet should contain other adequate sources of protein and vitamin B12 before these milks are introduced.

If you are going to place your child on a vegetarian or vegan diet, seek advice from a health professional on how to maintain a balanced diet and any supplements needed.

Where to get help

- Your **GP (your doctor)**
- **Dietitians Association of Australia** Tel. **1800 812 942**
- Your **maternal and child health nurse**
- **Australian Breastfeeding Association** Tel. **1800 686 268**

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