

## Vegetarians

### Trends in vegetarianism

In the UK, the number of vegetarians has increased over the last few years and is now estimated at about 7% of the population, most prevalent in ♀, young people and adolescents, black and minority ethnic groups, and higher socio-economic groups. It is important to respect the individual's choice when giving dietary advice.

Common reasons for choosing a vegetarian diet include:

- Religion (e.g. strict Hindus, Buddhists, and 7th Day Adventists);
- Cultural;
- Ethical, moral, or political beliefs;
- Environmental concerns for use of world resources;
- Animal welfare;
- Perceived health benefits;
- Food safety scares;
- Limited availability of halal or kosher meat;
- Financial constraints.

### Types of vegetarian diets

One cannot always categorize individuals along these lines, as there is a large variation, so health professionals should avoid making assumptions about which foods are acceptable, but generally vegetarians fall into the groups shown in Table 13.4.

**Table 13.4** Types of Vegetarian diet

Type of vegetarian	Eggs*	Dairy	Fish and shellfish	Poultry	Red meat†
Vegan	x	x	x	x	x
Lacto-vegetarian	x	✓	x	x	x
Lacto-ovo-vegetarian	✓	✓	x	x	x
Demi-vegetarian	✓	✓	✓	✓	x
Piscatarian	✓	✓	✓	x	x
Macrobiotic	x	x	✓‡	x	x
Fruitarian	x	x	x	x	x

\* Possibly free-range only.

† Beef, lamb, pork; also sometimes their derivatives, e.g. gelatine, rennet.

‡ Eaten at certain lower 'levels' of macrobiotic diet. Highest level eliminates everything except brown rice and water.

### Is a vegetarian diet a risk for health?

A well balanced vegetarian diet can be nutritionally adequate for all age groups **BUT** times of extra nutritional requirements need specific attention: pregnancy, lactation, infancy, childhood, and adolescence. Children consuming a well balanced vegetarian diet should meet all requirements for growth. A well-planned vegetarian diet is more likely to comply with food-based dietary guidelines for reducing long-term risk of certain nutrition-related chronic diseases (NCD). There is evidence that vegetarians suffer less NCD than non-vegetarians, but this may be due to vegetarians adopting other health-promoting behaviours, e.g. being physically active, avoiding smoking, or drinking less alcohol. However, those who rely heavily on full-fat cheese and dairy foods could have a high saturated fat diet.

❗ Diets that are unbalanced or more restrictive, e.g. strict macrobiotic, fruitarian, are likely to result in nutrient deficiencies and need particular attention, especially in infants, children, and pregnant and lactating women. Referral to a dietitian for assessment is essential.

#### Vegetarian groups at risk of an unbalanced diet

- Vegans
- Macrobiotics
- Fruitarians
- Strict Asian vegetarians
- Pregnant and lactating vegans
- Vegan infants and children
- Adolescent vegetarians
- 'New' vegetarians
- Vegetarians with an erratic eating pattern

#### Possible nutrients needing special attention for vegetarians

The main nutrients to keep an eye on are: protein, energy, vitamin B<sub>12</sub>, vitamin D, calcium, and iron. Iodine (vegans) and zinc intakes should also be verified.

##### Energy

Energy intake is only usually of concern for vegans and those with more restrictive macrobiotic and fruitarian diets. They need to avoid a low energy diet that is too bulky and rich in fibre for infants and children as this could restrict growth; vegan children tend to be leaner than omnivores. See 'Nutritionally vulnerable groups' in Chapter 10.

**Protein**

Protein intakes usually meet recommendations in well-balanced vegetarian diets. Protein is usually adequate if the diet contains a variety of the following (2–3 serving/day):

- Nuts and seeds, peanut butter;
- Beans and pulses, e.g. baked beans, red kidney beans, soya beans, chick peas, lentils, hummus;
- Soya products, e.g. bean curd (tofu), textured vegetable protein (TVP);
- Eggs;
- Dairy products: milk, cheese, yogurt, fromage frais.

For vegans, high quality protein (see 'Protein' in Chapter 5) can be achieved by 'protein complementing' but energy intakes need to be adequate; otherwise protein is used for energy. Protein complementing foods must be consumed on the same day, but not necessarily at the same meal.

High quality protein = grain (insufficient lysine) + pulse (insufficient methionine)

e.g. rice and dhal, beans on toast or rice and peas.

**Vitamin B<sub>12</sub>**

Animal foods are the main source of vitamin B<sub>12</sub>. (see 'Cobalamin B<sub>12</sub>', Chapter 5). Deficiency is rare but vegans and those following stricter macrobiotic and fruitarian diets need to be advised to consume suitably fortified foods:

- Yeast extracts/fortified vegetable stocks;
- Fortified rice and soya milks;
- Breakfast cereal fortified with B<sub>12</sub>;
- Fortified blackcurrant cordial;
- Fortified tinned spaghetti;
- Almonds.

If vitamin B<sub>12</sub> supplements are recommended these should not exceed the RNI. See DRV tables (Appendix 6).

NB. Vitamin B<sub>12</sub> analogues in seaweed and algae are not well absorbed.

**Vitamin D**

Vegetarians are no exception to the UK RNI for vitamin D that adults <65y and children >3y should meet their vitamin D requirement by solar UV radiation if living a normal lifestyle.

At risk groups that should take a daily supplement of Vitamin D are:

- Asian vegetarian children, adolescents, and women (see 'DRVs and dietary guidelines during pregnancy', Chapter 9);
- Children on strict vegan diets, especially African-Caribbean infants;
- Older vegetarians who are housebound or live in residential care.

### **Calcium**

Vegetarians who consume dairy products regularly are not at risk of calcium deficiency. Vegans, fruitarians, and macrobiotics may be at risk of deficiency. Three servings should be eaten daily from a variety of sources:

- Dairy products: milk, cheese, yogurt (if lacto-vegetarian);
- Tofu;
- Nuts: almonds, brazil, hazelnuts;
- Fortified soya or rice milks;
- Fortified bread;
- Green leafy vegetables, e.g. broccoli, spinach, rocket, watercress;
- Peas, beans and pulses, e.g. baked beans, red kidney beans, soya beans, chickpeas, broad beans;
- Sesame seeds, tahini;
- Dried fruit, e.g. apricots, figs;
- White bread and white flour products.

As vitamin D enhances calcium absorption, vegetarians at risk of poor vitamin D status in particular need to be encouraged to eat a variety of the above foods regularly. Vegan children and pregnant women should be referred to a dietitian who may recommend calcium supplements if dietary sources are insufficient.

### **Iron**

UK vegetarians generally consume similar intakes of dietary iron to UK non-vegetarians. However, non-haem iron (plant sources) is absorbed less readily than haem iron (animal sources). Vegetarians should be encouraged to consume a good source of vitamin C to help absorption, e.g. citrus fruits and juices, and avoid drinking tea at the same meal (↓ absorption). See 'Iron' and 'Vitamin C (ascorbic acid)', Chapter 5.

Good vegetarian sources of iron:

- Eggs;
- Wholemeal flour and bread;
- Breakfast cereals fortified with iron;
- Dark green leafy vegetables;
- Beans and pulses;
- Dried prunes, figs, and apricots;
- Yeast extract;

### **Iodine**

As milk is an important source of iodine in the UK, vegans, fruitarians, and macrobiotics are at risk of low intakes → ↑ levels of thyroid-stimulating hormone. Encourage vegans to use iodized salt or take iodine supplements.

### Zinc

Intakes of zinc by vegetarians and vegans are not lower than for omnivores. However, there is low bioavailability from plant sources due to phytates inhibiting zinc absorption;  $\therefore$  intakes of at least the RNI should be encouraged (7–9.5 mg/day in adults, depending on age and gender; see DRV tables, Appendix 6).

**Dietary guidelines for a balanced vegetarian diet** see 'Balance of good health' in 'Food-based dietary guidelines', Chapter 2.

### Vegetarians and pregnancy

Being vegetarian should pose no problem in pregnancy if the woman is well informed and eating a balanced lacto-ovo and lacto-vegetarian diet (see above). Pregnant vegan, fruitarian, and macrobiotic women should be seen by a dietitian to assess the overall nutrient adequacy of their diets. They may require supplementation of vitamin B<sub>12</sub>, iron, vitamin D, or calcium (if <600 mg/day consumed). Some fortified soya milks contain these nutrients.

Asian vegetarian women could be at risk of vitamin D deficiency if there is insufficient skin exposure  $\rightarrow$  neonatal hypocalcaemia and rickets,  $\therefore$  may need vitamin D supplements (see 'Minority ethnic communities', this chapter).

**Vegetarianism in childhood and adolescence** See 'Vegetarianism' in 'Nutritional problems of children and adolescents', Chapter 11.

**The vegetarian baby** See 'Nutritionally vulnerable groups' in Chapter 10.