

Introduction from Friendly Food

For most of us, food is more than a daily necessity. We get personal pleasure from it. We nurture our children with it. And sharing food around the table is at the heart of our family and social life. For some people, though, food intolerances can cause distressing—even dangerous—reactions, or chronic ill health, and that's why we wrote this book.

Based on more than 30 years of experience and research at the RPAH Allergy Unit and the University of Sydney, we've developed and refined a comprehensive dietary testing program that continues to be used throughout Australia to help people with food intolerances identify their problem foods and manage their daily diet.

Before the publication of the original edition of *Friendly Food* in 1991, there was virtually no reliable information of this kind available. In recent years there's been a worldwide surge of interest in food intolerances, and it's become increasingly common to find people avoiding various foods that they believe (rightly or wrongly) are responsible for their chronic ill health.

As a result, there's an ongoing need for a source of trustworthy information to help navigate the ever-changing, and often confusing, dietary advice with which we are constantly bombarded.

The dietary management information in *Friendly Food* has stood the test of time, its reliability reinforced by consistent feedback from users—patients, doctors and dietitians—around Australia. Its success is in no small part due to the dedicated team effort of our dietitian colleagues at the RPAH Allergy Unit (page 280) who provided a wide range of recipe ideas and helpful hints, and who helped our research students assess the nutritional adequacy, quality of life, and health outcomes of both adults and children on individually modified diets.

This new edition of *Friendly Food* features a completely revised set of recipes, all of which are strictly low chemical, gluten-free and dairy-free. There are also recipes for those people who are unable to tolerate egg, wheat and milk. More vegetarian alternatives have now been included, with the addition of new grain ingredients as well as recipes for risottos, salads, stir-fries and pasta sauces. All recipes now include relevant nutrition information, and the food chemical charts have been fully updated and made more user-friendly.

We're confident this new edition will continue to be a trusted and valuable resource to help people living with a food problem stay well and enjoy a full and rich life.



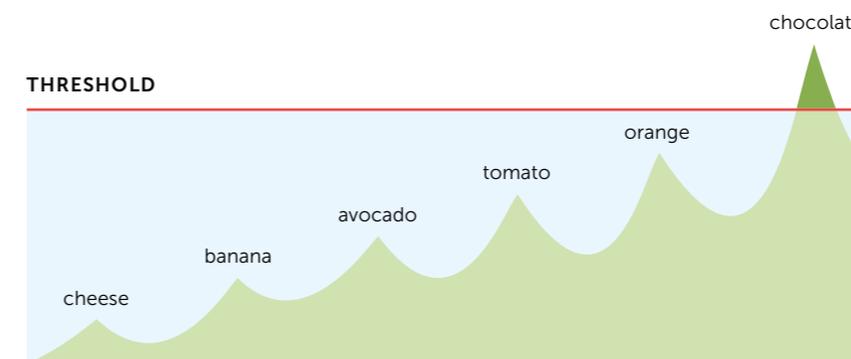
Tomatoes contain hundreds of chemicals that contribute to their unique flavour, including salicylates, amines and glutamate. The composition can vary according to fruit variety and time of season, and it changes as they ripen.

understanding food intolerances

Understanding the difference between intolerances and other types of food reaction is an important starting point because the approach to dealing with each of them is quite different. Unlike allergies, which are immune reactions to food proteins, intolerances don't involve the immune system at all. They are triggered by food chemicals that cause reactions by irritating nerve endings in different parts of the body, similar to the way that certain drugs can cause side-effects in sensitive people.

The chemicals involved vary from person to person, and are found in many different foods, so the management approach involves identifying the problem chemicals for each individual and reducing their daily intake of groups of foods, all of which contain the same offending substances. By contrast, the proteins responsible for allergies are unique to a single food (for example egg, milk, peanut, fish), and dealing with a food allergy involves identifying and avoiding all traces of that particular food.

Some people are born with a sensitive constitution and react more readily than others to food chemicals. The tendency is probably inherited, but environmental triggers—a sudden change of diet, a bad food or drug reaction, a nasty viral infection (for example, gastroenteritis, glandular fever)—can bring on symptoms at any age by altering the way the body reacts to food chemicals. Women often become more sensitive in their child-bearing years, perhaps due to hormonal changes, which might be nature's way of preventing pregnant and breast-feeding women from eating foods that could harm a developing baby.



CHEMICAL THRESHOLD

The small amounts of natural chemicals present in a particular food may not be enough to cause a reaction straight away. However, because one substance may be common to many different foods it can accumulate in the body, causing a reaction when the threshold is finally exceeded. On this graph, all the foods shown contain natural amines. Although the last food eaten (chocolate) is often blamed for a reaction, all the others have contributed as well.



Babies are more vulnerable to food chemicals because their metabolism, gastrointestinal and nervous systems are immature, leading them to prefer bland foods. As children mature, their bodies become accustomed to handling more of the rich, spicy and highly flavoured foods enjoyed by the rest of the family.

When *Friendly Food* was first published, little was known about why some people are sensitive to certain food chemicals and how these trigger individual symptoms. Since then, as a result of the genomics revolution, there's been an explosion of knowledge about how our 'chemosensory' system (that is, the taste, smell and sensory nerves and the specialised chemosensory cells present throughout all our mucous membranes) react to the chemicals in our diet and environment. Although many mysteries remain, a broad picture of the complex biological basis of food intolerance reactions is beginning to emerge.

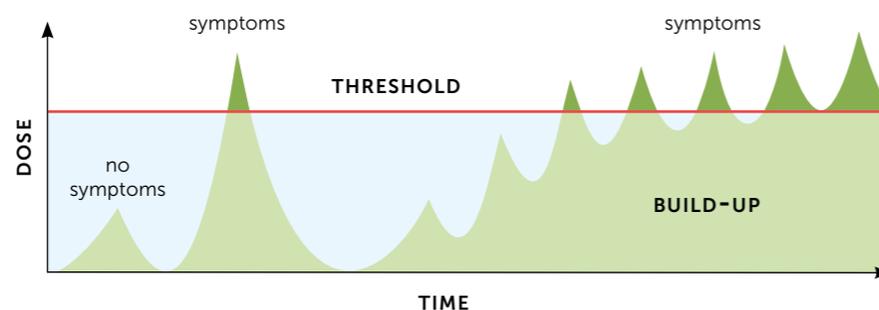
natural food chemicals

Chemicals are found everywhere in nature, including in foods. Some can be beneficial in small amounts—for example, the vitamins we need for good health, and the flavour and aroma substances that make foods so enjoyable. On the other hand, many plants contain substances that are poisonous to humans, and of course we avoid cultivating these as foods.

The staple foods we eat today have been selected by trial and error over thousands of years, both for their nutritional value and because most people can tolerate the low levels of natural chemicals present without getting sick. However, even these can cause illness if excessive amounts are consumed. This is the main reason for recommending that people eat a varied diet, and have all foods in moderation.

DOSE DEPENDENCE

Food intolerance reactions are dose dependent. A small amount of a chemical-rich food (for example one or two strawberries; a slice of fresh tomato) may cause no symptoms, whereas a larger amount that exceeds your dose threshold (for example a whole punnet of strawberries; tomato concentrated as a sauce or paste) can provoke a reaction. Eating small amounts regularly can cause a gradual build-up, with symptoms developing after a few days.



Foods vary tremendously in chemical composition. The natural substances most likely to upset sensitive individuals—salicylates, amines and glutamate—are the ones common to many different foods and are therefore consumed in the greatest quantity in our daily diet. As a rule, the tastier a food is, the richer it's likely to be in natural chemicals. A comprehensive list of foods and their natural chemical content is shown in the charts on pages 21–33.

food additives

People who are sensitive to natural food chemicals are often also sensitive to one or more of the common food additives, such as preservatives and artificial colours and/or flavourings. Reactions to these can be easier to recognise than reactions to natural chemicals because the higher doses present in processed foods trigger more immediate symptoms, making the cause-and-effect relationship more obvious.

As with natural chemicals, individuals vary in their sensitivity to particular additives, and it's often worthwhile testing this out systematically rather than trying to avoid all additives. The ones most likely to be a problem in people with food intolerances are listed on page 21, along with their code numbers.

food intolerance reactions

If you're susceptible to food intolerances, your reactions will depend on several factors: what symptoms you're prone to; what chemicals you're sensitive to; your degree of sensitivity to each chemical; and how much of each chemical you consume from all food sources on a daily basis.

Symptoms vary from person to person. The commonest symptoms are stomach and bowel problems, nausea, headaches, recurrent hives and swellings, and reflux (with heartburn, throat irritation and/or sinus trouble). Some people can feel vaguely unwell, with flu-like aches and pains, or can get unusually tired, run-down or moody—often for no apparent reason. Children can become irritable and restless, and behavioural problems can be aggravated in those with nervous system disorders such as ADHD (attention deficit hyperactivity disorder). Even breast-fed babies can have reactions as a result of chemicals from the mother's diet getting into the breast milk, causing reflux, colicky irritable behaviour, loose stools, eczema and nappy rashes.

Various combinations of natural chemicals and/or food additives can be responsible for provoking symptoms in susceptible individuals. The *Friendly Food* charts on pages 21–33 will help you work out which particular ones might be involved in your case.

SALICYLATES are a family of chemicals produced by plants for defence against insects, pests and microbial attack. They are present in many fruits, vegetables, herbs and spices, honey, tea, coffee, beer and wines.

AMINES are a diverse group of amino acid-derived substances with a wide range of biological functions. High levels are present in cheese, chocolate, wine and other fermented foods, and in fruits such as banana, avocado and tomato.

GLUTAMATE is an amino acid building block present in all proteins. In its free form, not linked to proteins, it enhances the flavour of food. This is why foods rich in glutamate (such as tomato, cheese, stock cubes) are used in many meals, and why pure MSG is added to noodles, soups, sauces and many dishes in Asian cooking.

Natural chemicals can be minimised in fruit and vegetables by:

- * peeling the skin
- * boiling in water
- * discarding the bitter outer leaves of lettuce, cabbage, brussels sprouts and the outer stalks of celery.

Avoid juicing fruit and vegetables, which increases the content of natural chemicals.



The degree of sensitivity to particular food chemicals varies—the more sensitive you are to a particular chemical, the less tolerant you'll be of foods containing that substance. The timing and severity of reactions can vary too. Symptoms can begin within an hour or two, or may be delayed by several hours or days; mild reactions can be brief—a few hours—but more severe ones can sometimes go on for several days.

Food intolerance reactions depend on the dose ingested of each of the relevant chemicals—amount and frequency—from all food sources. If you're not too sensitive (with a high 'dose threshold') you may only react after a particularly rich meal or after bingeing on fruits, juices or processed foods. Reducing your intake of these may be all you need to do to stay well.

However, if your chemosensory system is highly irritable you may be at the other end of the sensitivity spectrum, with a low dose threshold. In this case, recurrent or chronic symptoms can develop insidiously from the cumulative effects of small amounts of natural chemicals present in many otherwise 'healthy' foods. As a result, you'll need to be much more careful with what you eat on a daily basis in order to stay well.

dealing with food intolerances

The hints in this book may be enough to get you on the right track, but before making any major change to your diet you should go and see your doctor. Food intolerances can be distressing, but they don't cause permanent damage to the body. If you have persistent symptoms it's a good idea to first make sure some serious disease hasn't been overlooked.

If you're having trouble working out which foods are upsetting you, you may need professional help to investigate the problem by systematic dietary elimination and challenge testing. A dietitian with experience in the field can advise you how to identify the substances involved and manage your diet using the *Friendly Food* charts on pages 21–33, together with resources available from our website (www.allergy.net.au).

Whatever the outcome, don't be discouraged—food intolerances can improve over time as your chemosensory system readjusts. You may well be able to build up your tolerance level by gradually increasing the amount and variety of 'moderate' foods over several weeks or months. Eventually, you may be able to return to a more normal diet. Even if this is not possible, you'll learn how to balance the inconvenience of restricting your dietary choices against the benefits of being free from distressing symptoms.

understanding food allergies

Allergies occur in 'atopic' people—those born with an overactive immune system that, when stimulated by exposure, is predisposed to produce specific 'IgE' antibodies against otherwise harmless protein substances ('allergens') in the environment or diet. Children with eczema are particularly prone to becoming sensitised to foods through contact with dry or inflamed skin.

Egg, milk, peanut and seafoods have been recognised as common food allergens since the early twentieth century. However, in the last two to three decades, probably as a result of changes in lifestyle and the way we eat, there's been a sharp increase in the incidence of allergies to peanuts, cashews and other tree nuts, particularly among young children. Fortunately, most grow out of their egg and milk allergies during later childhood or their teenage years, but peanut, tree nut and seafood allergies tend to persist into adult life.

Allergies to certain other foods such as wheat and soy can occur, but are less common and tend to be mild and transient. In cooler climates where birch pollen allergies are common, atopic people can develop localised oral allergy reactions to certain raw fruits and vegetables; however, with the exception of kiwifruit and one or two others, most reactions to vegetables, fruits, herbs and spices are due to chemical intolerances rather than allergies.

food allergy reactions

Acute food allergy reactions begin soon after ingestion and can vary in severity. Mild/moderate reactions (hives, stomach cramps, nausea, vomiting) can be transient, but may progress to life-threatening anaphylaxis, with rapidly spreading hives, tissue swelling, breathing difficulty and/or collapse.

People with a documented food allergy who are at risk of anaphylaxis are provided with an adrenaline auto-injector (EpiPen®) to have on hand at all times. This can be self-administered or given by a bystander as first aid treatment in the event of a severe reaction.

testing for food allergies

IgE antibodies to specific food allergens can be detected by skin-prick tests or blood tests (RAST). As a rule, the higher the antibody levels, the more likely the person is to develop an allergic reaction after eating the food. If there is uncertainty about the diagnosis, a graded-dose food challenge can be performed under medical supervision.



COMMON FOOD ALLERGENS

- * Egg
- * Kiwifruit
- * Milk
- * Peanut, tree nuts
- * Seafood
- * Sesame
- * Soy
- * Wheat

tick-related red meat allergies

In recent years it's been recognised that people who've previously had tick bites can develop unusual delayed-onset anaphylaxis episodes three to six hours after eating red meat (beef, lamb, pork). The incidence is increasing among people living in areas where tick contact is becoming more frequent due to habitat changes. In this condition, the IgE antibodies are specific for a mammalian allergen known as 'alpha-Gal'.

wheat- and gluten-related reactions

IgE-mediated wheat allergy

Wheat allergy in young children is relatively common and almost always occurs together with allergies to other foods such as milk and egg. Usually it's mild and transient, but occasionally it can cause anaphylaxis and may persist into the teenage years.

A rare form of wheat allergy can develop in adults, with anaphylaxis triggered by exercise if the person has eaten wheat two to four hours beforehand. This sequence of food followed by exercise is required for the allergic reaction to occur—wheat alone or exercise alone will cause no problems. The IgE antibodies characteristic of this condition are specific for a particular wheat protein (omega-5 gliadin) and can be detected by a RAST blood test.

coeliac disease

Coeliac disease is caused by an immune reaction to gluten, a protein found in wheat, barley and rye. The reaction causes inflammation and damage to the lining of the small bowel, which impairs its ability to absorb nutrients.

Coeliac disease occurs in people with a genetic susceptibility, and can develop at any stage of life. Typical symptoms include fatigue, bloating, cramps and diarrhoea, but some people have no symptoms at all, and in others the only clue may be anaemia (due to iron or folic acid deficiency) or an unusual itchy skin rash (dermatitis herpetiformis). Coeliac disease often runs in families and can be associated with diabetes and/or thyroid disease.

Screening blood tests (to detect antibodies to tissue transglutaminase and gliadin) are available; if they are positive, a small bowel biopsy should be



FADS AND FASHIONS

Popular diets come and go, depending on what theories are currently in fashion. Those based on elimination of various food groups (for example wheat, milk, yeast, sugar, 'nightshades', 'acid' foods) or particular dietary components (for example FODMAPs) also eliminate a wide range of foods that are rich in natural chemicals, so it's not surprising that people with food chemical intolerances who follow these popular diets often feel better, at least temporarily.

If your health improves on one of these diets, it's easy to jump to the conclusion that you've identified the problem. However, when symptoms recur (as they usually do) you'll need to adopt a more systematic approach to tracking down the real culprits. The charts and recipes in *Friendly Food* are an excellent starting point.

performed to confirm the diagnosis. The blood tests can become negative after a few months of strict gluten avoidance, so if you think there's a possibility you might have coeliac disease it's best to have the blood tests before you go on a gluten-free diet. If you're already avoiding gluten, four to six weeks of regular gluten ingestion is required before having blood taken for screening.

Currently, a life-long gluten-free diet is the only known treatment. Untreated coeliac disease carries a long-term risk of nutritional deficiencies, osteoporosis and/or bowel malignancy.

non-coeliac gluten intolerance

Many people with an irritable bowel experience improvement with gluten avoidance and find that eating wheat causes a relapse of symptoms, even though they don't have coeliac disease. This has come to be known as 'non-coeliac gluten intolerance', but from our observations it's rarely an isolated problem. If you've identified gluten as a problem, it's very likely that you also have unrecognised intolerances to one or more of the natural food chemicals, milk and/or soy.



DIAGNOSIS OF FOOD INTOLERANCE

There are no reliable skin or blood tests for diagnosis of food intolerances. Food intolerances are diagnosed by a dietary elimination and challenge process.

cultivating your microbiome

gut microbes

We live in a world dominated by microbes. Like all plants and animals, we've developed mutually beneficial relationships with an array of microbial species—bacterial, fungal, viral—that inhabit all our internal and external body surfaces. They are collectively known as our 'microbiome'. The great majority live in the colon, which has a complex ecosystem determined by our dietary habits, ethnic origin, where we live and who we associate with. Our microbiome also varies throughout the life-cycle and can change from day to day, depending on what we eat and our state of health.

The bacteria we cultivate in our colon serve us by extracting additional nutrients from indigestible components of our diet, and by protecting us from hostile invasion by disease-causing organisms ('pathogens'). In return, we provide them with a warm and friendly environment and an ongoing supply of nutrients to support their growth and survival.

Exploring the role of the microbiome in various diseases is a rapidly evolving field of research, but whether changes observed in particular conditions are causal or simply a consequence of associated dietary variations remains uncertain. However, it's becoming clear that there's no such thing as a 'normal' or 'healthy' microbiome; categorising bacteria as 'good' and 'bad' is overly simplistic; and the notion of 'imbalance' (or 'dysbiosis') is questionable.

fibre and fermentation

Complex carbohydrates are variously linked sugar chains, many of which we are unable to digest. These pass through the small intestine into the colon, where they're broken down into component sugars by our resident microbes and used as their primary source of energy.

This fermentation process generates short-chain fatty acid by-products, which for us serve as a source of additional energy, as well as having a range of regulatory effects on our bowel function and metabolism. Fermentation also generates gases (some of which are smelly) and a variety of other chemical by-products.

'Fibre' is an all-encompassing term used to describe a diverse range of non-digestible carbohydrates, but the definition is rather loose and many experts now prefer to call them 'microbiota-accessible carbohydrates' (MACs).



Although standard dietary guidelines categorise fibre as a nutrient, and set recommended intake levels based on population studies, there are no specific deficiency disorders that can be attributed to inadequate fibre intake.

The degree of digestibility—and consequent availability for fermentation—of different types of fibre is influenced by many factors, including how foods are stored, processed and cooked, and even by how well we chew them.

The question of how much, and what type of, fibre should be included in a person's diet is a matter of individual choice. The sensory nerve endings in our bowel wall can react to products of fermentation, and if you have a hypersensitive bowel—with wind, cramps and diarrhoea—you may feel better by reducing your MAC/fibre intake.

fermentable sugars

lactose intolerance Lactose is the natural sugar present in all mammalian milk, including breast milk. It's a compound sugar made up of glucose and galactose, and cannot be absorbed until it has been digested by the enzyme lactase in the lining of the small bowel.

Almost all infants have normal amounts of lactase. In people of Northern European background, the enzyme continues to be produced throughout life, but among other ethnic groups (African, Asian, Mediterranean, Middle Eastern, Indigenous Australian) it fades during childhood. Temporary lactase deficiency can occur in infants who have damage of the small bowel lining due to infection or inflammation.

'Lactose intolerance' is the term used when people develop bowel symptoms because of difficulty digesting lactose. Incompletely digested lactose passes through to the colon, where it is fermented. Many people with absent lactase can tolerate small amounts of milk or yoghurt, but a sudden illness or change of diet can cause a loss of tolerance.

fructose and FODMAP sugars Fructose is the simple sugar present in fruits, some vegetables (for example corn) and honey. It is also present in sucrose (table sugar), which is a compound sugar made up of glucose and fructose.

Fructose itself doesn't require digestion by enzymes and is completely absorbed up to quite high levels (25–50 g) in most people. Absorptive capacity varies from person to person and can be modified by the presence of other sugars. Having large amounts of fruit (especially fruit juice and dried fruit) can lead to incomplete absorption, with fermentation of the excess fructose in the colon.



The term 'FODMAPs' (fermentable oligosaccharides, disaccharides, monosaccharides and polyols) is a broader categorisation of poorly absorbed sugars that can be fermented in the colon. If you get excessive wind, pain and diarrhoea after eating cabbage, brussels sprouts, shallot, leek, garlic or legumes, it's likely that by-products from fermentation of FODMAP sugars in these foods are irritating your bowel. A low FODMAP diet has been widely advocated for symptom relief in people with irritable bowel syndrome.

prebiotics and probiotics

prebiotics are essentially the same thing as MACs—non-digestible carbohydrates that pass through to the colon and are fermented by our gut microbes—and come with the additional claim that they selectively promote the growth of 'beneficial' bacteria. However, recent advances in our understanding of the complexities of the microbiome have cast doubt on the validity of this concept, and it's better to simply think of them as general fodder for our gut microbes.

Human milk oligosaccharides are an important exception. These consist of a large, structurally diverse group of complex non-digestible sugars, unique to breast milk, that shape development of the breast-fed infant's gut microbiome and prevent pathogens from gaining a foothold.

probiotics are defined as 'live micro-organisms that, when given in adequate amounts, are beneficial for health'. Although they have been heavily promoted for use in various conditions, claims of significant benefit have been difficult to confirm and, with a few exceptions, they have not made their way into mainstream medicine. Even where their use seems to make intuitive sense—for example, after the gut bacteria have been depleted by antibiotic treatment—it has been found that probiotics can delay the natural regeneration of the person's own pre-treatment microbial ecosystem.

When it comes to people with food intolerances, our experience has been that while many have tried taking probiotics for relief of stomach and bowel symptoms, few have had lasting benefit; and if they haven't already done so, most people stop taking them once their diet has been appropriately adjusted.



maintaining good nutrition

If you've got food intolerances, and need to restrict a lot of flavoursome and colourful fruits and vegetables, you may worry that you're not getting enough vitamins and other nutrients. Low-chemical sources of the most important nutrients are summarised in the table on page 18.

Even on a strict low-chemical diet you should be able to meet your protein and energy needs. If you're not maintaining your desired weight, you're probably not getting enough kilojoules (calories) and you'll need to increase your energy intake from staple foods. Ask your dietitian for help if necessary.

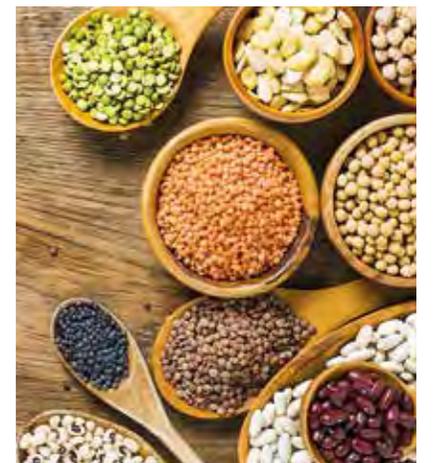
We now have access to a vast range of foods that were not available when *Friendly Food* was first published. Since then, our clinical experience with several thousand people on long-term low-chemical diets and detailed analysis of their nutrient intake has shown that almost all are able to maintain good nutrition. However, for the most highly sensitive people, and for those with special requirements, it's best to see a dietitian for tips about food choices and appropriate supplementation. Special attention may need to be paid to particular nutrients, as outlined below.

special requirements

pregnancy and breast-feeding increase requirements for energy, iron, folic acid, calcium and iodine. If you become pregnant and you're on a restricted diet, check the table on page 18 and consult a dietitian for detailed advice. When breast-feeding you'll need to increase your energy intake so as not to lose weight. If necessary, ask for help in preparing suitable snacks and main meals.

infants and young children have changing dietary requirements as they grow and develop, and their individual food preferences vary, so there's no one diet that suits every child. For those with food intolerances, low-chemical foods such as legumes and cabbages provide good nutrition, promote the development of healthy taste preferences and reduce fussy eating. Infants and toddlers with allergies to several staple foods such as egg, milk, soy and wheat can have difficulties meeting their nutritional needs if they have coexisting intolerances, and supplementation with an elemental (amino acid) formula may be necessary.

Remember that energy comes from major nutrients, not vitamins, so if you feel tired and run-down it's likely to be due to unrecognised intolerance reactions rather than a lack of vitamins.



LOW-CHEMICAL SOURCES OF MAJOR NUTRIENTS

NUTRIENT	FOOD SOURCE	NUTRIENT	FOOD SOURCE
Protein	Meat, fish, poultry, eggs, tofu and legumes (lentils, beans, chickpeas, split peas)	Folic acid (folate)	Lettuce, cabbage, fortified gluten-free cereals, legumes (lentils, beans, chickpeas, split peas) and gluten-free wholegrain cereals (e.g. quinoa, brown rice)
Fat	Oils, dairy-free margarine, meat and eggs	Vitamin B₁₂	Meat, chicken, fish and eggs
Carbohydrates	Rice, potato, swede, pear, and gluten-free breads, pasta and cereals	Vitamin C	Potato, parsley, brussels sprouts, cabbage, green beans, swede, pear, leek and celery
Fibre	Gluten-free wholegrain breads and cereals, fruit and vegetables, and legumes (lentils, beans, chickpeas, split peas)	Iron	Tofu, meat, chicken, white fish, eggs, legumes (lentils, beans, chickpeas, split peas), gluten-free wholegrain cereals (e.g. quinoa, brown rice), fortified gluten-free breakfast cereals and organic baby rice cereal (no rosemary)
Essential fatty acids (omega-3 fats)	Canola, sunflower and safflower oils and margarines, and egg yolk	Calcium	Calcium-fortified rice milk, tofu (set with calcium), calcium-fortified soy drink and other plant-based alternatives, green beans
Natural antioxidants	Fruit and vegetables, gluten-free wholegrains and cereals, and foods containing vitamins A and C and vitamin E (canola, sunflower and safflower oils, dairy-free margarine)	Zinc	Meat, chicken, seafood (e.g. oysters), tofu, eggs, legumes (lentils, beans, chickpeas, split peas) and gluten-free grains (e.g. quinoa, brown rice)
Vitamin A	Eggs, dairy-free margarine, lettuce, green beans, brussels sprouts and cabbage	Iodine	Fish, eggs, iodised salt and commercial gluten-free breads
B-group vitamins	Meat, chicken, fish, legumes (lentils, beans, chickpeas, split peas) and gluten-free wholegrain breads and cereals	Potassium	Potato, soya beans, legumes (lentils, beans, chickpeas, split peas), meat, fish and poultry
Vitamin B₁ (thiamin)	Brown rice, quinoa, fish and fortified gluten-free breads and breakfast cereals		

calcium and vitamin D Calcium is stored in our bones, and requirements change throughout life. Bone mass increases sevenfold from birth to puberty, another threefold during adolescence, and then remains stable up to middle age, after which it begins to decline—more so if you are physically inactive.

Hormonal control adjusts dietary absorption of calcium to meet our needs (pregnancy, breast-feeding) and to compensate for losses. Calcium intake varies greatly and should be averaged over months, not days or weeks.

The best natural sources of calcium are dairy products. If you're on a dairy-free diet, you can use a calcium-fortified rice drink or oat milk, or you can dissolve a plain calcium supplement in homemade drinks; these can be used in a variety of recipes.

Vitamin D is a hormone that regulates calcium absorption and is important for maintaining healthy immune function in the skin and gut. The food we normally eat cannot provide adequate doses of vitamin D to maintain bone and immune health, so regular sun exposure or supplements are necessary. We produce vitamin D naturally through the action of sunlight on the skin; this process is inhibited by use of sunblock.

iron We need iron to make haemoglobin, the oxygen-carrying protein in red blood cells. An efficient internal recycling system supplies most of our needs, and the remainder comes from the diet. Absorbed iron is stored in the liver, and is released and transported to the bone marrow as required for the manufacture of new blood cells.

The iron balance in our body—absorption, storage, release and use—is under complex hormonal control, and is not influenced by dietary intake. However, poor long-term intake that is insufficient to replace daily losses can lead to depletion of the body's iron stores. Measuring ferritin levels in the blood gives the best indication of iron status.

Pregnant women have increased needs because supply of iron to the foetus is prioritised at the mother's expense; vegetarians can have difficulty meeting their needs because iron from plant foods is poorly absorbed.

Although iron is most efficiently absorbed from meat, it is possible to meet your iron needs through consumption of plant foods. Good vegetarian sources of iron include egg yolk, tofu, cashews, legumes, quinoa and brown rice, as well as iron-fortified cereals.

vitamin A Vitamin A is stored in the liver, so short- to medium-term restriction will not lead to deficiency. Over the long term, however, stores of vitamin A



Dairy-free margarine (such as Nuttalex™) can be generously spread on toast and crackers, used in cooking and added to vegetables.

Many plant foods have high levels of natural pesticides and preservatives in the skin or outer leaves. 'Organically' grown fruits and vegetables can have even higher levels. Peel fruit and vegetables thickly or discard the outer leaves.

can become depleted, causing impairment of night vision, immunity and skin integrity.

Vitamin A is found in animal products such as meat, fish, poultry and dairy; and beta-carotene, which is converted to vitamin A, is present in some fruits and vegetables (see the tables on pp. 22–3). If you're having eggs, dairy and/or soy products, you'll be able to meet your requirements easily, but if these foods are excluded you can increase your intake by including dairy-free margarine, green beans, Chinese cabbage, chicken, carob powder and (if tolerated) small amounts of carrot and sweet potato. A multivitamin supplement containing vitamin A will make up for any deficit.

folic acid Folic acid is important for growth, blood cell production, and nervous system development in the foetus. It's found in a variety of vegetables and fruits, legumes, cereals and nuts. Good sources include cabbage, lettuce, lentils, beans, and fortified breads and cereals.

iodine Iodine is needed for the production of thyroid hormones. Deficiency can cause goitre, and during pregnancy it can lead to impaired brain development in the foetus. Australian and New Zealand soils are naturally deficient in iodine, so local farm produce is not a good source for meeting our daily requirements.

Seafood, commercial breads and iodised salt are good sources. Aim for approximately two fish meals a week and use iodised salt in your cooking. If you're on a low-chemical diet, your reduced intake of salt from processed foods means you can use iodised salt to flavour your meals without concern.

If you're pregnant or breast-feeding, you may need iodine supplementation.

living with food intolerances

Eating out and social occasions People with food intolerances often have problems when dining out, but you can minimise the severity of any reaction by ordering wisely, eating small portions and being extra careful with what you eat for a few days afterwards.

If you're planning to go out for a meal, choose a restaurant that offers some plain, simple dishes. Even if the menu doesn't have suitable choices, you can call beforehand to ask whether a special meal can be prepared for you with your tolerated ingredients or foods. This will save you the embarrassment of having to ask detailed questions about various dishes on the menu in front of your friends and acquaintances.

If you often dine at the home of close friends or relatives who know you've got food intolerances, you can give them a copy of *Friendly Food* and let them know which recipes you prefer. Beware, though, as well-meaning hosts will sometimes be tempted to spice up a meal, mistakenly believing you'll enjoy it more if it has some extra flavour.

At dinner parties, where you don't wish to offend the host by asking questions about the ingredients and refusing what's being offered, you can simply eat the meat and plain vegetables but leave the gravies, sauces and rich desserts.

Wherever you're planning to go, it sometimes helps to take the edge off your appetite in advance by having a snack before you leave. Then you'll be less tempted to eat rich, tasty foods and suffer the consequences.

When it comes to drinking when you're out, mineral water or plain water are the safest options, but if you feel like having alcohol, stick to whisky, gin or vodka (straight, or with ice, water, soda or tonic). If you're not too sensitive, you may be able to tolerate half a glass of wine. High-quality wines are less likely to cause reactions—a good excuse to choose a more expensive bottle!

Travel Plan your trip carefully. When going by road, pack suitable foods in a portable cooler, book your overnight accommodation and order your meals in advance. For long flights, take your own snacks, and avoid eating airline meals unless specially prepared. Pack enough food to last you for the first day at your destination, and try to book accommodation that has facilities for cooking your own food.

Once you know which foods you can tolerate safely, apply these general principles:

- * Vary the foods you eat from day to day as much as possible
- * EAT MOST bread, rice, potato, and other cereals, fruit and vegetables
- * EAT MODERATELY meat, fish, chicken, dairy or soy products (or vegetarian alternatives)
- * EAT LEAST fats and oils
- * Drink mostly water
- * Maintain a steady weight





When packing or buying lunch, stick to fresh rolls, unpreserved bread or plain crackers. For fillings, choose foods you know are safe, such as chicken, roast beef or lamb, egg, iceberg lettuce, celery, chives, bean sprouts, pear jam and golden syrup. If you're not too sensitive, you may be able to tolerate a thin slice of fresh tomato, mild cheese, beetroot, grated carrot or asparagus.

Smells and fumes Food intolerances sometimes go hand-in-hand with intolerances to various smells and fumes including perfume, car exhaust, petrol fumes, fresh paint, cigarette smoke and other irritants, and can cause nausea, headache or respiratory symptoms. Reactions like this can be unpleasant, but they are not dangerous and usually resolve quickly after exposure ceases.

Predictable exposures such as the perfume section in department stores, supermarket aisles with cleaning products, petrol stations and underground car parks are easily avoided. If you're unexpectedly exposed, don't hang around—leave the area quickly and get some fresh air.

The outdoor environment can sometimes be a problem too, depending where you live. The air near main roads (with heavy traffic or lots of trucks and buses) can be quite polluted; and in country areas, bush smells and smoke from fires can trigger symptoms. Being near the ocean suits some people, but not others. If you're thinking of moving, try out a few different areas before deciding.

Home environment Make sure your home is well ventilated with fresh air. Indoor air can become quite polluted with volatile chemicals released from carpets and underlays, furnishing materials, gas stoves, cooking odours, unflued gas heaters and cigarette smoke. If you feel unwell in your home environment and you're not sure why, check for hidden damp or mould, gas leaks and other sources of irritant smells or fumes.

Avoid using products with a strong aroma, such as air fresheners, concentrated detergents, perfumed candles, incense, eucalyptus oil, and massage or aromatherapy oils. For smell-sensitive children, ask family members and visitors not to use perfumes and strong-smelling deodorants; school materials such as coloured markers, glues and paints may also be a problem.

If you're planning to paint or renovate your home, and you're smell-sensitive, choose your materials carefully. Watch out for oil-based paints, glues, floor varnishes, chipboard and treated timbers, all of which can emit volatile chemicals for quite some time when fresh or new. It's best not to handle these materials yourself; you may even consider staying somewhere else for a few days or weeks while the work is being done, and airing out your home before going back. If you're not sure about a particular material or product, ask for a sample, take it home and see what happens after you've had it in your bedroom or living room for a few days.

Toiletries, cosmetics and cleaning agents Strong peppermint and menthol flavours and aromas are closely related to natural salicylates, so clean your teeth with unflavoured toothpaste, salt or bicarbonate of soda and avoid mouthwashes.

If you react to preservatives, read the labels of products carefully—most liquid cosmetics and sunscreens are preserved. If you're smell-sensitive, be careful with perfumes, deodorants, scented soaps, shampoos, conditioners, hair sprays, after-shave lotions and other toiletries. Vinegar and bicarbonate of soda are alternatives to strong-smelling detergents and cleaning agents.

Medications People with food intolerances will often react adversely to medicines. It's best only to take essential medications that have been prescribed by your doctor.

If you're salicylate-sensitive, non-steroidal anti-inflammatory drugs such as ibuprofen and aspirin should be avoided. Paracetamol can be used for pain relief, with codeine if required. If you need to take blood-thinning medication, clopidogrel is a suitable substitute for aspirin.

For people who are sensitive to food colourings, the colouring agents used in tablets and capsules can be a problem. If there are no suitable white alternatives, surface colourings can be washed off tablets by rubbing them gently under running tap water; and capsules can be opened, emptied onto a spoon and taken with some pure maple syrup or golden syrup.

Children's syrups are flavoured, coloured and/or preserved, and most antacid liquids are flavoured. Discuss suitable alternatives with your doctor and consult a compounding pharmacist if necessary.

Over-the-counter cold and flu preparations (with paracetamol, antihistamine and decongestants), if needed, are usually well tolerated. If you've got a sore throat, you can gargle with lukewarm salt water, but avoid cough syrups, throat lozenges, menthol, oil of wintergreen, eucalyptus, essential oils, and herbal and other home remedies (for example honey; tea with lemon or ginger), most of which contain natural salicylates or related substances. Make sure you see your doctor if symptoms persist.

Dental anaesthetic injections usually contain preservatives and can sometimes cause unpleasant reactions. If this happens, ask your dentist to use plain lignocaine. For major surgical procedures, general anaesthetics are rarely a problem but the premedications and post-operative painkillers can cause distressing side-effects. Discuss the choice of medications with your anaesthetist beforehand.

