

UNLOCK THE SECRETS TO SUPPORTING YOUR IMMUNE SYSTEM





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What is the immune system?



The immune system is your body's amazing natural defence system. It protects you against anything that manages to get past your first line of defence (your skin and mucous layers), and it usually does this so effectively you are not even aware it is at work!

There are two types of immune defence: the *adaptive response*, and the *innate response*.

The *adaptive response* protects against specific threats and is generated after your body has been exposed to a particular hazard. This response allows your body to adapt to pathogens that you encounter on a day-to-day basis. It is also the response that is prompted by vaccinations.

The *innate response* is present at birth and is the system of defence your body uses whenever it encounters a pathogen it does not recognise. Your body sets up a type of surveillance system to attack anything that it knows is not part of you, in the hopes of destroying it before any major harm happens.

How do we support innate immunity?



Supporting your body's innate immune system is vitally important; it is the only weapon of defence your body has when it encounters a new pathogen. It is worth keeping in mind that antibiotics may be helpful in the event of a bacterial infection, but when it comes to a virus- *your innate immune system is the only weapon you have!*

While important lifestyle factors such as stress, sleep and exercise can impact immunity, slight changes in nutritional status impact the immune system response the most. Poor nutrition compromises immune function, opening the doorway for infectious diseases. These generally raise your body's nutrient requirements, while lowering your appetite.

This can create a bit of an unfortunate cycle, as when we feel unwell our body craves fast-release energy (think: simple sugars and easy to digest food), which is generally lacking the very nutrients our body needs in order to fight effectively! Quite simply, optimal immunity requires optimal nutrition, with enough of the nourishing nutrients.

Nutrition and Immunity

Strong immune systems rely on adequate nutrition. The basis of any diet therefore needs to start with the absolute staple of human health: *vegetables!*

Vegetables are amazing little nutrient packets!

They are versatile; seasonal (so there's always a different nutrient available); vary enormously in taste and texture, and contain most of the compounds that are vital to human health.



Generally, different coloured vegetables offer different phytonutrients (plant substances that help prevent various diseases), plus an array of vitamins and minerals. It's great for your plate to look like a rainbow! Aim for 5-6 serves each and every day- 1 serve = 1/2 cup cooked, or 1 cup raw.

While veggies contain a host of vital nutrients for health, the key nutrients affecting innate immunity are proteins, fatty acids, vitamin A, C, E, and B6, folate, iron, zinc and selenium. Although nutrient profiles vary between veggies, typically:



Dark green vegetables such as spinach, bok choy, kale, broccoli, lettuce and silver beet contain vitamin A, vitamin C, iron, vitamin E, selenium and folate.

Red coloured vegetables such as tomatoes, beetroot, red capsicum and red cabbage are high in vitamin A, vitamin C, vitamin B6 and a fabulous antioxidant named lycopene which helps to fight infections.



Starchy vegetables such as potatoes and corn contain vitamin B6, folate and zinc.




Orange and deep yellow veggies such as carrots, pumpkin, sweet potatoes and squash contain vitamin A, vitamin C, vitamin B6 and folate.



Mushrooms (although technically not vegetables) are a great addition to any plate- they contain B vitamins, selenium and iron.





Fruit is also fantastic for immunity, containing loads of vitamin C, vitamin A and folate. Aim for two serves of fruit every day.

One serve is equal to:

- 1 medium piece e.g. an apple, orange, banana, pear
- 2 small pieces e.g. apricots, kiwifruit, plums
- 1 cup diced pieces or canned fruit (in juice please!)
- 1½ tablespoons sultanas, 4 dried apricot halves

Berries are particularly amazing, as they are delicious, low in kilojoules and high in antioxidants. Grapes however, are quite high in sugar and low in fibre, and should be consumed in moderation.

That being said, you may have heard fruit is not good for you because of the sugar it contains. This is not true! The sugar in fruit is called fructose, and the body metabolises it differently to other types of sugar. This isn't a problem when the fructose is in the fruit. Take it out however, and its a different story...

Fructose is converted into its usable form (glucose) by the liver. Too much burdens the liver, leading to obesity, metabolic syndrome and type 2 diabetes. Fructose is *exceptionally* sweet and is used by food manufacturers to sweeten foods.

This is where the problem occurs!

Eating super refined sugars is extremely hard on the body. Not only is the liver burdened, but so too are the pancreas, kidneys and gut. Your immune system is also affected (see page 12 for further details on this).

In whole fruit however, absorption is regulated by *soluble and insoluble fibre*. They work together to stop the fructose from being absorbed all at once, allowing it to travel further down your digestive system. As it travels it feeds gut bacteria, taking more of the fructose out of your system so you have less to absorb. This slowed process also helps keep you feeling full for longer. Whole fruit is perfectly designed for your body.



Herbs & Spices

Herbs and spices are not only delicious, aromatic additions to cooking, they can also be useful for supporting your innate immunity

Garlic

Technically a veggie, the overachiever award goes to... garlic! Garlic has known antibacterial, antiviral, antifungal, antiparasitic, and anti-inflammatory properties. It is also a prebiotic, which means it feeds the friendly bacteria living in your gut microbiome. This is quite a big deal considering the microbiome contributes around 80% of your immune system. While strong in flavour, garlic can be used heavily or sparingly and is a delicious addition to meals.

Ginger

Ginger has been widely used for medicinal purposes for centuries. It has well-documented antioxidant and anti-inflammatory properties and has been shown to enhance the immune response. Ginger reduces the production of pro-inflammatory proteins, and has potent compounds that are being researched for their potential for treating allergies. Ginger is not recommended for children under the age of two, and pregnant women should not have more than 1 gram per day. Try grating some fresh ginger into your meals for a flavoursome kick, or steep in hot water for a soothing tea.

Echinacea

Echinacea is a flowering herb that is best known as an ingredient in common cold medicines. There are three species of echinacea that are typically used, and different parts of the plant are used for different products.

Echinacea works by stimulating the immune system, and as such it not only assists in preventing common colds but can also shorten their length. This also means those with autoimmune conditions should consult their GP before using.

Echinacea can be taken as a tea, as a powdered extract (300-500mg, three times per day), or as a liquid tincture (2.5 ml, three times daily, or up to 10 ml daily).

Turmeric

Turmeric has been used medicinally for over 4000 years. The bright yellow spice has antimicrobial, antioxidant and anti-inflammatory properties, and is fantastic as a digestive aid. Turmeric contains powerful compounds including curcumin, curcuminoids and volatile oil which are currently being studied due to their vast potential for improving overall health and well-being. Turmeric is safe to be consumed by most people, however those with liver or gallbladder conditions should seek medical advice before regular use. The benefits of turmeric can be reaped through general dietary consumption- try adding it to your stir-frys, or make a delicious turmeric latte (see page 16).

A Word on Protein

Your body is made up almost entirely of protein, including your bones, muscles, organs, hair, and nails. It is also needed to make antibodies (immune system proteins that neutralise pathogens), and for optimal skin function – remember your skin is a first-line defence barrier! Most Australians get enough protein through their daily diet* but some protein sources are better than others.

Proteins are made up of amino acids- there are 20 of them in total. Your body can produce 11 of them, but 9 of them must be eaten- they are called essential amino acids. Therefore, 'better' proteins contain all 9 essential amino acids- they are 'complete' proteins, and include animal products (e.g. chicken, beef, fish, eggs, and dairy), along with soy products, quinoa, and amaranth.

The 'incomplete' proteins include beans, lentils, nuts, and whole grains; this means vegetarians and vegans need to eat a wider variety of foods to ensure they consume all the essential amino acids. This is quite simple though- peanut butter on toast is a delicious 'complete' protein meal.

*(adult men need 0.84 g/kg/day; adult women 0.75g/kg/day; increased by .20g/kg/day over age 70 both sexes)



Unhelpful Foods

There are some foods that are really unhelpful to your immune system. These should be avoided, or at least kept to a minimum.

Sugar has been scientifically shown to immediately suppress immune function. On a cellular level sugar and vitamin C share the same 'gateway'- the Glut-1 receptor. This receptor prefers glucose over vitamin C, so if it must choose, it will take the sugar over the vitamin C. White blood cells (immune cells) need lots of vitamin C to function optimally; too much sugar dampens their response. Aim for no more than 6 tsp per day.



Although coffee and tea have some beneficial antioxidants that may reduce inflammation, too much caffeine may lead to sleep deprivation. This is a problem, as sleep is incredibly restorative and vital for good immune function (see page 15). Try to limit yourself to 2 cups of tea or coffee per day and stop drinking at least 6 hours before bedtime.



Excess consumption of alcohol interferes with the immune system. Although researchers don't yet know exactly why alcohol affects systemic immunity, they know it disrupts the gastrointestinal (GI) mucous membranes, pH levels and cellular defenses, leading to damage of the GI tract and gut microbiome.

Keep alcohol consumption to 1-2 standard drinks per session, with at least 2 alcohol free days per week.



Vitamins & Supplements

There are some instances when your immune system may need additional support; this is where supplementation may be beneficial. Always speak to your healthcare provider before taking any supplemental products.

Vitamin C

Vitamin C (also known as ascorbic acid) is a well-known antioxidant that fights damaging free radicals in the body. It may also help to support tissue repair and healthy immune function. Vitamin C is water soluble, meaning it is not stored in the body and must be regularly replaced. Around 45mg per day is recommended; most people easily achieve this through a balanced diet. However, those who require additional amounts (smokers, athletes, inadequate diets) may require supplementation. Try vitamin C ascorbate if you have digestive issues, as it is buffered.

Vitamin D

Vitamin D is delightfully known as the 'sunshine vitamin', as our body can make it when we have adequate sunlight exposure. In fact, one theory as to why we have more cold and flu outbreaks in winter is due to reduced sunlight, as vitamin D seems to play an integral role in their prevention. Those at risk of vitamin D deficiency include people who are dark skinned; housebound, elderly, or disabled; night-shift workers; and fair-skinned or modestly dressed people who limit sun exposure. Eating vitamin D fortified foods and/ or taking supplements may be beneficial.

Zinc

Zinc is an amazing trace element that is directly involved in over 300 essential processes in the body. It helps to synthesise genetic material, stabilise cell walls, promotes wound healing, taste perception, immune reactions, foetal development, sperm production, and many other functions. Clinical trials have indicated zinc supplements given at the very beginning of a cold can reduce the duration and severity, and zinc is often an ingredient in cold treatments.

The recommended intake of zinc is 14mg/day for men and 8mg/day for women; most Australians will meet this through diet alone.

However older adults and people with absorption conditions may need to supplement.

High doses of zinc can be dangerous though, so be sure to stick to the advice of your GP.

Probiotics

The gastrointestinal (GI) tract is home to a vast microbe community, called the microbiome. These microorganisms are more numerous than the rest of the body's cells, and as such, they dictate the general health of their person. The microbiome changes dramatically in response to diet and is impacted by both your daily meal and your habitual dietary patterns. *Probiotics* are live microbes that change the GI tract beneficially, reducing digestive discomfort and restoring the optimal microbe balance for health. 80% of your immunity is found in the GI tract, so a healthy microbiome is important. While yogurt is a probiotic source, have a chat with your healthcare practitioner about which probiotic may be right for you.

Lifestyle

Apart from nutrition, there are lifestyle changes you can make to help support your immune system

Sleep

Sleep is vital as this is when our body repairs and regenerates. The average adult needs between 7 to 9 hours every night, however most adults are sleeping much less than this. It is important to establish good 'sleep hygiene' practices to minimise insomnia. These include going to bed and waking up at the same time each day; avoiding daytime naps, limiting caffeine near bedtime, and keeping your bedroom cool. You can also try eating a banana and drinking some warm milk before bed- they contain tryptophan, a serotonin precursor that helps with sleep.

Exercise

Routine *exercise* improves your health in every possible way, including your immunity. Aim to be active for 30 mins every single day- a walk, run or bike ride in the fresh air does wonders for the body! It also helps to relieve stress. *Stress relief* is important for the body as a whole- try breathing deeply from the bottom of your rib cage for one minute every hour or so and feel the tension leave your body.

Recipes

Superimmuno Smoothie

- 1 small banana
- 1/2 cup blueberries
- 1 tbsp Greek yogurt
- 1/2 cup rolled oats
- 1/2 cup baby spinach
- 3 ice cubes
- 1 cup skim, soy or almond milk
(calcium fortified, higher protein is optimal)

Combine all ingredients in a blender. Blend well and enjoy for a nourishing and filling breakfast. High in vitamins C & B6, this smoothie also contains probiotics from the yogurt. The rolled oats pack a nutrient punch, contributing fibre to keep you full, protein, zinc and folate.

Warming Golden Latte

- 1 tbsp ground turmeric
- 1 tbsp ground cinnamon
- 1 tbsp ground ginger
- 1 tsp honey or maple syrup
- 200ml coconut milk

Combine ground ingredients in a small bowl. Add 1 tsp mixture to a mug and combine with 1 tbsp hot water to dissolve. Add honey or maple syrup and stir. Heat milk, add to cup and stir. This latte is high in antioxidant and anti-inflammatory compounds. It's a really delicious way to hug your body.

Refreshing Vita C Smoothie

- 1 cup strawberries
- 1/2 cup blueberries
- 1/2 cup pineapple
- 1 cup coconut water
- 1 cup baby spinach or kale
(optional)
- 1 tsp chia seeds

Blend ingredients well and sip as a delicious afternoon pick-me-up

The pineapple alone contributes 60% of your daily vitamin C, not to mention what's in the berries!

If it's blended well you won't taste the spinach; the iron, zinc and vitamin A it contains make it worthy of adding! The chia seeds contribute massive amounts of trace minerals, plus anti-inflammatory omega-3 fatty acids.

Very Veggie Soup

150g potatoes, cubed
150g sweet potatoes, cubed
1 tomato, halved
1 onion, halved
1 garlic clove
1 bay leaf (optional)
400g mixed veggies (zucchini, cauliflower, carrot- whatever you like)
2 cups veggie stock
1 cup water
2 sprigs herbs of choice (e.g. parsley, basil, thyme)

Place all ingredients in a large pot and boil until veggies are soft. Carefully mix with a hand blender (remember to remove the bay leaf!), and serve with some cracked black pepper.

While cooking diminishes the vitamin C in many veggies, it can enhance other properties. Both carrots and tomato unleash super antioxidant properties when cooked, and the boiling process breaks down some of the structures that makes some veggies hard to digest. Add 500 grams of diced chicken for additional protein.

Scromlette

(Ingredients are per person)

1 tbsp olive oil
2 eggs
Assorted mixed herbs
1/2 capsicum, diced
3 sliced button mushrooms
1/4 onion thinly sliced
1/2 cup corn kernels
1/2 tomato, diced
1 cup baby spinach
Sides:
1/4 avocado, sliced
30g feta
2 Cos lettuce leaves

Combine eggs, herbs and veggies in a bowl. Heat oil in fry-pan, and add mixture. Cook slowly on medium heat, turning once. Serve with sides.

This high protein meal also has lots of good fats to support cellular health. Feta cheese has fewer kilojoules than hard cheeses, and contains good bacteria and fatty acids. It's quite high in sodium though so don't overdo it.

Written & Illustrated by Sarsha Carroll

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