



SELENIUM AND ZINC

Summary

Selenium and zinc are minerals we need to stay healthy. Plants take them up from soil and water – and we get them by eating plants or animals that have eaten them. Good sources of selenium include brazil nuts, fish and shellfish. Seafood, poultry and lean meats are good zinc sources, but we can also get some from plant seeds, legumes and leafy greens.

Selenium protects our cells, helps us fight illness and works with our thyroid gland. Zinc helps us with healing, and we also need it to grow, and for our sense of smell and taste.

NZ soils don't have much selenium or zinc. About half of our 5 to 14 year olds may not be getting enough selenium. But too much selenium is not good for us – just one brazil nut a day is all a child needs.

What are they?

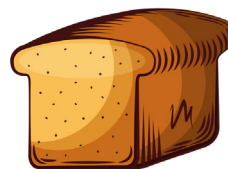
Selenium and Zinc are minerals that are usually found mixed with other elements in ores (rocks) and in soils. Plants take up these minerals in soil water, so their levels of selenium and zinc are related to the levels in the local soil. Because NZ soils are very low in selenium, our plants naturally have low levels of it. NZ soils are also low in zinc, but less so, and the levels are different from place to place. We get both of these minerals by eating plants, plant products (like flour), animals that have eaten plants, or their products (like dairy and eggs).

What foods do we get selenium from?

Selenium is found in good amounts in brazil nuts, fish, and shellfish. Only 1-2 brazil nuts a day will more than meet your needs. There's a smaller amount in meat, poultry, cereals, grains, mushrooms, some nuts and dairy – but as we eat lots of these foods they can be good sources. Foods like pasta, commercial breads, and ethnic breads (like pita or naan) may contain more if they've been made from high-selenium imported flours which are made from wheat grown on selenium-rich soils (e.g. in the Americas, India, or Australia).

What foods do we get zinc from?

Zinc is also found in good amounts in seafood (especially oysters), beef, lamb, and poultry. It's there, but less efficiently absorbed from the gut ("bioavailable") in plant-based foods like sunflower or pumpkin seeds, wholegrain breads, legumes (peas and beans), dairy, broccoli and leafy greens.



Why do we need them?

Selenium is an antioxidant, something that protects our cells from damage caused by free radicals (unstable molecules produced in the environment or by our bodies). It's needed for reproduction, helping our thyroid gland work, making enzymes, proteins and DNA, and for a healthy circulatory and immune system. We store it in our muscles and bones. The NZ Ministry of Health reckons about half of our 5 to 14 year olds may not be getting their recommended daily dose of selenium.

Zinc is needed to make proteins and DNA for growth and reproduction, for our immune system and healing cuts, and for our sense of smell and taste. We need to eat zinc each day as we can't store it. Zinc deficiency (not getting enough) isn't a major problem in NZ.



Can other substances affect how much we get?

Substances (called phytates) in some legumes, grains and nuts reduce the amount of zinc our gut can absorb from these foods – but grain and plant-based foods are still good sources. Taking large amounts of calcium or iron (like a dose of iron supplement pills) at the same time as zinc, can also reduce how much we can absorb.

What happens if we have too much or too little?

A mild deficiency (a bit too little) doesn't have major effects. It might reduce our ability to fight illness or worsen the effects of an iodine deficiency. But you can have too much of a good thing – too much selenium is toxic. Signs of excess include garlic-smelling breath, a metallic taste in the mouth, rashes, vomiting (being sick), diarrhoea (runny poo), brittle nails and hair loss. It's a good idea to eat no more than a few brazil nuts or oysters a day if you're eating them a lot.

Getting too little zinc is not common in NZ. A serious lack of it could reduce growth, general health, appetite, how cuts heal, and mental development. It might also cause poor night vision, hair loss, or change how food tastes. We're unlikely to get too much zinc naturally in NZ, but taking too many supplements could make someone sick.



Nutty facts

Packing 1,300 µg selenium/100 g, brazil nuts have the highest known selenium levels of any human food. Weight for weight they have 40 times more selenium than cashew nuts and nearly 10 times more than oysters. In selenium-rich but sulfur-poor soils of Brazil, the trees have evolved to use their large root systems to gather selenium. They deposit it – instead of the chemically-related sulfur – in their proteins, but in a safe form that won't harm them.



How do the selenium and zinc content of some common foods compare?

Source	Zinc (mg)	Source	Selenium (µg)
Raw oysters – 5 oysters	7.5	100 g microwaved snapper	110
Beef rump steak, fried – 160 g	6.5	Raw oysters – 5 oysters	105
Half cup of pumpkin seeds	5	Raw brazil nuts – 2 nuts	96
Canned chickpeas in brine – 1 cup	2.6	Canned salmon in water – 200 g	66
Fresh pasta – 1 cup cooked	2.2	Greenshell mussels, marinated – 5 mussels	43
Canned salmon in water – 200 g	1.8	Fresh pasta – 1 cup cooked	26
Wholemeal pita – 15 cm	1.4	Pita (white or wholemeal) – 15 cm	15-16
Wheatmeal sandwich bread – 2 slices	0.8	100 g grilled chicken breast	15
Wholegrain and seed-type bread – 2 slices	1.8	Fortified breakfast cereal like Special K or NutriGrain	7.9-8.1
100 g grilled chicken breast	1	White/wheatmeal sandwich bread – 2 slices	5.6-5.8
Raw avocado – 1 large	1	Wholegrain and seed-type bread – 2 slices	4.6-7
Cheddar cheese – 2 cm cube	0.3	Cheddar cheese – 2 cm cube	0.7
A microgram (µg) is one millionth of a gram (g), or one thousandth of a milligram (mg). A milligram is one thousandth of a gram. Source: The Concise New Zealand Food Tables, 12th edition 2016 (2017). Values may vary depending on where the food is grown/from and how it is made or prepared.			

The NZ Nutrition Foundation lists a recommended daily dietary intake (RDI) of zinc of 6 mg for 9 to 13 year olds, increasing to 8 mg (women) and 14 mg (men) for adults over 19 years. They recommend 50 µg selenium for 9 to 13 year olds, and 60 µg to 70 µg for women and men over 14 years. Children should have less than 280 µg selenium per day, adults under 400 µg. Manufacturers use a RDI value of 12 mg zinc and 70 µg selenium to calculate the %RDI values shown on packaging.

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