

healthy

LIVING

MACRONUTRIENTS & MICRONUTRIENTS

WHAT ARE THEY AND WHAT DO I NEED THEM FOR?

We all know that we eat in order to provide our bodies with energy so that we can perform our daily tasks.

Every single cell in our body also has 'a daily to do list', which differs between cells. However without energy and nutrition, these cells are unable to perform their tasks and our bodies will not perform optimally. Macronutrients are the energy providers for our cells and fuel for our bodies. The macronutrients are carbohydrate, protein and fat. Alcohol is also a high energy provider (see table 1), but it does not provide any essential nutrition that the three macronutrients do. Alcohol is classified as non-essential, as the body does not require it for survival but it does require the other three.

Table 1. Macronutrients and alcohol and the energy they provide per gram.

Macronutrient	kJ/gram	kCal/gram
Fat	37	9
Carbohydrate	16	4
Protein	17	4
Alcohol	29	7

Carbohydrate

A carbohydrate is a molecule consisting of carbon, hydrogen and oxygen, with hydrogen:oxygen ratio like that of water, hence the term carbohydrate meaning "the hydration of water".

Vegetables will vary in their carbohydrate content from 1.0gCHO/100g for leafy greens up to 25gCHO/100g for yams and sweet potato. Pasta and rice are slightly higher, with around 26-30gCHO/100g cooked.

Protein

Yes protein is an energy source; however proteins are most



often used in a growth and repair role or as an enzyme (all enzymes are protein structures) used to catalyse the chemical reactions in the body. Proteins are structured arrangements of amino acids joined together. There are 20 amino acids, some we make ourselves (endogenously) others we have to obtain from the food we eat (exogenously). Protein increases satiety, it helps keep the hunger pangs at bay. Therefore in order to reduce food cravings, aim to consume at least 15-20g of lean protein with each meal. A couple of boiled eggs will provide around 15g of protein and 100g of lean chicken breast will yield around 27g of protein. How much protein is enough? Aim to get 15-25% of your total daily energy requirements from protein. For the average person this would equate to approximately 0.8-1.6grams of protein per kilogram of body weight. For example, a 70kg moderately active person would require approximately 1.2gPRO/kg body mass, which equates to a daily protein intake of around 84 grams of protein (see example overleaf).

Table 2. Example of a daily protein intake of 84 grams.

Source of Protein	Protein (g)
3/4 cup beans/chickpeas/lentils	14g
100g chicken breast	27g
2 medium-large eggs	14g
1/2 cup cooked quinoa	12g
1 cup cooked broccoli	4g
12 almonds	4g
medium flat white	8g

Fat

Fats, sometimes referred to as oils or lipids, are required for regulation of body temperature, cushioning and protecting vital organs, maintaining healthy hair and absorbing toxic substances from the blood stream, when levels get too high. There are two essential fatty acids that we need from our diet, alpha-linolenic acid (an omega 3 fatty acid) and linoleic acid (an omega-6 fatty acid). From these, the body then produces other fatty acids required for multiple functions. We require fat in our diet so that we can digest and absorb fat soluble vitamins. The majority should be healthy fats, such as those that come predominantly from plant sources, e.g. avocados, nuts and olives, or from fatty fish such as salmon and sardines. Limit the amount of added fats found in processed foods and saturated fat from animal sources.

Alcohol

Not technically a macronutrient; alcohol provides energy but without any additional nutrients. Be mindful of its consumption just one apple cider (330mL) will have on average 700kJ and a pint (570mL) lager will contain close to 900kJ. It's easy to see how a couple of drinks in the evening can lead to excess weight gain.

Micronutrients

Vitamins and minerals are micronutrients; they provide the body with essential nutrients but not energy. Micronutrients are not mutually exclusive of macronutrients, we consume food and it provides us with energy and nutrients together. That's why it is important to ensure that a wide variety of foods are consumed, think of the more colour the better. Colour variety is the key to ensure a diet rich in a spectra of essential vitamins and minerals.

Some vitamins are fat soluble, they need fat to be digested and absorbed. Fat soluble vitamins are stored in body tissue, so excess consumption can be toxic. The fat soluble vitamins are A, D E & K. Water soluble vitamins are required on a daily basis as they are not stored within tissue. These vitamins are the B-complex group (of which there are a few) and vitamin C. Rich sources of these vitamins are fruits and vegetables, yeasts and complex carbohydrates (for some of the B-group vitamins).

Minerals are required by the body in trace amounts and come from a wide range of foods, originating from the soil, they are absorbed by plants and then eaten by mammals. People who avoid certain food groups, i.e. vegetarians, may be at risk of mineral deficiencies and will often need to supplement their diets to ensure they meet all of their nutritional needs.

At risk deficiencies in Australia and New Zealand and rich food sources

- **Iron**
Flesh foods, green leafy vegetables
- **Iodine**
Seaweed, potato (with skin), milk, seafood, prunes
- **Calcium**
Dairy, broccoli, sesame seeds (tahini)
- **Vitamin D**
Cod liver, fish, animal products, egg yolks
- **Zinc**
Oysters, flesh foods, spinach, pumpkin seeds, cocoa
- **Selenium**
Brazil nuts, sunflower seeds, seafood
- **Omega 3 FA's**
Flaxseed, fatty fish, chia seeds, walnuts

Fibre

Are you getting enough? The recommended daily fibre intake is 30 grams for men and 25 grams for women.

Fibre is essentially required to:

- **Move bulk and regulate pH balance through the intestines**
- **Eliminate toxins**
- **Bind with fatty acids**
- **Slow the release of sugar into the blood stream**
- **Lower total and LDL cholesterol, hence reduces risk of heart disease.**
- **Promote regular bowel movement and prevent constipation.**

Last, but definitely not least, is water. Aim for two litres everyday to help flush out toxins, keep the body well hydrated and the skin looking clear and radiant!

