



Energy In: Macronutrients explained

Where does our body get energy?

Is a kilojoule a kilojoule?

A 'kilojoule' is the international unit for measuring the potential energy from food or drink.

Food energy is 'potential' because it remains chemically inactive (stored) in your body until energy demand outstrips food intake and your body has to call on stored energy. Suffice to say, 65% of Australian adults, and 25% of children, are carrying too much 'potential' energy.

There is ongoing debate about whether all kilojoules (or calories) are created equal.

A kilojoule is a standard unit of measure, so that is not the issue. It is the **source** of the kilojoule that dictates how the potential energy is processed in your body.

All three of the macronutrients – Carbohydrates, Proteins and edible Fats – are **sources** of potential energy, but their energy molecules are different (see grid below). Also, the foods that sit within these three groups are wildly different in terms of their nutrient characteristics (e.g. both celery and table sugar are Carbohydrates). We need all the macronutrients, but we have to get the 'mix' right to function properly.

Dietitians talk about food energy in terms of 'density'. The higher the density, the more energy there is per gram of that kind of food or drink. This is not, however, the only consideration when choosing what to include in your 'diet'. The nutrient characteristics of the food must also be taken into account. Some foods, like nuts, are high density in terms of energy, but they make an extremely valuable contribution to a healthy diet.

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For example:



An **apple** is **low density** because it is an unprocessed Carbohydrate with natural sugar and plenty of fibre, vitamins and minerals. (150g = 380kJ).

Apple pie is **high density** because butter, table sugar and processed flour have been added to the mix. (150g = 1540kJ).



A serve of apple pie contains **four times more kilojoules** than an apple. The butter is a healthy edible Fat, however our body struggles to process the extra kilojoules from table sugar and refined grains.

Alcohol is not a macronutrient but it is a source of high-density energy

| WEIGHT | EACH GRAM OF MACRONUTRIENT | | | | |
|------------------------|----------------------------|---------|------------|------------|------------|
| MACRONUTRIENT [SOURCE] | CARBOHYDRATE | | PROTEIN | ALCOHOL | FAT |
| ENERGY MOLECULE | FRUCTOSE | GLUCOSE | AMINO ACID | FATTY ACID | FATTY ACID |
| KILOJOULES | 15.6kJ | 16kJ | 17kJ | 29kJ | 37kJ |
| DENSITY | LOW | | | | HIGH |

No such things as a carb-free lunch

Every newborn begins life on a diet of breast milk or formula, which is a perfect combination of vitamins, Carbohydrate (lactose for energy), Protein (building blocks of life) and edible Fats (cell/nerve function, brain development).

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As children grow, the quantity of food will change, but this winning nutritional combo needs to be maintained throughout life.

Carrots, bread, chocolate, bananas, table sugar, pizza, fruit juice and pasta are all examples of predominantly Carbohydrate foods – but they are **NOT** created equal.

Whole fruits and vegetables are the cornerstone of a healthy diet, so going 'carb-free' is not possible. They, along with dairy products such as milk and yoghurt, also contain natural sugars and edible Fats, which are essential for life. Going completely 'sugar-free' or 'fat-free' is also not possible.

You just need to make wise choices about the **source** of your energy (i.e. unprocessed wholefood rather than processed).

Fibre is your friend!

The unsung hero in all this is Dietary Fibre, which is the indigestible plant matter from fruits, vegetables, legumes, grains and nuts. Eating foods with fibre slows down digestion, holds your hunger at bay for longer, cleans out your gut and keeps those toxic waste products moving on through!

Fibre is only effective if you consume **plenty of water**. Even mild dehydration can cause a traffic jam that makes you feel bloated and unwell!

When choosing Carbohydrates, wholefoods with natural sugars and fibre (nature-made) are a daily essential; whereas products containing added sugars, with little or no fibre (man-made), should only be consumed occasionally.