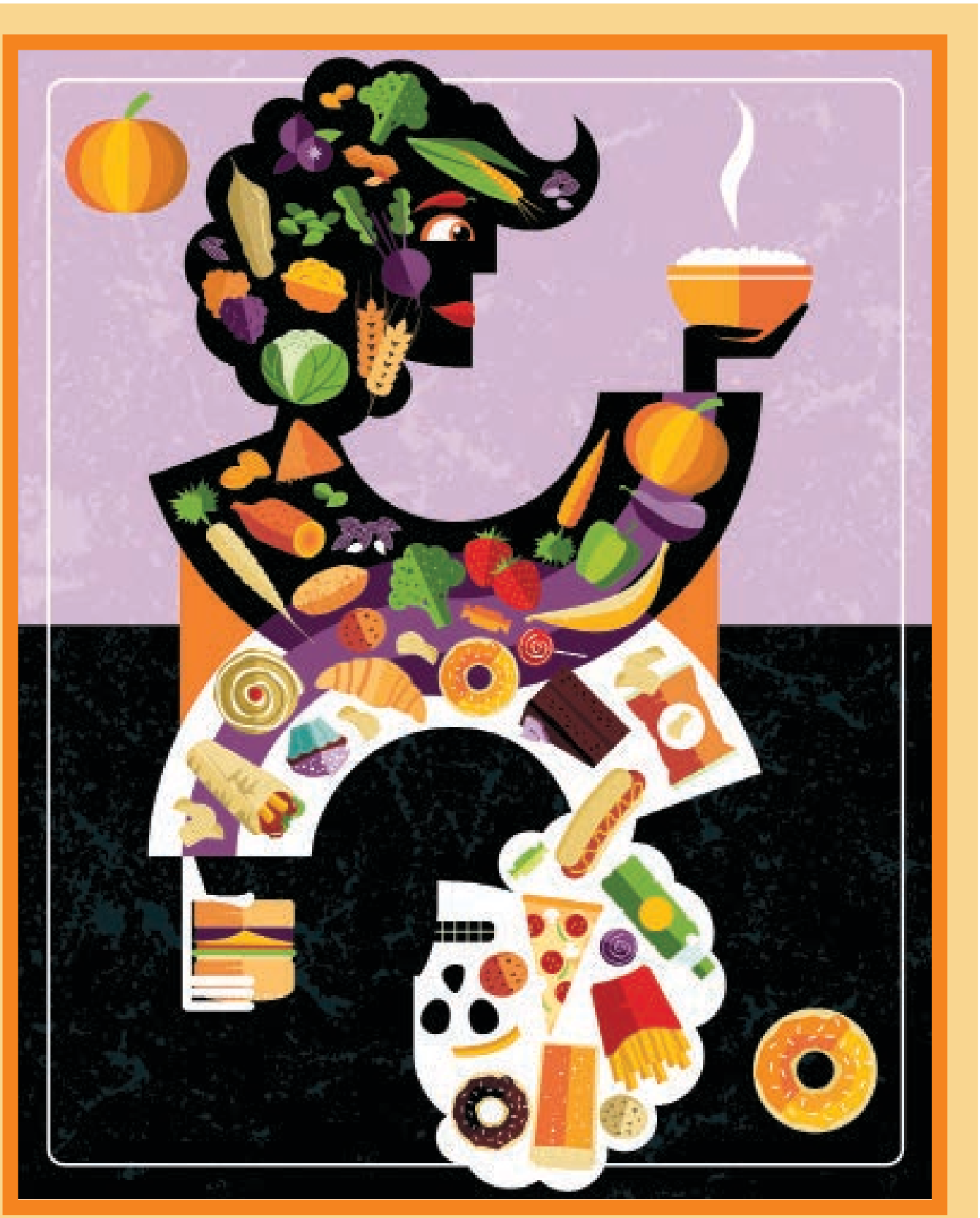


Carbs: The good, the bad, and the ugly

The humble carbohydrate has become the great villain of nutrition in recent years. Are they good for you or not? Naturopath Tania Flack sorts fact from fiction.

SEVERAL popular recent diet movements have promoted the belief that 'carbs' are the primary driving factor behind Australia's ever-growing obesity crisis. This trend is comparable to the low-fat movement of the 1980s, which painted dietary fats as the culprit behind cardiovascular disease, and subsequently led to a decrease in consumption of natural fats, and sprouted a high science industry producing 'Frankenfood' creations like margarine and low-fat salad dressings. With each swing of the pendulum, we are moving further away from a simple wholefoods diet, one that our bodies - and the vast colonies of bacteria contained within them - are genetically programmed to thrive on. So, are carbs good for you, or bad? The truth lies somewhere in between and depends on which type of carbs you choose.

Know your carbs

Carbohydrates are promoted in the old-fashioned food pyramid as the primary source of fuel for the body, because the simple sugars, which are the final product of carbohydrate digestion, are easily utilised by all cells for energy. However, it is the only one of the three macronutrients that technically has no minimum requirement, because the human body has been shown to thrive on a predominantly protein-and-fat diet, as seen in the Inuits, Laplanders and some Native Americans tribes who consume very limited amount of carbohydrates. That fact, along with examples of more primitive diets, has fuelled the question about our need for dietary carbohydrates. But rather than being seen as the pinnacle of healthy eating, being able to survive with very minimal quantities of carbohydrates should be celebrated as yet another example of the supreme adaptive abilities of human physiology - not necessarily an ideal to aspire to.

Carbohydrates are produced by photosynthesis in plants, such as fruits, vegetables, grains, legumes, nuts, seeds, and tubers. Carbohydrates contain carbon, hydrogen and oxygen in a ratio of 1:2:1, and yield 4 calories per gram. All carbohydrate-containing food can be digested or metabolically transformed into glucose, which is then used by cells as a primary source of energy. While proteins and fat can also be converted into fuel that can be used by cells, carbohydrate metabolism is a more direct process. Carbohydrates can be classified broadly into three main groups - sugars, starches, and fibre - all of which have varying impacts on human health.

Sugars are the lightning-fast fuels that people love. Sugars are broken down into two categories, monosaccharides and disaccharides, based on their chemical structure.

Monosaccharides

Glucose: This is the end product of carbohydrate metabolism and is also found in some fruits, such as grapes. Glucose is the basic unit of energy for all cells in the body. When you have a blood sugar test, this is what is being measured. The body has careful checks and

5 golden rules for carbs

1. Maximise your vegetables
2. Choose wholegrains
3. Enjoy low glycaemic index carbs
4. Focus on fibre
5. Avoid sugar

A sugar by any other name …

When reading labels, be aware that sugar masquerades under many names:

- Brown sugar
- Corn sweetener
- Corn syrup
- Dextrose
- Fructose
- Fruit juice concentrates
- Glucose
- High fructose corn syrup
- Honey
- Invert sugar
- Lactose
- Maltose
- Malt syrup
- Molasses
- Raw sugar
- Sucrose
- Sugar

balances to try to keep blood glucose levels in a healthy range; however, excess dietary sugar and processed carbohydrates can overwhelm these systems and lead to significant health problems.
Fructose: Found in most fruits, honey and some vegetables. It is easily converted to glucose in the liver and small intestine.
Galactose: Comes from the digestion and conversion of the milk sugar lactose. Like fructose, it is easily converted into glucose in the liver.

Disaccharides

Lactose: This is the only animal source of carbohydrate and is the sugar contained in milk.
Sucrose: Arguably the villain of the sugar group, mainly due to its intense sweetness and overuse in food production. It is found in sugar cane, sugar beets, maple syrup, molasses, sorghum and pineapple. It contains both fructose and glucose and provides a huge energy hit for very little digestive effort. Its connection with a vast array of health problems is well established.
Maltose: Two glucose molecules together, which is produced by the breakdown of many cereal grains. It is found commonly in beer, snacks, crackers and some breakfast cereals. Read labels to get a better idea of how common this form of sugar is.

The starches category of carbohydrates has longer chain molecules called polysaccharides, which, like the sugar group, are broken down into glucose; however, far more effort is needed for this process which is why they are known as complex carbohydrates. Digestion starts in the mouth with special enzymes found in saliva, then other enzymes are required during the digestive process in order to produce the final glucose molecule, which is needed for energy production. This group of carbs includes: Starchy root vegetables (e.g. potatoes, sweet potato, cassava, parsnip, beetroot), wholegrains (corn, wild rice, barley, oats, whole wheat), pseudograins (quinoa, buckwheat, amaranth, millet), and nuts and seeds (cashews, almonds, walnuts, pumpkin seeds, sesame seeds, pine nuts).

The final important group of carbohydrates is fibre, which provides structure in the plant cell wall. Dietary fibre has different beneficial effects on health and bowel function, depending on its structure. A low fibre diet is associated with an increased risk of colon cancer, cardiovascular disease, diabetes, obesity, diverticulitis, haemorrhoids, and a range of other bowel problems. Fibre can be broken down into three groups:
Soluble: This draws water and turns into a gel-like substance within the bowel, slowing transit time and helping you feel fuller for longer. This type of fibre is found in barley, oat bran, legumes, nuts and seeds and some fruits and vegetables.
Insoluble: This is found in the outer covering of wholegrains and the skin of some vegetables. It adds bulk to the stool and helps regulate bowel function and transit time.
Resistant starch: While not traditionally thought of as fibre, resistant starch acts in similar ways. It is found in unripe bananas and cooked and cooled rice and potatoes. This type of starch resists digestion in the small intestines and is broken down by beneficial bacteria in the large bowel which produces butyrate, a short chain fatty acid which is fuel for the cells lining the bowel.

Whole vs. processed

The benefits of a diet rich in wholegrains have been studied extensively and consistently found to lower the risk of atherosclerosis, cardiovascular disease and type II diabetes by between 20-40%. While these results are impressive, we need to be clear on what wholegrains are and understand how to incorporate them into the diet. The term 'wholegrain' is bandied about by food manufacturers, when in actual fact, wholegrains by definition should not be processed - which

rules out food manufacturers altogether. Often wholegrains are added to a refined carbohydrate product to boost its shelf appeal, but these foods provide little of the benefit of cooking wholegrains yourself and adding them to your diet.

The structure of grains can be broken down into three distinct fractions: the germ, the bran and the starchy endosperm. Wholegrains are rich in a variety of beneficial vitamins, minerals, fats and phytochemicals which act as potent antioxidants, much of which is contained in the germ and bran parts of the grain. The bran contains the most fibre of all the grain components and is largely responsible for the digestive benefits seen with wholegrain consumption. During conventional processing, the nutritious germ and bran are removed from the grain leaving the starchy endosperm, which is the energy-dense component of the grain. This processing increases the speed of breakdown in the digestive tract and absorption of fuel into the bloodstream, increasing its glycaemic index and reducing the health benefits. To ensure you are getting the benefits of wholegrains add barley, whole oats, brown rice, corn, quinoa, millet, amaranth, buckwheat and freekah to your diet.

Sweet poison

In the last century, sugar consumption in Australia has increased astronomically. It is so ingrained in our culture that it has led to generation after generation relying on sugar to self soothe. Isn't it 'normal' to reward yourself with a piece of chocolate after a hard day, or give a child a sweet treat if they fall over and hurt themselves?

Refined sugar has no nutritional value aside from pure energy, and MRI scans demonstrate its ability to impact areas of the brain associated with pleasure and reward, making it very addictive. The psychology behind sugar consumption is fascinating, however its effects on human physiology is where the real damage is done. The increase in refined sugars in the Western diet is a major driving factor behind obesity, type II diabetes and cardiovascular disease.

According to the Australian Bureau of Statistics, the message about the health risks associated with sugar consumption has been trickling through and we have reduced our intake from the dizzying highs of 1995, due largely to the success of high profile programs such as 'I Quit Sugar' and the Paleo movement. Despite this success, Australians still consume way too much sugar and we have a long way to go before we meet World Health Organization's recommendations of less than 5% of our dietary energy coming from sugar. Thanks to the chemical wizardry of the food manufacturing sector, getting clear information on sugar consumption is difficult because there are so many hidden sugars in processed foods. These foods are often marketed to teenagers who have the highest consumption, with teenage boys estimated to consume 92g or 18 teaspoons per day.

The best way to avoid sugar is to focus on a wholefoods diet; while it may take more time in food preparation, your intake of incidental sugars from processed foods will drop dramatically. So, the bottom line is, carbohydrates are not the devil that we have been led to believe. Certainly, you should be mindful of what types of carbs you consume and avoid processed carbohydrates and sugars. Keep in mind if you have to read a label, it has had some sort of processing. Choose carbs that are as close to their natural state as you can get them. Include a moderate amount of wholegrains, legumes, nuts and seeds in your diet along with an abundance of vegetables to reap the health benefits of carbohydrates.

> The term 'wholegrain' is bandied about on labels, when in actual fact, wholegrains by definition should not be processed - which rules out manufactured and processed food altogether.

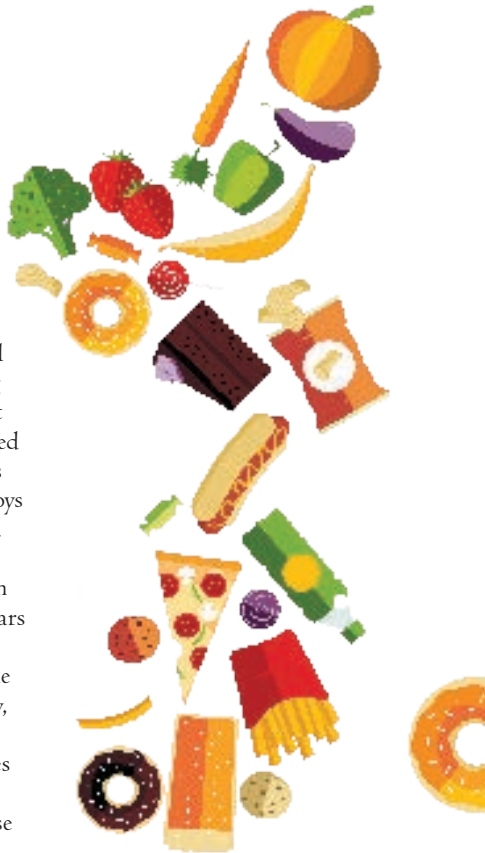
High GI vs low GI

So, while research shows the benefits of a wholegrain diet, other large studies have found that an increased intake of carbohydrates does the exact opposite, and increases the risk of cardiovascular disease. The key lies in the 'glycaemic index' of the carbohydrates we eat: the higher the blood glucose response to a carbohydrate, the higher the glycaemic index.

For example, a large American study followed the diets of 75,521 women for a decade. Increases in their total glycaemic load were associated with a significantly increased risk in coronary heart disease. Interestingly, the total glycaemic load of their diet was a greater predictor of coronary heart disease than their intake of simple versus complex carbohydrates. While foods like rice and potatoes are traditionally considered complex carbohydrates, they each have a high glycaemic index and are digested and absorbed quickly, inducing a high blood glucose response. In contrast, simple carbs like vegetables and fruit, have a lower glycaemic index and yield only a small blood glucose response. So, the take-home message is: choose low glycaemic index carbohydrates and focus on vegetables.

Microbiome magic

Our gut contains trillions of bacteria that have evolved with us since the dawn of time. Not only do they help us break down fibres from food we eat to extract every available nutrient, they also play an important role in regulating the immune system, producing vitamins, and influencing brain health. Beneficial bacteria in the gut rely on a fibre-rich diet to maintain their balance and diversity, as well as promote production of short chain fatty acids, including butyrate which acts as fuel to ensure the healthy function of the cells lining the gut. This is one of the ways that a high fibre diet helps to protect us against bowel cancer.



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