



# ***Glycemic Index***

## ***what it is and why it matters***

**By Kate Marsh**

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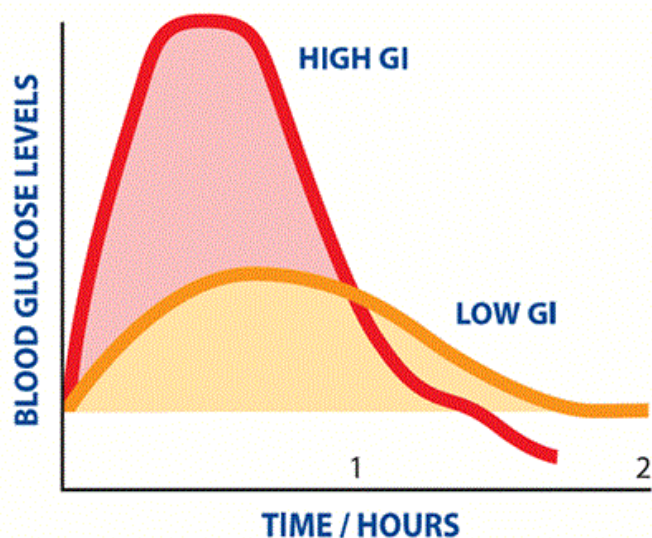
### ***What is GI?***

Glycemic Index (GI) is the scientifically proven way of describing how the carbohydrates in foods affect our blood glucose levels. Carbohydrate foods are those containing starches (breads, cereals, grains, pasta, noodles, legumes and starchy vegetables) and sugars (including the natural sugars in fruit and some dairy products, and added sugars).»»





When we eat, carbohydrates are broken down during digestion into glucose and provide the body with energy. However, different carbohydrate foods have different effects on our blood glucose levels. Some carbohydrate foods are quickly digested and absorbed (referred to as high GI), while others break down slowly, gradually releasing glucose into the bloodstream (low GI).



The Glycemic Index ranks foods (on a scale from 0 to 100) according to the extent to which they raise blood glucose levels after eating. It is measured using valid scientific methods and in human subjects. It can't be estimated by looking at the composition of the food, nor can it be tested in vitro (in a test-tube), which explains why we don't see GI on all food labels like we do with fat and sugar. »



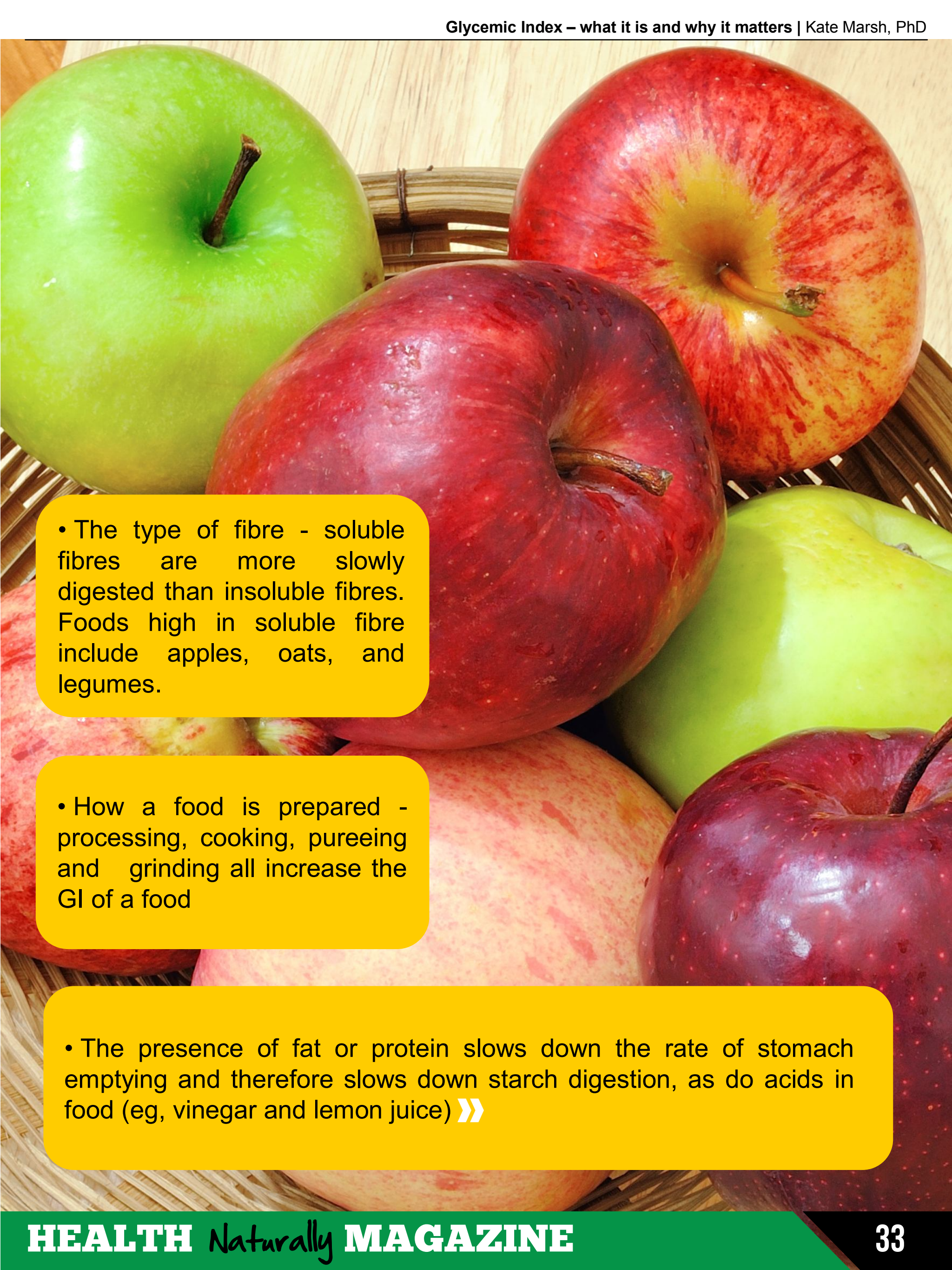
# *What influences the GI of a food?*

The GI of a food is affected by many different factors including:

- The type of sugar - eg fructose, glucose, lactose and maltose all have different GI values

- The type of starch - eg. the proportion of amylose to amylopectin and the gelatinisation of the starch. The more amylose a food contains, the less easily the starch is gelatinised (due to the structure of the glucose molecules) and the slower its rate of digestion will be. For example, Basmati rice and legumes have a higher proportion of amylose and therefore have a lower GI. Wheat flour and short grain rice have a higher proportion of amylopectin, which is more easily digested, and therefore have a higher GI. >>





• The type of fibre - soluble fibres are more slowly digested than insoluble fibres. Foods high in soluble fibre include apples, oats, and legumes.

• How a food is prepared - processing, cooking, pureeing and grinding all increase the GI of a food

• The presence of fat or protein slows down the rate of stomach emptying and therefore slows down starch digestion, as do acids in food (eg, vinegar and lemon juice) »»





## *How do I know which foods are low or high GI?*

Unfortunately it is difficult to predict the GI of a food due to the variety of factors above – it really must be tested. However we now know the GI of many common foods and new foods are being tested all the time.

- **Low GI foods** include rolled oats, barley, quinoa, cracked wheat, dense wholegrain breads, legumes, corn, pasta (not the gluten-free variety), many fruits including apples, pears, berries, citrus fruit, peaches and nectarines, and dairy foods like milk and yoghurt. >>



- **Higher GI foods** include white and wholemeal bread, puffed/flaked cereals and crackers, most varieties of rice and potato, and most gluten-free breads and pastas. »»






The table below shows some typical high GI foods and lower GI alternatives

High GI Food	Low GI Alternative
Bread – white or wholemeal	Bread containing lots of whole grains; sourdough and pumpernickel breads
Processed breakfast cereals	Unrefined cereals such as rolled oats or natural muesli or a low GI processed cereal such as those containing psyllium husks
Plain biscuits or crackers	Biscuits made with dried fruit, rolled oats and wholegrains
Cakes and Muffins	Make them with fruit, oats, oatbran, rice bran and psyllium husks
Potato	Substitute with Carisma™ potatoes, butternut pumpkin or corn; make mashed potato with half cannellini beans
Rice	Try lower GI varieties such as Basmati or Doongara™ or try pearled barley, quinoa, cracked wheat or noodles instead



When it comes to packaged foods, the best option is to look for the Glycemic Index Foundation’s Low GI Certified symbol. As well as certifying that a food is low GI (as tested by approved methods), it must also be an overall healthy choice within its category, having to meet criteria for energy, total and saturated fat, sodium, and where appropriate fibre and calcium. To find out more about the symbol, visit <http://www.gisymbol.com> 

# What are the benefits of a low GI diet?

Research suggests that we could all benefit from choosing low GI carbs. Not only can they help with weight management by filling us up for longer and making it easier to burn fat, but they also have many health benefits – from improving blood fats, blood glucose and insulin levels to reducing the risk of chronic diseases such as heart disease, type 2 diabetes and some types of cancer. Low GI foods may also help with exercise endurance and weight management.

## ***Studies have found that low GI diets:***

- are associated with a reduced risk of cardiovascular disease and type 2 diabetes
- can improve blood glucose levels in people with diabetes
- can reduce levels of the 'bad' LDL cholesterol in people with diabetes
- are associated with a reduced risk of certain cancers including endometrial, breast, colon and ovarian cancer
- result in higher rates of fat burning during exercise
- are associated with a reduced risk of stroke in women
- can help to prevent excess weight gain in pregnancy
- can reduce the risk of delivering a large baby
- can produce better weight loss and loss of body fat compared to higher GI diets

High GI diets, on the other hand, have been linked to a worsening of insulin resistance, a higher incidence of metabolic risk factors and the metabolic syndrome, fatty liver, the progression of blood vessel disease (atherosclerosis) and a higher risk of prostate cancer and age-related macular degeneration.

Importantly, there appears to be no down-side to eating the low GI way, something which can't be said for many 'diets'. In fact a low GI diet fits very well with the general healthy eating recommendations we know can help with weight management and reducing disease risk, including eating more fibre, fruits, vegetables and wholegrain breads and cereals. »



## *It's not just about GI*

It is important to keep in mind, though, that GI shouldn't be used in isolation when making healthy food choices. You may notice that some low-GI foods are high in saturated fat (e.g. chocolates, pizza, and potato chips), while some high-GI foods may still be good choices because they are nutritious and relatively low in energy and carbohydrate (e.g. watermelon). So, when using GI, it should be used to supplement other healthy eating guidelines including eating plenty of fruits, vegetables and wholegrain breads and cereals, eating less saturated fats and limiting foods high in added sugar. »»



## *What is glycemic load?*

The overall effect that a food has on blood glucose levels is dependent on both the nature (GI) of the carbohydrate it contains and the amount (ie grams of carbs). Glycemic load takes both of these factors into account and is calculated by multiplying the GI of the food by the amount of carbohydrate per serve and then dividing by 100. For example an apple has a GI of 40 and contains 15 grams of carbohydrate so has a GL of 6  $(40 \times 15)/100$ .

While foods with a high carbohydrate content and those with higher GI values will generally have the highest GL, this also means that small amounts of a high GI food may have only modest effects on blood glucose levels while large amounts of a low GI food can still raise blood glucose and insulin levels significantly. What this means in practice, is that **there is no need to avoid foods that have a high GI but are low in carbohydrate and nutrient-dense**. On the other hand, just because a food is low GI, it doesn't mean you can eat as much as you like, particularly if you are watching your weight or your blood glucose or insulin levels. >>

### Where can I find out more?

Sydney University GI Website

[www.glycemicindex.com](http://www.glycemicindex.com)

GI Symbol Program

[www.gisymbol.com.au](http://www.gisymbol.com.au)

Sydney University GI Newsletter

<http://ginews.blogspot.com/>

The Low GI Diet Handbook

<http://glycemicindex.com/publicationsList.php>

The Low GI Diet Shoppers Guide

<http://glycemicindex.com/publicationsList.php>





## ABOUT THE AUTHOR

**Kate Marsh, PhD, M Nutr Diet, BSc,  
Grad Cert Diab Edn & Mgt**

Kate Marsh is an Advanced Accredited Practising Dietitian and Credentialed Diabetes Educator working in private practice in Sydney and is co-author of *The Low GI Vegetarian Cookbook*, *The Low GI Diet for PCOS*, *Low GI Gluten-free Cooking* and *The Bump to Baby Diet*. She has a particular interest and expertise in the dietary management of PCOS, diabetes, insulin resistance and vegetarian nutrition.

Kate graduated with a Master of Nutrition and Dietetics from the University of Sydney in 1995 and completed a Graduate Certificate in Diabetes Education and Management in 1997. She has more recently completed her PhD looking at the effects of Glycemic Index (GI) in the diets of women with PCOS and is co-author of *The Low GI Guide to Managing PCOS*, *The Low GI Vegetarian Cookbook*, *Low GI Gluten-Free Living* and *The Bump to Baby Diet*.

Kate works with clients with type 1 and gestational diabetes, PCOS, and those following a vegetarian diet. As a diabetes educator, she can also offer diabetes education to people with newly diagnosed diabetes, or those needing review of their diabetes education and management.



# Salmon and Pumpkin Patties with Butter Bean Salad

Makes 4 patties, Preparation time: 25 minutes,  
Chilling time: 30 minutes, Cooking time: 25 minutes

## Ingredients:

- 200 g can pink salmon, drained
- 400 g can butter beans, drained
- 1/3 cup mashed butternut pumpkin
- 2 spring onions, chopped
- 2 teaspoons rice bran
- 1/2 teaspoon gluten-free curry powder
- 1 tablespoon brown rice flour
- 2 teaspoons canola oil
- 80g wild rocket

## *Butter Bean Salad*

- 2 tablespoons balsamic vinegar
- 1 tablespoon extra virgin olive oil
- 1 small red capsicum, chopped
- 1/2 small red onion, diced
- 1 small avocado, diced »





## Method:

1. In a medium bowl, mash the salmon and ½ cup butter beans with a fork. (Reserve the remaining beans for the salad.)
2. Mix in the pumpkin, spring onions, bran and curry powder. Divide the mix into 4 portions and shape each into a pattie about 8–9 cm across. Chill in the refrigerator for 30 minutes.
3. Meanwhile, preheat the oven to 180°C. Line a baking tray with baking paper. Dust the patties with brown rice flour. In a large frying pan, heat the canola oil, add the patties and cook on a medium heat for 1 minute each side or until just golden brown. Place the patties on the baking tray and cook in the oven for 20–25 minutes or until firm.
4. To make the Butter Bean Salad, whisk together the balsamic vinegar and oil. Combine the capsicum, onion, avocado and reserved butter beans in a small bowl. Toss with half of the balsamic dressing.
5. Place the rocket in a bowl and toss with the remaining dressing. Divide the rocket equally among four serving plates, top each with a salmon pattie and a large spoonful of butter bean salad.

**Note:** To make the amount of mashed pumpkin you need for this recipe, boil, steam or microwave 100 grams peeled butternut pumpkin. Drain off any excess liquid and mash with a fork.

**Source:** The Low GI Diet for Gluten-Free Cooking – Marsh, Brand Miller & Sandall; Hachette Australia 2010



# French Toast with Strawberry and Banana Topping

**Preparation time:** 5 minutes, **Cooking time:** 4 minutes, **Serves** 2

## Ingredients:

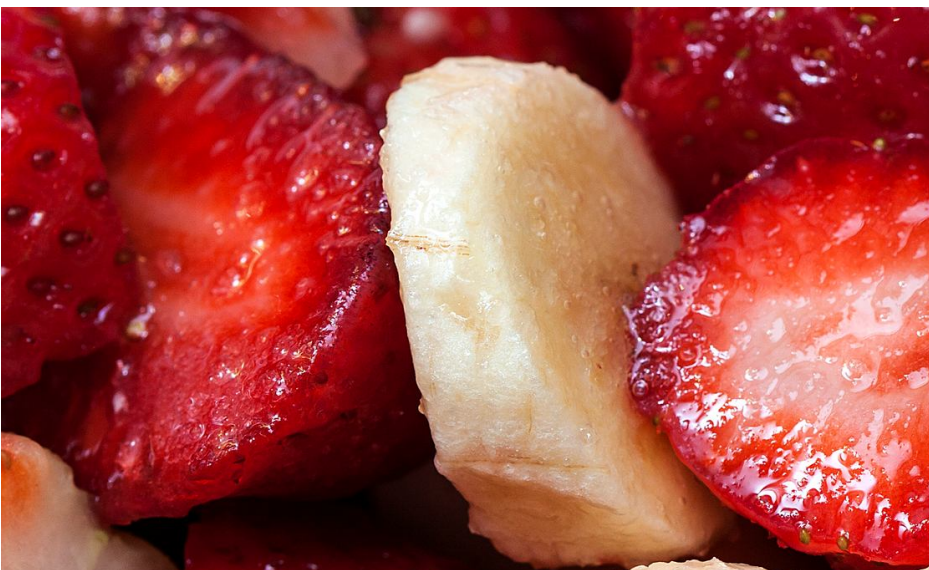
- 1 egg
- 1 tbsp reduced fat milk
- ½ tsp vanilla essence
- 1 tsp olive or canola oil margarine
- 2 thick slices grainy low GI bread, halved
- Low fat plain yoghurt, to serve (optional)

## *Strawberry and banana topping*

- 125g (4 ½ oz) strawberries, hulled and halved
- 1 banana, sliced
- 2 tsp pure maple syrup

## Method:

1. To make the Strawberry and Banana Topping, combine all the ingredients in a small bowl.
2. To make the French Toast, use a fork to whisk together the egg, milk and vanilla in a shallow bowl.
3. Heat a large non-stick frying pan over medium heat. Rub the margarine over the base of the pan. Dip the bread slices in the egg mixture, allowing the bread to soak it up. Remove the bread, allowing any excess egg mixture to drain off. When the margarine is sizzling, add the dipped bread to the pan and cook for 2 minutes each side or until well browned.
4. Serve immediately accompanied by fruit topping and a dollop of yoghurt, if desired. »»



**Source:** : The Low GI Family Cookbook –

Brand Miller, Foster-Powell, Manning & Sandall; Hachette Australia 2008



# Pork, Bok Choy and Noodle Stir-Fry

**Preparation time:** 20 minutes, **Cooking time:** 15 minutes, **Serves** 4



## Ingredients:

- 200 g dry rice noodles
- 2 tablespoons gluten-free reduced-salt tamari
- 2 tablespoons gluten-free sweet chilli sauce
- 1 teaspoon sesame oil
- 1 tablespoon canola oil
- 500 g pork fillet, sliced thinly
- 1 red (Spanish) onion, sliced into thin wedges
- 2 teaspoons finely grated fresh ginger
- 1 red capsicum, sliced into thin strips
- 115 g (or use nearest sized punnet) baby corn, sliced in half lengthwise
- 150 g snow peas, trimmed, sliced diagonally in half
- 1 bunch baby bok choy, trimmed, halved at stem joint, stem bases removed, leaves and stems sliced
- 1/3 cup (50 g) toasted cashews, chopped roughly »»



## Method:

1. Prepare the noodles according to packet directions, drain and set aside.
2. In a small bowl, combine the tamari, sweet chilli sauce and sesame oil and set aside.
3. In a large frying pan or wok, heat 2 teaspoons of canola oil. Add half the pork strips and stir-fry for 1–2 minutes or until just cooked. Spoon into a heatproof bowl and set aside. Repeat with the remaining pork.
4. Heat the remaining oil in the pan over medium–high heat. Add the onion and stir-fry for 2 minutes. Add the ginger, capsicum and corn, and stir fry for about 1 minute. Add the snow peas and bok choy stems, and stir fry for a further 1 minute. (Add a little water or gluten-free reduced-salt chicken stock to pan, if it starts to stick.)
5. Return the pork to the pan with tamari mix, bok choy leaves and the noodles. Toss until well combined and heated through.
6. Spoon into serving bowls and serve sprinkled with cashew nuts.

**Variation:** to make a vegetarian version, Tofu, Bok Choy and Noodle Stir Fry, replace the pork with 300 g firm tofu, drained and cut into 2 cm cubes.

**Source:** The Low GI Diet for Gluten-Free Cooking – Marsh, Brand Miller & Sandall; Hachette Australia 2010