• Bread: ‘ingenious technology for improving the flavour, digestibility and nutritional value of grass’ - Michael Pollan;
• Paleolithic bread: looks like we have had our nose to the grindstone for about 30,000 years;
• Why white veggies are so good;
• Prof Jennie Brand-Miller: why we don't estimate the GI of our recipes;
• Nicole Senior: baby's first foods.

GI News
Editor: Philippa Sandall
Web management and design: Alan Barclay, PhD
Contact email (for questions or permission to reproduce stories from this newsletter):
info@gisymbol.com for technical problems or faults please contact smb.ginewstech@sydney.edu.au

Food for Thought

Staff of life.
Did you know that the Middle English word ‘companion’ (from Old French compagnon), literally means ‘one who breaks bread with another’, based on Latin com- ‘together with’ + panis ‘bread’. It is a gentle reminder in these ‘nutritionist’ times that no food is more basic, more essential and more universal, and has been for thousands of years. Common to the diets of both rich and poor, bread is one of our oldest processed foods. Loaves and rolls have been found in ancient Egyptian tombs, and excavated from ovens in Pompeii. From the 16th-century English peasants’ bread made with pea flour and rye to the pure white bread of the French court, from the crusty sourdough loaf made by artisan bakers to the doughy ‘sliced white’ found in every supermarket, there is a bread for every time and place. And you can read all about it in William Rubel’s Bread, A global history (Reaktion books). It’s a fascinating tale.

We don’t know who made the first breads, or when or where. We do know that our ancestors were pounding and grinding thousands of years before the invention of agriculture. The starch grains from various wild plants that Anna Revedin and colleagues found on the surfaces of grinding stones across Europe go about 30,000 years (PNAS). While over in Israel, Dolores Piperno and colleagues not only discovered barley grains in a 23,000-year-old grindstone (Nature), but also an oven-like hearth suggesting that the locals had baked a ‘dough’ from grain flour on the site they were excavating. It makes sense. Our Paleolithic forebears had to do something to the tough, plant foods they foraged, because they didn’t have the teeth or stomach for dealing with raw grains or rhizomes. They innovated. They transformed the indigestible into something digestible through grinding and cooking. It seems they baked a sort of flat bread.

Michael Pollan isn’t giving up bread. He loves it (well, good quality bread) and bakes it. And he devotes a whole, page-turning chapter to it in his new book – Cooked, A natural history
In talking about his book, he reminds us just what an amazing advance the invention of bread is – an ‘ingenious technology for improving the flavour, digestibility and nutritional value of grass’ (well, grass seeds). Bread became a staple food because ‘the cooking process unlocks the nutrients in that seed,’ says Pollan. ‘And seeds have everything you need to live, but it all must be unlocked. And a slow fermentation and cooking at a high temperature unlocks all that. The loaf of bread itself becomes a pressure cooker ... And so you’re steaming the starches, which breaks them down. It’s just the most beautiful technology.’ For those inspired to bake his sourdough, stone-ground, whole-wheat bread, he includes the recipe.

**What’s New?**

**The white stuff is the right stuff, too.**

That rainbow of green, red and orange veggies tends to take prime position for top nutrient sources, but white vegetables (e.g. potatoes, cauliflower, turnips, onions, parsnips, mushrooms and kohlrabi) are nutrient powerhouses that have a place at the table too according to the authors of the *Advances in Nutrition* supplement [*White Vegetables: A Forgotten Source of Nutrients*](http://advances.nutrition.org/content/4/3/318S.full). The authors review current and emerging science about some of the key health benefits we can gain from tucking into white veggies, including increasing our intake of fibre, potassium and magnesium – nutrients many of us don't get enough of.

‘It’s recommended that the variety of fruits and vegetables consumed daily should include dark green and orange vegetables, but no such recommendation exists for white vegetables, even though they are rich in fiber, potassium and magnesium,’ says the supplement’s editor Prof. Connie Weaver from Purdue University, an expert in mineral bioavailability, calcium metabolism and bone health. ‘Western diets have led to a decrease in potassium with fewer fruits and vegetables, and at the same time, there’s been an increase in sodium consumption because people eat more processed foods. While potatoes are one of the highest sources of dietary potassium, when processed, they are often higher in salt. While potassium improves blood flow, too much salt increases blood pressure, making the vascular system work harder. The relationship between potassium and sodium is interesting because how the two work together may influence risk of cardiovascular disease. The human body needs both, but today's problem is sodium consumption is up and potassium is down. Because potassium-to-sodium intake ratios are more strongly related to cardiovascular disease risk than either nutrient alone, more research is needed to understand this relationship.’

– The *Advances in Nutrition* supplement is the outcome of a June 2012 Purdue University roundtable on white vegetable nutrition which was supported by an unrestricted grant by the Alliance for Potato Research and Education.

**Dr Alan Barclay comments:** There’s no need to say ‘no’ to potatoes just because most varieties have a high GI. They are fat free (when you don’t fry them), nutrient rich and filling. But look for the lower GI varieties, keep portions moderate or serve them in a way to reduce their glycemic impact – such as potato salad with a vinaigrette dressing. Because we saw the evidence mounting that it is the potato variety itself that makes the real difference to its GI (not the cooking method) we sat down with chef and potato expert Graham Liney, Australian potato growers and the Dutch potato breeding company Agrico back very early in 2007, to bring Carisma, Australia’s first low GI potato to the table. It’s a versatile, general purpose potato that’s full of flavour with a creamy taste and ‘melt in the mouth’ texture and a GI of 55. The good news is that Carisma potatoes are now been grown all over Australia, and they
are just going in to the ground in North America and Europe, so they will be commercially available in those regions in the near future. As for the other white veggies mentioned in the supplement, parsnips have a low GI (52), while veggies like cauliflower, turnips, onions and mushrooms contain so little carbohydrate (they are mostly water!) we can’t actually test their GI.

**Scientific review of Robert Lustig’s *Fat Chance.*

*Fat Chance: Beating the Odds Against Sugar, Processed Food, Obesity and Disease* is the product of one individual’s point of view – a perspective that is not supported by the vast majority of scientific research on nutrition and metabolism, writes Prof Mark Kern, from San Diego State University. Kern highlights ‘the critical need for the increased communication of weight management strategies that are science-based and realistic. As we’ve witnessed in the past several decades, blaming one particular food or ingredient for the obesity and chronic disease rates in America is unsubstantiated; restriction and avoidance of particular foods (especially those that are most enjoyed by many consumers) is not a sustainable healthy eating strategy.’ You can download the review at [http://admin.sweetenerstudies.com/sites/default/files/resources/files/Scientific-Review-of-Lustigs-Fat-Chance.pdf](http://admin.sweetenerstudies.com/sites/default/files/resources/files/Scientific-Review-of-Lustigs-Fat-Chance.pdf).

**What’s new on the bookshelf?**

*Share* ‘Food builds our physical resilience, brings us joy, and strengthens our bonds with friends and family. It maintains our connection to the seasons, and generates employment, wealth, and economic stability. What we choose to eat and how we choose to prepare it reflect our ancestral traditions and cultural heritage as well as our abundant creativity’ writes Meryl Streep in this uplifting, charity cookbook. There’s a wide range of wholefood and traditional recipes to try (many low GI) including Beans with cassava and Stuffed bitter gourds (melons) from Rwanda.

Edited by Alison Oakervvee and with a foreword by Meryl Streep, *Share* is published by Kyle Books (RRP AUD$39.95). Royalties will support WfWI's farming and food training initiatives in the countries in which WfWI operates – Afghanistan, Bosnia and Herzegovina, DR Congo, Iraq, Kosovo, Nigeria, Rwanda and South Sudan.

**Nicole’s Taste of Health**

*Baby cakes.*

What we feed babies is important for their growth and development but we are finding out it is also important for the development of their future food habits. The food we offer is priming their tastebuds for later life.

This idea was sensationaly brought to the world’s attention when the results of study in rats showed feeding high sugar, high fat food during pregnancy resulted in offspring that craved the same kind of food. The news media stories trumpeted the disaster of human babies born craving the same junk food their pregnant mothers ate. While this is scientifically a big stretch, it does underline the idea that babies learn to eat what their mother’s eat even before they are born. Baby’s first taste sensations are from the amniotic fluid surrounding them in the womb and this is influenced by the mother’s diet. They next experience flavours passed on via breast milk, which again is determined by the food mum is eating (bottle fed babies miss this stage). This is why Indian babies eat curries, Japanese babies eat fish and Italian babies eat garlic in their first foods – they’ve tasted it before and are more accepting of it.
The next step in a baby’s flavour journey is the introduction of solid foods at around 6 months.

Many parents say commercial baby food tastes awful and bland, but it is a mistake to judge baby food with an adult palate. Their taste-buds are pristine and highly sensitive; not yet beaten down by over-seasoned, flavour-enhanced and sickly sweet fare.

Babies don’t need the kind of intensity of flavour we grown-ups eat in highly processed food. The salt and sugar/starch levels in most prepared, packaged and restaurant foods are way too high for us and bordering on toxic for babies. The baby food industry has stepped up to the plate with many now offering ‘clean’ labelled products with no added anything, and with improved texture grading to allow older babies to progress from puree to mashed to lumpy as is recommended. As good as quality commercial baby foods are, in my experience they miss out on the full flavour spectrum of home prepared foods which still hold a pivotal place in an infant’s diet. Home prepared foods are also ‘real’ flavours: I tasted one brand of banana custard for babies with ‘natural banana flavour’ that did not taste like any banana I’ve ever eaten. It’s still worth the effort to prepare vegetables, fruits, grains, legumes, meat and fish you don’t find in a jar (or pouch, as is increasingly the trend).

You can also offer lower GI grains such as quinoa, barley and polenta and low GI legumes such as lentils, chickpeas and kidney beans in a suitable texture according to baby’s stage. And you can add herbs and spices as well, such as: cinnamon to apple; nutmeg to banana or cardamom to custard; basil to pasta or dill to fish. To offer variety and make baby meal planning easier, the good old ice-cube method works well: freeze individual portions of cooked meats, fish, vegetables, grains and legumes in an ice cube tray and simply take them out as needed, choosing a balanced meal of protein (meat, fish or legumes), grain/starchy vegetables and a green and red/orange vegetable (just like an adult).

As a baby reaches a year old they should be progressing to ‘family foods’. They need finger foods they can hold and feed themselves and one of the easiest is a finger of bread but most bread is very salty – it pays to hunt down a lower-salt brand. Babies are naturally curious about what we eat too – nothing is so enticing than food which is headed for our mouth – but increasingly the morsels we share are passing on bad habits rather than modelling healthy preferences. New life is cause for joy but perhaps a baby can also be the catalyst for a healthy change in family foods as well.

Nicole Senior is an Accredited Practising Dietitian and Nutritionist, author, speaker, consultant, and commentator with an interest in how we can learn to love good food that's good for us.

In the GI News Kitchen

American dietitian and author of Good Carbs, Bad Carbs, Johanna Burani, shares favourite recipes with a low or moderate GI from her Italian kitchen. For more information, check out Johanna's website at www.eatgoodcarbs.com. The photographs are by Sergio Burani. His food, travel and wine photography website is www.photosbysergio.com.

Strawberry yoghurt dessert.
Here is a simple, healthful dessert with an Italian twist. Serves 4.
15 fresh, washed, hulled strawberries
1 tbsp sugar
2 tbsp Grand Marnier liqueur
2 cups fat-free plain yoghurt
¼ cup mascarpone
1 tsp vanilla

Cut strawberries horizontally into 4 slices. Place in a small mixing bowl. Set aside.
Combine the sugar and Grand Marnier in a small cup. Pour over the strawberries. Allow to macerate at least 30 minutes. In the meantime …
Mix the yoghurt, mascarpone and vanilla in a medium-sized mixing bowl. Pour into 4 dessert dishes. When ready, pour the strawberry mixture equally over the 4 yogurt servings. Serve cold.

Per serve
649kJ/155 calories; 6g protein; 6g fat (includes 4g saturated fat); 15g available carbs; less than 1g fibre

Here's how you can cut back on the food bills and enjoy fresh-tasting, easily prepared, seasonal, satisfying and delicious low or moderate GI meals that don’t compromise on quality and flavour one little bit with our Money Saving Meals (www.moneysavingmeals.com.au) including BakeClub Anneka Manning's Tomato and red lentil soup with toast fingers. Yum.

**Tomato and red lentil soup with toast fingers.**
Anneka Manning’s simple and tasty soup from *The Low GI Family Cookbook* (Hachette Australia) is a great way to get in an extra serve or two of vegetables along with a scoop of nutritional power pack lentils. Dress it up with a dollop of plain yoghurt and a sprinkling of chopped parsley. Serves 4

1 brown onion, chopped
1 medium carrot, peeled, chopped
1 celery stick, chopped
2 garlic cloves, crushed
¼ cup water
2 tsp ground cumin
½ tsp paprika (optional)
400g (14oz) can no-added-salt diced tomatoes
1 tbsp no-added-salt tomato paste
½ cup split red lentils
3 cups salt-reduced vegetable stock
2 tsp sugar, or to taste freshly ground black pepper, to taste

**Toast fingers**
4 slices multigrain low GI bread
2 tsp olive or canola oil margarine

Combine the onion, carrot, celery, garlic and water in a large saucepan. Cover and cook over medium heat, stirring occasionally, for 8–10 minutes or until the onion is soft. Stir in the cumin and paprika (if using) and cook, uncovered, for 1–2 minutes or until the water has evaporated.
Add the canned tomatoes, tomato paste, lentils and stock and bring to a simmer. Reduce heat to low, cover partially, and simmer gently, stirring occasionally, for 20 minutes or until the lentils are tender. Meanwhile, to make the toast fingers ...

Preheat oven to 200ºC (400ºF) and line an oven tray with non-stick baking paper. Spread both sides of the bread slices with the margarine and cut each into 3 fingers. Place the bread on the lined oven tray. Just as the lentils are becoming tender, bake the bread for 10 minutes or until lightly golden and crisp. Turn off oven and leave it there to keep warm.

Transfer half the soup mixture to a blender or food processor and blend until smooth. Repeat with the remaining mixture. Return the soup to the pan and simmer gently until heated through or reduced to desired consistency. Taste before seasoning with a little sugar and pepper if you wish. Serve with the warm toast fingers for dipping. Yum.

Per serve
440kJ/105calories; 5g protein; 2.5g fat (includes 0.4g saturated fat); 14g available carbs; 4g fibre

Anneka’s tips • If you make the soup a day or two ahead, keep in an airtight container in the refrigerator. Reheat in a saucepan over medium heat, stirring frequently, until simmering and heated through. • Freeze leftovers in serving portions in airtight containers for up to 2 months. Thaw in the refrigerator before reheating.

We Are What We Ate

Looks like we have had our nose to the grindstone for at least 30,000 years.

Grinding starchy grains, tubers and rhizomes, possibly into flour, was a widespread practice across Europe 30,000 years ago according to Anna Revedin and colleagues’ findings in PNAS (www.ncbi.nlm.nih.gov/pmc/articles/PMC2973873). The grinding stones they discovered at sites in Italy, Russia and the Czech Republic contained the remains of starch from various wild plants, including cattail rhizomes, cattail leaves, moonworts, the ternate grapefern, lady’s mantle, burdock, lettuce roots, rye, burr chervil root, parts of edible grasses, edible seeds and more. As well as analysing the stones for traces of wear and residue by microscope, they did a bit of Paleolithic recipe testing. Anna Revedin explains.

‘We collected typha (cattail) rhizomes at the beginning of October, when the roots are starch-rich to survive the winter. We peeled the rhizomes before grinding them, and we found this process was easier if they are still moist. Then we dried them in sun before using two fragments of sandstone of similar size and shape to those at the Bilancino site to produce flour. We found that you first need to use the ‘active tool’ like a pestle to open up the fibres, and then like a grinder to extract the flour which was a fine, white-beige powder with a slightly sweet aroma. We then mixed the flour with water to make dough, which we baked over a fire similar to Bilancino hearth B (Upper Palaeolithic). After cooking it for about 20 minutes on a sandstone pebble that was well heated on embers, we had an edible flat bread which we ate and offered to our colleagues. It was quite good to eat, although without any salt or oil to flavour the dough it wasn’t very tasty.’

GI Symbol News with Dr Alan Barclay

Give us this day our daily bread.

Taken literally, this line from the Lord’s Prayer (Matthew 6:9–13 and Luke 11:2–4) reminds us that bread has been a staple food for humankind for millenia. And still today it is
consumed at breakfast, lunch and dinner time, and often for snacks in many parts of the world. Taste, value for money and convenience are no doubt primary reasons for its ongoing popularity. It is also nutritious and depending on the type, a good source of protein, B vitamins, minerals like potassium and magnesium and dietary fibre (if not highly processed). The carbohydrate content of a typical slice of bread ranges from 11–19 grams with an average of 15 grams – which is a typical diabetic exchange.

**What about the GI?** Being high in carbs, the GI really matters a lot if you need to manage your BGLs. Values range from a low 39 for dense wholegrain breads to a high 91 for some varieties of Middle Eastern flatbreads. Typical white and brown breads from the supermarket or corner store are generally high GI, while authentic sourdough breads made from white flour are typically low. Low GI breads with the GI symbol available in Australia include:

- **Bürgen®** Soy-Lin bread 52; Pumpkin Seeds bread GI51; Rye bread GI53; Fruit & Muesli bread GI53; Wholemeal & Seeds bread GI39; Wholegrain & Oats bread GI51.
- **Tip Top** 9 Grain Original GI53; 9 Grain™ Pumpkin Seed GI53; 9 Grain Wholemeal GI53; 9 Grain™ Mini Loaf Original GI53; 9 Grain™ 9 Seed GI53.
- **Mission Foods** White Corn Tortilla GI52.

**Isn’t wholegrain bread low GI?** No, not all wholegrain breads are low GI. This is because the definition of wholegrain now means "the intact grain or the dehulled, ground, milled, cracked or flaked grain where the constituents – endosperm, germ and bran – are present in such proportions that represent the typical ratio of those fractions occurring in the whole cereal, and includes wholemeal" ([www.foodstandards.gov.au/consumer/nutrition/wholegrain/Pages/default.aspx](http://www.foodstandards.gov.au/consumer/nutrition/wholegrain/Pages/default.aspx)). In other words, wholegrain products can be made from flour that has been milled very finely down to white flour, then had the endosperm, germ and bran added back in, so that it contains the same proportions as in the original grain. However, the starch in the finely milled white flour is typically very rapidly digested and absorbed, so many wholegrain breads in fact have a medium-to-high GI. Varieties that have a high proportion of kibbled grains and whole seeds – around 20% of the total ingredients – are generally the lower GI varieties.

**I can’t eat bread because ...** You hear people say this a lot these days. But in fact, not that many people really do need to avoid bread for their health. It is more often a matter of choice.

- People with coeliac disease must avoid breads that contain gluten because their immune system reacts to it, leading to damage to the small intestine, malabsorption of essential nutrients, and associated symptoms like wind, bloating and diarrhoea.
- People with wheat intolerance, which is not the same as coeliac disease because it is not an auto-immune condition, need to limit their intake of wheat (and sometimes other gluten-containing grains) to avoid gastro-intestinal symptoms like wind, bloating and diarrhoea.

Because the symptoms can be very similar it is important that you don’t self-diagnose. See your doctor.

Luckily for those with diagnosed coeliac disease or wheat intolerance, an ever increasing range of gluten free breads are becoming available in local supermarkets, and a few of these are even low GI.
Recipe kindly provided by Burgen (www.burgen.com.au)

**Herbed-crusted fish**: Burgen low GI breads are popular and widely available here in Australia. For those living elsewhere, use a low GI dense grainy bread. Serves 4

4 slices Bürgen® Wholegrains & Oats bread
mixed bunch flat-leaf parsley and chives, chopped
1 tsp lemon zest 2 tbsp olive oil
freshly ground black pepper, to taste
4 fish fillets (dory or bream)
lemon wedges, to serve

Pre-heat oven to 200°C (400F). Combine bread, parsley and chives in a food processor and process until you have fine breadcrumbs. Add lemon zest, olive oil and pepper to taste. Place fish fillets onto a lightly-greased oven tray and evenly coat the fish with the bread crumb mixture and bake for 10-15 minutes or until fish is cooked through and crust is golden brown. Serve with lemon wedges.

*Per serve*: 1025kJ/245 calories; 25g protein; 9g fat (includes 1g saturated fat); 14g available carbs; 2g fibre

**The GI Symbol, making healthy low GI choices easy choices**

For more information about the GI Symbol Program
**Dr Alan W Barclay, PhD**
Chief Scientific Officer
Glycemic Index Foundation (Ltd)
Phone: +61 (0)2 9785 1037
Mob: +61 (0)416 111 046
Fax: +61 (0)2 9785 1037
**Email**: alan.barclay@gisymbol.com
**Website**: www.gisymbol.com
Prof Jennie Brand-Miller answers your questions.

‘How about giving us the GL of your recipes? Calories, fat, etc are all very interesting, but you’re supposed to be the “Glycemic Index Newsletter” and I find it frustrating that I have to go searching and calculating the GL of your recipes.’

Most of us have great faith in numbers, especially ones that are boldly printed in black and white on labels and in books. And with the current trend to count each and every gram of carbohydrate (or every calorie/kilojoule) in a food or beverage, it is easy to understand why you like many other people feel that you should be adding up the GI values of your meals. Relax. You absolutely don’t need calculators, pen and paper to eat the low GI way.

GL or glycemic load: First of all, there's no need to calculate the GL unless you’re a researcher doing studies based on high and low GI diets. If you can verify that the main carbohydrate source in your recipe is low GI (e.g. it’s a legume), then the GL will automatically be relatively low. To calculate the glycemic load (GL), you need to know both the available carbohydrate content (easy) as well as the GI (not always easy). Then you use the equation: GL = grams of carbohydrate per serving x GI divided by 100. If there's only one carbohydrate source e.g. spaghetti, then it's a simple task. But if you’ve got a mix of carbohydrate sources or you start with a flour, then it gets a bit tricky.

GI or glycemic index: Unlike grams of carbohydrate and other nutrient or calorie (kilojoule) counts, the GI is a measure of quality – not quantity. A useful analogy is that of mixing paints – the final colour will reflect the dominant colour used, not simply the sum of its parts. It’s true that researchers sometimes calculate what is called the average dietary GI, or to be more precise, the weighted average GI – where the weighting is a percentage value representing the proportion of total carbohydrate contributed by each individual food and beverage. But this is for studies to be published in peer-reviewed scientific journals. For everyday use, this is simply not necessary as we know from what’s called ‘dietary modelling’ that simply replacing most of the high GI carbs you eat with medium or low GI ones will lower the GI of the average person’s diet sufficiently to reduce their risk of developing type 2 diabetes and will also help them achieve and maintain a healthier weight. In addition, numerous studies have shown that people with diabetes can improve their glycated hemoglobin (a measure of their average blood glucose level over a 3–4 month period) simply by lowering the GI of their diet. In these studies, the people did not have to calculate their daily GI values – it was not necessary: they just used the substitution model (look how easy it is):
Don't sweat the small stuff: Just like grams of carbohydrate and other nutrients and calories/kilojoules, GI values aren’t 100% accurate – for all of the same reasons: foods are grown in different soils, under different weather conditions, and consequently, all have a slightly different nutrient composition. We suggest you simply swap the high GI carbs you eat at most meals for low or moderate GI counterparts because this will help you will achieve a low (or lower) GI diet overall. And don’t forget about the total calories/kilojoules, type of fat and sodium content of your meals – GI is only one part of healthy eating.

Latest GI values - belVita biscuits
A year ago we reported on the GI values of three flavours of belVita, a European-style breakfast biscuit intended to be consumed as part of a balanced breakfast with a portion of fruit and a serving of low-fat dairy. Kraft Foods Australia has now added two more flavours to the range:
• belVita Breakfast Cranberry – GI40, 34g carbs, 835kJ
• belVita Breakfast Honey & Nut with choc chips – GI46, 34g carbs, 975kJ