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GI News is published online every month by the University of Sydney, School of Life and Environmental Sciences and the Charles Perkins Centre, and delivered to the mailboxes of our 97,000 subscribers. Our goal is to help people choose the high-quality carbs that are digested at a rate that our bodies can comfortably accommodate and to share the latest scientific findings on food and diet with a particular focus on carbohydrates, dietary fibres, blood glucose and the glycemic index.

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FOOD FOR THOUGHT

FERMENTED FOODS ARE BACK

Fermented foods have burst onto the health scene and are packing the supermarket shelves. What are they? Do the health claims stack up? Here, dietitian Nicole Senior checks them out and Prof Jennie Brand-Miller explains why many are low GI.

Everywhere you look there is a revival of time-honoured food preserving skills including jams, preserves, pickles and chutneys. What was once a prudent method for prolonging the nutrition and enjoyment of a seasonal harvest has become an uber-cool way to turn your back on mass-produced food and make your own local artisanal, bespoke food with heart.



What is fermentation? Fermentation occurs naturally when bacteria is given an opportunity to transform the carbohydrates into more complex substances. It is a process of using microorganisms such as yeasts, bacteria and fungi as a food production or preserving method. In the case of alcoholic beverages, yeast is used to ferment sugars into alcohol, whereas in yoghurt bacterial cultures are used to ferment lactose into lactic acid. Fungi can also be used to ferment foods, such as the Japanese filamentous fungi *Aspergillus oryzae* called koji used to make miso. Sourdough bread is another example of a fermented food using wild yeasts in a sourdough culture. The ripening of cheeses involves the introduction of microbes that develop flavour from breakdown products of proteins and fats, and moulds are sometimes introduced such as in blue-vein cheese. Fermented foods tend to be sour tasting but can be very complex in flavour which adds to their culinary appeal. Here are some common fermented foods and beverages:

- *Sauerkraut* – fermented cabbage
- *Kim chee* – Korean sauerkraut with added chilli
- *Tempeh* – fermented soybean cake, similar to tofu but with a beanier, lumpier texture
- *Miso* – fermented soybean paste used as a soup base and marinade
- *Yoghurt* – cultured milk using a variety of lactobacillus strains
- *Kefir* – milk drink cultured with bacteria and yeasts – the bacteria is different to yoghurt
- *Kombucha* – an effervescent fermented tea

Are fermented foods better for you? They seem to have taken on superfood status and this invites some pretty fanciful marketing hype; everything from preventing intestinal gas to preventing cancer. Most evidence for the benefits of fermented foods is for supporting gut health, particularly their probiotic effect of promoting beneficial gut flora, although other benefits are likely. Most research has been done on dairy foods and consuming fermented dairy foods (yoghurt and cheese) is associated with a reduced risk of cardiovascular disease, although more research is needed. But for most fermented foods, there is very little scientific evidence at all except centuries of traditional use and folklore. Enjoy them for their interesting tastes and textures and the nutritional value of the food itself, and any additional effects are a bonus.

Why do many fermented foods have a low GI? Prof Jennie Brand-Miller explains. “One reason many fermented foods are beneficial to health is the production of organic acids such as lactic acid, acetic acid (the same acid as in vinegar), etc. These are by-products of the fermentation process when the bacteria/yeast metabolise the carbohydrates (sugars and starches) in the food or drink. These organic acids not only add distinctive flavours to the food or drink, they also lower the pH, making it difficult for harmful microorganisms to grow. In our stomachs, they slow down a food’s rate of emptying into the intestine, which in turn slows the rate of digestion and absorption of the food’s carbohydrates into the blood stream, lowering the overall GI.

In traditional breads (e.g., sourdoughs), the slow fermentation not only produces the organic acids that create that unique flavour, but also the slow rise of the dough due to the production of gases (e.g., carbon dioxide). This helps the bread develop the bubbly and chewy texture characteristic of a quality bread. The gluten (protein in wheat) matrix slowly develops and traps the bubbles of gas, which is why traditional sourdough breads have a low GI (54), even when they are made of refined white flour.

Yoghurt and fermented milk drinks like kefir, lassi, leben, and Yakult all have a low GI. There are several reasons why.

- Unique proteins in milk increase insulin production which accelerates the removal of glucose from the bloodstream.
- Milk sugar (lactose) has a lower GI (46) than sucrose (65) because the enzyme lactase works more slowly.
- Finally, the lactic acid produced by the fermentation of the lactose by various strains of bacteria like of *Lactobacillus delbrueckii* subsp. *bulgaricus* and *Streptococcus thermophiles* slows stomach emptying and therefore the rate that food is digested and absorbed.

While milk itself is low GI (20–34), the GI values of natural yoghurts (the fermented version of milk) are even lower, ranging from 10–19, depending on whether full cream or skim milk is used. Even sweetened yogurts have a GI in the 30s and 40s.

WHAT'S NEW?

YOGHURT – ITS INSULINEMIC INDEX IS HIGHER THAN ITS GI

Numerous studies over the past 20 years have shown that high yoghurt intake is associated with a reduced risk of type 2 diabetes. In *Nutrition Today*, Prof Tom Wolever talks about yoghurt's glycemic and insulinemic impact of yoghurt.



“There is evidence that low GI and low GL (glycemic load) diets are associated with a reduced risk of type 2 diabetes. The 93 GI values for yoghurt in the University of Sydney’s GI database have an average of 34 and most (9 out of 10) of the yoghurts are low GI. The 43 plain yoghurts in the database have a lower GI (average GI = 27) than the 50 sweetened yoghurts (average GI = 41). This difference is not explained by sugar, per se, but rather by the higher protein-to-carbohydrate ratio in plain yoghurt. Although yoghurt has a low GI, its insulinemic index is higher than its GI. High insulin responses may be deleterious because hyperinsulinemia is associated with an increased risk of type 2 diabetes. Nevertheless, this may not be a concern for yoghurt because, although its insulinemic index is higher than its GI, the insulinemic index of yoghurt is within the range of insulinemic index values for non-dairy low-GI foods. In addition, mixed meals containing dairy protein elicit insulin responses similar to those elicited by mixed meals of similar composition containing non-dairy protein. Because the GI of yoghurt is lower than that of most other carbohydrate foods, exchanging yoghurt for other protein and carbohydrate sources can reduce the GI and GL of the diet, and is in line with recommended dietary patterns, which include whole grains, fruits, vegetables, nuts, legumes, fish, vegetable oils, and yoghurt.”

What’s the Insulinemic Index? Prof Jennie Brand-Miller explains. “One of insulin’s many functions is to act as a growth hormone designed to drive nutrients into cells – not

just glucose but also amino acids, the building blocks of new tissue. When we eat carb-rich foods our blood glucose levels rise and our pancreas then releases insulin (a hormone) that drives the glucose out of our bloodstream and into our body's cells where our body can use it as an immediate source of energy or store it as glycogen. What many people don't realise is that protein foods (meat, fish, eggs and dairy foods) also stimulate insulin secretion – that's why you may see them described as insulinogenic."

Scientists at the University of Sydney have been researching the food insulin index or FII for more than 20 years. "The FII looks at how much insulin the body normally releases in response to a whole food or meal (its carbohydrate and the quantity and quality of its protein and fat). Some foods need more insulin to help utilise them, while other foods need much less. Choosing foods with a lower FII can help reduce your overall insulin demand on your pancreas or insulin requirements," says dietitian and diabetes educator Dr Kirstie Bell.

Read more

- **Study:** <https://www.ncbi.nlm.nih.gov/pubmed/28615381>
- **Food Insulin Index:** [Validation of the food insulin index in lean, young, healthy individuals, and type 2 diabetes in the context of mixed meals: an acute randomized crossover trial](#)

WHAT'S HOT?

KOMBUCHA

Does kombucha shape up as the magic elixir of life that "wellness" gurus make out? Is it a "super food"? Dietitian Catherine Saxelby, who maintains the popular Foodwatch website, investigates.



Should you start making it at home? Is it something to add to your daily intake? The short answer is "not really". If you want to add fermented food to your diet you'd be better off making your own sauerkraut which is quicker and easier to do. The long answer? Well, you MAY be getting some friendly bacteria to help your digestion or gut function but no-one knows for sure, and there is likely to be significant differences due to natural variations in the organisms used in the fermentation. There's not a huge amount of research into

Kombucha's health benefits. To my way of thinking, its greatest advantage is its lower sugar content combined with its refreshment value as a tart, effervescent drink.

Kombucha is a slightly sweet, slightly acidic, fermented beverage based on tea, generally black tea but occasionally green or herbal tisanes. It is made from water, tea, sugar, bacteria and yeast. It's a little fizzy which is refreshing and is drunk for its supposed health benefits which are mainly improved digestive balance and gut health from the bacteria you ingest. It's been drunk for this health reason for centuries in Japan, China, Russia, Germany and the USA. It is obtained from an infusion of tea leaves with a SCOBY (which stands for a "Symbiotic Culture Of Bacteria and Yeast"). The fermentation by this "tea fungus" or "mother" is the process that ferments the sugar and yields acetic acid (which gives a characteristic sharp taste), carbonic acid, alcohol and carbon dioxide gas that adds the bubbles.

At around 1 per cent sugar, Kombucha is much lower in kilojoules/calories than other sweet drinks, such as juices (8–14 per cent) or iced teas (range 5–6 per cent). A half cup (125ml) of kombucha has 75kJ/18 calories while the same amount of iced lemon tea has 380kJ/90 calories. Of course, all this depends on what brand you buy or how you brew it. Devotees of kombucha claim it can stimulate the immune system, prevent cancer, improve digestion, prevent heart disease and boost liver function, claims similar to those made for vinegar. It may but it all depends on how you've brewed it. There's scant scientific research to support these health claims. An excellent summary of the research can be found in a review in the online Journal of Food Science and Food Safety. In it, Jayabalan et al sum up my thoughts nicely when they say: "Currently Kombucha is alternately praised as 'the ultimate health drink' or damned as 'unsafe medicinal tea'. There are many conceptions and misconceptions regarding the health benefits and toxicity of Kombucha beverage. Though it is claimed to be beneficial for several medical ailments, very little or no clinical evidence is available for that."

You can buy bottled kombucha, both pasteurized and unpasteurized, in various flavours everywhere from health food stores to supermarkets. The downside is that kombucha's probiotics do not survive the pasteurization process, and drinking it unpasteurized, if it was not produced in sanitary conditions, may pose a food safety threat, especially for those who are pregnant or have compromised immune systems. So be careful where you buy it. And only buy it if it's refrigerated.

Read more:

- [Kombucha – should you be drinking it?](#)
- [A Review on Kombucha Tea—Microbiology, Composition, Fermentation, Beneficial Effects, Toxicity, and Tea Fungus](#)

PRODUCT REVIEW

WHAT'S IN KOMBUCHA?

Mostly water. To brew a batch that's all you need along with a few black or green tea or teabags, some sugar and a SCOBY "pancake". For flavour, add slices of lemon, orange, strawberries or ginger root when serving. Most recipes we looked at make around 2 litres (quarts) which makes the price per 100ml/3½fl oz around the cost of a teabag and a couple of teaspoons of sugar (say 30 cents) – most people get the SCOBY from a neighbour or friend already brewing. We took a look at what's in three top-selling brands owned by

international corporations. We found that they cost significantly more – around AUD\$1–1.35 per 100ml/3½fl oz serving.

KEVITA Master Brew Kombucha – Ginger (PepsiCo)

Ingredients: Sparkling Water, Kombucha Culture (Filtered Water, Black Tea Extract, Green Tea Extract, Natural Flavor), Filtered Water, Cane Sugar, Ginger Extract, *Bacillus coagulans* LactoSpore MTCC 5856, Black Tea Extract, Black Tea Essence, Caffeine (Green Coffee Bean Extract), Green Tea Extract, Stevia Leaf Extract.

- **LactoSpore** is a commercial probiotic preparation containing L(+) lactic acid producing microbial preparation from *Bacillus coagulans*, MTCC 5856 (earlier known to be *Lactobacillus sporogenes*).
- **Stevia Leaf Extract** is a collection of intense sweeteners derived from stevia leaves. These contain a number of steviol glycosides – a type of very sweet molecule. Stevioside, rebaudioside A and M have been commercialised and are added to foods and beverages and used in tabletop and pourable products.

Nutrition Facts	Per 450ml bottle	Per 100ml
Energy (kilojoules)	273kJ	60 kJ
Energy (Calories)	65 Cal	14 Cal
Protein	0g	0g
Fat	0g	0g
Total carbohydrate	15g	3g
– Sugars	15g	3g
Sodium	37mg	8mg
Probiotic content – <i>Bacillus coagulans</i> LactoSpore MTCC 5856		

MOJO Crafted Kombucha – Ginger (Coca-Cola)

Ingredients: Organic Crafted Kombucha (Water, Organic Sugar, Organic Tea, Kombucha Culture), Ginger Juice (2%), Probiotic (*Bacillus coagulans* GBI-30 6086).

Nutrition Facts	Per 330ml bottle	Per 100ml
Energy (kilojoules)	165kJ	50 kJ
Energy (Calories)	39 Cal	12 Cal
Protein	0g	0g
Fat	0g	0g
Total carbohydrate	6.6g	2g
– Sugars	6.3g	1.9g
Sodium	18.2mg	5.5mg
Probiotic content – <i>Bacillus coagulans</i> GBI-30 6086	1 billion organisms	

REMEDY Organic Kombucha – Ginger Lemon (Lion Nathan)

Ingredients: Certified organic raw kombucha, (pure water, wild kombucha culture, organic black tea, organic green tea), organic ginger, naturally fermented organic glucose (erythritol), organic lemon, organic stevia (steviol glycosides).

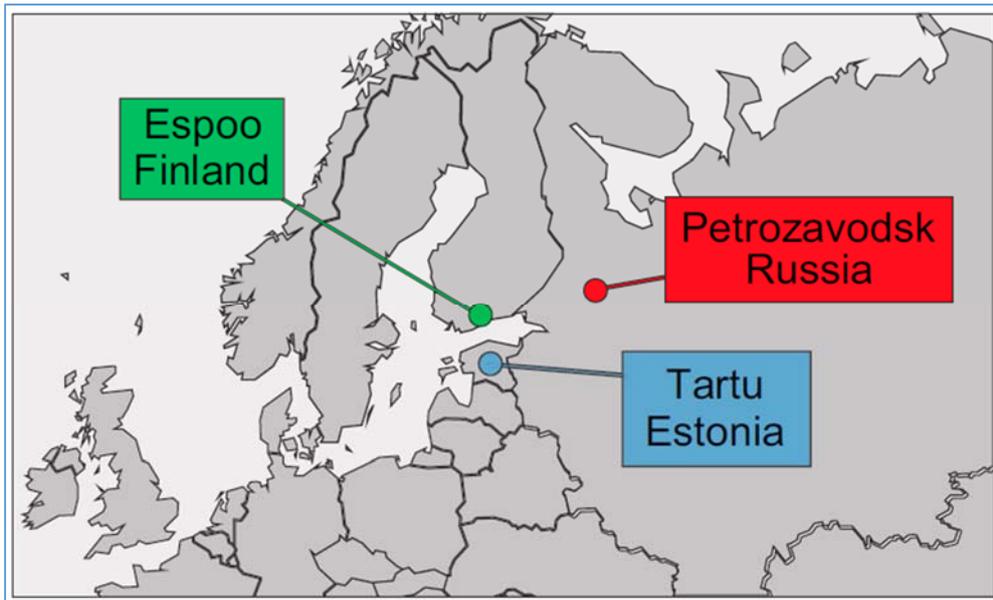
- According to the nutrition information panel, Remedy contains 5g carbohydrate but no sugars. So where do the carbs come from? We think it is probably the erythritol which is a derivative of glucose (a monosaccharide sugar). It would be interesting to know how much glucose goes into the pot.
- Erythritol is a polyol (sugar alcohol), which is a type of carbohydrate with a chemical structure that partially resembles sugar and partially resembles alcohol. It's naturally found in very small amounts in some plants (grapes, melons, and mushrooms), and is manufactured in commercial quantities by a fermentation process typically using wheat or cornstarch. In the US and Canada, polyols are listed on food labels in the carbohydrates section; Australia's regulations are unhelpful for consumers in this regard which is a pity as they are increasingly being added to the food supply as sugar replacers – and the more you consume the more likely you will succumb to the potential laxative effect.
- While most polyols have a reputation for having a gassy and laxative effect, erythritol doesn't because most of it is rapidly absorbed in the small intestine and excreted unchanged in urine. Only about 10 per cent enters the large intestine, where either the healthy bacteria feast on it, or it is excreted in faeces. EU approval for erythritol excludes its use in beverages, as there is a concern that the laxative threshold value may be exceeded when it is consumed this way, especially by young people.

Nutrition Facts	Per 330ml bottle	Per 100ml
Energy (kilojoules)	99kJ	29 kJ
Energy (Calories)	23 Cal	7 Cal
Protein	0g	0g
Fat	0g	0g
Total carbohydrate	5g	1.5g
– Sugars	0g	0g
Sodium	Less than 5mg	Less than 5mg
Probiotic content not provided		

PERSPECTIVES: DR ALAN BARCLAY

DOES THE MICROBIOME AFFECT THE RISK OF DEVELOPING TYPE 1 DIABETES?

The number of people developing type 1 diabetes has increased significantly all around the world since World War II, but incidence rates (number of new cases in a year) vary amongst regions. It is most common in Northern Europe, with Finland having the highest rate in the world, with more than 60 new cases per 100,000 people per year. Surprisingly, there is a 5- to 6-fold higher incidence of type 1 diabetes in Finnish Karelia compared to Russian Karelia. Karelia is a region in Finland that crosses into Russia. The border between Finnish and Russian Karelia marks one of the sharpest boundaries in the standard of living and health in the world.



The risk factors for type 1 diabetes are still not fully known or understood and are the subject of ongoing scientific research. Environmental factors (e.g., sunlight and vitamin D production) and exposure to certain infectious diseases have been linked to the risk of developing type 1 diabetes, but the research is not conclusive. There is emerging evidence that the microbiome can affect the risk of developing type 1 diabetes in genetically susceptible individuals.

Recently, 148 infants who were at risk of developing type 1 diabetes and living in Finland and Russia were followed from birth to 3 years of age. Each month, stool samples and laboratory assays were collected, and questionnaires regarding breastfeeding, diet, allergies, infections, family history, use of medications, and clinical examinations were conducted. It was found that Finnish infants had a greater proportion of *Bacteroides* species, whereas the Russians had more *Bifidobacterium* in their stools. The nature and composition of different lipopolysaccharides derived from the respective microbiomes determined the level of immune activation in the infants. It is interesting to note that it has also been found that the injection of an immunogenic subtype of lipopolysaccharides from *E. coli* in to mice can decrease the incidence of diabetes. More research is needed to determine if changing the microbiome can decrease the risk of developing type 1 diabetes in susceptible humans.

There are a number of differences between Finnish and Russian Karelia that will have important public health implications. Here are four:	
Lifestyle	This is largely urbanised in Finnish Karelia; Russian Karelia's is more agricultural.
Water supply	Many Russians still use wells and water from lakes, Finns have tap water.
Milk	Russians predominantly use unpasteurised milk, not so neighbouring Finland.
Diet	Karelian Finn's eat more packaged processed foods and have more refrigeration than Karelian Russians.

However, despite having a much greater risk of type 1 diabetes, Karelian Finns live on average 13 years longer than their Russian counterparts.

The gut microbiome composition within the first year of an infant's life is largely shaped by milk, the sole nutrient source available to infants, whether from breast- or bottle-feeding. After that, foods and drinks consumed have an increasingly large impact. Traditional Russian Karelian cuisine has been developing for centuries and incorporates a variety of local foods including fish (lake), wild mushrooms, berries and honey. Milk and dairy foods are popular, along with bread made from barley, rye or oat flour. Meat is traditionally a winter dish and is not eaten every day. Drinks include bread and turnip "kvas" (In Russian "kvas" means mildly alcoholic drink made from fermented rye bread, yeast or berries) and teas from wild raspberries and currants.

While we are unable to prevent type 1 diabetes at this point in time, research into our microbiome may help certain at-risk individuals prevent it in the future. Stay tuned.

Read more:

- [The emerging global epidemic of type 1 diabetes.](#)
- [Hunt for the origin of allergy - comparing the Finnish and Russian Karelia.](#)
- [Environmental risk factors for type 1 diabetes.](#)
- [The Role of the Intestinal Microbiome in Type 1 Diabetes Pathogenesis.](#)
- [The Karelia study of type 1 diabetes.](#)
- [Russian Karelian cuisine.](#)



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KEEPING IT GREEN – EATING FOR BODY AND PLANET

OUR E-WASTE PROBLEM

Were you gifted yet another unneeded donut maker or fondue fountain for Christmas? After being stored in your kitchen for a short while, your electronic waste or 'e-waste' will eventually be thrown into landfill. E-waste includes any gadgets with a battery or power cord, including kitchen appliances and white goods. Throwing these unwanted items into landfill isn't just wasteful; it is harmful to our environment.



The issue with e-waste The consequences of our lust for the latest and greatest gadgets are disturbing. According to the government of Victoria, Australia, in 2016 we produced almost 45 million tonnes of e-waste globally and sadly only 20 per cent was recycled. The rest went straight to landfill. Burying enormous volumes of e-waste is simply not sustainable.

When we throw away electronics, we waste the resources used to make them and produce even more greenhouse gases trying to mine and process more metals for new ones. E-waste contains valuable metals that can be recycled and reused multiple times. We are literally throwing away tonnes of precious metals like copper, gold and silver every year. These resources are limited, once they end up in landfill, they are gone forever. The Victorian Government is putting a ban on e-waste in landfill from 1 July 2019 (you could lobby your government to do the same).

If not recycled properly, our devices can end up in e-waste graveyards in Asia, Africa and South America. There you find children gathering and burning e-waste while inhaling toxic fumes that increase their risk of lead poisoning. Burying it is also a bad idea as heavy metals can leach into the soil and potentially enter the food chain. According to community group *Clean Up Australia*, a massive 70% of the toxic chemicals in landfill, such as mercury and lead, come from e-waste.

Do you really need to upgrade? Only upgrade your gadgets when they have reached the end of their life and cannot be repaired. Before buying new electronics do your research and invest in items that can be repaired and recycled. Often slimmer designs are glued or soldered together, making them difficult to recycle or repair. Support companies that create sustainable designs.

How to recycle your e-waste If you have somehow ended up with more electronics than you can use, give them to friends or a local charity. Check out online communities like Oz Recycle where you can give away unwanted electronics to people who need them. For any electronics containing personal data such as mobile phones or computers, use the factory reset setting to wipe the data before giving them away.

If your e-waste can't be re-used, recycle it. You can often recycle e-waste for free, just Google 'nearby e-waste drop off locations' or contact your local council. Some governments have implemented stewardship schemes that require manufacturers of electronics to fund the collection and recycling of their products when they can no longer be used. In Australia, visit Recycling Near You to find local drop off points for a range of e-waste, even whitegoods and light bulbs. In Europe you can return e-waste to the retailer, as they are required by law to organise suitable recycling (why isn't the rest of the world doing this?). Whereas in the US, recycling schemes vary in each state so you will need to contact your local government authority to find drop off points.

E-Waste in a Nut Shell

- To reduce your environmental footprint, minimise your e-waste.
- Extend the life of your electronics by repairing them and replace only as needed.
- Recycle electronic appliances and gadgets at the end of their life.
- Choose electronic goods carefully and support companies with repairable and recyclable designs.

Read more:

- <https://www.sustainability.vic.gov.au/Campaigns/eWaste/Why-recycle-ewaste>
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4957139/>

- <https://www.researchgate.net/publication/275152363> The Global E-waste Monitor - 2014
- <https://www.cleanup.org.au/electronic-waste>
- <https://www.ozrecycle.com/>
- <https://recyclingnearyou.com.au/ewastescheme/>
- http://ec.europa.eu/environment/waste/weee/index_en.htm

Thanks to Rachel Ananin aka TheSeasonalDietitian.com for her assistance with this article.



In this series we explore how you can reduce your ecological impact through your food choices. We'll help you do your bit for the environment, one mouthful at a time.

Nicole Senior is an Accredited Nutritionist, author, consultant, cook, food enthusiast and mother who strives to make sense of nutrition science and delights in making healthy food delicious.

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GOOD CARBS FOOD FACTS

CABBAGE

Dietitian Nicole Senior wrote this for us a few years ago. We asked her to update it for Good Carbs Food Facts this month as sauerkraut is a must for our fermented issue.

Rich in vitamin C, vitamin K, folate and cancer-fighting phytochemicals, cabbage is one of those veggies you can enjoy in many different ways. Some people hold back because it's famous for causing profuse bottom burps high on the malodorous meter. The gas is due to high fibre and FODMAP content and the whiff is caused by a sulfurous compound called sulforaphane. FODMAPs (an acronym for **F**ructose, **O**ligosaccharides, **D**isaccharides, **M**onosaccharides **A**nd **P**olyols) are essentially poorly absorbed sugars and polyols (sugar alcohols) that ferment in the bowel and create gases that are actually beneficial but can also cause misery in people with IBS (Irritable Bowel Syndrome) who tend to be sensitive to FODMAPs.



Cabbage is most aggressive when raw and is tamed by cooking and particularly by fermenting; another bonus for this ancient preservation method. Cabbage can become

stinky even before you eat it but you can prevent this by not over cooking it. Try it stir-fried with sliced onion and finished with a dash of balsamic or raspberry vinegar.

Sauerkraut is one of the most well known fermented foods. The word *sauerkraut* is German but it's popular throughout Eastern Europe, and the Dutch and French also have their own versions. Fermenting cabbage was traditionally used to preserve a glut of cabbage without refrigeration and has become popular again with a trend toward more wholesome, home-made, natural foods, as well as food preserving. The recipe is very simple and the flavour comes from the magic that happens when lactic acid bacteria have their way with shredded cabbage – a process similar to making yoghurt from milk. Sauerkraut is basically cabbage that has been left to stew in its own juice. The result is sour, a bit salty and marvellously complex. Making sauerkraut is pretty simple as it only requires salt and a bit of elbow grease. Simply bruise shredded cabbage, add salt, weigh the cabbage down with something heavy and fill with water. You could add some spices such as juniper berries to the water, or mix in some red cabbage to make pink sauerkraut. You need to leave it about a month.

Slaw is short for coleslaw, also known as cabbage salad and is a recipe as old as the hills and used to be as uncool as they come. It just goes to show everything old can be new again. I'm delighted this salad classic is having its moment in the sun. I was amazed to discover that slaw was not invented by the Australian Country Women's Association (a group of strong, resourceful rural women famous for their food skills), but rather it is quite cosmopolitan in its provenance. The American classic is made with mayonnaise rather than vinaigrette dressing; the German version *krautsalat* often has apple; the Italians have one called *capricciosa*; the Swedes have *pizzasallad* (and they eat it with pizza); and the British version has carrot and red onion (and this is the one I grew up with). The 'slaw I make most often now is Asian style with cabbage, carrot, spring onion, fried noodles and sesame oil vinaigrette- yum. 'Slaw adds colour, crunch, flavour and health to rolls, wraps and sandwiches, and makes a smashing side to grilled meats or fish.

Good Carbs Food Facts	
Cabbage	
★ ★ ★ ★ 1/2	
Glycemic index – not applicable	
Gluten free	
Serving size – ½ cup	
Kilojoules	52
Calories	13
Protein	0.7
Fats – Total	<0.1
Includes:	
–Saturated fat	0
–Unsaturated fat	0
–Cholesterol	0
Saturated : unsaturated fat ratio	0.0
Carbohydrates – Total	3
<i>Available</i>	
Includes:	

--Natural sugars	1.6
–Natural starches	0
–Added sugars	0
–Added starches	0
<i>Unavailable</i>	
Includes:	
–Dietary fibre	1.4
Sodium	8
Potassium	153
Sodium : potassium ratio	0.05
Glycemic load	N/a
Diabetes exchange	0
Ingredients: Cabbage	

IN THE GI NEWS KITCHEN THE GOOD CARBS COOKBOOK

	<p><i>The Good Carbs Cookbook</i> (by Alan Barclay, Kate McGhie and Philippa Sandall) published by Murdoch Books helps you choose the best fruits, vegetables, beans, peas, lentils, seeds, nuts and grains and includes 100 recipes using them to enjoy every day, for breakfast, lunch, dinner and dessert. The recipes are quick to cook (mostly), long in flavour and full of sustaining goodness. There is a nutritional analysis for each and tips for the novice, nervous, curious or time-starved cook.</p>
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FERMENTED BEETROOT, CARROT AND CAULIFLOWER

The vegetables must be of the highest quality for fermenting. Broccoli florets the same size as the cauli or small trimmed halved Brussels sprouts make a lovely ‘green’ addition. Other than the ratio of sea salt to water for the brine, there’s no standard recipe. You create your own.

- 3 garlic cloves, peeled and bruised (optional)
- 2 cups small cauliflower florets
- 2 large carrots, peeled, cut into thin sticks
- 3 tablespoons (12 teaspoons)
- 3 cups (1.25 litres/24 fl oz) filtered water

Place the garlic in the bottom of clean jars or large container. Cover with even layers of beetroot, cauliflower and carrot leaving a space at the top of about 2.5 cm (1 inch). • Dissolve sea salt in the water and pour slowly over the vegetables. Use a thin utensil (a chopstick is ideal) to release any trapped air bubbles. Add more brine if necessary to completely cover the vegetables. Weigh the vegetables down with the weight of choice. • Cover each jar with a tight lid, airlock lid, cabbage leaves or coffee filter secured with a rubber band. • Ferment at room temperature until the desired flavours and textures are achieved. If using a tight lid without an airlock, “burp” daily by gently starting to unscrew the lid to release excess pressure. Once the vegetables are finished, secure with a tight lid on the jars and move to cold storage or refrigerate.

Per serve

430kJ/103 calories; 5g protein; 0.5g fat (includes 0g saturated fat; saturated : unsaturated fat ratio 0.0); 15g available carbs (includes 15g sugars and 0g starches); 9.5g fibre; 3065mg sodium; 920mg potassium; sodium : potassium ratio 3.3

A DOLLOP MAKES A DIFFERENCE

 <p>A little pot of purity</p>	<p>Jalna yoghurt is made the traditional pot set way to produce a thick and creamy texture. Inspired by the flavour, colour, texture and taste of the vegetable garden, they have developed a range of recipes to help us up our veg intake by adding a dollop of their pot-set Greek yoghurt toppings. They have kindly shared the following recipes with GI News readers.</p>
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QUINOA CRUSTED VEGGIE CAKES WITH HORSE RADISH YOGHURT

Horseradish yoghurt is a great way to add oomph to veggie fritters. Add other vegetables such as wilted kale, grated eggplant, zucchini or corn and substitute wasabi for horseradish and amaranth for quinoa if you wish. Serves 6



400g (14oz) can cannellini beans, rinsed and drained

400g (14oz) can chickpeas, rinsed and drained

1 cup coriander leaves

1 medium red chilli, seeded and chopped

1 clove garlic, crushed

1 egg, lightly beaten

1 tbsp Greek yoghurt

1 cup cooked quinoa

⅓ cup edamame, blanched

⅓ cup green peas, blanched

1 green onion, finely sliced

⅓ cup quinoa flour

2 eggs, lightly beaten with 2 tbsp Greek yoghurt
1½ cups quinoa flakes
Vegetable oil or oil spray
Lemon wedges to serve

Horseradish yoghurt

1 cup Greek yoghurt
1½ tbsp (6 tsp) prepared horseradish
1½ tbsp (6 tsp) lemon juice
Salt and cracked pepper, to taste

Preheat oven (220°C/200°C fan forced) and line a baking tray with baking paper • Puree cannellini, chickpeas, coriander, chilli, garlic, egg and yoghurt in a food processor until coarsely mashed but mixture holds together. • Place mixture in a large bowl and add quinoa, edamame, green peas, green onion, and salt and pepper to taste if desired. Shape approx ¼ cup of mixture into balls and flatten slightly. Dip in flour, dust off excess, dip in egg and yoghurt mix, then roll in quinoa flakes. • Spray or lightly brush with oil and bake, for 20 minutes or until golden, turning halfway through. • To make horseradish yoghurt, place all ingredients in a bowl & whisk to combine. • Serve fritters with horseradish yoghurt and lemon wedges.

Per serve

2025kJ/485 calories; 25g protein; 10g fat (includes 2.5g saturated fat; saturated : unsaturated fat ratio 0.33); 64g available carbs (includes 15g sugars and 49g starches); 15g fibre; 465mg sodium; 943mg potassium; sodium : potassium ratio 0.49

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